Draft Master Plan of Drainage Report

for

World Logistics Center Specific Plan and Environmental Impact Report

Prepared for

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Section 1 Introduction

The drainage report is prepared to provide engineering technical support for the World Logistics Center Specific Plan (Project) and Environmental Impact Report (EIR). This drainage report contains discussion of the existing drainage condition, proposed drainage condition, impacts of Project, and mitigation measures.

1.1 Project Description

The proposed World Logistics Center Specific Plan (WLC) is a master plan for the development of logistics warehouse distribution facilities on approximately 2,710 acres of land in the Rancho Belago area of eastern Moreno Valley. The Specific Plan proposes the development of approximately 41.4 million square feet of high-cube logistics facilities on 2,606 acres, 200,000 square feet of general warehousing facilities on 29 acres, an in-project fueling station, and 75 acres of permanent open space.

The Specific Plan area is situated southerly of State Route 60, generally between Redlands Boulevard and Gilman Springs Road (the easterly City limit). The Specific Plan extends to, but does not include, the San Jacinto Wildlife Area (SJWA). The General Plan Amendment and Zone Change which accompany the Specific Plan do include the SJWA property in order to designate the SJWA land for open space use. The project site is shown on Figure 1.

1.2 Objectives

The primary objectives of the study are as following:

1. Identify the existing drainage pattern and surface water runoff.
2. Conduct hydrology analysis of both offsite and onsite watersheds based on the existing and proposed land uses and drainage patterns.
3. Identify the potential runoff impacts associated with the proposed land development.
4. Propose drainage systems and mitigation measures including detention basins to mitigate the increased runoff due to the land development.

The hydrology analysis in this report is in compliance with the guidelines and requirement of local agencies, and has been prepared at a preliminary planning level. Additional engineering analysis and field investigation will be required to support future tentative parcel map(s) and final engineering drawings.

Section 2 Existing Condition

2.1 Existing Condition

2.1.1 Existing Land Use

The project site is primarily agricultural farmland, and a few residential units. The area is mostly undeveloped with some vegetative coverage.

2.1.2 Hydrogeologic Condition

The project site is located within the Perris hydrologic area of the Santa Ana Basin. California Department of Water Resources identifies groundwater wells located within of the project site. Groundwater measurements from 1939 to 1985 indicate a depth range from approximately 100 to 150 feet below ground surface. Groundwater was measured at 106 feet below ground surface within an onsite well (Geoscience 2007).

According to the City of Moreno Valley General Plan EIR, the project site lies primarily on tectonic block known as the Perris Block. The Project Preliminary Geotechnical Evaluation for EIR (2011) indicated that the onsite earth materials consist of undocumented fill, topsoil, alluvium, landslide materials, San Timoteo Formation and granitic bedrock. The structural unit is located within the Peninsular Range Geomorphic Province, one of the major geologic provinces of southern California. The study area covers portions of the watershed encompassing approximately 3,796 acres, of which approximately 10 percent is developed and 90 percent consists of native open brush that provides poor coverage. The off-site tributary areas are generally undeveloped. The offsite flows tributary to the Project area originate from the upstream foothill area known as “The Badlands” as well as a small portion of moderately developed areas and open space. Flows from the upstream watershed collect in natural drainage courses and flow southerly under SR-60 and Gilman Springs Road through existing drainage culverts and onto the project site.

2.1.3 Existing Watershed

The stormwater runoff from the project generally flows in a southerly direction to the San Jacinto River. A topographic divide located west of Theodore Street separates stormwater flows to the San Jacinto River in two directions. Runoff east of the divide flows through the San Jacinto Valley at a gradient ranging from 1 to 2 percent to the San Jacinto Wildlife Area and ultimately drains toward the Gilman Hot Springs hydro-subarea; and runoff west of the divide flows to the Perris Valley Storm Drain at a gradient ranging from 1 to 2 percent and ultimately drains toward the Perris Valley hydro-subarea. Both hydro-subareas eventually flow to the San Jacinto River, approximately 10 miles south of the project site.

Flows tributary to the project site originate from the upstream Badlands and open space, specifically from north of SR-60 and Gilman Springs road, are considered as the offsite tributary areas. For the hydrologic analysis and modeling purposes, the project onsite area along with the offsite tributary areas are divided to six (6) sub watersheds, named Watershed “A”, Watershed “B”, Watershed “C”, Watershed “D”, Watershed “E”, and Watershed “F”, shown on Figure 3.

2.2 Existing Drainage Systems

2.2.1 Watershed “A”

Watershed “A” is located within Riverside County Flood Control and Water Conservation District (RCFCWCD) Moreno Master Drainage Plan (MMDP) area. RCFCWCD is currently preparing a revised MMDP as shown on Figure 2. The existing 12-foot wide by 8-foot high reinforced concrete box (RCB) east of Redlands Blvd is owned by RCFCWCD and is designated as Line “F” in the MMDP. The RCB

was constructed as part of the Highland Fairview Corporate Park (HFCP) development that was completed in 2011. The 12-foot wide by 8-foot high RCB conveys runoff from the existing culverts under SR-60. The RCB is located further west than depicted on the MMDP to avoid the existing Logistics Building south of SR-60. As part of the HFCP development a Logistic Building Runoff Management Plan (LBRMP) was prepared by RBF in 2008. That report indicated that the existing culverts under SR-60 were partially blocked by sediment and debris allowing little flow from the culverts to enter the project site. As a result, water ponds north of State Route 60 and peak flow rates decrease due to the capacity of the existing culverts.

The offsite area north of SR-60 is largely undeveloped with clusters of low density residential development within the Moreno Valley city limits. The MMDP indicates that storm flows north of SR-60 will be routed to the proposed Sinclair Basin and Redlands Basin. Flows released from the proposed basins will pass under SR-60 and be conveyed to Line "F" as shown on Figure 2. Because it is unknown as to when these basins will be constructed, this study is prepared with the assumption that the Basins are not in place prior to this project, and the offsite flow will be conveyed to Line "F" directly.

A 36-inch and 42-inch storm drain in Eucalyptus Avenue confluence with Line "F" prior to the end of the RCB south of Eucalyptus Avenue. The outflow from Line "F" sheet flows via a spreading area into the agricultural land downstream. Further south, the agricultural land drains to an existing RCFCWCD earthen channel southwest of Redlands Blvd, which flows to the Greenbelt Channel located south of Cactus Avenue as shown on Figure 2. The Greenbelt channel ultimately drains to the Perris Valley Storm Drain. Along the east side of Redlands Blvd, is an existing storm drain which outlets to the earthen channel. An existing open v-ditch along the east side of Redlands Blvd from Dracaea St. to the earthen channel collects flows from the west side of the project boundary. The v-ditch also outlets to the existing RCFCWCD earthen channel.

2.2.2 Watershed "B"

In Watershed "B", an open ditch exists along both sides of Theodore Street to convey runoff from adjacent areas shown on Figure 3. The ditches are moderately covered by vegetation with bottom widths varying from 1 to 2 feet and depths varying from 1 to 3 feet

2.2.3 Watershed "C"

The natural drainage course in Watershed "C" is covered by vegetation, with an average bottom width of approximately 3 feet and a depth of approximately 2 feet. The drainage course drains southerly through the project boundary.

2.2.4 Watershed "D"

The natural drainage course in Watershed "D" is also heavily vegetated. Its bottom width varies from approximately 1 to 3 feet, and its depth varies from approximately 1 to 2 feet. The drainage course ends east of the existing gas facility. It is estimated that when significant storm events occur, the runoff ponds locally and eventually drains southwest.

2.2.5 Watershed "E"

The natural drainage course in Watershed "E" has a bottom widths varying from approximately 20 to 30 feet and depths varying from approximately 10 to 15 feet. The majority of this channel is covered by vegetation, with a few locations of erosion. Approximately 1,500 feet north of the southerly project boundary, another natural drainage course confluences with the earthen channel forming a "V" shape junction. The junction is moderately eroded.

2.2.6 Watershed "F"

The natural drainage course in Watershed "F" is located approximately 500 feet west of Gilman Springs Rd. The drainage course is vegetated, with bottom widths varying from approximately 5 to 10 feet, and depths varying from approximately 1 to 3 feet.

These natural drainage courses in Watersheds "B" through "F" drain into the San Jacinto Wildlife Area downstream. The majority of the project site sheets flow through the project southerly boundary.

2.3 Floodplain Analysis

The project site is located in the Moreno Valley drainage area and is tributary to the San Jacinto River, which is approximately 10 miles south of the project site. Based on the latest Flood Insurance Rate Map (FIRM) published by the Federal Emergency Management Agency (FEMA), the Project site is not located within the 100-year floodplain, and the proposed development will not encroach into the 100-year floodplain boundaries. The FIRMs 06065C0760G, 06065C0770G, and 06065C0790G are included in Appendix B.

2.4 Hydrology Analysis for Existing Condition

The hydrologic models have been set up to simulate the existing conditions for the study area. CivilD Unit Hydrograph and Flood Routing programs are used to analyze the existing condition for 100-year 3-hour and 100-year 24-hour storm events. Based on the modeling results, the 100-year 3-hour storm provides the highest peak flows, and the 100-year 24-hour storm provides the highest flow volumes, which are presented in the Appendix A. These results are consistent with the LBRMP prepared by RBF dated 2008. The modeling results are summarized as follows:

Table 2.1 Project Existing Condition for 100-year 3-hour Storm Event

Watershed	***Discharge Point***	***Area(ac)***	***Manning's n***	***Peak Flow(cfs)***
"A"	78	2484	0.03	2810
"B"	12	502	0.03	430
	22	857	0.03	700
"C"	37	956	0.03	705
	41	121	0.03	115
"D"	53	767	0.03	600
	61	231	0.03	215
"E"	73	2510	0.03	1990
"F"	81	99	0.03	100
	93	121	0.03	120
	102	152	0.03	150
	112	74	0.03	75

Table 2.2 Project Existing Condition for 100-year 24-hour Storm Event

Watershed	**Discharge Point**	**Area(ac)**	**Manning's n**	**Peak Flow(cfs)**
"A"	78	2484	0.03	1170
"B"	12	502	0.03	190
	22	857	0.03	320
"C"	37	956	0.03	330
	41	121	0.03	55
"D"	53	767	0.03	260
	61	231	0.03	100
"E"	73	2510	0.03	860
"F"	81	99	0.03	40
	93	121	0.03	50
	102	152	0.03	60
	112	74	0.03	30

Section 3 Proposed Condition

3.1 Proposed Condition

3.1.1 Proposed Land Use

The Project proposes a land use of high-cube logistics distribution facilities. These proposed buildings are used for receipt and shipment of goods to secondary retail markets. The project amends the City's General Plan and Zoning Ordinance and adopts a specific plan to set forth comprehensive land use regulations governing the project area.

3.1.2 Proposed Watershed

The proposed project will maintain the existing drainage pattern generally flowing southerly through the project site. The project area will remain in the Gilman Hot Springs hydro-subarea and Perris Valley hydro-subarea, and ultimately drains to the San Jacinto River. Without mitigation, the proposed land uses have the potential to impact the hydrologic characteristics of the watershed through the following:

1. Increasing the percentage of impervious areas.
2. Increasing the peak flow.
3. Reducing the time to peak flow.
4. Increasing the hydraulic efficiency of the drainage systems from natural drainage courses to improved underground drainage systems and detention basins.

Consistent with the existing condition, the offsite and onsite tributary areas are divided into six (6) sub watersheds, named Watershed "A", Watershed "B", Watershed "C", Watershed "D", Watershed "E", and Watershed "F", shown on Figure 4. For the project onsite areas, the boundaries of the proposed sub watersheds are set to accommodate the proposed land use and roadway layout; however in general, the layout of proposed sub watersheds are consistent with the existing sub watersheds.

3.1.3 Design Guidelines

Due to the land use change associated with the land development, a number of drainage systems are proposed to mitigate the changes of hydrologic characteristics of the watershed. The design guidelines for this project are in accordance with RCFCWCD requirements, and relevant local agency guidelines. The design guidelines and local flood protection requirements are summarized as the following:

- Drainage facilities shall be designed in accordance with the Riverside County Hydrology Manual and Design Manual Standard Drawings.
- The drainage systems shall be designed to provide 100-year level of flood protection through a combined hydraulic conveyance of the underground storm drains and detention basins.

- Proposed drainage systems which are connecting to the existing downstream facilities, shall be designed so the proposed discharge does not exceed the existing discharge to the downstream facilities.
- Provisions for maintenance and/or easement shall be incorporated in the proposed drainage systems.

3.2 Proposed Drainage Systems

Development of the proposed project site will increase the impervious surface due to the construction of the projects buildings, roadways and associated improvements. The improvements will have the potential to increase stormwater runoff. Underground drainage systems and detention basins are proposed to convey the stormwater runoff and mitigate the increased flow due to the proposed land development. Ultimately, for the proposed condition, the peak flows at downstream discharge points where the flows exit the southerly project boundary will not exceed the peak flows for the existing condition..

Six (6) major drainage systems are proposed, named Line “A” (referred to Line “F” in MMDP), Line “B”, Line “C”, Line “D”, Line “E” and Line “F”, shown on Figure 4. The majority of the Line “E” will remain as is; with three exceptions: 1) where Line “E” crossing the proposed Street C, a culvert will be provided at the crossing; 2) where Line “E” crossing the proposed Street G, a culvert will be provided at the crossing; 3) a lateral connected with Line “E” will be re-aligned and improved. The Unit hydrographs and flood routing models have been set up to simulate the proposed condition. Based on the modeling results, the 100-year 3-hour storm provides the highest peak flows, and the 100-year 24-hour storm provides the highest flow volumes, which are presented in the Appendix A, and summarized in Table 3.1 and 3.2, respectively.

The 100-year 3-hour storms providing the highest peak flows are used to preliminarily size the proposed drainage systems. Because there are no sediment basins constructed upstream of Gilman Spring Road, some sediment from offsite could flow to the project sites through the existing culverts at the SR-60 and Gilman Springs road. To be conservative, bulking is considered for the offsite flow. Bulking results in the increase of the flow rate due to inclusion of sediment in the flow. This condition applies primarily to mountain areas subject to the poor vegetative cover protecting the soil. It also applies to watersheds in mountain areas with loose surface material that is likely to produce sediment. The soil cover of the offsite areas is in fairly good condition. For this study, a bulking factor (Fb) of 1.6 is adopted to bulk the offsite flows from north of SR-60 and Gilman Springs road. The bulking factor is calculated in accordance with the RCFCWCD Hydrology Manual, and the detailed calculations are included in Appendix C. At the time of final design, the bulking factor calculations will be finalized for design purposes. Where the offsite flow exists, the bulked offsite flow combined with onsite flow is used as the design peak flow to size the drainage system. Utilizing normal depth calculations, the Flow Master Program was used for the preliminary pipe sizing. The normal depth calculations are also included in Appendix C, and the preliminary sizes of proposed drainage systems are summarized in Table 3.1.

Table 3.1 Project Proposed Condition for 100-year 3-hour Storm Event

Drainage System	*Watershed*	*Discharge Point*	*Manning's n*	*Peak Flow(cfs)*	*Preliminary Sizing*
"A"	"A"	A4	0.015	2190	12'X8'RCB
"B"	"B"	B4	0.015	1080	96" RCP
"C"	"C"	C4	0.015	825	9'X8' RCB
"D"	"D"	D3	0.015	655	96" RCP
*	"D"			85	-
"E" **	"E"	71	0.015	1360	12'X8' RCB***
"E" Lateral	"E"	72	0.015	650	96" RCP
"E" **	"E"	73	0.015	1950	12'X9' RCB***
*	"F"			30	-
"F"	"F"	F3	0.015	395	96" RCP

** Basin only*
***The Line "E" is the existing earthen channel to be protected in place except at street crossings.*
****See Figure 1 and 4 for culvert locations at street crossings*

Table 3.2 Project Proposed Condition for 100-year 24-hour Storm Event

Drainage System	*Watershed*	*Discharge Point*	*Manning's n*	*Peak Flow(cfs)*
"A"	"A"	A4	0.015	1215
"B"	"B"	B4	0.015	470
"C"	"C"	C4	0.015	390
"D"	"D"	D3	0.015	265
*	"D"			40
"E"	"E"	71	0.015	580
"E" Lateral	"E"	72	0.015	270
"E"	"E"	73	0.015	830
*	"F"			15
"F"	"F"	F3	0.015	125

** Basin only*

3.2.1 Watershed "A"

Within Watershed "A", the runoff from north of the SR-60 currently flows to the existing 12-foot (W) by 8-foot (H) RCB, referred as Line "F" in MMDP; then flows to the spreading area, constructed as part of the HFCP project. The 12-foot by 8-foot RCB will need to be extended southerly as the

proposed Line "A" to convey the offsite flow. The project also proposes four (4) onsite detention basins, identified as A1 to A4, to mitigate onsite flows before outletting to Line "A" as shown on Figure 4. The approximate sizes of the basins will need to be confirmed in the final design phase. Ultimately, Line "A" flows to the discharge point Node A4 at Redlands Blvd, and eventually drains to the RCFCWCD regional facility. The flow from Line "A" exiting the project southerly boundary is 2,190 cfs, presented in Table 3.1.

3.2.2 Watershed "B"

Within Watershed "B", the offsite runoff from north of SR-60 flows to the proposed Line "B" located along the west side of Street A. The project proposes three (3) detention Basins B1, B2 and B3 shown on Figure 4 to mitigate the onsite flows. Basins B1 and B2 are located near Street E to mitigate the flow west of Street A. The outflow from these basins will be conveyed to Line "B". On the east side of Street A, water flows to the Basin B3.

At the project southerly boundary, Line "B" outlets to the proposed Basin B3, which also serves as a spreading area for Watershed "B". When the water level in the basin rises to a certain elevation, the runoff will be gradually released through an engineered outlet structure illustrated on Figure 5. As part of the outlet structure, the risers will only allow a certain amount of flow through, while keeping the rest stored in the basin. The outflow from the riser/pipe will flow through an energy dissipation area - Rock Slope Protection (RSP), then flow through a slotted curb. This concept allows the proposed drainage system to control the amount of outflow in a way consistent with the existing sheet flow condition and avoiding the potential downstream erosion. With attenuation, a peak runoff of approximately 1,050 cfs exits the project southerly boundary at discharge point Node B4, presented in Table 3.1. The approximate sizes of the basins, riser, piping and slotted curb will need to be finalized in the final design phase. Preliminary calculations indicate that Line "B" requires a 36-inch RCP to convey the runoff transitioning to a 96-inch RCP as the flow increases downstream.

3.2.3 Watershed "C"

Within Watershed "C", the offsite runoff from north of SR-60 flows to the proposed Line "C". The project proposes two (2) detention Basins C1, and C2 shown on Figure 4 to mitigate the onsite flows. Basin C1 is located near Street F, and Basin C2 is located near the project southerly boundary, which also serves as a spreading area. Both offsite and onsite runoff will ultimately flow to Basin C2. When the water level in the basin rises to a certain elevation, the runoff will be gradually released through an engineered outlet structure similar to that described above and illustrated on Figure 5. The approximate sizes of the basins, riser, piping and slotted drains will need to be finalized in the final design phase. With attenuation, a peak runoff of approximately 825 cfs exits the project southerly boundary at discharge point Node C4, presented in Table 3.1. It is estimated that an 9'(W) by 8'(H) RCB is required to convey the bulked offsite runoff.

3.2.4 Watershed "D"

Within Watershed "D", the offsite runoff from north of SR-60 flows to the proposed Line "D". The project proposes two (2) detention Basins D1, and D2 shown on Figure 4 to mitigate the onsite flows. Basin D1 is located near Street C, and Basin D2 is located near the project southerly boundary, which also serves as a spreading area. Both offsite and onsite runoff will ultimately flow to Basin D2. When the water level in the basin rises to a certain elevation, the runoff will be gradually released through an engineered outlet structure similar to that described previously and illustrated on Figure 5. The approximate sizes of the basins, riser, piping and slotted drains will need to be finalized in the final design phase. With attenuation, a peak runoff of approximately 655 and 125 cfs exits the project southerly boundary at discharge point Node C4, presented in Table 3.1. It is estimated that a 96-inch RCP is required to convey the bulked offsite runoff.

3.2.5 Watershed "E"

Within Watershed "E", the offsite runoff from north of Gilman Springs Road flows to the existing earthen channel Line "E". The majority of Line "E" will be protected in place. Two culverts are proposed where Line "E" crossing the proposed Street C and Street G; the existing lateral earthen channel connected with Line "E" will be re-aligned and improved. It is estimated that the cross culverts at Street C and Street G will be 12' (W) by 8' (H) RCB and 12' (W) by 9' (H) RCB, respectively. The existing lateral earthen ditch connected to Line "E" will be improved to a 96-inch RCP. The runoff exits the project southerly boundary at discharge point Node 73, presented in Table 3.1. It is concluded that there will be no potential impacts to the downstream of Line "E", due to the following reasons: 1) the majority of Line "E" will be protected in place; 2) the offsite tributary areas remain the same; 3) a small onsite tributary area will flow to a proposed Basin F1 located in Watershed F, which results in less onsite tributary area to Line "E".

3.2.6 Watershed "F"

Within Watershed "F", the offsite runoff from north of Gilman Springs Rd flows to the proposed Line "F". The project proposes three (3) detention Basins F1, F2 and F3 as shown on Figure 4 to mitigate the onsite flows. Basin F2 and F3 also serve as spreading areas near the project southerly boundary. The outflow from these two basins will be gradually released through the outlet structures illustrated on Figure 5. The outlet structures allow the proposed drainage system to control the amount of outflow in a way consistent with the existing sheet flow condition and avoiding the potential downstream erosion. The approximate sizes of the basins, risers, piping and slotted curbs will need to be finalized in the final design phase. With attenuation, a peak runoff of approximately 395 cfs exits the project southerly boundary at discharge point Node F3, presented in Table 3.1. It is estimated that a 96-inch RCP is required to convey the bulked offsite and onsite runoff.

Section 4 Mitigation of Impacts of Proposed Land Development

4.1 Drainage Area Comparison

For the existing condition, the boundaries of sub watersheds are determined based on the topographic characteristics. For the proposed condition, the boundaries of the sub watersheds are altered slightly to accommodate the proposed grading and roadways, as shown on Figure 4. As a result, the tributary areas of the proposed sub watersheds are slightly different compared to the existing condition. However, the proposed boundaries are generally consistent with the existing boundaries. The proposed project will not alter the existing drainage pattern flowing southerly throughout the project site. All flow from offsite and onsite will drain to Perris Valley hydro-subarea or Gilman Springs hydro-subarea. The total drainage areas of proposed condition remain the same as the existing condition, as presented in Table 4.1.

Table 4.1 Comparison of Existing and Proposed Drainage Areas

Exist. Condition			***Prop. Condition***		
Watershed	***Area(ac)***	***Hydro-Subarea***	***Watershed***	***Area(ac)***	***Hydro-Subarea***
"A"	2657	Perris Valley	"A"	2728	Perris Valley
"B"	1361	Gilman Hot Springs	"B"	1165	Gilman Hot Springs
"C"	1061	Gilman Hot Springs	"C"	1149	Gilman Hot Springs
"D"	965	Gilman Hot Springs	"D"	1013	Gilman Hot Springs
"E"	2510	Gilman Hot Springs	"E"	2446	Gilman Hot Springs
"F"	445	Gilman Hot Springs	"F"	498	Gilman Hot Springs
Total	8999			8999	

4.2 Stormwater Runoff Comparison

The proposed project will increase the percentage of impervious areas and will have the potential to increase peak discharges. The proposed detention basins and spreading areas will mitigate the increased peak discharges. With attenuation, the total peak discharge at the project southerly boundary will be less than the total peak discharge of the existing condition. Table 4.2 compares the peak discharges at the downstream discharge points where the stormwater runoff exits the project southerly boundary for 100-year 3-hour storm events.

Table 4.2 Comparison of Existing and Proposed Stormwater Runoff for 100-year 3-hour Storm

Hydro-Subarea	***Watershed***	***Exist. Condition***		***Prop. Condition***	
		Discharge Point	***Peak Discharge(cfs)***	***Discharge Point***	***Peak Discharge(cfs)***
Perris Valley	"A"	78	2810	A4	2190
	Total		2810		2190
Gilman Hot Springs	"B"	12	430	B4	1080
	"B"	22	700		
	Subtotal		1130		1080
	"C"	37	705	C4	825
	"C"	41	115		
	Subtotal		820		825
	"D"	53	600	D3	655
	"D"	61	215	*	85
	Subtotal		815		740
	"E"	73	1990	73	1950
	Subtotal		1990		1950
	"F"	81	100	**	30
	"F"	93	120		
	"F"	102	140	F3	395
	"F"	112	135		
	Subtotal		495		425
	Total		5250		5020

** Outflow from Basin D3*
*** Outflow from Basin F3*

4.3 Flows at Project Boundary

Flows exiting the project boundary in the proposed condition will mimic existing conditions. There are six watershed areas and drainage courses that deliver flow through the project area. These are identified as watershed areas A through E on Figure 3. The existing capacity of these drainage courses at the project boundary was determined. Flows in excess of this capacity would flow overland and sheet flow across the project boundary in the existing condition. Detention Basins and spreading area facilities are proposed to reduce the proposed conditions flow to pre-project conditions at the project boundary. Table 4.3 identifies the existing and proposed 100-year flow, the drainage course capacity, and the sheet flow at the project boundary.

Table 4.3 Comparison of Existing and Proposed Flows at Project Boundary

	Existing Conditions at Project Boundary			***Proposed Conditions at Project Boundary***		
Watershed	***Existing 100-year Flow (cfs)***	***Existing Drainage Course Capacity (cfs)***	***Existing 100-year sheet flow (cfs)***	***Proposed 100-year Flow (cfs)***	***Proposed 100-year flow from Basin to Drainage Course (cfs)***	***Proposed 100-year sheet flow from Basin (cfs)***
A[1]	2,810	2,200	610	2,190	N/A	N/A
B	1,130	55	1,075	1,080	55	1,025
C	820	165	655	825	165	660
D	815	65	750	740	65	675
E[2]	1,990	6,220	0	1,950	N/A	N/A
F	495	70	425	425	70	355

Notes: 1. Flows to improved channel - No sheet flow proposed in proposed conditions
2. Existing facility has capacity for flow – No detention basin proposed

Section 5 Hydrologic Conditions of Concern

Hydrologic Conditions of Concern are impacts to the hydrologic regime resulting from the Project. These Hydrologic Conditions of Concern may include increased runoff volume and velocity; increased storm duration and peaks; shorter time of concentration; reduced infiltration; and water quality degradation. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding the downstream channel. Without proper mitigation measures, these changes have the potential to impact downstream channels and habitat integrity compared to the pre-development condition, alone or as part of a cumulative impact from the project development.

This project will increase the impervious areas, thus there will be potential increase of runoff volume and velocity, and decrease of time of concentration and infiltration. This project proposes a number of open space, detention basins and spreading areas (shown in Figure 1 and Figure 4) to mitigate the increased runoff, slow the flow velocities, and enhance the onsite infiltration. The detailed mitigation measures are discussed in Section 8.

To determine if there are potential impacts to the sediment-carrying capacity, the sediment analysis has been conducted and discussed in Section 6. It is concluded that the proposed project will not impact the sediment-carrying capacity at the project boundary; therefore, there is no potential to impact to downstream channels and habitat integrity compared to the pre-development condition.

Section 6 Sediment Analysis

6.1 Sediment Analysis for Existing Condition

Under the existing condition, offsite tributary areas north of SR-60 and Gilman Springs Road have the potential to generate sediment. This is shown by the accumulation of sediment and debris at the culverts crossing the SR-60 and Gilman Springs Road. Recent field visits found that some of the culverts do not function properly or are completely buried due to the accumulation of sediment and debris. Ultimately, the culverts will need to be cleaned out and increased in size to convey the 100-year offsite runoff.

The amount of sediment generated is estimated using methodology in the U.S. Army Corps of Engineers published in 2000. The sediment yield calculations for both offsite and onsite tributary areas are included in Appendix E. The following equation is used for watershed areas smaller than 3 mi^2.

LOG Dy = 0.65 (LOG P) + 0.18 (LOG A) + 0.62 (LOG RR) + 0.12 (FF), where

"Dy" represents Unit Debris Yield
"P" represents Maximum 1-hour precipitation times 100
"RR" represents Relief Ratio
"A" represents Drainage Area
"FF" represents Non-dimensional Fire Factor

In general, sediment is carried by flows in the existing drainage courses. When velocities are high the channel erodes and picks up sediment. When flow velocities are low the sediment drops out and deposition occurs. An estimation of the existing drainage courses flow capacity and velocities was conducted to determine whether the existing drainage courses are eroding or depositing sediment Depending on the vegetative cover of the channel eroding channels generally have velocities greater than 3 to 7 fps. Vegetated channels will begin carrying sediment at velocities from 5 to 7 fps. Clean sandy or silty channels will begin to erode with velocities ranging from 3 to 5 fps. Velocities greater than 8 fps generally cause significant erosion. Each of the existing drainage courses is analyzed determine their ability to erode or deposit sediment.

The existing drainage course in watershed "A" downstream of the outlet of the existing RCB is heavily vegetated and consists of a channel with a bottom width of 5 feet and a depth of 4 feet. The top width of the channel is 37 feet. Through normal depth calculations, it is estimated that the drainage course can convey 375 cfs flow at a velocity of 4.5 fps. Because the velocity is less than 5 fps sediment will generally deposit in the existing drainage course and the majority of the sediment generated from Watershed "A" will be deposited along traveling routes due to the vegetated soil cover.

The existing drainage course in watershed "B" is vegetated and consists of a bottom width of 2 feet and a depth of 2 feet. The top width of the drainage course is 18 feet. Through normal depth

calculations, it is estimated that the existing drainage course can convey 55 cfs flow at a velocity of 2.8 fps. Because the velocity is less than 5 fps sediment will generally deposit in the existing drainage course and the majority of the sediment generated from Watershed "B" will be deposited along traveling routes due to the vegetated soil cover.

The existing drainage course in watershed "C" is heavily vegetated and consists of a bottom width of 3 feet and a depth of 3 feet. The top width of the drainage course is 27 feet. Through normal depth calculations, it is estimated that the existing drainage course can convey 163 cfs flow at a velocity of 3.6 fps. Because the velocity is less than 5 fps sediment will generally deposit in the existing drainage course and the majority of the sediment generated from Watershed "C" will be deposited along traveling routes due to the vegetated soil cover.

The existing drainage course in watershed "D" is heavily vegetated and consists of a bottom width of 3 feet and a depth of 2 feet. The top width of the existing drainage course is 19 feet. Through normal depth calculations, it is estimated that the existing drainage course can convey 63 cfs flow at a velocity of 2.9 fps. Because the velocity is less than 5 fps sediment will generally deposit in the existing drainage course and the majority of the sediment generated from Watershed "D" will be deposited along traveling routes due to the vegetated soil cover.

The existing drainage course in watershed "E" is heavily vegetated and consists of a channel with a bottom width of 30 feet and a depth of 10 feet. The top width of the existing drainage course is 110 feet. Through normal depth calculations, it is estimated that the existing drainage course can convey 6220 cfs flow at a velocity of 8.9 fps. Because the flow velocities are above 5 fps, erosion within the channel will occur. However, it is proposed to leave this facility as is and as such the sediment carrying capacity will remain the same.

The existing drainage course in watershed "F" is heavily vegetated and consists of a bottom width of 4 feet and a depth of 2 feet. The top width of the channel is 20 feet. Through normal depth calculations, it is estimated that the existing drainage course can convey 70 cfs flow at a velocity of 2.9 fps. Because the velocity is less than 5 fps sediment will generally deposit in the existing drainage course and the majority of the sediment generated from Watershed "F" will be deposited along traveling routes due to the vegetated soil cover.

6.2 Sediment Analysis for Proposed Condition

It is important to avoid excessive sediment transported downstream, which could cause sediment filling the downstream channel, leading to a decrease in channel capacity and increase in flooding and overbank deposition. Ultimately, sediment basins should be constructed upstream of Gilman Springs Road to contain the existing sediment and minimize the total suspended solids in the runoff. The culverts at Gilman Springs Road should be maintained by the appropriate agency to ensure proper conveyance of the offsite flows. The majority of the sediment will deposit upstream of Gilman Springs Road. However, because the recommended sediment basins will not be constructed as part of this project, it is expected that some of the offsite sediment will continue to be transported through the culverts along Gilman Springs Road.

The project onsite will not generate significant amount of sediment due to the proposed land use being logistic. Ultimately sediment will be transported to the proposed basins. The proposed basins will settle most of the sediment before exiting the project boundary, similar to the existing condition. Therefore, the amount of sediment traveling through the southerly project boundary will remain comparable to the existing condition.

Section 7 Gilman Springs Road Culvert Capacity Analysis

Recent field visits conducted by CH2M HILL staff found that most of the existing culverts were partially or completely blocked by sediment and debris allowing little flow from the culverts to enter the project site. In order to confirm if the existing culverts are sized appropriately to convey the offsite flow, the existing culvert capacities were analyzed using the inlet control capacity analysis chart. The analysis indicated that many of these culverts are undersized to convey the tributary 100-year flows even with proper maintenance. The flows will pond and overtop the road and cross onto the east project site. It is recommended that the culverts be maintained to remove the existing sediment and debris. The results of the analysis are included in Appendix D, and summarized in Table 7.2. For this project, the runoff potentially overtopping Gilman Springs Road will be collected in an open channel just inside the property boundary along the south side of Gilman Springs Road and conveyed to the proposed drainage facilities.

Table 7.2 Gilman Springs Road Culvert Capacity Analysis

Culvert	*Size/ Material*	*Node*	*Culvert Capacity * (cfs)*	*Tributary 100-yr Flow (cfs)*	*Adequate to Convey 100-year flow*
1	24” CMP	341	20	60	No
2	36” CMP	351	50	15	Yes
3	36” CMP	51	40	370	No
4	48” CMP	52	100	170	No
5	7’x6’ RCB	71	370	1360	No
6	4’X4’ RCB	721	130	650	No
7	36” CMP	921	70	20	Yes
8	36” CMP	91	45	55	No
9	24” CMP	101	20	140	No
10	24” CMP	111	20	70	No

Note: see Figure 1 for the locations of existing culverts

** assuming culverts cleared of sediment and debris*

Section 8 Proposed Mitigation Measures

The proposed project will not result in a significant adverse impact to the downstream watershed by implementing the following mitigation measures:

Hydro-1: Detention basins and spreading areas shall be placed within each proposed watershed to mitigate the impacts of increased peak flow rate, velocity, flow volume and reduced time of concentration by storing increased runoff for a limited period of a time and release the outflow at a rate that does not exceed the pre-development condition.

Hydro-2: Energy dissipaters shall be used as the spillways of basins to reduce the runoff velocity and dissipate the flow energy. Drainage structures shall be constructed at the downstream end of the watersheds flowing to the San Jacinto Wildlife Area to control the runoff and spread the flow in such a way that the flows exiting the project boundary will return to the sheet flow pattern similar to the existing condition.

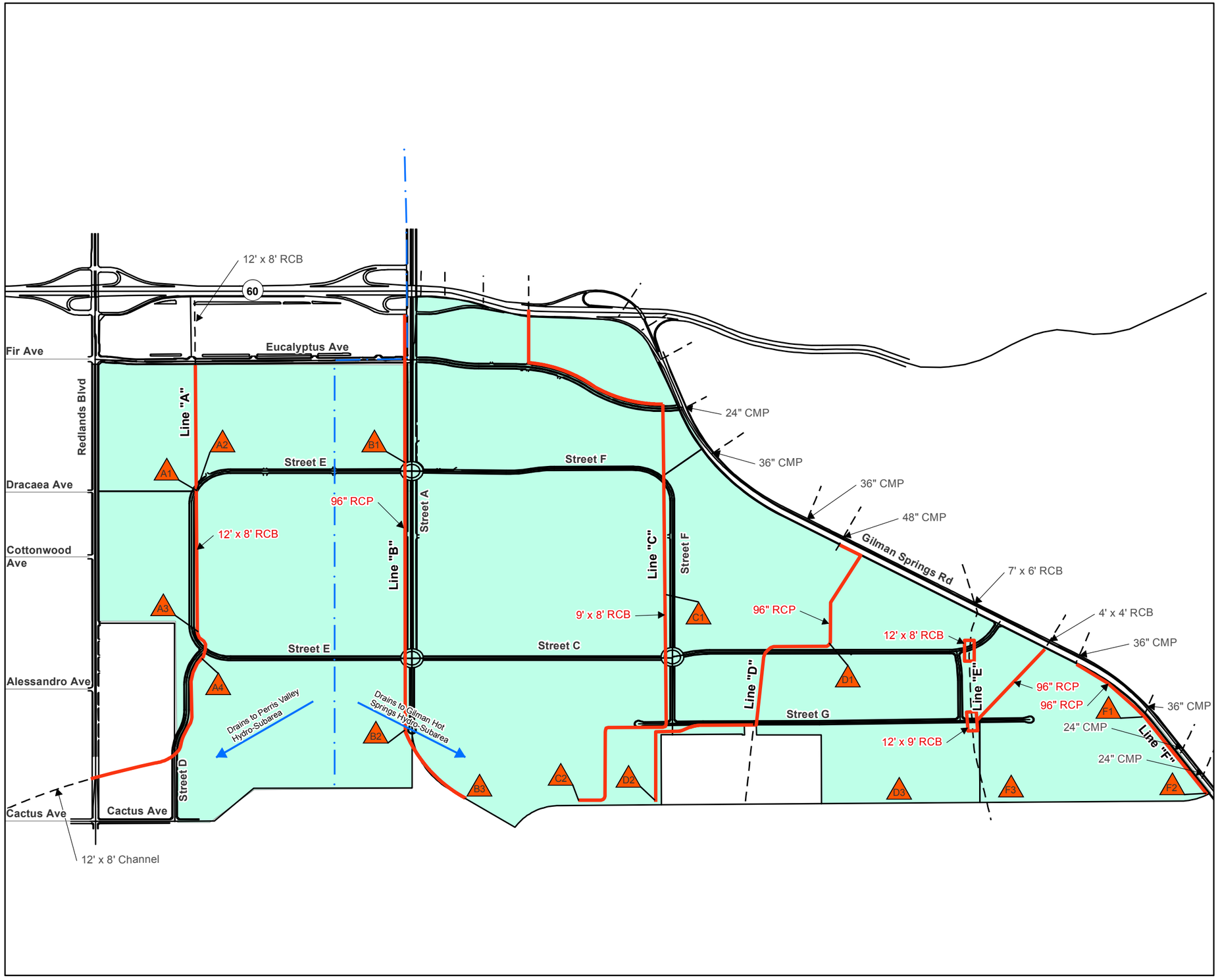
Hydro-3: Detention basins and spreading areas, shall be designed to account for the amount of the sediment transported through the project boundary so that the existing sediment carrying capacity is maintained.

By implementing the mitigation measures discussed above, the project will address the hydrologic conditions of concern and mitigate project impacts to less than significant. At the time of final design for the project, detailed hydrologic and hydraulic calculations will be performed to ensure that the mitigation is appropriately implemented.

Section 9 Conclusions

The study identifies the existing drainage features and constraints, and provides preliminary hydrology and hydraulic analysis for the proposed land development. The analysis includes the evaluation of stormwater runoff at the existing and proposed condition, comparison of hydrologic characteristics of the existing and proposed condition, impacts of the proposed land development and proposed mitigation measures, identification of hydrologic conditions of concern, existing culvert capacity analysis, sediment analysis and discussion of proposed mitigation measures. The proposed project will not alter the existing drainage pattern or cause watershed diversion. Drainage systems and detention basins are proposed to address the flood protection requirements to ensure compatibility with local agency guidelines. The proposed drainage systems and detention basins are adequate to convey the offsite and onsite runoff and to mitigate the potential impacts due to the proposed land development.

Figures



VICINITY MAP

Legend

- Proposed Basin
- Proposed Drainage System
- Proposed Cross Culvert
- Hydro-Subarea Boundary
- Existing Flow Path
- Roads
- Logistic Development

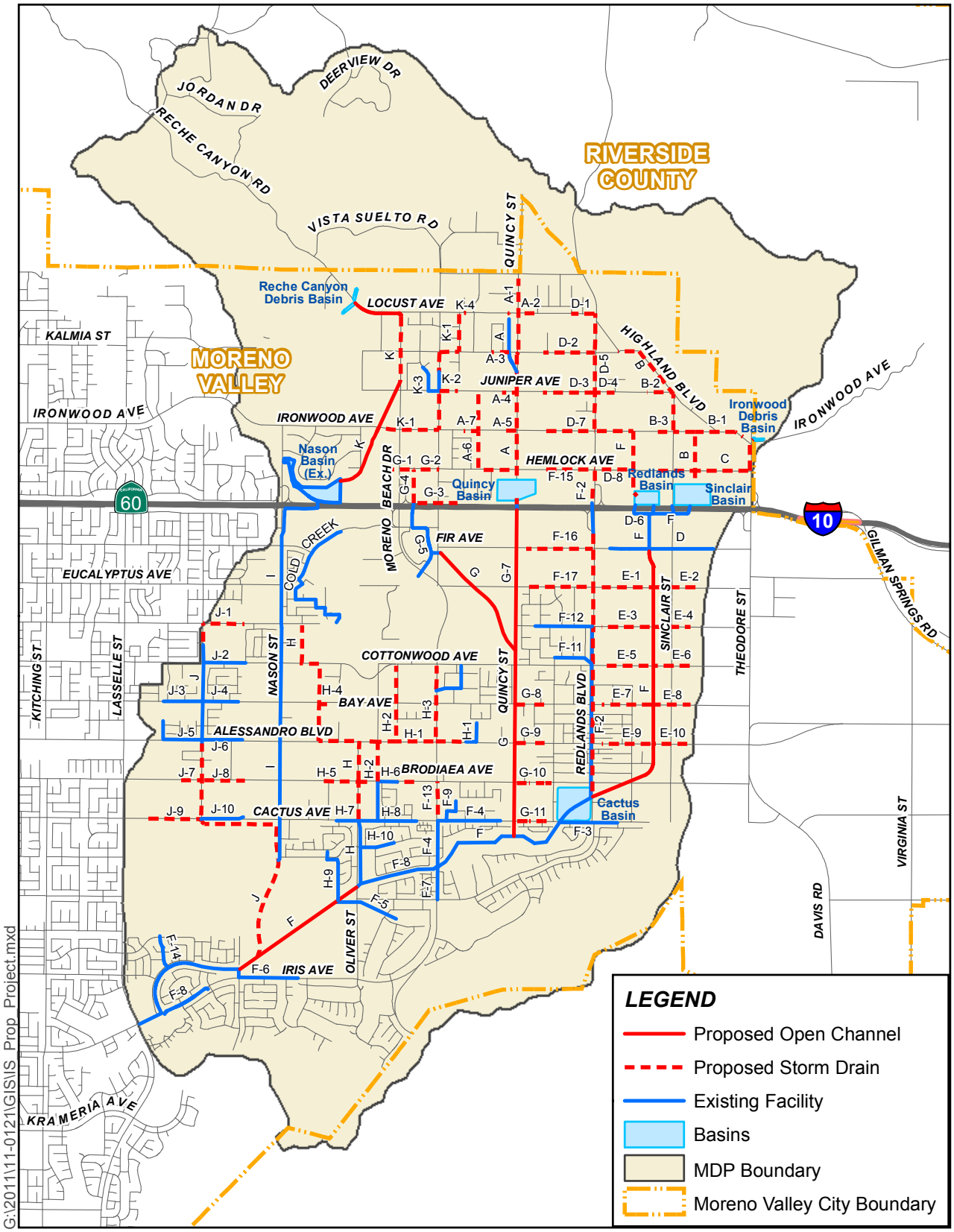
N

0 1,000 2,000
Feet

Figure 1
Proposed Drainage
World Logistics Center Project

CH2MHILL.

SCO \\CHERON\PROJ\HIGHLANDFAIRVIEW\418273\DRAINAGE\GIS\MAPFILES\FIGURE 1 - PROPOSED DRAINAGE.MXD MTUNG 11/1/2012 2:32:01 PM

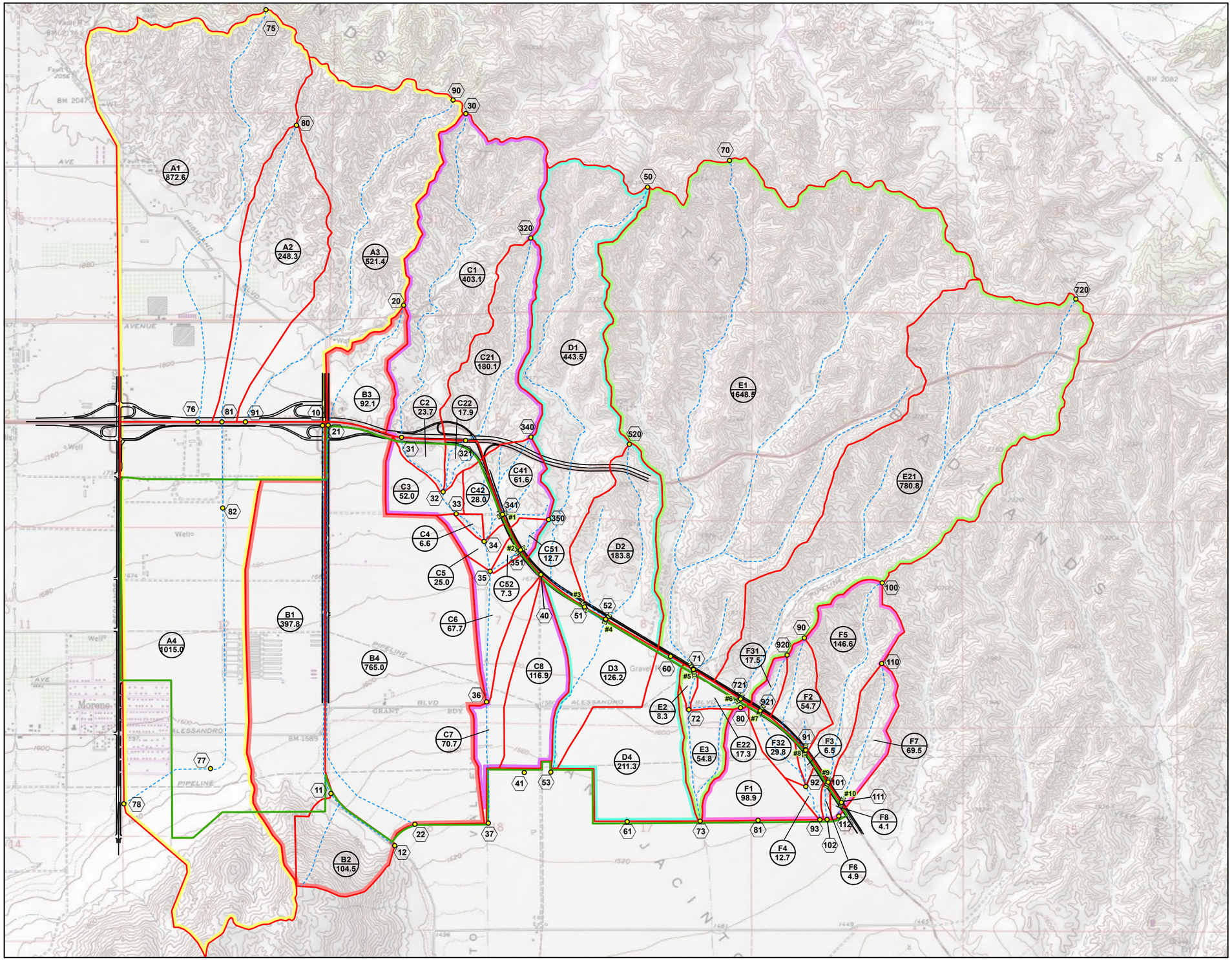


Source: County of Riverside GIS, 2012.

Figure 2 - Proposed Project

Moreno Master Drainage Plan Revision

Albert A. WEBB Associates



VICINITY MAP

A1 872.64 Subarea Designation
Subarea Area (acres)

70 Hydrology Node

Existing Natural Drainage Course

Existing Culvert

Roads

Project Boundary

Watershed Boundary

- A
- B
- C
- D
- E
- F

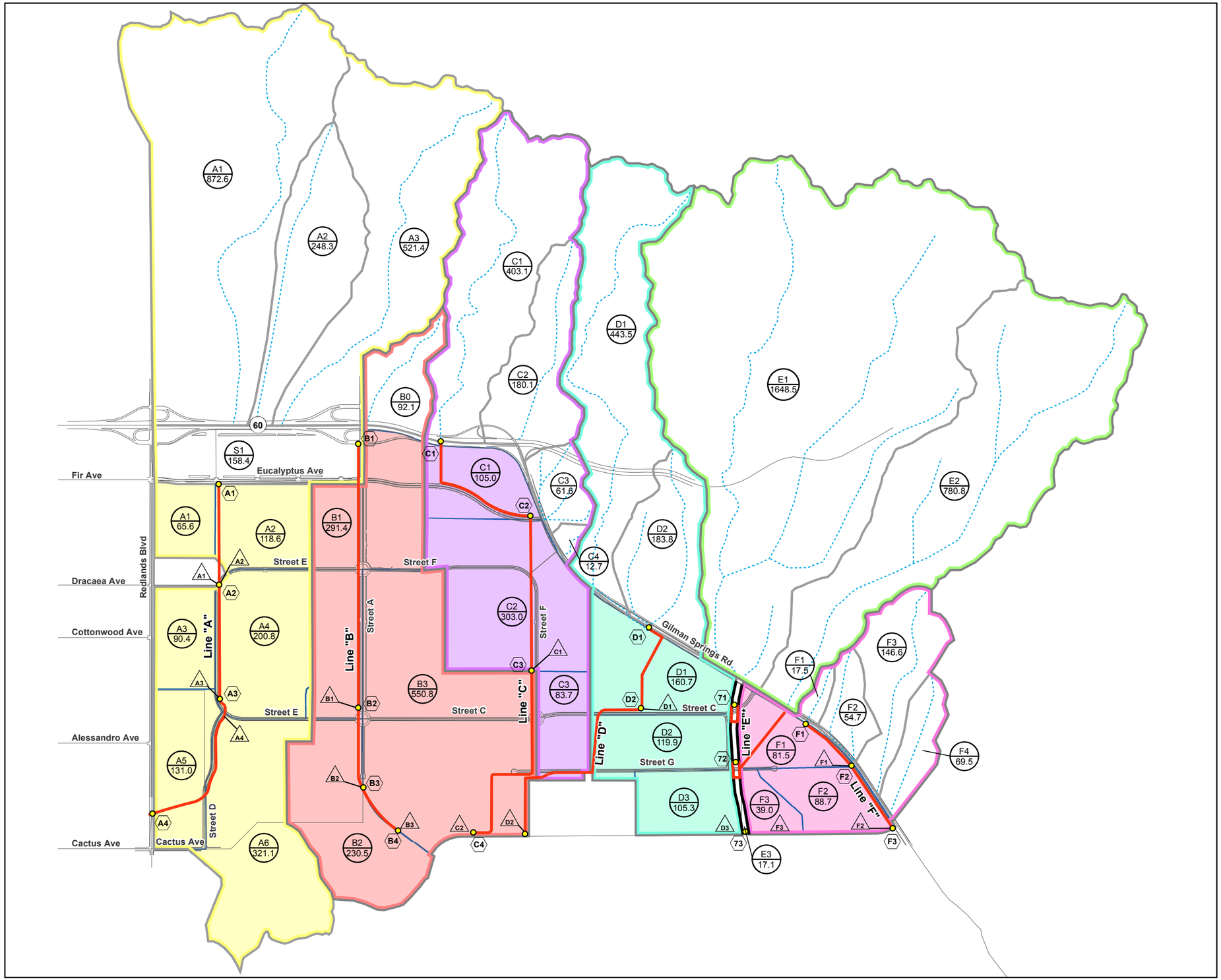
Watershed Subarea

N

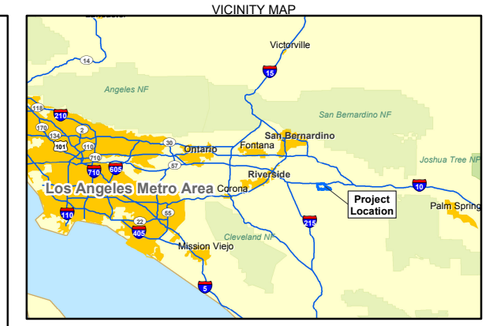
0 1,250 2,500
Feet

FIGURE 3
Hydrology Map for Existing Condition
World Logistics Center Project

CH2MHILL



VICINITY MAP



Legend

- A1 / 872.64 — Subarea Designation / Subarea Area (acres)
- Hydrology Node
- Proposed Basin
- Roads
- Offsite Existing Natural Drainage Course
- Proposed Drainage
- Flood Control Easement
- Project Boundary

Watershed Boundary

- A
- B
- C
- D
- E
- F

*Note:
1. Line "E" (Exist Natural Drainage Course) will be protected in place.

N

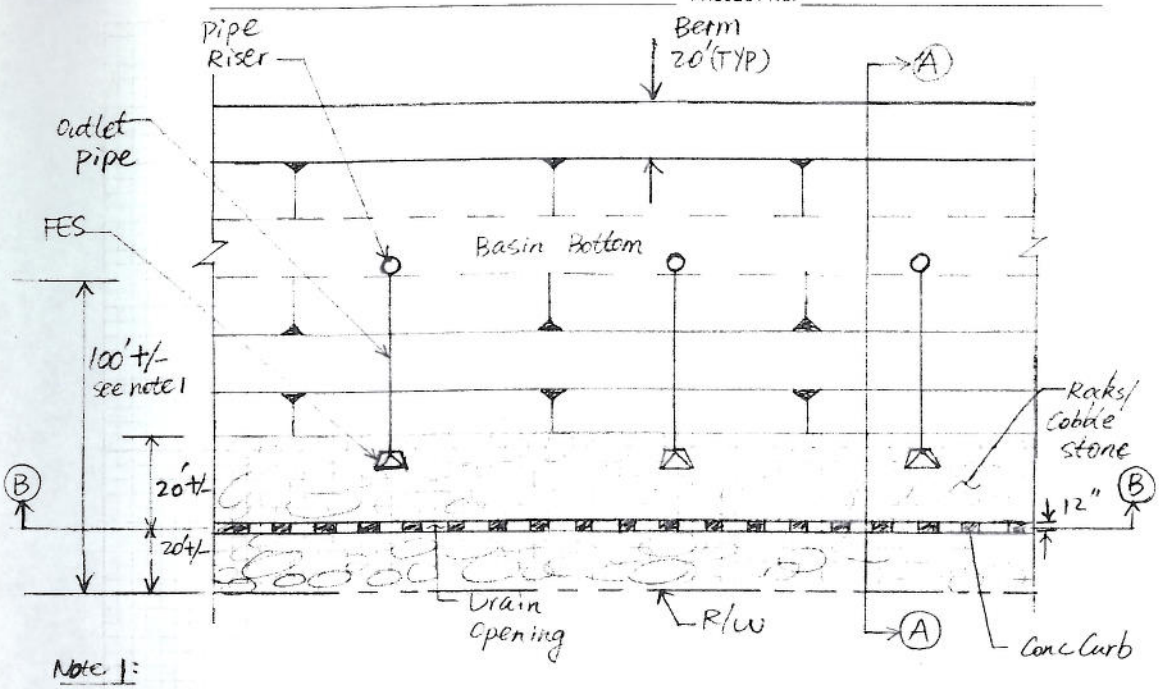
0 1,250 2,500
Feet

FIGURE 4
Hydrology Map for Proposed Condition
World Logistics Center Project

CH2MHILL

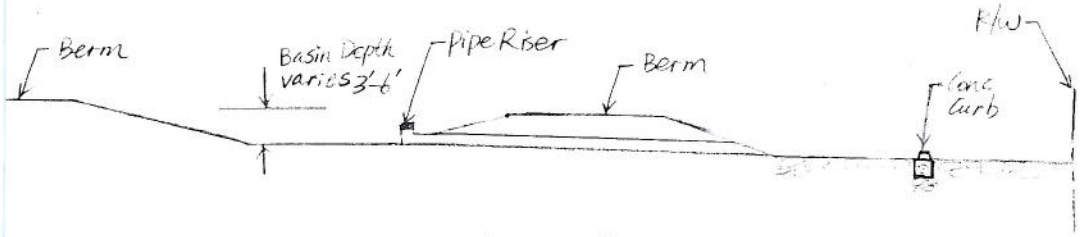
SCO \\CHERON\PROJECTS\HIGHLANDFAIRVIEW\418273\DRAINAGE\GIS\MAPFILES\FIGURE 4 - PROPOSED HYDROLOGY.MXD AGORDEN 5/7/2012 3:27:36 PM

CH2MHILL SUBJECT UWC Basin Outlet Structure BY
SHEET NO. ____ of ____ DATE 05/03/12
PROJECT NO.

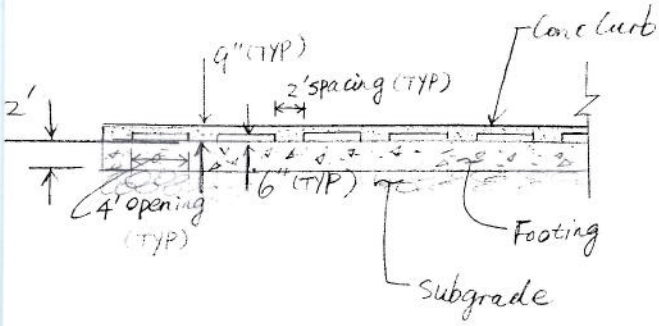


Note 1:
Distance shown varies from 50' to 100'+/- depending on Basin Depth.

Basin Outlet Structure



SECTION A



SECTION B

Figure 5 - Basin Outlet Structure

Appendix A
Civil-D Unit Hydrograph and Routing Models

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                          Study date: 05/07/12

      ---------------------------------------------------------------------


      Watershed A, Routed
      Exist condition, 100 yr 3 hr


      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA13100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    15
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      931.518 (CFS)
                    Total volume =      96.840 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: A2A3RT.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      438.7     877.5    1316.2    1754.9
  ---------------------------------------------------------------------
    0+15      29.1905     60.90  qQ        |         |         |         |
    0+30      91.8540    194.19  | q Q     |         |         |         |
    0+45     137.4128    291.98  |  q  Q   |         |         |         |
    1+ 0     147.7872    314.76  |  q   Q  |         |         |         |
    1+15     184.3699    391.06  |   q   Q |         |         |         |
    1+30     250.7138    533.09  |    q    | Q       |         |         |
    1+45     305.3341    649.17  |     q   |   Q     |         |         |
    2+ 0     356.8728    759.53  |       q |      Q  |         |         |
    2+15     458.4674    973.54  |         q         | Q       |         |
    2+30     685.4703   1454.97  |         |    q    |         |  Q      |
    2+45     823.4111   1754.93  |         |       q |         |         Q
    3+ 0     525.2500   1130.66  |         |q        |    Q    |         |
    3+15     128.2819    277.49  | q   Q   |         |         |         |
    3+30      19.6313     43.05  Q         |         |         |         |
    3+45       1.6150      3.39  Q         |         |         |         |
    4+ 0       0.0237      0.02  Q         |         |         |         |
    4+15       0.0001      0.00  Q         |         |         |         |
    4+30       0.0000      0.00  Q         |         |         |         |
  ---------------------------------------------------------------------
      ****************************HYDROGRAPH DATA****************************
```

```
                Number of intervals =    18
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =     1754.929 (CFS)
                Total volume =     182.495 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       76.000 to Point/Station       76.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    700.00 (Ft.)
Elevation difference =   14.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   700.00(Ft.)     Elevation difference =  14.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    8.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    709.066(CFS)
Depth of flow =     2.941(Ft.)
Average velocity =    22.032(Ft/s)
Total flow rate =   709.066(CFS)
Channel flow top width =   13.883(Ft.)
Depth of flow in channel =   2.94(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   22.03(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  709.066(CFS)
Total capacity of improved channels =    709.066(CFS)
Critical Depth in Channel =    5.03(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1754.929(CFS)
Depth of flow =     4.838(Ft.)
Average velocity =    28.256(Ft/s)
Total flow rate =  1754.929(CFS)
Channel flow top width =   17.676(Ft.)
Depth of flow in channel =   4.84(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   28.26(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1754.929(CFS)
Total capacity of improved channels =   1754.929(CFS)
Critical Depth in Channel =    8.19(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9433   Travel time =   0.41 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  26.0103
        dt(routing time-step) =   0.39 (min.),   c* =   1.0000
```

```
Output hydrograph delayed by 0  unit time increments

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      438.7     877.5    1316.2    1754.9
----------------------------------------------------------------------
  0+15      59.3233     60.90  |O        |         |         |         |
  0+30     190.7321    194.19  |   O     |         |         |         |
  0+45     289.4411    291.98  |     O   |         |         |         |
  1+ 0     314.1678    314.76  |      O  |         |         |         |
  1+15     389.0834    391.06  |       O |         |         |         |
  1+30     529.3989    533.09  |         | O       |         |         |
  1+45     646.1575    649.17  |         |   O     |         |         |
  2+ 0     756.6678    759.53  |         |      O  |         |         |
  2+15     967.9799    973.54  |         |         | O       |         |
  2+30    1442.4716   1454.97  |         |         |         | OI      |
  2+45    1747.1408   1754.93  |         |         |         |        OI
  3+ 0    1146.8715   1130.66  |         |         |    IO   |         |
  3+15     299.6412    277.49  |     O   |         |         |         |
  3+30      49.1395     43.05  IO        |         |         |         |
  3+45       4.4218      3.39  O         |         |         |         |
  4+ 0       0.1111      0.02  O         |         |         |         |
  4+15       0.0007      0.00  O         |         |         |         |
  4+30       0.0000      0.00  O         |         |         |         |
  4+45       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
*****************************HYDROGRAPH DATA***************************
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                Total volume =     182.495 (Ac.Ft)
          Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

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                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      466.2     932.4    1398.7    1864.9
----------------------------------------------------------------------
  0+15       3.3849     62.71  qQ        |         |         |         |
  0+30      12.5919    203.32  q   Q     |         |         |         |
  0+45      23.7506    313.19  q     Q   |         |         |         |
  1+ 0      32.7971    346.96  q      Q  |         |         |         |
  1+15      40.7688    429.85  q        Q|         |         |         |
  1+30      50.0073    579.41  |q        | Q       |         |         |
  1+45      60.2450    706.40  |q        |    Q    |         |         |
  2+ 0      70.6747    827.34  |q        |      Q  |         |         |
  2+15      83.6690   1051.65  |q        |         | Q       |         |
```

```
  2+30     103.0457   1545.52  | q       |         |         |  Q      |
  2+45     117.7360   1864.88  | q       |         |         |         Q
  3+ 0     123.2480   1270.12  | q       |         |      Q  |         |
  3+15     112.4906    412.13  | q     Q |         |         |         |
  3+30      89.3336    138.47  |qQ       |         |         |         |
  3+45      59.1662     63.59  |Q        |         |         |         |
  4+ 0      38.8972     39.01  Q         |         |         |         |
  4+15      25.5720     25.57  Q         |         |         |         |
  4+30      16.8116     16.81  Q         |         |         |         |
  4+45      11.0523     11.05  Q         |         |         |         |
  5+ 0       7.2661      7.27  Q         |         |         |         |
  5+15       4.7769      4.78  Q         |         |         |         |
  5+30       3.1404      3.14  Q         |         |         |         |
  5+45       2.0646      2.06  Q         |         |         |         |
  6+ 0       1.3573      1.36  Q         |         |         |         |
  6+15       0.8923      0.89  Q         |         |         |         |
  6+30       0.5866      0.59  Q         |         |         |         |
  6+45       0.3857      0.39  Q         |         |         |         |
  7+ 0       0.2535      0.25  Q         |         |         |         |
  7+15       0.1667      0.17  Q         |         |         |         |
  7+30       0.1096      0.11  Q         |         |         |         |
  7+45       0.0720      0.07  Q         |         |         |         |
  8+ 0       0.0474      0.05  Q         |         |         |         |
  8+15       0.0311      0.03  Q         |         |         |         |
  8+30       0.0205      0.02  Q         |         |         |         |
  8+45       0.0135      0.01  Q         |         |         |         |
  9+ 0       0.0088      0.01  Q         |         |         |         |
  9+15       0.0058      0.01  Q         |         |         |         |
  9+30       0.0038      0.00  Q         |         |         |         |
  9+45       0.0025      0.00  Q         |         |         |         |
 10+ 0       0.0017      0.00  Q         |         |         |         |
 10+15       0.0011      0.00  Q         |         |         |         |
 10+30       0.0010      0.00  Q         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    42
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =     1864.877 (CFS)
                       Total volume =     205.149 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       76.000 to Point/Station       77.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1600.00 (Ft.)
        Elevation difference =   32.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  1600.00(Ft.)     Elevation difference =  32.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   2.000
        Slope or 'Z' of right channel bank =   2.000
        Manning's 'N'    = 0.030
        Maximum depth of channel  =   10.000(Ft.)
        Flow(q) thru subarea =    766.780(CFS)
        Depth of flow =     3.589(Ft.)
        Average velocity =    12.439(Ft/s)
        Total flow rate =   766.780(CFS)
```

```
Channel flow top width =   24.354(Ft.)
Depth of flow in channel =   3.59(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   12.44(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  766.780(CFS)
Total capacity of improved channels =    766.780(CFS)
Critical Depth in Channel =    4.25(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1864.877(CFS)
Depth of flow =     5.584(Ft.)
Average velocity =    15.777(Ft/s)
Total flow rate =  1864.877(CFS)
Channel flow top width =   32.336(Ft.)
Depth of flow in channel =   5.58(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   15.78(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1864.877(CFS)
Total capacity of improved channels =   1864.877(CFS)
Critical Depth in Channel =    6.75(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9027   Travel time =   1.69 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   6.8871
        dt(routing time-step) =   1.53 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      466.2     932.4    1398.7    1864.9
-----------------------------------------------------------------------
  0+15      56.3294     62.71  |O        |         |         |         |
  0+30     189.0202    203.32  |   O     |         |         |         |
  0+45     302.0157    313.19  |     O   |         |         |         |
  1+ 0     343.5294    346.96  |      O  |         |         |         |
  1+15     421.4207    429.85  |        O|         |         |         |
  1+30     564.1931    579.41  |         | O       |         |         |
  1+45     693.4841    706.40  |         |   OI    |         |         |
  2+ 0     815.0401    827.34  |         |      O  |         |         |
  2+15    1028.8318   1051.65  |         |         | O       |         |
  2+30    1495.2796   1545.52  |         |         |         | OI      |
  2+45    1832.3906   1864.88  |         |         |         |        OI
  3+ 0    1330.6199   1270.12  |         |         |      IO |         |
  3+15     499.4088    412.13  |       I O         |         |         |
  3+30     166.3104    138.47  | IO      |         |         |         |
  3+45      71.2055     63.59  |O        |         |         |         |
  4+ 0      41.5087     39.01  O         |         |         |         |
  4+15      26.9394     25.57  O         |         |         |         |
  4+30      17.7028     16.81  O         |         |         |         |
  4+45      11.6382     11.05  O         |         |         |         |
  5+ 0       7.6512      7.27  O         |         |         |         |
  5+15       5.0301      4.78  O         |         |         |         |
  5+30       3.3069      3.14  O         |         |         |         |
  5+45       2.1740      2.06  O         |         |         |         |
  6+ 0       1.4293      1.36  O         |         |         |         |
```

```
  6+15       0.9396      0.89  O         |         |         |         |
  6+30       0.6177      0.59  O         |         |         |         |
  6+45       0.4061      0.39  O         |         |         |         |
  7+ 0       0.2670      0.25  O         |         |         |         |
  7+15       0.1755      0.17  O         |         |         |         |
  7+30       0.1154      0.11  O         |         |         |         |
  7+45       0.0759      0.07  O         |         |         |         |
  8+ 0       0.0499      0.05  O         |         |         |         |
  8+15       0.0328      0.03  O         |         |         |         |
  8+30       0.0216      0.02  O         |         |         |         |
  8+45       0.0142      0.01  O         |         |         |         |
  9+ 0       0.0093      0.01  O         |         |         |         |
  9+15       0.0061      0.01  O         |         |         |         |
  9+30       0.0040      0.00  O         |         |         |         |
  9+45       0.0026      0.00  O         |         |         |         |
 10+ 0       0.0017      0.00  O         |         |         |         |
 10+15       0.0011      0.00  O         |         |         |         |
 10+30       0.0010      0.00  O         |         |         |         |
 10+45       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    43
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     1832.391 (CFS)
                      Total volume =     205.149 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       76.000 to Point/Station       77.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ____________________________________________________________________
       ******************** HYDROGRAPH INFORMATION *********************

                      From study/file name: SUBA43100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      714.0    1428.0    2142.0    2856.0
 ----------------------------------------------------------------------
  0+15      30.6392     86.97  qQ        |         |         |         |
  0+30     103.0654    292.09  |q  Q     |         |         |         |
  0+45     161.6957    463.71  | q   Q   |         |         |         |
  1+ 0     182.1817    525.71  | q    Q  |         |         |         |
  1+15     226.6307    648.05  |  q     Q|         |         |         |
  1+30     309.3633    873.56  |   q     | Q       |         |         |
  1+45     378.5605   1072.04  |    q    |    Q    |         |         |
  2+ 0     446.5340   1261.57  |     q   |      Q  |         |         |
  2+15     566.4228   1595.25  |      q  |         | Q       |         |
  2+30     832.3957   2327.68  |         |q        |         | Q       |
  2+45    1023.6035   2855.99  |         |   q     |         |         Q
  3+ 0     734.0005   2064.62  |         q         |       Q |         |
  3+15     269.6479    769.06  |  q      Q         |         |         |
  3+30     109.7317    276.04  |q Q      |         |         |         |
  3+45      51.4448    122.65  qQ        |         |         |         |
  4+ 0      19.1901     60.70  Q         |         |         |         |
  4+15       1.9950     28.93  Q         |         |         |         |
  4+30       0.0000     17.70  Q         |         |         |         |
  4+45       0.0000     11.64  Q         |         |         |         |
  5+ 0       0.0000      7.65  Q         |         |         |         |
  5+15       0.0000      5.03  Q         |         |         |         |
```

```
   5+30       0.0000      3.31  Q         |         |         |         |
   5+45       0.0000      2.17  Q         |         |         |         |
   6+ 0       0.0000      1.43  Q         |         |         |         |
   6+15       0.0000      0.94  Q         |         |         |         |
   6+30       0.0000      0.62  Q         |         |         |         |
   6+45       0.0000      0.41  Q         |         |         |         |
   7+ 0       0.0000      0.27  Q         |         |         |         |
   7+15       0.0000      0.18  Q         |         |         |         |
   7+30       0.0000      0.12  Q         |         |         |         |
   7+45       0.0000      0.08  Q         |         |         |         |
   8+ 0       0.0000      0.05  Q         |         |         |         |
   8+15       0.0000      0.03  Q         |         |         |         |
   8+30       0.0000      0.02  Q         |         |         |         |
   8+45       0.0000      0.01  Q         |         |         |         |
   9+ 0       0.0000      0.01  Q         |         |         |         |
   9+15       0.0000      0.01  Q         |         |         |         |
   9+30       0.0000      0.00  Q         |         |         |         |
   9+45       0.0000      0.00  Q         |         |         |         |
  10+ 0       0.0000      0.00  Q         |         |         |         |
  10+15       0.0000      0.00  Q         |         |         |         |
  10+30       0.0000      0.00  Q         |         |         |         |
  10+45       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    43
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     2855.994 (CFS)
                      Total volume =     317.692 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *********************************************************************

       ---------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       77.000 to Point/Station       78.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ______________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   1600.00 (Ft.)
       Elevation difference =   30.00 (Ft.)
       Slope of channel =  0.018750 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  1600.00(Ft.)     Elevation difference =  30.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =   10.000(Ft.)
       Slope or 'Z' of left channel bank =   2.000
       Slope or 'Z' of right channel bank =   2.000
       Manning's 'N'    = 0.030
       Maximum depth of channel  =   10.000(Ft.)
       Flow(q) thru subarea =   1172.271(CFS)
       Depth of flow =     4.519(Ft.)
       Average velocity =    13.627(Ft/s)
       Total flow rate =  1172.271(CFS)
       Channel flow top width =   28.075(Ft.)
       Depth of flow in channel =   4.52(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   13.63(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow = 1172.271(CFS)
       Total capacity of improved channels =   1172.271(CFS)
       Critical Depth in Channel =    5.31(Ft.)


       Channel evaluation using maximum flow rate of hydrograph
```

```
Covered channel
Flow(q) thru subarea =   2855.994(CFS)
Depth of flow =     6.946(Ft.)
Average velocity =    17.209(Ft/s)
Total flow rate =  2855.994(CFS)
Channel flow top width =   37.785(Ft.)
Depth of flow in channel =   6.95(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.21(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 2855.994(CFS)
Total capacity of improved channels =   2855.994(CFS)
Critical Depth in Channel =    8.31(Ft.)


********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9101   Travel time =   1.55 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   7.4242
       dt(routing time-step) =   1.41 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      714.0    1428.0    2142.0    2856.0
----------------------------------------------------------------------
  0+15      78.7920     86.97  |O        |         |         |         |
  0+30     272.8011    292.09  |  OI     |         |         |         |
  0+45     447.5756    463.71  |     O   |         |         |         |
  1+ 0     519.8821    525.71  |      O  |         |         |         |
  1+15     636.5493    648.05  |       OI|         |         |         |
  1+30     852.3550    873.56  |         |OI       |         |         |
  1+45    1053.3833   1072.04  |         |   OI    |         |         |
  2+ 0    1243.7550   1261.57  |         |      O  |         |         |
  2+15    1563.8829   1595.25  |         |         |OI       |         |
  2+30    2258.8151   2327.68  |         |         |         |OI       |
  2+45    2806.3231   2855.99  |         |         |         |        OI
  3+ 0    2139.0232   2064.62  |         |         |       IO|         |
  3+15     890.8620    769.06  |         I O       |         |         |
  3+30     322.3940    276.04  |  IO     |         |         |         |
  3+45     137.0718    122.65  |O        |         |         |         |
  4+ 0      66.5233     60.70  O         |         |         |         |
  4+15      31.9207     28.93  O         |         |         |         |
  4+30      18.7588     17.70  O         |         |         |         |
  4+45      12.2084     11.64  O         |         |         |         |
  5+ 0       8.0261      7.65  O         |         |         |         |
  5+15       5.2765      5.03  O         |         |         |         |
  5+30       3.4689      3.31  O         |         |         |         |
  5+45       2.2805      2.17  O         |         |         |         |
  6+ 0       1.4993      1.43  O         |         |         |         |
  6+15       0.9857      0.94  O         |         |         |         |
  6+30       0.6480      0.62  O         |         |         |         |
  6+45       0.4260      0.41  O         |         |         |         |
  7+ 0       0.2801      0.27  O         |         |         |         |
  7+15       0.1841      0.18  O         |         |         |         |
  7+30       0.1210      0.12  O         |         |         |         |
  7+45       0.0796      0.08  O         |         |         |         |
  8+ 0       0.0523      0.05  O         |         |         |         |
  8+15       0.0344      0.03  O         |         |         |         |
  8+30       0.0226      0.02  O         |         |         |         |
  8+45       0.0149      0.01  O         |         |         |         |
```

```
   9+ 0       0.0098      0.01  O         |         |         |         |
   9+15       0.0064      0.01  O         |         |         |         |
   9+30       0.0042      0.00  O         |         |         |         |
   9+45       0.0028      0.00  O         |         |         |         |
  10+ 0       0.0018      0.00  O         |         |         |         |
  10+15       0.0012      0.00  O         |         |         |         |
  10+30       0.0010      0.00  O         |         |         |         |
  10+45       0.0001      0.00  O         |         |         |         |
  11+ 0       0.0000      0.00  O         |         |         |         |
--------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    44
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =     2806.323 (CFS)
                       Total volume =     317.692 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       78.000 to Point/Station       78.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file WSA3hr.rte
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =     0
                       Time interval =    0.0 (Min.)
                       Maximum/Peak flow rate =        0.000 (CFS)
                       Total volume =       0.000 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 02/10/12

      ---------------------------------------------------------------------


      Watershed A, offsite - Sketcher site, prop condition
      100 yr 3 hr


      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: Sketcher3100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      169.336 (CFS)
                    Total volume =      19.225 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        0.000 to Point/Station        1.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.00(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.00 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000      5.000     20.000      4.793        5.207
         4.000     10.000     30.000      9.690       10.310
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      42.3   84.67  127.00  169.34 (Ft.)
 0.250   17.82    0.70      0.177  O  I    |       |       |       |     2.03
 0.500   34.78    2.73      0.685  O     I |       |       |       |     2.14
```

```
 0.750   41.63    5.55      1.388  |O     I|       |       |       |     2.28
 1.000   42.18    8.44      2.110  |O     I|       |       |       |     2.42
 1.250   49.90   11.42      2.856  | O     |I      |       |       |     2.57
 1.500   58.52   14.82      3.705  | O     |  I    |       |       |     2.74
 1.750   67.31   18.64      4.659  |  O    |   I   |       |       |     2.93
 2.000   75.53   21.44      5.721  |   O   |     I |       |       |     3.14
 2.250  101.56   24.16      7.079  |   O   |       |  I    |       |     3.42
 2.500  153.33   28.34      9.170  |    O  |       |       |   I   |     3.83
      Warning: Basin depth limit exceeded, the data here is an estimation
 2.750  169.34   33.72     11.862  |     O |       |       |       I     4.37
      Warning: Basin depth limit exceeded, the data here is an estimation
 3.000   92.95   37.67     13.834  |      O|       |I      |       |     4.77
      Warning: Basin depth limit exceeded, the data here is an estimation
 3.250   23.45   38.50     14.250  |   I  O|       |       |       |     4.85
      Warning: Basin depth limit exceeded, the data here is an estimation
 3.500    2.20   37.46     13.730  I      O|       |       |       |     4.75
      Warning: Basin depth limit exceeded, the data here is an estimation
 3.750    0.00   35.99     12.994  I     O |       |       |       |     4.60
      Warning: Basin depth limit exceeded, the data here is an estimation
 4.000    0.00   34.53     12.266  I     O |       |       |       |     4.45
      Warning: Basin depth limit exceeded, the data here is an estimation
 4.250    0.00   33.13     11.567  I     O |       |       |       |     4.31
      Warning: Basin depth limit exceeded, the data here is an estimation
 4.500    0.00   31.79     10.896  I     O |       |       |       |     4.18
      Warning: Basin depth limit exceeded, the data here is an estimation
 4.750    0.00   30.50     10.252  I    O  |       |       |       |     4.05
 5.000    0.00   29.27      9.635  I    O  |       |       |       |     3.93
 5.250    0.00   28.08      9.042  I    O  |       |       |       |     3.81
 5.500    0.00   26.95      8.474  I    O  |       |       |       |     3.69
 5.750    0.00   25.86      7.928  I   O   |       |       |       |     3.59
 6.000    0.00   24.81      7.405  I   O   |       |       |       |     3.48
 6.250    0.00   23.81      6.903  I   O   |       |       |       |     3.38
 6.500    0.00   22.84      6.421  I   O   |       |       |       |     3.28
 6.750    0.00   21.92      5.958  I   O   |       |       |       |     3.19
 7.000    0.00   21.03      5.515  I  O    |       |       |       |     3.10
 7.250    0.00   20.18      5.089  I  O    |       |       |       |     3.02
 7.500    0.00   18.75      4.687  I  O    |       |       |       |     2.94
 7.750    0.00   17.26      4.315  I  O    |       |       |       |     2.86
 8.000    0.00   15.89      3.973  I  O    |       |       |       |     2.79
 8.250    0.00   14.63      3.657  I O     |       |       |       |     2.73
 8.500    0.00   13.47      3.367  I O     |       |       |       |     2.67
 8.750    0.00   12.40      3.100  I O     |       |       |       |     2.62
 9.000    0.00   11.41      2.854  I O     |       |       |       |     2.57
 9.250    0.00   10.51      2.628  IO      |       |       |       |     2.53
 9.500    0.00    9.67      2.419  IO      |       |       |       |     2.48
 9.750    0.00    8.90      2.227  IO      |       |       |       |     2.45
10.000    0.00    8.20      2.050  IO      |       |       |       |     2.41
10.250    0.00    7.55      1.888  IO      |       |       |       |     2.38
10.500    0.00    6.95      1.738  IO      |       |       |       |     2.35
10.750    0.00    6.40      1.600  IO      |       |       |       |     2.32
11.000    0.00    5.89      1.473  IO      |       |       |       |     2.29
11.250    0.00    5.42      1.356  IO      |       |       |       |     2.27
11.500    0.00    4.99      1.249  O       |       |       |       |     2.25
11.750    0.00    4.59      1.150  O       |       |       |       |     2.23
12.000    0.00    4.23      1.059  O       |       |       |       |     2.21
12.250    0.00    3.89      0.975  O       |       |       |       |     2.19
12.500    0.00    3.58      0.898  O       |       |       |       |     2.18
12.750    0.00    3.30      0.826  O       |       |       |       |     2.16
13.000    0.00    3.04      0.761  O       |       |       |       |     2.15
13.250    0.00    2.80      0.701  O       |       |       |       |     2.14
13.500    0.00    2.57      0.645  O       |       |       |       |     2.13
13.750    0.00    2.37      0.594  O       |       |       |       |     2.12
14.000    0.00    2.18      0.547  O       |       |       |       |     2.11
14.250    0.00    2.01      0.504  O       |       |       |       |     2.10
14.500    0.00    1.85      0.464  O       |       |       |       |     2.09
14.750    0.00    1.70      0.427  O       |       |       |       |     2.09
15.000    0.00    1.57      0.393  O       |       |       |       |     2.08
15.250    0.00    1.44      0.362  O       |       |       |       |     2.07
15.500    0.00    1.33      0.334  O       |       |       |       |     2.07
15.750    0.00    1.22      0.307  O       |       |       |       |     2.06
16.000    0.00    1.13      0.283  O       |       |       |       |     2.06
```

16.250	0.00	1.04	0.261	O	|	|	|	|	2.05
16.500	0.00	0.95	0.240	O	|	|	|	|	2.05
16.750	0.00	0.88	0.221	O	|	|	|	|	2.04
17.000	0.00	0.81	0.204	O	|	|	|	|	2.04
17.250	0.00	0.74	0.188	O	|	|	|	|	2.04
17.500	0.00	0.69	0.173	O	|	|	|	|	2.03
17.750	0.00	0.63	0.159	O	|	|	|	|	2.03
18.000	0.00	0.58	0.147	O	|	|	|	|	2.03
18.250	0.00	0.53	0.135	O	|	|	|	|	2.03
18.500	0.00	0.49	0.125	O	|	|	|	|	2.02
18.750	0.00	0.45	0.115	O	|	|	|	|	2.02
19.000	0.00	0.42	0.106	O	|	|	|	|	2.02
19.250	0.00	0.38	0.098	O	|	|	|	|	2.02
19.500	0.00	0.35	0.090	O	|	|	|	|	2.02
19.750	0.00	0.33	0.083	O	|	|	|	|	2.02
20.000	0.00	0.30	0.077	O	|	|	|	|	2.01
20.250	0.00	0.28	0.071	O	|	|	|	|	2.01
20.500	0.00	0.25	0.065	O	|	|	|	|	2.01
20.750	0.00	0.23	0.060	O	|	|	|	|	2.01
21.000	0.00	0.22	0.056	O	|	|	|	|	2.01
21.250	0.00	0.20	0.051	O	|	|	|	|	2.01
21.500	0.00	0.18	0.047	O	|	|	|	|	2.01
21.750	0.00	0.17	0.044	O	|	|	|	|	2.01
22.000	0.00	0.15	0.040	O	|	|	|	|	2.01
22.250	0.00	0.14	0.037	O	|	|	|	|	2.01
22.500	0.00	0.13	0.035	O	|	|	|	|	2.01
22.750	0.00	0.12	0.032	O	|	|	|	|	2.01
23.000	0.00	0.11	0.030	O	|	|	|	|	2.01
23.250	0.00	0.10	0.027	O	|	|	|	|	2.01
23.500	0.00	0.09	0.025	O	|	|	|	|	2.00
23.750	0.00	0.09	0.023	O	|	|	|	|	2.00
24.000	0.00	0.08	0.022	O	|	|	|	|	2.00
24.250	0.00	0.07	0.020	O	|	|	|	|	2.00
24.500	0.00	0.07	0.019	O	|	|	|	|	2.00
24.750	0.00	0.06	0.017	O	|	|	|	|	2.00
25.000	0.00	0.06	0.016	O	|	|	|	|	2.00
25.250	0.00	0.05	0.015	O	|	|	|	|	2.00
25.500	0.00	0.05	0.014	O	|	|	|	|	2.00
25.750	0.00	0.04	0.013	O	|	|	|	|	2.00
26.000	0.00	0.04	0.012	O	|	|	|	|	2.00
26.250	0.00	0.04	0.011	O	|	|	|	|	2.00
26.500	0.00	0.03	0.010	O	|	|	|	|	2.00
26.750	0.00	0.03	0.010	O	|	|	|	|	2.00
27.000	0.00	0.03	0.009	O	|	|	|	|	2.00
27.250	0.00	0.03	0.009	O	|	|	|	|	2.00
27.500	0.00	0.03	0.008	O	|	|	|	|	2.00
27.750	0.00	0.02	0.008	O	|	|	|	|	2.00
28.000	0.00	0.02	0.007	O	|	|	|	|	2.00
28.250	0.00	0.02	0.007	O	|	|	|	|	2.00
28.500	0.00	0.02	0.006	O	|	|	|	|	2.00
28.750	0.00	0.02	0.006	O	|	|	|	|	2.00
29.000	0.00	0.02	0.006	O	|	|	|	|	2.00
29.250	0.00	0.01	0.005	O	|	|	|	|	2.00
29.500	0.00	0.01	0.005	O	|	|	|	|	2.00
29.750	0.00	0.01	0.005	O	|	|	|	|	2.00
30.000	0.00	0.01	0.004	O	|	|	|	|	2.00
30.250	0.00	0.01	0.004	O	|	|	|	|	2.00
30.500	0.00	0.01	0.004	O	|	|	|	|	2.00
30.750	0.00	0.01	0.004	O	|	|	|	|	2.00
31.000	0.00	0.01	0.004	O	|	|	|	|	2.00
31.250	0.00	0.01	0.004	O	|	|	|	|	2.00
31.500	0.00	0.01	0.003	O	|	|	|	|	2.00
31.750	0.00	0.01	0.003	O	|	|	|	|	2.00
32.000	0.00	0.01	0.003	O	|	|	|	|	2.00
32.250	0.00	0.01	0.003	O	|	|	|	|	2.00
32.500	0.00	0.00	0.003	O	|	|	|	|	2.00
32.750	0.00	0.00	0.003	O	|	|	|	|	2.00
33.000	0.00	0.00	0.003	O	|	|	|	|	2.00
33.250	0.00	0.00	0.003	O	|	|	|	|	2.00
33.500	0.00	0.00	0.003	O	|	|	|	|	2.00
33.750	0.00	0.00	0.003	O	|	|	|	|	2.00

```
34.000    0.00    0.00      0.002  O       |       |       |       |     2.00
34.250    0.00    0.00      0.002  O       |       |       |       |     2.00
34.500    0.00    0.00      0.002  O       |       |       |       |     2.00
34.750    0.00    0.00      0.002  O       |       |       |       |     2.00
35.000    0.00    0.00      0.002  O       |       |       |       |     2.00
35.250    0.00    0.00      0.002  O       |       |       |       |     2.00
35.500    0.00    0.00      0.002  O       |       |       |       |     2.00
35.750    0.00    0.00      0.002  O       |       |       |       |     2.00
36.000    0.00    0.00      0.002  O       |       |       |       |     2.00
36.250    0.00    0.00      0.002  O       |       |       |       |     2.00
36.500    0.00    0.00      0.002  O       |       |       |       |     2.00
36.750    0.00    0.00      0.002  O       |       |       |       |     2.00
37.000    0.00    0.00      0.002  O       |       |       |       |     2.00
37.250    0.00    0.00      0.002  O       |       |       |       |     2.00

       Remaining water in basin =    0.00 (Ac.Ft)

       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   149
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       38.500 (CFS)
                      Total volume =      19.223 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        0.000 to Point/Station        1.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ______________________________________________________________________
       Current stream hydrograph saved in file SketcherRT.rte
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 02/13/12

------------------------------------------------------------------


Watershed A, Offsite, north of 60fwy, routed
Exist condition, 100 yr 3hr


-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SUBA33100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    15
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      557.615 (CFS)
               Total volume =      57.991 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       81.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    200.00 (Ft.)
Elevation difference =    4.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   200.00(Ft.)     Elevation difference =   4.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    8.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    225.191(CFS)
Depth of flow =     1.517(Ft.)
Average velocity =    15.597(Ft/s)
Total flow rate =   225.191(CFS)
Channel flow top width =   11.034(Ft.)
Depth of flow in channel =   1.52(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   15.60(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  225.191(CFS)
Total capacity of improved channels =    225.191(CFS)
Critical Depth in Channel =    2.59(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    557.615(CFS)
```

```
Depth of flow =     2.567(Ft.)
Average velocity =    20.558(Ft/s)
Total flow rate =   557.615(CFS)
Channel flow top width =   13.134(Ft.)
Depth of flow in channel =   2.57(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   20.56(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  557.615(CFS)
Total capacity of improved channels =    557.615(CFS)
Critical Depth in Channel =    4.38(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9236   Travel time =   0.16 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  67.1063
       dt(routing time-step) =   0.15 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f      H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0      139.4     278.8     418.2     557.6
 ----------------------------------------------------------------------
   0+15      18.8478     19.04  |O        |         |         |         |
   0+30      60.9584     61.38  |   O     |         |         |         |
   0+45      92.3373     92.65  |     O   |         |         |         |
   1+ 0     100.0013    100.08  |      O  |         |         |         |
   1+15     123.6100    123.85  |       O |         |         |         |
   1+30     168.6842    169.14  |         | O       |         |         |
   1+45     205.5526    205.92  |         |   O     |         |         |
   2+ 0     240.7708    241.12  |         |      O  |         |         |
   2+15     307.7210    308.39  |         |         | O       |         |
   2+30     459.1365    460.66  |         |         |         | OI      |
   2+45     556.6468    557.61  |         |         |         |        OI
   3+ 0     364.4074    362.46  |         |         |     O   |         |
   3+15      92.1123     89.39  |     O   |         |         |         |
   3+30      14.7835     14.03  |O        |         |         |         |
   3+45       1.1952      1.07  O         |         |         |         |
   4+ 0       0.0106      0.00  O         |         |         |         |
   4+15       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
********************************HYDROGRAPH DATA***************************
                Number of intervals =    17
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      556.647 (CFS)
                Total volume =      57.991 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       81.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************
```

```
                    From study/file name: SUBA23100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      206.2     412.3     618.5     824.6
  ---------------------------------------------------------------------
    0+15      10.6077     29.46  qQ        |         |         |         |
    0+30      31.4622     92.42  |q  Q     |         |         |         |
    0+45      45.4841    137.82  | q   Q   |         |         |         |
    1+ 0      47.8764    147.88  | q    Q  |         |         |         |
    1+15      61.0913    184.70  | q     Q |         |         |         |
    1+30      82.6289    251.31  |   q     | Q       |         |         |
    1+45     100.2721    305.82  |   q     |   Q     |         |         |
    2+ 0     116.5655    357.34  |    q    |      Q  |         |         |
    2+15     151.6647    459.39  |      q  |         | Q       |         |
    2+30     228.3868    687.52  |         |q        |         |  Q      |
    2+45     267.9982    824.65  |         | q       |         |         Q
    3+ 0     158.1239    522.53  |      q  |         |    Q    |         |
    3+15      32.5896    124.70  |q    Q   |         |         |         |
    3+30       3.8937     18.68  Q         |         |         |         |
    3+45       0.2649      1.46  Q         |         |         |         |
    4+ 0       0.0000      0.01  Q         |         |         |         |
    4+15       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    17
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      824.645 (CFS)
                    Total volume =      85.655 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ---------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       81.000 to Point/Station       76.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ______________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =    200.00 (Ft.)
       Elevation difference =    4.00 (Ft.)
       Slope of channel =  0.020000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =   200.00(Ft.)     Elevation difference =   4.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =    8.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =   10.000(Ft.)
       Flow(q) thru subarea =    333.403(CFS)
       Depth of flow =     1.909(Ft.)
       Average velocity =    17.629(Ft/s)
       Total flow rate =   333.403(CFS)
       Channel flow top width =   11.817(Ft.)
       Depth of flow in channel =   1.91(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   17.63(Ft/s)
       Travel time  =    0.00 min.
```

```
Individual channel flow =  333.403(CFS)
Total capacity of improved channels =    333.403(CFS)
Critical Depth in Channel =    3.28(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    824.645(CFS)
Depth of flow =     3.202(Ft.)
Average velocity =    22.995(Ft/s)
Total flow rate =   824.645(CFS)
Channel flow top width =   14.403(Ft.)
Depth of flow in channel =   3.20(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   22.99(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  824.645(CFS)
Total capacity of improved channels =    824.645(CFS)
Critical Depth in Channel =    5.50(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9312   Travel time =   0.14 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  74.4175
       dt(routing time-step) =   0.13 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-----------------------------------------------------------------------
  Time(h+m) Out = O(CFS) In = I  0      206.2     412.3     618.5     824.6
  ----------------------------------------------------------------------
    0+15      29.1905     29.46  |O        |         |         |         |
    0+30      91.8540     92.42  |   O     |         |         |         |
    0+45     137.4128    137.82  |     O   |         |         |         |
    1+ 0     147.7872    147.88  |      O  |         |         |         |
    1+15     184.3699    184.70  |       O |         |         |         |
    1+30     250.7138    251.31  |         | O       |         |         |
    1+45     305.3341    305.82  |         |   O     |         |         |
    2+ 0     356.8728    357.34  |         |      O  |         |         |
    2+15     458.4674    459.39  |         |         | O       |         |
    2+30     685.4703    687.52  |         |         |         |  O      |
    2+45     823.4111    824.65  |         |         |         |        OI
    3+ 0     525.2500    522.53  |         |         |    O    |         |
    3+15     128.2819    124.70  |     O   |         |         |         |
    3+30      19.6313     18.68  O         |         |         |         |
    3+45       1.6150      1.46  O         |         |         |         |
    4+ 0       0.0237      0.01  O         |         |         |         |
    4+15       0.0001      0.00  O         |         |         |         |
    4+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =    18
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      823.411 (CFS)
                     Total volume =      85.655 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************
```

```
-----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       81.000 to Point/Station       76.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file A2A3RT.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

-------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed A, Offiste- Sketcher, prop condition
100 yr 3 hr


--------------------------------------------------------------------
Drainage Area =     158.40(Ac.)  =      0.248 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     158.70(Ac.)  =      0.248 Sq. Mi.
Length along longest watercourse =    1400.00(Ft.)
Length along longest watercourse measured to centroid =     700.00(Ft.)
Length along longest watercourse =      0.265 Mi.
Length along longest watercourse measured to centroid =      0.133 Mi.
Difference in elevation =      28.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.083 Hr.
Lag time =     4.99 Min.
25% of lag time =     1.25 Min.
40% of lag time =     2.00 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.70           0.85                134.89

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.70           1.90                301.53

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.93 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   158.400           85.00         0.000
 Total Area Entered =    158.40(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.000        0.187       1.000      0.187
                                                  Sum (F) =   0.187
Area averaged mean soil loss (F) (In/Hr) =  0.187
Minimum soil loss rate ((In/Hr)) =  0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
-------------------------------------------------------------------
               Unit Hydrograph Data
-------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
    1   0.250        300.358         56.717             90.541
    2   0.500        600.716         37.109             59.239
    3   0.750        901.075          6.175              9.857
                                Sum = 100.000   Sum=     159.637
-------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	(0.187)	0.084	0.197
2 0.50	4.80	0.365	(0.187)	0.109	0.255
3 0.75	5.10	0.387	(0.187)	0.116	0.271
4 1.00	4.90	0.372	(0.187)	0.112	0.260
5 1.25	6.60	0.501	(0.187)	0.150	0.351
6 1.50	7.30	0.554	(0.187)	0.166	0.388
7 1.75	8.40	0.638	0.187	(0.191)	0.451
8 2.00	9.00	0.684	0.187	(0.205)	0.497
9 2.25	12.30	0.934	0.187	(0.280)	0.747
10 2.50	17.60	1.337	0.187	(0.401)	1.150
11 2.75	16.10	1.223	0.187	(0.367)	1.036
12 3.00	4.20	0.319	(0.187)	0.096	0.223
	(Loss Rate Not Used)				
Sum =	100.0			Sum =	5.8

```
Flood volume = Effective rainfall      1.46(In)
 times area     158.4(Ac.)/[(In)/(Ft.)] =      19.2(Ac.Ft)
Total soil loss =      0.44(In)
Total soil loss =     5.837(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      837450.3 Cubic Feet
Total soil loss =      254275.9 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    169.336(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------
  0+15       0.3682     17.82  V  Q      |         |         |         |
  0+30       1.0867     34.78  | V   Q   |         |         |         |
  0+45       1.9467     41.63  |   V   Q |         |         |         |
  1+ 0       2.8183     42.18  |    V  Q |         |         |         |
  1+15       3.8492     49.90  |       VQ|         |         |         |
  1+30       5.0584     58.52  |         VQ        |         |         |
```

```
    1+45       6.4492     67.31  |         |  Q      |         |         |
    2+ 0       8.0098     75.53  |         |    QV   |         |         |
    2+15      10.1081    101.56  |         |         QV        |         |
    2+30      13.2760    153.33  |         |         |      V  Q         |
    2+45      16.7747    169.34  |         |         |            QV     |
    3+ 0      18.6952     92.95  |         |       Q |         |       V |
    3+15      19.1797     23.45  |   Q     |         |         |        V|
    3+30      19.2252      2.20  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Subdrain Area A1, Offsite, north of 60 fwy
Exist condition, 100 yr 3 hr


-------------------------------------------------------------------
Drainage Area =     872.60(Ac.)  =      1.363 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     872.60(Ac.)  =      1.363 Sq. Mi.
Length along longest watercourse =   10000.00(Ft.)
Length along longest watercourse measured to centroid =    5000.00(Ft.)
Length along longest watercourse =      1.894 Mi.
Length along longest watercourse measured to centroid =      0.947 Mi.
Difference in elevation =    1000.00(Ft.)
Slope along watercourse =    528.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.137 Hr.
Lag time =     8.20 Min.
25% of lag time =     2.05 Min.
40% of lag time =     3.28 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      872.60           0.85                741.71

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      872.60           1.90               1657.94

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.62 %
Adjusted average point rain =    1.893(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   872.600           85.00         0.000
 Total Area Entered =    872.60(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.000        0.187       1.000      0.187
                                                  Sum (F) =   0.187
Area averaged mean soil loss (F) (In/Hr) =  0.187
Minimum soil loss rate ((In/Hr)) =  0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
-------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %           (CFS)
---------------------------------------------------------------------
    1   0.250        183.034         38.704            340.373
    2   0.500        366.067         51.579            453.594
    3   0.750        549.101          8.175             71.890
    4   1.000        732.135          1.542             13.560
                                Sum = 100.000   Sum=     879.417
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.280	0.187	(0.252)	0.093
2	0.50	4.80	0.363	0.187	(0.327)	0.176
3	0.75	5.10	0.386	0.187	(0.348)	0.199
4	1.00	4.90	0.371	0.187	(0.334)	0.184
5	1.25	6.60	0.500	0.187	(0.450)	0.313
6	1.50	7.30	0.553	0.187	(0.497)	0.366
7	1.75	8.40	0.636	0.187	(0.572)	0.449
8	2.00	9.00	0.681	0.187	(0.613)	0.494
9	2.25	12.30	0.931	0.187	(0.838)	0.744
10	2.50	17.60	1.332	0.187	(1.199)	1.145
11	2.75	16.10	1.219	0.187	(1.097)	1.032
12	3.00	4.20	0.318	0.187	(0.286)	0.131
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.3

```
Flood volume = Effective rainfall      1.33(In)
 times area     872.6(Ac.)/[(In)/(Ft.)] =      96.8(Ac.Ft)
Total soil loss =      0.56(In)
Total soil loss =    40.794(Ac.Ft)
Total rainfall =      1.89(In)
Flood volume =     4218357.7 Cubic Feet
Total soil loss =     1776988.8 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    931.518(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      250.0     500.0     750.0    1000.0
-------------------------------------------------------------------
  0+15       0.6553     31.71  VQ        |         |         |         |
  0+30       2.7697    102.34   V  Q     |         |         |         |
  0+45       5.9632    154.57  | V   Q   |         |         |         |
  1+ 0       9.4131    166.97  |  V  Q   |         |         |         |
  1+15      13.6836    206.69  |    V  Q |         |         |         |
```

```
   1+30      19.5178    282.37  |       V |Q        |         |         |
   1+45      26.6218    343.84  |         V  Q      |         |         |
   2+ 0      34.9413    402.66  |         |   V Q   |         |         |
   2+15      45.5832    515.07  |         |       V Q         |         |
   2+30      61.4820    769.50  |         |         |    V    Q         |
   2+45      80.7282    931.52  |         |         |            V   Q  |
   3+ 0      93.2367    605.41  |         |         |   Q     |       V |
   3+15      96.3195    149.21  |    Q    |         |         |        V|
   3+30      96.8035     23.42  Q         |         |         |        V|
   3+45      96.8402      1.78  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Subdrain Area A2, Offsite, north of 60fwy
Exist condition, 100 yr 3 hr


-------------------------------------------------------------------
Drainage Area =     248.30(Ac.)  =      0.388 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     248.30(Ac.)  =      0.388 Sq. Mi.
Length along longest watercourse =    8200.00(Ft.)
Length along longest watercourse measured to centroid =    4000.00(Ft.)
Length along longest watercourse =      1.553 Mi.
Length along longest watercourse measured to centroid =      0.758 Mi.
Difference in elevation =     820.00(Ft.)
Slope along watercourse =    528.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.116 Hr.
Lag time =     6.98 Min.
25% of lag time =     1.75 Min.
40% of lag time =     2.79 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      248.30           0.85                 211.06

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      248.30           1.90                 471.77

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.89 %
Adjusted average point rain =    1.898(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   248.300           85.00         0.000
 Total Area Entered =    248.30(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.000        0.187       1.000      0.187
                                                  Sum (F) =   0.187
Area averaged mean soil loss (F) (In/Hr) =  0.187
Minimum soil loss rate ((In/Hr)) =  0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
-------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        214.836         45.123            112.916
    2   0.500        429.673         48.579            121.564
    3   0.750        644.509          5.496             13.752
    4   1.000        859.345          0.802              2.008
                                 Sum = 100.000   Sum=     250.240
-------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.187	(0.253)	0.094
2 0.50	4.80	0.364	0.187	(0.328)	0.177
3 0.75	5.10	0.387	0.187	(0.348)	0.200
4 1.00	4.90	0.372	0.187	(0.335)	0.185
5 1.25	6.60	0.501	0.187	(0.451)	0.314
6 1.50	7.30	0.554	0.187	(0.499)	0.367
7 1.75	8.40	0.638	0.187	(0.574)	0.451
8 2.00	9.00	0.683	0.187	(0.615)	0.496
9 2.25	12.30	0.934	0.187	(0.840)	0.747
10 2.50	17.60	1.336	0.187	(1.203)	1.149
11 2.75	16.10	1.222	0.187	(1.100)	1.035
12 3.00	4.20	0.319	0.187	(0.287)	0.132
	(Loss Rate Not Used)				
Sum =	100.0			Sum =	5.3

```
Flood volume = Effective rainfall      1.34(In)
 times area     248.3(Ac.)/[(In)/(Ft.)] =      27.7(Ac.Ft)
Total soil loss =      0.56(In)
Total soil loss =    11.608(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =     1205019.2 Cubic Feet
Total soil loss =      505645.6 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    267.998(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
-------------------------------------------------------------------
  0+15       0.2192     10.61  VQ        |         |         |         |
  0+30       0.8692     31.46   V  Q     |         |         |         |
  0+45       1.8090     45.48  | V   Q   |         |         |         |
  1+ 0       2.7981     47.88  |   V Q   |         |         |         |
  1+15       4.0604     61.09  |    V  Q |         |         |         |
```

```
   1+30       5.7676     82.63  |       V |Q        |         |         |
   1+45       7.8393    100.27  |          V Q      |         |         |
   2+ 0      10.2477    116.57  |         |   VQ    |         |         |
   2+15      13.3813    151.66  |         |        VQ         |         |
   2+30      18.1000    228.39  |         |         |     V   Q         |
   2+45      23.6371    268.00  |         |         |         |   VQ    |
   3+ 0      26.9042    158.12  |         |         |Q        |       V |
   3+15      27.5775     32.59  |   Q     |         |         |        V|
   3+30      27.6580      3.89  Q         |         |         |        V|
   3+45      27.6634      0.26  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Offsite, north of 60fwy
Exist condition, 100 yr 3 hr


-------------------------------------------------------------------
Drainage Area =     521.40(Ac.)  =      0.815 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     521.40(Ac.)  =      0.815 Sq. Mi.
Length along longest watercourse =   10000.00(Ft.)
Length along longest watercourse measured to centroid =    5000.00(Ft.)
Length along longest watercourse =      1.894 Mi.
Length along longest watercourse measured to centroid =      0.947 Mi.
Difference in elevation =    1000.00(Ft.)
Slope along watercourse =    528.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.137 Hr.
Lag time =     8.20 Min.
25% of lag time =     2.05 Min.
40% of lag time =     3.28 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      521.40           0.85                443.19

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      521.40           1.90                990.66

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.77 %
Adjusted average point rain =    1.896(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   521.400           85.00         0.000
 Total Area Entered =    521.40(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.000        0.187       1.000      0.187
                                                  Sum (F) =   0.187
Area averaged mean soil loss (F) (In/Hr) =  0.187
Minimum soil loss rate ((In/Hr)) =  0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
-------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        183.034         38.704            203.381
    2   0.500        366.067         51.579            271.033
    3   0.750        549.101          8.175             42.956
    4   1.000        732.135          1.542              8.102
                                Sum = 100.000   Sum=     525.473
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.187    (  0.253)        0.094
   2   0.50     4.80      0.364          0.187    (  0.328)        0.177
   3   0.75     5.10      0.387          0.187    (  0.348)        0.200
   4   1.00     4.90      0.372          0.187    (  0.334)        0.185
   5   1.25     6.60      0.500          0.187    (  0.450)        0.313
   6   1.50     7.30      0.554          0.187    (  0.498)        0.367
   7   1.75     8.40      0.637          0.187    (  0.573)        0.450
   8   2.00     9.00      0.682          0.187    (  0.614)        0.495
   9   2.25    12.30      0.933          0.187    (  0.839)        0.746
  10   2.50    17.60      1.335          0.187    (  1.201)        1.148
  11   2.75    16.10      1.221          0.187    (  1.099)        1.034
  12   3.00     4.20      0.318          0.187    (  0.287)        0.131
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     5.3
       Flood volume = Effective rainfall      1.33(In)
        times area     521.4(Ac.)/[(In)/(Ft.)] =      58.0(Ac.Ft)
       Total soil loss =      0.56(In)
       Total soil loss =    24.375(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =     2526098.1 Cubic Feet
       Total soil loss =     1061794.6 Cubic Feet
       -------------------------------------------------------------------
        Peak flow rate of this hydrograph =    557.615(CFS)
       -------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

       -------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0      150.0     300.0     450.0     600.0
  ---------------------------------------------------------------------
    0+15       0.3933     19.04  VQ        |         |         |         |
    0+30       1.6616     61.38   V  Q     |         |         |         |
    0+45       3.5758     92.65  | V   Q   |         |         |         |
    1+ 0       5.6435    100.08  |  V  Q   |         |         |         |
    1+15       8.2023    123.85  |    V  Q |         |         |         |
```

```
   1+30      11.6969    169.14  |       V |Q        |         |         |
   1+45      15.9514    205.92  |          V Q      |         |         |
   2+ 0      20.9333    241.12  |         |   V Q   |         |         |
   2+15      27.3050    308.39  |         |       V Q         |         |
   2+30      36.8227    460.66  |         |         |    V    Q         |
   2+45      48.3437    557.61  |         |         |            V   Q  |
   3+ 0      55.8325    362.46  |         |         |   Q     |       V |
   3+15      57.6793     89.39  |    Q    |         |         |        V|
   3+30      57.9692     14.03  Q         |         |         |        V|
   3+45      57.9912      1.07  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/07/12 File: SUBA43100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Onsite, Subdrain Area A4
Exist condition, 100 yr 3 hr


-------------------------------------------------------------------
Drainage Area =    1015.00(Ac.)  =      1.586 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =    1015.00(Ac.)  =      1.586 Sq. Mi.
Length along longest watercourse =    9000.00(Ft.)
Length along longest watercourse measured to centroid =    4500.00(Ft.)
Length along longest watercourse =      1.705 Mi.
Length along longest watercourse measured to centroid =      0.852 Mi.
Difference in elevation =     180.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.171 Hr.
Lag time =    10.27 Min.
25% of lag time =     2.57 Min.
40% of lag time =     4.11 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1015.00           0.85                 862.75

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1015.00           1.90                1928.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.56 %
Adjusted average point rain =    1.892(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
  1015.000           85.00         0.000
 Total Area Entered =   1015.00(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.000        0.187       1.000      0.187
                                                  Sum (F) =   0.187
Area averaged mean soil loss (F) (In/Hr) =  0.187
Minimum soil loss rate ((In/Hr)) =  0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
-----------------------------------------------------------------------
               Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.250        146.050         32.207            329.456
    2   0.500        292.101         47.294            483.787
    3   0.750        438.151         11.418            116.800
    4   1.000        584.201          5.005             51.193
    5   1.250        730.252          2.585             26.447
    6   1.500        876.302          1.490             15.246
                                Sum = 100.000   Sum=    1022.930
-----------------------------------------------------------------------

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

 Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
      (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
  1   0.25     3.70      0.280          0.187    (  0.252)        0.093
  2   0.50     4.80      0.363          0.187    (  0.327)        0.176
  3   0.75     5.10      0.386          0.187    (  0.347)        0.199
  4   1.00     4.90      0.371          0.187    (  0.334)        0.184
  5   1.25     6.60      0.499          0.187    (  0.449)        0.312
  6   1.50     7.30      0.552          0.187    (  0.497)        0.365
  7   1.75     8.40      0.636          0.187    (  0.572)        0.449
  8   2.00     9.00      0.681          0.187    (  0.613)        0.494
  9   2.25    12.30      0.931          0.187    (  0.838)        0.744
 10   2.50    17.60      1.332          0.187    (  1.198)        1.145
 11   2.75    16.10      1.218          0.187    (  1.096)        1.031
 12   3.00     4.20      0.318          0.187    (  0.286)        0.131
               (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     5.3
       Flood volume = Effective rainfall      1.33(In)
        times area    1015.0(Ac.)/[(In)/(Ft.)] =     112.5(Ac.Ft)
       Total soil loss =      0.56(In)
       Total soil loss =    47.451(Ac.Ft)
       Total rainfall =      1.89(In)
       Flood volume =     4902392.2 Cubic Feet
       Total soil loss =     2066976.5 Cubic Feet
       -------------------------------------------------------------------
        Peak flow rate of this hydrograph =   1023.604(CFS)
       -------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       -------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0      275.0     550.0     825.0    1100.0
 ---------------------------------------------------------------------
   0+15       0.6330     30.64  VQ        |         |         |         |
   0+30       2.7625    103.07  V  Q      |         |         |         |
   0+45       6.1033    161.70  | V  Q    |         |         |         |
```

```
   1+ 0       9.8674    182.18  |  V  Q   |         |         |         |
   1+15      14.5498    226.63  |    V  Q |         |         |         |
   1+30      20.9417    309.36  |      V  |Q        |         |         |
   1+45      28.7632    378.56  |         V  Q      |         |         |
   2+ 0      37.9891    446.53  |         |  V  Q   |         |         |
   2+15      49.6920    566.42  |         |      V  Q         |         |
   2+30      66.8903    832.40  |         |         |  V      Q         |
   2+45      88.0391   1023.60  |         |         |         |V     Q  |
   3+ 0     103.2044    734.00  |         |         |     Q   |     V   |
   3+15     108.7756    269.65  |        Q|         |         |       V |
   3+30     111.0428    109.73  |  Q      |         |         |        V|
   3+45     112.1057     51.44  |Q        |         |         |        V|
   4+ 0     112.5022     19.19  Q         |         |         |        V|
   4+15     112.5434      1.99  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/02/12

------------------------------------------------------------------


Watershed B, Stream 1
Existing Condition
100-year, 3-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubB13100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    22
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      343.915 (CFS)
               Total volume =      43.572 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   2500.00 (Ft.)
Elevation difference =   50.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  2500.00(Ft.)     Elevation difference =  50.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    143.059(CFS)
Depth of flow =     1.453(Ft.)
Average velocity =     7.629(Ft/s)
Total flow rate =   143.059(CFS)
Channel flow top width =   15.812(Ft.)
Depth of flow in channel =   1.45(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.63(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  143.059(CFS)
Total capacity of improved channels =    143.059(CFS)
Critical Depth in Channel =    1.66(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    343.915(CFS)
Depth of flow =     2.355(Ft.)
Average velocity =     9.928(Ft/s)
```

```
Total flow rate =   343.915(CFS)
Channel flow top width =   19.420(Ft.)
Depth of flow in channel =   2.35(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.93(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  343.915(CFS)
Total capacity of improved channels =    343.915(CFS)
Critical Depth in Channel =    2.75(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8538   Travel time =   4.20 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   3.1240
       dt(routing time-step) =   3.58 (min.),   c* =   0.9975

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
              R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       86.0     172.0     257.9     343.9
 ---------------------------------------------------------------------
   0+15       3.2795      4.32  O         |         |         |         |
   0+30      18.9604     23.61  | O       |         |         |         |
   0+45      40.9849     46.51  |   OI    |         |         |         |
   1+ 0      56.5754     59.78  |     O   |         |         |         |
   1+15      67.5566     70.03  |      OI |         |         |         |
   1+30      90.4551     96.94  |         OI        |         |         |
   1+45     116.5757    122.82  |         |  OI     |         |         |
   2+ 0     143.0515    149.49  |         |     OI  |         |         |
   2+15     174.0207    181.82  |         |         OI        |         |
   2+30     236.6008    254.00  |         |         |      O I|         |
   2+45     322.2231    343.91  |         |         |         |      O  I
   3+ 0     331.3070    327.38  |         |         |         |       O |
   3+15     214.8501    179.15  |         |         I   O     |         |
   3+30     111.7265     90.23  |         I O       |         |         |
   3+45      63.7403     55.27  |     IO  |         |         |         |
   4+ 0      41.3484     36.91  |   O     |         |         |         |
   4+15      28.2794     25.53  | IO      |         |         |         |
   4+30      19.4606     17.53  | O       |         |         |         |
   4+45      13.1977     11.82  |O        |         |         |         |
   5+ 0       8.6666      7.66  IO        |         |         |         |
   5+15       4.7156      3.78  O         |         |         |         |
   5+30       1.2284      0.42  O         |         |         |         |
   5+45       0.1024      0.00  O         |         |         |         |
   6+ 0       0.0000      0.00  O         |         |         |         |
---------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =    24
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      331.307 (CFS)
                     Total volume =      43.572 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubB23100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      107.2     214.4     321.6     428.7
 -------------------------------------------------------------------
   0+15       1.5903      4.87  Q         |         |         |         |
   0+30       7.1653     26.13  q Q       |         |         |         |
   0+45      12.9015     53.89  |q   Q    |         |         |         |
   1+ 0      14.1555     70.73  |q    Q   |         |         |         |
   1+15      19.1897     86.75  |q      Q |         |         |         |
   1+30      28.3060    118.76  | q       |Q        |         |         |
   1+45      35.7173    152.29  |  q      |   Q     |         |         |
   2+ 0      42.7324    185.78  |  q      |      Q  |         |         |
   2+15      56.6771    230.70  |    q    |         |Q        |         |
   2+30      87.8923    324.49  |       q |         |         Q         |
   2+45     106.5127    428.74  |        q|         |         |         Q
   3+ 0      64.9017    396.21  |     q   |         |         |     Q   |
   3+15      12.9609    227.81  |q        |         |Q        |         |
   3+30       1.8870    113.61  q         Q         |         |         |
   3+45       0.1006     63.84  q    Q    |         |         |         |
   4+ 0       0.0000     41.35  q  Q      |         |         |         |
   4+15       0.0000     28.28  q Q       |         |         |         |
   4+30       0.0000     19.46  qQ        |         |         |         |
   4+45       0.0000     13.20  qQ        |         |         |         |
   5+ 0       0.0000      8.67  Q         |         |         |         |
   5+15       0.0000      4.72  Q         |         |         |         |
   5+30       0.0000      1.23  Q         |         |         |         |
   5+45       0.0000      0.10  Q         |         |         |         |
   6+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
****************************HYDROGRAPH DATA****************************
                Number of intervals =    24
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      428.736 (CFS)
                Total volume =      53.752 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

--------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSB3hrSt1.rte
****************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/27/12

------------------------------------------------------------------


Watershed B, Sream 2
Existing Condition
100-year, 3-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubB33100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    15
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       82.945 (CFS)
               Total volume =       6.835 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       21.000 to Point/Station       22.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =  11400.00 (Ft.)
Elevation difference =  239.00 (Ft.)
Slope of channel =  0.020965 (Vert/Horiz)
Channel type - Improved Channel


Channel length = 11400.00(Ft.)     Elevation difference = 239.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     26.576(CFS)
Depth of flow =     0.542(Ft.)
Average velocity =     4.420(Ft/s)
Total flow rate =    26.576(CFS)
Channel flow top width =   12.170(Ft.)
Depth of flow in channel =   0.54(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    4.42(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   26.576(CFS)
Total capacity of improved channels =     26.576(CFS)
Critical Depth in Channel =    0.58(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     82.945(CFS)
Depth of flow =     1.052(Ft.)
Average velocity =     6.515(Ft/s)
```

```
Total flow rate =    82.945(CFS)
Channel flow top width =   14.207(Ft.)
Depth of flow in channel =   1.05(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.52(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   82.945(CFS)
Total capacity of improved channels =     82.945(CFS)
Critical Depth in Channel =    1.19(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.7931   Travel time =  29.16 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   0.7657
       dt(routing time-step) =  23.13 (min.),   c* =   0.7007

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
              R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       20.7      41.5      62.2      82.9
 ---------------------------------------------------------------------
   0+15       0.2405      0.98  O         |         |         |         |
   0+30       1.1626      2.63  OI        |         |         |         |
   0+45       2.3639      3.34  |O        |         |         |         |
   1+ 0       3.0891      3.51  |O        |         |         |         |
   1+15       4.3105      7.27  | OI      |         |         |         |
   1+30       8.1438     14.41  |  O  I   |         |         |         |
   1+45      14.1017     20.77  |     O   I         |         |         |
   2+ 0      20.3127     27.01  |        O|  I      |         |         |
   2+15      27.8818     38.69  |         |  O    I |         |         |
   2+30      42.0114     65.31  |         |         O         |I        |
   2+45      62.6807     82.94  |         |         |         O         I
   3+ 0      69.2710     52.05  |         |         |    I    |  O      |
   3+15      46.8957     10.19  |   I     |         | O       |         |
   3+30      19.0773      1.66  I        O|         |         |         |
   3+45       6.4772      0.05  I  O      |         |         |         |
   4+ 0       1.9621      0.00  O         |         |         |         |
   4+15       0.5873      0.00  O         |         |         |         |
   4+30       0.1758      0.00  O         |         |         |         |
   4+45       0.0526      0.00  O         |         |         |         |
   5+ 0       0.0157      0.00  O         |         |         |         |
   5+15       0.0047      0.00  O         |         |         |         |
   5+30       0.0014      0.00  O         |         |         |         |
   5+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =    23
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       69.271 (CFS)
                     Total volume =       6.835 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station       21.000 to Point/Station       22.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
____________________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: SubB43100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      175.1     350.2     525.2     700.3
 ---------------------------------------------------------------------
   0+15       6.1389      6.38  Q         |         |         |         |
   0+30      36.7298     37.89  | Q       |         |         |         |
   0+45      79.3314     81.70  |   Q     |         |         |         |
   1+ 0     108.2732    111.36  |     Q   |         |         |         |
   1+15     127.9594    132.27  |      Q  |         |         |         |
   1+30     171.9488    180.09  |        qQ         |         |         |
   1+45     222.1816    236.28  |         | qQ      |         |         |
   2+ 0     271.6867    292.00  |         |    qQ   |         |         |
   2+15     329.9380    357.82  |         |       q Q         |         |
   2+30     448.6348    490.65  |         |         |    q  Q |         |
   2+45     613.5788    676.26  |         |         |         |    q  Q |
   3+ 0     631.0456    700.32  |         |         |         |     q   Q
   3+15     403.6117    450.51  |         |         |  q Q    |         |
   3+30     210.0944    229.17  |         |q Q      |         |         |
   3+45     130.5012    136.98  |      Q  |         |         |         |
   4+ 0      90.3137     92.28  |    Q    |         |         |         |
   4+15      65.4981     66.09  |  Q      |         |         |         |
   4+30      48.5466     48.72  | Q       |         |         |         |
   4+45      36.4139     36.47  | Q       |         |         |         |
   5+ 0      26.1980     26.21  |Q        |         |         |         |
   5+15      19.1231     19.13  |Q        |         |         |         |
   5+30      13.8558     13.86  Q         |         |         |         |
   5+45       7.6660      7.67  Q         |         |         |         |
   6+ 0       0.8834      0.88  Q         |         |         |         |
-----------------------------------------------------------------------
******************************HYDROGRAPH DATA****************************
                Number of intervals =    24
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      700.317 (CFS)
                Total volume =      91.549 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       22.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
____________________________________________________________________________
Current stream hydrograph saved in file WSB3hrSt2.rte
******************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

---------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  02/10/12 File: SubB13100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Subdrain Area B1, Exist condition
100 yr 3 hr


-------------------------------------------------------------------
Drainage Area =     395.00(Ac.)  =      0.617 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     395.00(Ac.)  =      0.617 Sq. Mi.
Length along longest watercourse =    9460.00(Ft.)
Length along longest watercourse measured to centroid =    4140.00(Ft.)
Length along longest watercourse =      1.792 Mi.
Length along longest watercourse measured to centroid =      0.784 Mi.
Difference in elevation =     212.00(Ft.)
Slope along watercourse =    118.3256 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.331 Hr.
Lag time =    19.85 Min.
25% of lag time =     4.96 Min.
40% of lag time =     7.94 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      395.00           0.85                 335.75

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      395.00           1.90                 750.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.83 %
Adjusted average point rain =    1.897(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     6.800           76.00         0.000
   350.000           85.00         0.000
```

```
    38.200          83.00         0.000
 Total Area Entered =    395.00(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
76.0  76.0      0.291     0.000        0.291       0.017      0.005
85.0  85.0      0.187     0.000        0.187       0.886      0.166
83.0  83.0      0.210     0.000        0.210       0.097      0.020
                                                  Sum (F) =   0.191
Area averaged mean soil loss (F) (In/Hr) =  0.191
Minimum soil loss rate ((In/Hr)) =  0.095
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250         75.578         12.088             48.122
    2   0.500        151.156         42.731            170.105
    3   0.750        226.734         21.283             84.724
    4   1.000        302.312          8.554             34.052
    5   1.250        377.890          5.168             20.573
    6   1.500        453.468          3.339             13.292
    7   1.750        529.046          2.330              9.277
    8   2.000        604.624          1.698              6.759
    9   2.250        680.202          1.179              4.693
   10   2.500        755.780          0.810              3.226
   11   2.750        831.358          0.820              3.265
                                 Sum = 100.000   Sum=     398.086
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.191    (  0.253)        0.090
   2   0.50     4.80      0.364          0.191    (  0.328)        0.173
   3   0.75     5.10      0.387          0.191    (  0.348)        0.196
   4   1.00     4.90      0.372          0.191    (  0.335)        0.181
   5   1.25     6.60      0.501          0.191    (  0.451)        0.310
   6   1.50     7.30      0.554          0.191    (  0.498)        0.363
   7   1.75     8.40      0.637          0.191    (  0.574)        0.446
   8   2.00     9.00      0.683          0.191    (  0.615)        0.492
   9   2.25    12.30      0.933          0.191    (  0.840)        0.742
  10   2.50    17.60      1.335          0.191    (  1.202)        1.144
  11   2.75    16.10      1.221          0.191    (  1.099)        1.030
  12   3.00     4.20      0.319          0.191    (  0.287)        0.128
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     5.3
       Flood volume = Effective rainfall      1.32(In)
        times area     395.0(Ac.)/[(In)/(Ft.)] =      43.6(Ac.Ft)
       Total soil loss =      0.57(In)
       Total soil loss =    18.861(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =     1898016.2 Cubic Feet
       Total soil loss =      821590.8 Cubic Feet
       ---------------------------------------------------------------
        Peak flow rate of this hydrograph =    343.915(CFS)
       ---------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
```

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 100.0 200.0 300.0 400.0
0+15	0.0892	4.32	Q
0+30	0.5770	23.61	V Q
0+45	1.5380	46.51	V Q
1+ 0	2.7732	59.78	| V Q
1+15	4.2201	70.03	| V Q |
1+30	6.2230	96.94	| V Q|
1+45	8.7607	122.82	| V | Q
2+ 0	11.8492	149.49	| V Q |
2+15	15.6059	181.82	| | V Q |
2+30	20.8538	254.00	| | V| Q |
2+45	27.9594	343.91	| | | V | Q |
3+ 0	34.7235	327.38	| | | |VQ |
3+15	38.4250	179.15	| | Q | | V |
3+30	40.2892	90.23	| Q| | | V |
3+45	41.4312	55.27	| Q | | | V |
4+ 0	42.1937	36.91	| Q | | | V |
4+15	42.7212	25.53	| Q | | | V|
4+30	43.0833	17.53	|Q | | | V|
4+45	43.3275	11.82	|Q | | | V|
5+ 0	43.4858	7.66	Q | | | V|
5+15	43.5638	3.78	Q | | | V|
5+30	43.5725	0.42	Q | | | V

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Subdrain Area B2, Exist Condition
100 yr 3 hr


-------------------------------------------------------------------
Drainage Area =     104.70(Ac.)  =      0.164 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     104.70(Ac.)  =      0.164 Sq. Mi.
Length along longest watercourse =    2120.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.402 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      30.00(Ft.)
Slope along watercourse =     74.7170 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.130 Hr.
Lag time =     7.78 Min.
25% of lag time =     1.95 Min.
40% of lag time =     3.11 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      104.70           0.85                 89.00

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      104.70           1.90                198.93

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    18.400           66.00         0.000
    86.300           83.00         0.000
```

Total Area Entered = 104.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.176	0.071
83.0	83.0	0.210	0.000	0.210	0.824	0.173
					Sum (F) =	0.244

Area averaged mean soil loss (F) (In/Hr) = 0.244
Minimum soil loss rate ((In/Hr)) = 0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	192.719	40.788	43.039
2	0.500	385.439	50.698	53.496
3	0.750	578.158	7.242	7.641
4	1.000	770.878	1.272	1.342
			Sum = 100.000	Sum= 105.518

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.244	(0.253)	0.037
2	0.50	4.80	0.365	0.244	(0.328)	0.120
3	0.75	5.10	0.387	0.244	(0.349)	0.143
4	1.00	4.90	0.372	0.244	(0.335)	0.128
5	1.25	6.60	0.501	0.244	(0.451)	0.257
6	1.50	7.30	0.555	0.244	(0.499)	0.310
7	1.75	8.40	0.638	0.244	(0.574)	0.394
8	2.00	9.00	0.684	0.244	(0.615)	0.440
9	2.25	12.30	0.934	0.244	(0.841)	0.690
10	2.50	17.60	1.337	0.244	(1.203)	1.093
11	2.75	16.10	1.223	0.244	(1.101)	0.979
12	3.00	4.20	0.319	0.244	(0.287)	0.075
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.7

Flood volume = Effective rainfall 1.17(In)
times area 104.7(Ac.)/[(In)/(Ft.)] = 10.2(Ac.Ft)
Total soil loss = 0.73(In)
Total soil loss = 6.390(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 443421.3 Cubic Feet
Total soil loss = 278363.9 Cubic Feet

Peak flow rate of this hydrograph = 106.513(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+15	0.0329	1.59	Q	|	|	|	|
0+30	0.1809	7.17	VQ	|	|	|	|
0+45	0.4475	12.90	|VQ	|	|	|	|

```
    1+ 0       0.7399     14.16  | Q       |         |         |         |
    1+15       1.1364     19.19  |  QV     |         |         |         |
    1+30       1.7212     28.31  |    QV   |         |         |         |
    1+45       2.4592     35.72  |      Q V|         |         |         |
    2+ 0       3.3421     42.73  |       Q    V      |         |         |
    2+15       4.5131     56.68  |         |Q     V  |         |         |
    2+30       6.3291     87.89  |         |      Q      V     |         |
    2+45       8.5298    106.51  |         |         |Q           V      |
    3+ 0       9.8707     64.90  |         | Q       |         |       V |
    3+15      10.1385     12.96  | Q       |         |         |        V|
    3+30      10.1775      1.89  Q         |         |         |        V|
    3+45      10.1796      0.10  Q         |         |         |        V|
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/25/12 File: SubB33100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Stream 3, Existing Condition
Stream 2
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =      92.10(Ac.)  =      0.144 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      92.10(Ac.)  =      0.144 Sq. Mi.
Length along longest watercourse =    3800.00(Ft.)
Length along longest watercourse measured to centroid =    1780.00(Ft.)
Length along longest watercourse =      0.720 Mi.
Length along longest watercourse measured to centroid =      0.337 Mi.
Difference in elevation =     226.00(Ft.)
Slope along watercourse =    314.0211 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.141 Hr.
Lag time =     8.46 Min.
25% of lag time =     2.11 Min.
40% of lag time =     3.38 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           0.85                 78.28

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           1.90                174.99

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.000           46.00         0.000
    28.000           66.00         0.000
```

3.500	77.00	0.000
41.600	83.00	0.000

Total Area Entered = 92.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.206	0.126
66.0	66.0	0.405	0.000	0.405	0.304	0.123
77.0	77.0	0.279	0.000	0.279	0.038	0.011
83.0	83.0	0.210	0.000	0.210	0.452	0.095
					Sum (F) =	0.355

Area averaged mean soil loss (F) (In/Hr) = 0.355
Minimum soil loss rate ((In/Hr)) = 0.177
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	177.319	37.414	34.727
2	0.500	354.637	52.090	48.350
3	0.750	531.956	8.760	8.131
4	1.000	709.274	1.737	1.612
			Sum = 100.000	Sum= 92.820

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	(Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.355)	0.253	0.028
2	0.50	4.80	0.365	(0.355)	0.328	0.036
3	0.75	5.10	0.387	(0.355)	0.349	0.039
4	1.00	4.90	0.372	(0.355)	0.335	0.037
5	1.25	6.60	0.501	0.355	(0.451)	0.147
6	1.50	7.30	0.555	0.355	(0.499)	0.200
7	1.75	8.40	0.638	0.355	(0.574)	0.283
8	2.00	9.00	0.684	0.355	(0.615)	0.329
9	2.25	12.30	0.934	0.355	(0.841)	0.580
10	2.50	17.60	1.337	0.355	(1.203)	0.982
11	2.75	16.10	1.223	0.355	(1.101)	0.868
12	3.00	4.20	0.319	(0.355)	0.287	0.032
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	3.6

Flood volume = Effective rainfall 0.89(In)
times area 92.1(Ac.)/[(In)/(Ft.)] = 6.8(Ac.Ft)
Total soil loss = 1.01(In)
Total soil loss = 7.742(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 297737.9 Cubic Feet
Total soil loss = 337219.8 Cubic Feet

Peak flow rate of this hydrograph = 82.945(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0

```
  ---------------------------------------------------------------------
    0+15       0.0202      0.98  Q         |         |         |         |
    0+30       0.0744      2.63  VQ        |         |         |         |
    0+45       0.1434      3.34  VQ        |         |         |         |
    1+ 0       0.2159      3.51   Q        |         |         |         |
    1+15       0.3662      7.27  | VQ      |         |         |         |
    1+30       0.6639     14.41  |  V  Q   |         |         |         |
    1+45       1.0932     20.77  |     V  Q|         |         |         |
    2+ 0       1.6512     27.01  |        V| Q       |         |         |
    2+15       2.4506     38.69  |         |   V  Q  |         |         |
    2+30       3.8001     65.31  |         |         | V      Q|         |
    2+45       5.5138     82.94  |         |         |         | V   Q   |
    3+ 0       6.5892     52.05  |         |         |  Q      |       V |
    3+15       6.7998     10.19  |   Q     |         |         |        V|
    3+30       6.8341      1.66  Q         |         |         |        V|
    3+45       6.8351      0.05  Q         |         |         |        V|
---------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/25/12 File: SubB43100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Stream 2, Existing Condition
Subarea B4
100-year 3-hour

--------------------------------------------------------------------
Drainage Area =     765.00(Ac.)  =      1.195 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     765.00(Ac.)  =      1.195 Sq. Mi.
Length along longest watercourse =   11400.00(Ft.)
Length along longest watercourse measured to centroid =    5620.00(Ft.)
Length along longest watercourse =      2.159 Mi.
Length along longest watercourse measured to centroid =      1.064 Mi.
Difference in elevation =     239.00(Ft.)
Slope along watercourse =    110.6947 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.404 Hr.
Lag time =    24.23 Min.
25% of lag time =     6.06 Min.
40% of lag time =     9.69 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      765.00           0.85                650.25

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      765.00           1.90               1453.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.67 %
Adjusted average point rain =    1.894(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    11.200           76.00         0.000
   751.400           85.00         0.000
```

```
     2.400           92.00         0.000
 Total Area Entered =    765.00(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
76.0  76.0      0.291     0.000        0.291       0.015      0.004
85.0  85.0      0.187     0.000        0.187       0.982      0.184
92.0  92.0      0.104     0.000        0.104       0.003      0.000
                                                  Sum (F) =   0.188
Area averaged mean soil loss (F) (In/Hr) =  0.188
Minimum soil loss rate ((In/Hr)) =  0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
---------------------------------------------------------------------
              Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250         61.897          8.651             66.698
    2   0.500        123.794         35.274            271.951
    3   0.750        185.691         25.950            200.068
    4   1.000        247.588          9.993             77.047
    5   1.250        309.485          5.980             46.106
    6   1.500        371.382          4.019             30.983
    7   1.750        433.279          2.828             21.805
    8   2.000        495.176          2.027             15.629
    9   2.250        557.073          1.649             12.716
   10   2.500        618.970          1.201              9.261
   11   2.750        680.867          0.895              6.903
   12   3.000        742.764          0.650              5.012
   13   3.250        804.661          0.882              6.799
                                 Sum = 100.000   Sum=     770.977
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.280          0.188    (  0.252)        0.092
   2   0.50     4.80      0.364          0.188    (  0.327)        0.175
   3   0.75     5.10      0.386          0.188    (  0.348)        0.198
   4   1.00     4.90      0.371          0.188    (  0.334)        0.183
   5   1.25     6.60      0.500          0.188    (  0.450)        0.312
   6   1.50     7.30      0.553          0.188    (  0.498)        0.365
   7   1.75     8.40      0.636          0.188    (  0.573)        0.448
   8   2.00     9.00      0.682          0.188    (  0.614)        0.493
   9   2.25    12.30      0.932          0.188    (  0.839)        0.743
  10   2.50    17.60      1.333          0.188    (  1.200)        1.145
  11   2.75    16.10      1.220          0.188    (  1.098)        1.031
  12   3.00     4.20      0.318          0.188    (  0.286)        0.130
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     5.3
       Flood volume = Effective rainfall      1.33(In)
        times area     765.0(Ac.)/[(In)/(Ft.)] =      84.7(Ac.Ft)
       Total soil loss =      0.56(In)
       Total soil loss =    36.006(Ac.Ft)
       Total rainfall =      1.89(In)
       Flood volume =     3690137.5 Cubic Feet
       Total soil loss =     1568408.7 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    631.046(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 175.0 350.0 525.0 700.0
0+15	0.1268	6.14	Q
0+30	0.8857	36.73	V Q
0+45	2.5248	79.33	V Q
1+ 0	4.7618	108.27	V Q
1+15	7.4056	127.96	V Q
1+30	10.9583	171.95	V Q
1+45	15.5488	222.18	V Q
2+ 0	21.1622	271.69	V Q
2+15	27.9791	329.94	V Q
2+30	37.2484	448.63	V Q
2+45	49.9256	613.58	V Q
3+ 0	62.9638	631.05	V Q
3+15	71.3029	403.61	Q V
3+30	75.6437	210.09	Q V
3+45	78.3400	130.50	Q V
4+ 0	80.2059	90.31	Q V
4+15	81.5592	65.50	Q V
4+30	82.5622	48.55	Q V
4+45	83.3146	36.41	Q V
5+ 0	83.8559	26.20	Q V
5+15	84.2510	19.12	Q V
5+30	84.5373	13.86	Q V
5+45	84.6956	7.67	Q V
6+ 0	84.7139	0.88	Q V

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 04/27/12

------------------------------------------------------------------


Watershed C, Stream 1
Existing Condition
100-year, 3-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC13100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    20
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      360.479 (CFS)
               Total volume =      41.223 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       31.000 to Point/Station       32.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1900.00 (Ft.)
Elevation difference =   58.00 (Ft.)
Slope of channel =  0.030526 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1900.00(Ft.)     Elevation difference =  58.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    140.469(CFS)
Depth of flow =     1.276(Ft.)
Average velocity =     8.769(Ft/s)
Total flow rate =   140.469(CFS)
Channel flow top width =   15.105(Ft.)
Depth of flow in channel =   1.28(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.77(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  140.469(CFS)
Total capacity of improved channels =    140.469(CFS)
Critical Depth in Channel =    1.63(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    360.479(CFS)
Depth of flow =     2.155(Ft.)
Average velocity =    11.691(Ft/s)
```

```
Total flow rate =   360.479(CFS)
Channel flow top width =   18.619(Ft.)
Depth of flow in channel =   2.15(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.69(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  360.479(CFS)
Total capacity of improved channels =    360.479(CFS)
Critical Depth in Channel =    2.81(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8731   Travel time =   2.71 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   4.5622
       dt(routing time-step) =   2.36 (min.),   c* =   0.9999

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       90.1     180.2     270.4     360.5
 ---------------------------------------------------------------------
   0+15       1.8734      2.22  O         |         |         |         |
   0+30      14.7521     17.10  |O        |         |         |         |
   0+45      36.7051     40.38  |   O     |         |         |         |
   1+ 0      52.3510     54.59  |    OI   |         |         |         |
   1+15      61.6442     62.96  |     O   |         |         |         |
   1+30      87.8271     92.48  |        OI         |         |         |
   1+45     115.1167    119.36  |         | OI      |         |         |
   2+ 0     143.7143    148.28  |         |    OI   |         |         |
   2+15     174.8309    179.80  |         |        O|         |         |
   2+30     243.5720    255.51  |         |         |      OI |         |
   2+45     343.9231    360.48  |         |         |         |       O I
   3+ 0     353.7217    352.46  |         |         |         |        O|
   3+15     203.8548    176.03  |         |        I| O       |         |
   3+30      91.3219     75.46  |       I O         |         |         |
   3+45      39.7483     33.06  |  IO     |         |         |         |
   4+ 0      16.6222     13.54  |O        |         |         |         |
   4+15       7.7144      6.62  O         |         |         |         |
   4+30       4.0328      3.55  O         |         |         |         |
   4+45       1.5640      1.19  O         |         |         |         |
   5+ 0       0.2674      0.09  O         |         |         |         |
   5+15       0.0149      0.00  O         |         |         |         |
   5+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    22
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      353.722 (CFS)
                Total volume =      41.223 (Ac.Ft)
          Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       31.000 to Point/Station       32.000
```

```
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: SubC23100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0       91.4     182.7     274.1     365.4
 -------------------------------------------------------------------
   0+15       0.3569      2.23  Q         |         |         |         |
   0+30       0.7561     15.51  qQ        |         |         |         |
   0+45       0.8941     37.60  q   Q     |         |         |         |
   1+ 0       0.9051     53.26  q    Q    |         |         |         |
   1+15       2.1648     63.81  q     Q   |         |         |         |
   1+30       3.8847     91.71  q         Q         |         |         |
   1+45       5.5785    120.70  q         |  Q      |         |         |
   2+ 0       7.0701    150.78  q         |     Q   |         |         |
   2+15      10.7940    185.62  |q        |         Q         |         |
   2+30      18.5563    262.13  | q       |         |       Q |         |
   2+45      21.5029    365.43  | q       |         |         |         Q
   3+ 0      10.1228    363.84  |q        |         |         |        Q|
   3+15       1.0027    204.86  q         |         | Q       |         |
   3+30       0.0249     91.35  q        Q|         |         |         |
   3+45       0.0000     39.75  q   Q     |         |         |         |
   4+ 0       0.0000     16.62  qQ        |         |         |         |
   4+15       0.0000      7.71  Q         |         |         |         |
   4+30       0.0000      4.03  Q         |         |         |         |
   4+45       0.0000      1.56  Q         |         |         |         |
   5+ 0       0.0000      0.27  Q         |         |         |         |
   5+15       0.0000      0.01  Q         |         |         |         |
   5+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
****************************HYDROGRAPH DATA***************************
                Number of intervals =    22
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      365.426 (CFS)
                Total volume =      42.950 (Ac.Ft)
          Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

--------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       31.000 to Point/Station       32.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: C21and22N32.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      139.5     279.0     418.6     558.1
 -------------------------------------------------------------------
   0+15       2.7907      5.02  Q         |         |         |         |
   0+30      11.9069     27.42  qQ        |         |         |         |
   0+45      22.4999     60.10  |q  Q     |         |         |         |
   1+ 0      26.9565     80.21  |q   Q    |         |         |         |
```

```
 1+15      34.0181     97.83  | q    Q  |         |         |         |
 1+30      49.4673    141.18  |  q      Q         |         |         |
 1+45      63.8361    184.53  |   q     |  Q      |         |         |
 2+ 0      77.4088    228.19  |    q    |     Q   |         |         |
 2+15      99.8682    285.49  |      q  |         Q         |         |
 2+30     150.4082    412.54  |         q         |        Q|         |
 2+45     192.6729    558.10  |         |  q      |         |         Q
 3+ 0     144.8838    508.73  |         q         |         |     Q   |
 3+15      50.2888    255.15  |  q      |       Q |         |         |
 3+30      11.8580    103.20  q      Q  |         |         |         |
 3+45       2.7127     42.46  q  Q      |         |         |         |
 4+ 0       0.3889     17.01  qQ        |         |         |         |
 4+15       0.0200      7.73  Q         |         |         |         |
 4+30       0.0000      4.03  Q         |         |         |         |
 4+45       0.0000      1.56  Q         |         |         |         |
 5+ 0       0.0000      0.27  Q         |         |         |         |
 5+15       0.0000      0.01  Q         |         |         |         |
 5+30       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    22
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      558.099 (CFS)
                    Total volume =      62.413 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station       32.000 to Point/Station       33.000
      **** STREAM ROUTING SCS CONVEX METHOD ****
      ______________________________________________________________________
      HYDROGRAPH STREAM ROUTING DATA:
      Length of stream =    700.00 (Ft.)
      Elevation difference =   22.00 (Ft.)
      Slope of channel =  0.031429 (Vert/Horiz)
      Channel type - Improved Channel


      Channel length =   700.00(Ft.)     Elevation difference =  22.00(Ft.)
      Channel evaluation using mean flow rate of hydrograph
      Channel base width  =   10.000(Ft.)
      Slope or 'Z' of left channel bank =   2.000
      Slope or 'Z' of right channel bank =   2.000
      Manning's 'N'    = 0.030
      Maximum depth of channel  =    5.000(Ft.)
      Flow(q) thru subarea =    215.778(CFS)
      Depth of flow =     1.611(Ft.)
      Average velocity =    10.127(Ft/s)
      Total flow rate =   215.778(CFS)
      Channel flow top width =   16.446(Ft.)
      Depth of flow in channel =   1.61(Ft.)
      Total number of channels (same dimensions) = 1
      Flow Velocity =   10.13(Ft/s)
      Travel time  =    0.00 min.
      Individual channel flow =  215.778(CFS)
      Total capacity of improved channels =    215.778(CFS)
      Critical Depth in Channel =    2.09(Ft.)


      Channel evaluation using maximum flow rate of hydrograph
      Flow(q) thru subarea =    558.099(CFS)
      Depth of flow =     2.703(Ft.)
      Average velocity =    13.401(Ft/s)
      Total flow rate =   558.099(CFS)
      Channel flow top width =   20.812(Ft.)
```

```
Depth of flow in channel =   2.70(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   13.40(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  558.099(CFS)
Total capacity of improved channels =    558.099(CFS)
Critical Depth in Channel =    3.59(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8874   Travel time =   0.87 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  13.2775
       dt(routing time-step) =   0.77 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0      139.5     279.0     418.6     558.1
 ---------------------------------------------------------------------
   0+15       4.7624      5.02  O         |         |         |         |
   0+30      26.2617     27.42  |O        |         |         |         |
   0+45      58.4158     60.10  |   O     |         |         |         |
   1+ 0      79.1767     80.21  |    O    |         |         |         |
   1+15      96.9199     97.83  |     OI  |         |         |         |
   1+30     138.9464    141.18  |        OI         |         |         |
   1+45     182.2986    184.53  |         |  O      |         |         |
   2+ 0     225.9445    228.19  |         |     O   |         |         |
   2+15     282.5420    285.49  |         |         O         |         |
   2+30     405.9934    412.54  |         |         |        O|         |
   2+45     550.6019    558.10  |         |         |         |        OI
   3+ 0     511.2710    508.73  |         |         |         |     O   |
   3+15     268.2066    255.15  |         |       IO|         |         |
   3+30     111.0302    103.20  |      O  |         |         |         |
   3+45      45.5895     42.46  |  O      |         |         |         |
   4+ 0      18.3219     17.01  |O        |         |         |         |
   4+15       8.2122      7.73  O         |         |         |         |
   4+30       4.2235      4.03  O         |         |         |         |
   4+45       1.6912      1.56  O         |         |         |         |
   5+ 0       0.3342      0.27  O         |         |         |         |
   5+15       0.0279      0.01  O         |         |         |         |
   5+30       0.0008      0.00  O         |         |         |         |
   5+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
********************************HYDROGRAPH DATA***************************
                Number of intervals =    23
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      550.602 (CFS)
                Total volume =      62.413 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       32.000 to Point/Station       33.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
```

```
____________________________________________________________________
********************* HYDROGRAPH INFORMATION **********************

                From study/file name: SubC33100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      148.8     297.6     446.4     595.2
 ---------------------------------------------------------------------
   0+15       1.0440      5.81  Q         |         |         |         |
   0+30       1.7845     28.05  qQ        |         |         |         |
   0+45       1.9970     60.41  q   Q     |         |         |         |
   1+ 0       1.9754     81.15  q    Q    |         |         |         |
   1+15       4.1451    101.06  q     Q   |         |         |         |
   1+30       7.0236    145.97  q        Q|         |         |         |
   1+45      10.9411    193.24  q         | Q       |         |         |
   2+ 0      13.9127    239.86  q         |     Q   |         |         |
   2+15      23.9212    306.46  |q        |         Q         |         |
   2+30      42.7115    448.70  | q       |         |         Q         |
   2+45      44.6406    595.24  | q       |         |         |         Q
   3+ 0      13.7022    524.97  q         |         |         |    Q    |
   3+15       0.4883    268.69  q         |       Q |         |         |
   3+30       0.0000    111.03  q      Q  |         |         |         |
   3+45       0.0000     45.59  q  Q      |         |         |         |
   4+ 0       0.0000     18.32  qQ        |         |         |         |
   4+15       0.0000      8.21  Q         |         |         |         |
   4+30       0.0000      4.22  Q         |         |         |         |
   4+45       0.0000      1.69  Q         |         |         |         |
   5+ 0       0.0000      0.33  Q         |         |         |         |
   5+15       0.0000      0.03  Q         |         |         |         |
   5+30       0.0000      0.00  Q         |         |         |         |
   5+45       0.0000      0.00  Q         |         |         |         |
---------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    23
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      595.243 (CFS)
                Total volume =      65.890 (Ac.Ft)
           Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       33.000 to Point/Station       34.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ____________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1050.00 (Ft.)
        Elevation difference =   20.00 (Ft.)
        Slope of channel =  0.019048 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  1050.00(Ft.)     Elevation difference =  20.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   2.000
        Slope or 'Z' of right channel bank =   2.000
        Manning's 'N'    = 0.030
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =    227.578(CFS)
        Depth of flow =     1.906(Ft.)
```

```
Average velocity =     8.642(Ft/s)
Total flow rate =   227.578(CFS)
Channel flow top width =   17.626(Ft.)
Depth of flow in channel =   1.91(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.64(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  227.578(CFS)
Total capacity of improved channels =    227.578(CFS)
Critical Depth in Channel =    2.16(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    595.243(CFS)
Depth of flow =     3.189(Ft.)
Average velocity =    11.397(Ft/s)
Total flow rate =   595.243(CFS)
Channel flow top width =   22.755(Ft.)
Depth of flow in channel =   3.19(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.40(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  595.243(CFS)
Total capacity of improved channels =    595.243(CFS)
Critical Depth in Channel =    3.72(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8702   Travel time =   1.54 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   7.8175
        dt(routing time-step) =   1.34 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      148.8     297.6     446.4     595.2
----------------------------------------------------------------------
  0+15       5.2891      5.81  O         |         |         |         |
  0+30      26.0651     28.05  |O        |         |         |         |
  0+45      57.5297     60.41  |  OI     |         |         |         |
  1+ 0      79.3047     81.15  |    O    |         |         |         |
  1+15      99.2912    101.06  |     O   |         |         |         |
  1+30     141.9700    145.97  |        O|         |         |         |
  1+45     189.0290    193.24  |         | O       |         |         |
  2+ 0     235.7047    239.86  |         |    OI   |         |         |
  2+15     300.5301    306.46  |         |         O         |         |
  2+30     436.0345    448.70  |         |         |        OI         |
  2+45     582.1895    595.24  |         |         |         |        OI
  3+ 0     531.2325    524.97  |         |         |         |    O    |
  3+15     291.5233    268.69  |         |       IO|         |         |
  3+30     125.0745    111.03  |      IO |         |         |         |
  3+45      51.4188     45.59  |  O      |         |         |         |
  4+ 0      20.7508     18.32  |O        |         |         |         |
  4+15       9.1127      8.21  O         |         |         |         |
  4+30       4.5788      4.22  O         |         |         |         |
  4+45       1.9167      1.69  O         |         |         |         |
  5+ 0       0.4551      0.33  O         |         |         |         |
  5+15       0.0552      0.03  O         |         |         |         |
  5+30       0.0032      0.00  O         |         |         |         |
  5+45       0.0001      0.00  O         |         |         |         |
```

```
   6+ 0       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    24
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      582.189 (CFS)
                      Total volume =      65.890 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       33.000 to Point/Station       34.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: SubC43100.rte
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ----------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      147.3     294.7     442.0     589.4
  ---------------------------------------------------------------------
   0+15       0.4429      5.73  Q         |         |         |         |
   0+30       1.0298     27.09  qQ        |         |         |         |
   0+45       1.3383     58.87  q  Q      |         |         |         |
   1+ 0       1.3465     80.65  q    Q    |         |         |         |
   1+15       1.8563    101.15  q     Q   |         |         |         |
   1+30       2.3643    144.33  q        Q|         |         |         |
   1+45       2.8635    191.89  q         |  Q      |         |         |
   2+ 0       3.2541    238.96  q         |     Q   |         |         |
   2+15       4.4219    304.95  q         |         Q         |         |
   2+30       6.6743    442.71  q         |         |         Q         |
   2+45       7.1643    589.35  q         |         |         |         Q
   3+ 0       3.2378    534.47  q         |         |         |     Q   |
   3+15       0.5791    292.10  q         |        Q|         |         |
   3+30       0.0351    125.11  q       Q |         |         |         |
   3+45       0.0000     51.42  q  Q      |         |         |         |
   4+ 0       0.0000     20.75  qQ        |         |         |         |
   4+15       0.0000      9.11  Q         |         |         |         |
   4+30       0.0000      4.58  Q         |         |         |         |
   4+45       0.0000      1.92  Q         |         |         |         |
   5+ 0       0.0000      0.46  Q         |         |         |         |
   5+15       0.0000      0.06  Q         |         |         |         |
   5+30       0.0000      0.00  Q         |         |         |         |
   5+45       0.0000      0.00  Q         |         |         |         |
   6+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    24
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      589.354 (CFS)
                      Total volume =      66.646 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       33.000 to Point/Station       34.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: C41and42N34.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      155.4     310.8     466.2     621.6
 -------------------------------------------------------------------
   0+15       0.9072      6.64  Q         |         |         |         |
   0+30       1.8691     28.96  qQ        |         |         |         |
   0+45       2.3495     61.22  q  Q      |         |         |         |
   1+ 0       2.4083     83.06  q    Q    |         |         |         |
   1+15       4.7080    105.86  q     Q   |         |         |         |
   1+30       7.0892    151.42  q        Q|         |         |         |
   1+45       9.6901    201.58  q         | Q       |         |         |
   2+ 0      11.7149    250.67  q         |     Q   |         |         |
   2+15      18.0515    323.00  |q        |         Q         |         |
   2+30      30.1549    472.86  |q        |         |         Q         |
   2+45      32.1988    621.55  | q       |         |         |         Q
   3+ 0      11.9755    546.45  q         |         |         |    Q    |
   3+15       1.3962    293.50  q         |       Q |         |         |
   3+30       0.1512    125.26  q       Q |         |         |         |
   3+45       0.0085     51.43  q  Q      |         |         |         |
   4+ 0       0.0000     20.75  qQ        |         |         |         |
   4+15       0.0000      9.11  Q         |         |         |         |
   4+30       0.0000      4.58  Q         |         |         |         |
   4+45       0.0000      1.92  Q         |         |         |         |
   5+ 0       0.0000      0.46  Q         |         |         |         |
   5+15       0.0000      0.06  Q         |         |         |         |
   5+30       0.0000      0.00  Q         |         |         |         |
   5+45       0.0000      0.00  Q         |         |         |         |
   6+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
****************************HYDROGRAPH DATA***************************
                Number of intervals =    24
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      621.553 (CFS)
                Total volume =      69.429 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

--------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       34.000 to Point/Station       35.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    790.00 (Ft.)
Elevation difference =   12.00 (Ft.)
Slope of channel =  0.015190 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   790.00(Ft.)     Elevation difference =  12.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
```

```
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    237.773(CFS)
Depth of flow =     2.077(Ft.)
Average velocity =     8.086(Ft/s)
Total flow rate =   237.773(CFS)
Channel flow top width =   18.310(Ft.)
Depth of flow in channel =   2.08(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.09(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  237.773(CFS)
Total capacity of improved channels =    237.773(CFS)
Critical Depth in Channel =    2.22(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    621.553(CFS)
Depth of flow =     3.458(Ft.)
Average velocity =    10.628(Ft/s)
Total flow rate =   621.553(CFS)
Channel flow top width =   23.830(Ft.)
Depth of flow in channel =   3.46(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   10.63(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  621.553(CFS)
Total capacity of improved channels =    621.553(CFS)
Critical Depth in Channel =    3.81(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8621   Travel time =   1.24 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   9.6961
       dt(routing time-step) =   1.07 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      155.4     310.8     466.2     621.6
----------------------------------------------------------------------
  0+15       6.1665      6.64  O         |         |         |         |
  0+30      27.3744     28.96  |O        |         |         |         |
  0+45      58.9210     61.22  |  O      |         |         |         |
  1+ 0      81.5043     83.06  |    O    |         |         |         |
  1+15     104.2324    105.86  |     O   |         |         |         |
  1+30     148.1788    151.42  |        O|         |         |         |
  1+45     198.0110    201.58  |         | O       |         |         |
  2+ 0     247.1781    250.67  |         |    OI   |         |         |
  2+15     317.8533    323.00  |         |         O         |         |
  2+30     462.1930    472.86  |         |         |        OI         |
  2+45     610.9653    621.55  |         |         |         |        OI
  3+ 0     551.7938    546.45  |         |         |         |    O    |
  3+15     311.5095    293.50  |         |       I O         |         |
  3+30     137.2400    125.26  |       O |         |         |         |
  3+45      56.6845     51.43  |  O      |         |         |         |
  4+ 0      22.9351     20.75  |O        |         |         |         |
  4+15       9.9414      9.11  O         |         |         |         |
  4+30       4.9016      4.58  O         |         |         |         |
  4+45       2.1063      1.92  O         |         |         |         |
```

```
  5+ 0       0.5591      0.46  O         |         |         |         |
  5+15       0.0836      0.06  O         |         |         |         |
  5+30       0.0069      0.00  O         |         |         |         |
  5+45       0.0003      0.00  O         |         |         |         |
  6+ 0       0.0000      0.00  O         |         |         |         |
  6+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    25
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      610.965 (CFS)
                    Total volume =      69.429 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      *********************************************************************

      -------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station       34.000 to Point/Station       35.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION *********************

                    From study/file name: SubC53100.rte
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

      ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      159.5     319.0     478.5     637.9
  ----------------------------------------------------------------------
  0+15       1.5321      7.70  Q         |         |         |         |
  0+30       3.6949     31.07  qQ        |         |         |         |
  0+45       4.8977     63.82  q   Q     |         |         |         |
  1+ 0       4.9650     86.47  q    Q    |         |         |         |
  1+15       6.8208    111.05  q     Q   |         |         |         |
  1+30       8.7552    156.93  q        Q|         |         |         |
  1+45      10.6461    208.66  q         |  Q      |         |         |
  2+ 0      12.1405    259.32  q         |     Q   |         |         |
  2+15      16.4530    334.31  |q        |         Q         |         |
  2+30      24.8480    487.04  |q        |         |         Q         |
  2+45      26.9695    637.93  |q        |         |         |         Q
  3+ 0      12.6785    564.47  q         |         |         |    Q    |
  3+15       2.4334    313.94  q         |        Q|         |         |
  3+30       0.1603    137.40  q       Q |         |         |         |
  3+45       0.0000     56.68  q  Q      |         |         |         |
  4+ 0       0.0000     22.94  qQ        |         |         |         |
  4+15       0.0000      9.94  Q         |         |         |         |
  4+30       0.0000      4.90  Q         |         |         |         |
  4+45       0.0000      2.11  Q         |         |         |         |
  5+ 0       0.0000      0.56  Q         |         |         |         |
  5+15       0.0000      0.08  Q         |         |         |         |
  5+30       0.0000      0.01  Q         |         |         |         |
  5+45       0.0000      0.00  Q         |         |         |         |
  6+ 0       0.0000      0.00  Q         |         |         |         |
  6+15       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    25
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      637.935 (CFS)
                    Total volume =      72.259 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
```

```
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       34.000 to Point/Station       35.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: C51and52N35.rte
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      164.6     329.3     493.9     658.5
  ---------------------------------------------------------------------
    0+15       0.7603      8.46  Q         |         |         |         |
    0+30       2.0748     33.14  q Q       |         |         |         |
    0+45       2.8877     66.71  q   Q     |         |         |         |
    1+ 0       2.9078     89.38  q    Q    |         |         |         |
    1+15       4.4107    115.46  q      Q  |         |         |         |
    1+30       5.9773    162.91  q        Q|         |         |         |
    1+45       7.4773    216.13  q         |  Q      |         |         |
    2+ 0       8.6735    267.99  q         |     Q   |         |         |
    2+15      12.1523    346.46  q         |         |Q        |         |
    2+30      18.9431    505.98  |q        |         |         Q         |
    2+45      20.5786    658.51  |q        |         |         |         Q
    3+ 0       8.8829    573.36  q         |         |         |   Q     |
    3+15       1.2740    315.22  q         |        Q|         |         |
    3+30       0.0407    137.44  q       Q |         |         |         |
    3+45       0.0000     56.68  q  Q      |         |         |         |
    4+ 0       0.0000     22.94  qQ        |         |         |         |
    4+15       0.0000      9.94  Q         |         |         |         |
    4+30       0.0000      4.90  Q         |         |         |         |
    4+45       0.0000      2.11  Q         |         |         |         |
    5+ 0       0.0000      0.56  Q         |         |         |         |
    5+15       0.0000      0.08  Q         |         |         |         |
    5+30       0.0000      0.01  Q         |         |         |         |
    5+45       0.0000      0.00  Q         |         |         |         |
    6+ 0       0.0000      0.00  Q         |         |         |         |
    6+15       0.0000      0.00  Q         |         |         |         |
---------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    25
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      658.513 (CFS)
                Total volume =      74.264 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       35.000 to Point/Station       36.000
**** STREAM ROUTING SCS CONVEX METHOD ****
_____________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   3400.00 (Ft.)
Elevation difference =   68.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel
```

```
Channel length =  3400.00(Ft.)     Elevation difference =  68.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    253.708(CFS)
Depth of flow =     1.997(Ft.)
Average velocity =     9.081(Ft/s)
Total flow rate =   253.708(CFS)
Channel flow top width =   17.986(Ft.)
Depth of flow in channel =   2.00(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.08(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  253.708(CFS)
Total capacity of improved channels =    253.708(CFS)
Critical Depth in Channel =    2.31(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    658.513(CFS)
Depth of flow =     3.318(Ft.)
Average velocity =    11.929(Ft/s)
Total flow rate =   658.513(CFS)
Channel flow top width =   23.272(Ft.)
Depth of flow in channel =   3.32(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.93(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  658.513(CFS)
Total capacity of improved channels =    658.513(CFS)
Critical Depth in Channel =    3.94(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8753   Travel time =   4.75 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   2.7385
       dt(routing time-step) =   4.16 (min.),   c* =   0.9967

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      164.6     329.3     493.9     658.5
----------------------------------------------------------------------
  0+15       6.0938      8.46  O         |         |         |         |
  0+30      26.2343     33.14  |OI       |         |         |         |
  0+45      57.2994     66.71  |  OI     |         |         |         |
  1+ 0      83.0070     89.38  |    O    |         |         |         |
  1+15     108.1488    115.46  |     OI  |         |         |         |
  1+30     149.6208    162.91  |        O|         |         |         |
  1+45     201.2091    216.13  |         | OI      |         |         |
  2+ 0     253.4431    267.99  |         |    OI   |         |         |
  2+15     324.4711    346.46  |         |        O|I        |         |
  2+30     461.3080    505.98  |         |         |       O I         |
  2+45     615.7175    658.51  |         |         |         |      O  I
  3+ 0     597.0219    573.36  |         |         |         |   I O   |
```

```
  3+15     387.4703    315.22  |          |        I|  O      |          |
  3+30     187.3880    137.44  |       I  |O        |         |          |
  3+45      79.4307     56.68  |  IO      |         |         |          |
  4+ 0      32.4474     22.94  |O         |         |         |          |
  4+15      13.6062      9.94  O          |         |         |          |
  4+30       6.3230      4.90  O          |         |         |          |
  4+45       2.8926      2.11  O          |         |         |          |
  5+ 0       0.9943      0.56  O          |         |         |          |
  5+15       0.2180      0.08  O          |         |         |          |
  5+30       0.0288      0.01  O          |         |         |          |
  5+45       0.0022      0.00  O          |         |         |          |
  6+ 0       0.0001      0.00  O          |         |         |          |
  6+15       0.0000      0.00  O          |         |         |          |
  6+30       0.0000      0.00  O          |         |         |          |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                     Number of intervals =    26
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      615.717 (CFS)
                     Total volume =      74.264 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      *************************************************************************

      ------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station       35.000 to Point/Station       36.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION *********************

                     From study/file name: SubC63100.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      ------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      170.5     340.9     511.4     681.9
 ----------------------------------------------------------------------
  0+15       1.3723      7.47  Q         |         |         |         |
  0+30       5.2992     31.53  qQ        |         |         |         |
  0+45       9.0705     66.37  q  Q      |         |         |         |
  1+ 0      10.4690     93.48  q    Q    |         |         |         |
  1+15      13.1757    121.32  q      Q  |         |         |         |
  1+30      18.7024    168.32  |q       Q|         |         |         |
  1+45      23.3020    224.51  |q         |  Q      |         |         |
  2+ 0      27.8759    281.32  |q        |     Q   |         |         |
  2+15      35.4853    359.96  | q       |         |Q        |         |
  2+30      52.7077    514.02  |  q      |         |         Q         |
  2+45      66.1660    681.88  |  q      |         |         |         Q
  3+ 0      48.9649    645.99  | q       |         |         |      Q  |
  3+15      18.2839    405.75  |q        |         |  Q      |         |
  3+30       8.0056    195.39  q         |Q        |         |         |
  3+45       4.1477     83.58  q   Q     |         |         |         |
  4+ 0       1.7530     34.20  q Q       |         |         |         |
  4+15       0.1627     13.77  Q         |         |         |         |
  4+30       0.0000      6.32  Q         |         |         |         |
  4+45       0.0000      2.89  Q         |         |         |         |
  5+ 0       0.0000      0.99  Q         |         |         |         |
  5+15       0.0000      0.22  Q         |         |         |         |
  5+30       0.0000      0.03  Q         |         |         |         |
  5+45       0.0000      0.00  Q         |         |         |         |
  6+ 0       0.0000      0.00  Q         |         |         |         |
  6+15       0.0000      0.00  Q         |         |         |         |
  6+30       0.0000      0.00  Q         |         |         |         |
```

```
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    26
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      681.884 (CFS)
                       Total volume =      81.391 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       36.000 to Point/Station       37.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   3100.00 (Ft.)
        Elevation difference =   54.00 (Ft.)
        Slope of channel =  0.017419 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  3100.00(Ft.)     Elevation difference =  54.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   2.000
        Slope or 'Z' of right channel bank =   2.000
        Manning's 'N'    = 0.030
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =    277.071(CFS)
        Depth of flow =     2.175(Ft.)
        Average velocity =     8.877(Ft/s)
        Total flow rate =   277.071(CFS)
        Channel flow top width =   18.700(Ft.)
        Depth of flow in channel =   2.18(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =    8.88(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  277.071(CFS)
        Total capacity of improved channels =    277.071(CFS)
        Critical Depth in Channel =    2.44(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Flow(q) thru subarea =    681.884(CFS)
        Depth of flow =     3.501(Ft.)
        Average velocity =    11.457(Ft/s)
        Total flow rate =   681.884(CFS)
        Channel flow top width =   24.003(Ft.)
        Depth of flow in channel =   3.50(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   11.46(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  681.884(CFS)
        Total capacity of improved channels =    681.884(CFS)
        Critical Depth in Channel =    4.00(Ft.)


        ********************** SCS CONVEX CHANNEL ROUTING ********************
        Convex method of stream routing  data items:
        Using equation: Outflow =
        O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
                 where c* = 1 - (1-c)^e and dt = c(length)/velocity
                 c(v/v+1.7) =   0.8708   Travel time =   4.51 (min.)
               dt*(unit time interval) =  15.00(min.),  e=   2.8798
               dt(routing time-step) =   3.93 (min.),   c* =   0.9972
```

```
Output hydrograph delayed by 0  unit time increments

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      170.5     340.9     511.4     681.9
----------------------------------------------------------------------
  0+15       5.4963      7.47  O         |         |         |         |
  0+30      25.1782     31.53  |O        |         |         |         |
  0+45      57.1611     66.37  |  O      |         |         |         |
  1+ 0      86.2989     93.48  |    O    |         |         |         |
  1+15     113.9571    121.32  |     OI  |         |         |         |
  1+30     155.9027    168.32  |        O|         |         |         |
  1+45     209.6522    224.51  |         | OI      |         |         |
  2+ 0     266.2898    281.32  |         |    OI   |         |         |
  2+15     339.1673    359.96  |         |        O|I        |         |
  2+30     473.3114    514.02  |         |         |      O  I         |
  2+45     637.4810    681.88  |         |         |         |      O  I
  3+ 0     655.3353    645.99  |         |         |         |      IO |
  3+15     469.1629    405.75  |         |         |  I   O  |         |
  3+30     251.0700    195.39  |         |I  O     |         |         |
  3+45     113.2333     83.58  |   I O   |         |         |         |
  4+ 0      47.3101     34.20  | O       |         |         |         |
  4+15      19.1957     13.77  IO        |         |         |         |
  4+30       8.3025      6.32  O         |         |         |         |
  4+45       3.8031      2.89  O         |         |         |         |
  5+ 0       1.4977      0.99  O         |         |         |         |
  5+15       0.4242      0.22  O         |         |         |         |
  5+30       0.0793      0.03  O         |         |         |         |
  5+45       0.0094      0.00  O         |         |         |         |
  6+ 0       0.0007      0.00  O         |         |         |         |
  6+15       0.0000      0.00  O         |         |         |         |
  6+30       0.0000      0.00  O         |         |         |         |
  6+45       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                Number of intervals =    27
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      655.335 (CFS)
                Total volume =      81.391 (Ac.Ft)
          Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       36.000 to Point/Station       37.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ********************* HYDROGRAPH INFORMATION **********************

                From study/file name: SubC73100.rte
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      176.4     352.7     529.1     705.5
----------------------------------------------------------------------
  0+15       0.7082      6.20  Q         |         |         |         |
```

```
 0+30       3.5839     28.76  qQ        |         |         |         |
 0+45       7.2543     64.42  q  Q      |         |         |         |
 1+ 0       8.6867     94.99  q    Q    |         |         |         |
 1+15      11.2350    125.19  q      Q  |         |         |         |
 1+30      16.9042    172.81  q        Q|         |         |         |
 1+45      21.6401    231.29  |q         |  Q      |         |         |
 2+ 0      26.4850    292.77  |q         |     Q   |         |         |
 2+15      34.0706    373.24  |q         |         |Q        |         |
 2+30      51.3701    524.68  | q       |         |        Q|         |
 2+45      66.0483    703.53  |  q      |         |         |        Q|
 3+ 0      50.1247    705.46  | q       |         |         |         Q
 3+15      18.7306    487.89  |q         |         |      Q  |         |
 3+30       8.5796    259.65  q          |   Q     |         |         |
 3+45       4.5863    117.82  q     Q   |         |         |         |
 4+ 0       2.3682     49.68  q Q       |         |         |         |
 4+15       0.9278     20.12  qQ        |         |         |         |
 4+30       0.0641      8.37  Q         |         |         |         |
 4+45       0.0000      3.80  Q         |         |         |         |
 5+ 0       0.0000      1.50  Q         |         |         |         |
 5+15       0.0000      0.42  Q         |         |         |         |
 5+30       0.0000      0.08  Q         |         |         |         |
 5+45       0.0000      0.01  Q         |         |         |         |
 6+ 0       0.0000      0.00  Q         |         |         |         |
 6+15       0.0000      0.00  Q         |         |         |         |
 6+30       0.0000      0.00  Q         |         |         |         |
 6+45       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    27
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      705.460 (CFS)
                    Total volume =      88.279 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station       30.000 to Point/Station       37.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file WSC3hrSt1.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =     0
                    Time interval =    0.0 (Min.)
                    Maximum/Peak flow rate =        0.000 (CFS)
                    Total volume =       0.000 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 04/27/12

------------------------------------------------------------------


Watershed C,, Stream 1, Node 320 to 32
Existing Condition
100-year, 3-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC213100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    16
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      182.509 (CFS)
               Total volume =      18.194 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      321.000 to Point/Station       32.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1550.00 (Ft.)
Elevation difference =   51.00 (Ft.)
Slope of channel =  0.032903 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1550.00(Ft.)     Elevation difference =  51.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     69.623(CFS)
Depth of flow =     0.835(Ft.)
Average velocity =     7.147(Ft/s)
Total flow rate =    69.623(CFS)
Channel flow top width =   13.339(Ft.)
Depth of flow in channel =   0.83(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.15(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   69.623(CFS)
Total capacity of improved channels =     69.623(CFS)
Critical Depth in Channel =    1.06(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    182.509(CFS)
Depth of flow =     1.449(Ft.)
Average velocity =     9.769(Ft/s)
```

```
Total flow rate =   182.509(CFS)
Channel flow top width =   15.794(Ft.)
Depth of flow in channel =   1.45(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.77(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  182.509(CFS)
Total capacity of improved channels =    182.509(CFS)
Critical Depth in Channel =    1.91(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8518   Travel time =   2.64 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   4.7730
       dt(routing time-step) =   2.25 (min.),   c* =   0.9999

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
              R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       45.6      91.3     136.9     182.5
 ----------------------------------------------------------------------
   0+15       2.5078      2.95  O         |         |         |         |
   0+30      11.3282     12.81  | O       |         |         |         |
   0+45      21.8225     23.42  |   OI    |         |         |         |
   1+ 0      26.2733     26.78  |    O    |         |         |         |
   1+15      32.4760     33.48  |      O  |         |         |         |
   1+30      46.7400     49.08  |         O         |         |         |
   1+45      59.8277     61.73  |         |  O      |         |         |
   2+ 0      72.2878     74.16  |         |    OI   |         |         |
   2+15      91.8428     94.97  |         |         O         |         |
   2+30     136.4216    143.75  |         |         |        O|I        |
   2+45     176.6844    182.51  |         |         |         |       O I
   3+ 0     137.7542    129.84  |         |         |       I O         |
   3+15      49.6608     35.48  |      I  O         |         |         |
   3+30      11.8434      7.66  |IO       |         |         |         |
   3+45       2.7127      1.84  O         |         |         |         |
   4+ 0       0.3889      0.13  O         |         |         |         |
   4+15       0.0200      0.00  O         |         |         |         |
   4+30       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
****************************HYDROGRAPH DATA***************************
                Number of intervals =    18
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      176.684 (CFS)
                Total volume =      18.194 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      321.000 to Point/Station       32.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************
```

```
                    From study/file name: SubC223100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       48.2      96.3     144.5     192.7
 ---------------------------------------------------------------------
    0+15       0.2828      2.79  Q         |         |         |         |
    0+30       0.5787     11.91  q Q       |         |         |         |
    0+45       0.6775     22.50  q   Q     |         |         |         |
    1+ 0       0.6832     26.96  q    Q    |         |         |         |
    1+15       1.5421     34.02  q      Q  |         |         |         |
    1+30       2.7273     49.47  q         Q         |         |         |
    1+45       4.0084     63.84  q         |  Q      |         |         |
    2+ 0       5.1211     77.41  |q        |     Q   |         |         |
    2+15       8.0255     99.87  |q        |         Q         |         |
    2+30      13.9867    150.41  | q       |         |         |Q        |
    2+45      15.9885    192.67  |  q      |         |         |         Q
    3+ 0       7.1296    144.88  |q        |         |         Q         |
    3+15       0.6280     50.29  q         Q         |         |         |
    3+30       0.0146     11.86  q Q       |         |         |         |
    3+45       0.0000      2.71  Q         |         |         |         |
    4+ 0       0.0000      0.39  Q         |         |         |         |
    4+15       0.0000      0.02  Q         |         |         |         |
    4+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    18
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      192.673 (CFS)
                       Total volume =      19.463 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      321.000 to Point/Station       32.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ____________________________________________________________________
        Current stream hydrograph saved in file C21and22N32.rte
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =     0
                       Time interval =    0.0 (Min.)
                       Maximum/Peak flow rate =        0.000 (CFS)
                       Total volume =       0.000 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/27/12

------------------------------------------------------------------


Watershed C, Stream 1, Node 340 to 34
Existing Condition
100-year, 3-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC43100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    14
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =        7.164 (CFS)
               Total volume =       0.756 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      341.000 to Point/Station       34.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    920.00 (Ft.)
Elevation difference =   49.00 (Ft.)
Slope of channel =  0.053261 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   920.00(Ft.)     Elevation difference =  49.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      2.978(CFS)
Depth of flow =     0.112(Ft.)
Average velocity =     2.606(Ft/s)
Total flow rate =     2.978(CFS)
Channel flow top width =   10.447(Ft.)
Depth of flow in channel =   0.11(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    2.61(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    2.978(CFS)
Total capacity of improved channels =      2.978(CFS)
Critical Depth in Channel =    0.14(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =      7.164(CFS)
Depth of flow =     0.189(Ft.)
Average velocity =     3.655(Ft/s)
```

```
Total flow rate =     7.164(CFS)
Channel flow top width =   10.756(Ft.)
Depth of flow in channel =   0.19(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    3.65(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    7.164(CFS)
Total capacity of improved channels =      7.164(CFS)
Critical Depth in Channel =    0.25(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.6825   Travel time =   4.20 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.8255
        dt(routing time-step) =   2.86 (min.),   c* =   0.9876

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0        1.8       3.6       5.4       7.2
 ---------------------------------------------------------------------
   0+15       0.3539      0.44  |OI       |         |         |         |
   0+30       0.9108      1.03  |    O    |         |         |         |
   0+45       1.2748      1.34  |      O  |         |         |         |
   1+ 0       1.3441      1.35  |      O  |         |         |         |
   1+15       1.7538      1.86  |        OI         |         |         |
   1+30       2.2609      2.36  |         | OI      |         |         |
   1+45       2.7619      2.86  |         |    O    |         |         |
   2+ 0       3.1743      3.25  |         |      OI |         |         |
   2+15       4.1862      4.42  |         |         |  OI     |         |
   2+30       6.2188      6.67  |         |         |         |   O  I  |
   2+45       7.0602      7.16  |         |         |         |        OI
   3+ 0       4.0256      3.24  |         |       I | O       |         |
   3+15       1.1232      0.58  |  I  O   |         |         |         |
   3+30       0.1512      0.04  O         |         |         |         |
   3+45       0.0085      0.00  O         |         |         |         |
   4+ 0       0.0000      0.00  O         |         |         |         |
---------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    16
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =        7.060 (CFS)
                    Total volume =       0.756 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ---------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      341.000 to Point/Station       34.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION *********************

                    From study/file name: SubC423100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
                    P R I N T  O F  S T O R M
                  R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

      ----------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0        8.0      16.1      24.1      32.2
  ----------------------------------------------------------------
    0+15       0.5533      0.91  qQ        |         |         |         |
    0+30       0.9583      1.87  |qQ       |         |         |         |
    0+45       1.0747      2.35  |qQ       |         |         |         |
    1+ 0       1.0643      2.41  |qQ       |         |         |         |
    1+15       2.9542      4.71  |  q Q    |         |         |         |
    1+30       4.8282      7.09  |    q  Q |         |         |         |
    1+45       6.9282      9.69  |       q | Q       |         |         |
    2+ 0       8.5405     11.71  |         q   Q     |         |         |
    2+15      13.8653     18.05  |         |      q  | Q       |         |
    2+30      23.9361     30.15  |         |         |        q|      Q  |
    2+45      25.1386     32.20  |         |         |         |q        Q
    3+ 0       7.9499     11.98  |        q|   Q     |         |         |
    3+15       0.2730      1.40  qQ        |         |         |         |
    3+30       0.0000      0.15  Q         |         |         |         |
    3+45       0.0000      0.01  Q         |         |         |         |
    4+ 0       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    16
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       32.199 (CFS)
                    Total volume =       2.782 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ********************************************************************

      ----------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station      341.000 to Point/Station       34.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ____________________________________________________________________
      Current stream hydrograph saved in file C41and42N34.rte
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =     0
                    Time interval =    0.0 (Min.)
                    Maximum/Peak flow rate =        0.000 (CFS)
                    Total volume =       0.000 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ********************************************************************

      ----------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/27/12

------------------------------------------------------------------


Watershed C, Stream 1, Node 350 to 35
Existing Condition
100-year, 3-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC513100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    13
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       12.577 (CFS)
               Total volume =       1.154 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      351.000 to Point/Station       35.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    950.00 (Ft.)
Elevation difference =   29.00 (Ft.)
Slope of channel =  0.030526 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   950.00(Ft.)     Elevation difference =  29.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      4.731(CFS)
Depth of flow =     0.174(Ft.)
Average velocity =     2.626(Ft/s)
Total flow rate =     4.731(CFS)
Channel flow top width =   10.696(Ft.)
Depth of flow in channel =   0.17(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    2.63(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    4.731(CFS)
Total capacity of improved channels =      4.731(CFS)
Critical Depth in Channel =    0.19(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     12.577(CFS)
Depth of flow =     0.312(Ft.)
Average velocity =     3.798(Ft/s)
```

```
Total flow rate =    12.577(CFS)
Channel flow top width =   11.247(Ft.)
Depth of flow in channel =   0.31(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    3.80(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   12.577(CFS)
Total capacity of improved channels =     12.577(CFS)
Critical Depth in Channel =    0.36(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.6908   Travel time =   4.17 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   3.8054
       dt(routing time-step) =   2.88 (min.),   c* =   0.9885

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
              R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0        3.1       6.3       9.4      12.6
 ---------------------------------------------------------------------
   0+15       0.2120      0.27  O         |         |         |         |
   0+30       0.8330      0.98  | OI      |         |         |         |
   0+45       1.3226      1.41  |   O     |         |         |         |
   1+ 0       1.3574      1.34  |   O     |         |         |         |
   1+15       2.2786      2.51  |      O  |         |         |         |
   1+30       3.2593      3.45  |         O         |         |         |
   1+45       4.2217      4.42  |         |  OI     |         |         |
   2+ 0       4.9850      5.13  |         |    OI   |         |         |
   2+15       7.1426      7.65  |         |         | O I     |         |
   2+30      11.3572     12.30  |         |         |         |     O  I|
   2+45      12.5101     12.58  |         |         |         |        OI
   3+ 0       5.4500      3.65  |         |I     O  |         |         |
   3+15       0.8849      0.16  I O       |         |         |         |
   3+30       0.0407      0.00  O         |         |         |         |
   3+45       0.0000      0.00  O         |         |         |         |
---------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    15
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =       12.510 (CFS)
                Total volume =       1.154 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      351.000 to Point/Station       35.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubC523100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
```

```
                    R u n o f f     H y d r o g r a p h
        ----------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

        ----------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0        5.1      10.3      15.4      20.6
  ---------------------------------------------------------------------
    0+15       0.5483      0.76  |Q        |         |         |         |
    0+30       1.2418      2.07  | q Q     |         |         |         |
    0+45       1.5651      2.89  |  q Q    |         |         |         |
    1+ 0       1.5504      2.91  |  q Q    |         |         |         |
    1+15       2.1321      4.41  |   q   Q |         |         |         |
    1+30       2.7180      5.98  |    q    |Q        |         |         |
    1+45       3.2556      7.48  |     q   |   Q     |         |         |
    2+ 0       3.6885      8.67  |      q  |     Q   |         |         |
    2+15       5.0097     12.15  |        q|         |  Q      |         |
    2+30       7.5858     18.94  |         |   q     |         |     Q   |
    2+45       8.0684     20.58  |         |    q    |         |         Q
    3+ 0       3.4329      8.88  |     q   |      Q  |         |         |
    3+15       0.3891      1.27  q Q       |         |         |         |
    3+30       0.0000      0.04  Q         |         |         |         |
    3+45       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    15
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       20.579 (CFS)
                      Total volume =       2.005 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      351.000 to Point/Station       35.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file C51and52N35.rte
        ****************************HYDROGRAPH DATA***************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/25/12 File: SubC13100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C1
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =     403.10(Ac.)  =      0.630 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     403.10(Ac.)  =      0.630 Sq. Mi.
Length along longest watercourse =    9900.00(Ft.)
Length along longest watercourse measured to centroid =    5600.00(Ft.)
Length along longest watercourse =      1.875 Mi.
Length along longest watercourse measured to centroid =      1.061 Mi.
Difference in elevation =     700.00(Ft.)
Slope along watercourse =    373.3333 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.303 Hr.
Lag time =    18.21 Min.
25% of lag time =     4.55 Min.
40% of lag time =     7.28 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10           0.85                342.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10           1.90                765.89

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.82 %
Adjusted average point rain =    1.897(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.500           46.00         0.000
     5.400           66.00         0.000
```

13.200	77.00	0.000
376.000	83.00	0.000

Total Area Entered = 403.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.021	0.013
66.0	66.0	0.405	0.000	0.405	0.013	0.005
77.0	77.0	0.279	0.000	0.279	0.033	0.009
83.0	83.0	0.210	0.000	0.210	0.933	0.196
					Sum (F) =	0.223

Area averaged mean soil loss (F) (In/Hr) = 0.223
Minimum soil loss rate ((In/Hr)) = 0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	82.386	9.509	38.632
2	0.500	164.773	49.802	202.320
3	0.750	247.159	23.542	95.638
4	1.000	329.545	9.452	38.397
5	1.250	411.931	4.591	18.651
6	1.500	494.318	1.618	6.571
7	1.750	576.704	0.707	2.873
8	2.000	659.090	0.536	2.179
9	2.250	741.476	0.243	0.986
			Sum = 100.000	Sum= 406.249

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.223	(0.253)	0.058
2	0.50	4.80	0.364	0.223	(0.328)	0.141
3	0.75	5.10	0.387	0.223	(0.348)	0.164
4	1.00	4.90	0.372	0.223	(0.335)	0.149
5	1.25	6.60	0.501	0.223	(0.451)	0.278
6	1.50	7.30	0.554	0.223	(0.498)	0.331
7	1.75	8.40	0.637	0.223	(0.574)	0.414
8	2.00	9.00	0.683	0.223	(0.615)	0.460
9	2.25	12.30	0.933	0.223	(0.840)	0.710
10	2.50	17.60	1.335	0.223	(1.202)	1.112
11	2.75	16.10	1.221	0.223	(1.099)	0.998
12	3.00	4.20	0.319	0.223	(0.287)	0.095
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.9

Flood volume = Effective rainfall 1.23(In)
times area 403.1(Ac.)/[(In)/(Ft.)] = 41.2(Ac.Ft)
Total soil loss = 0.67(In)
Total soil loss = 22.489(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 1795655.1 Cubic Feet
Total soil loss = 979622.6 Cubic Feet

Peak flow rate of this hydrograph = 360.479(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 100.0 200.0 300.0 400.0
0+15	0.0460	2.22	Q
0+30	0.3992	17.10	VQ
0+45	1.2334	40.38	V Q
1+ 0	2.3614	54.59	| V Q
1+15	3.6623	62.96	| V Q
1+30	5.5731	92.48	| V Q|
1+45	8.0391	119.36	| V |Q
2+ 0	11.1027	148.28	| V Q
2+15	14.8176	179.80	| V Q |
2+30	20.0968	255.51	| V| Q |
2+45	27.5447	360.48	| V | Q
3+ 0	34.8269	352.46	| V Q
3+15	38.4639	176.03	| Q | V
3+30	40.0230	75.46	| Q | V |
3+45	40.7060	33.06	| Q | V|
4+ 0	40.9859	13.54	|Q | V|
4+15	41.1227	6.62	Q | V|
4+30	41.1960	3.55	Q | V|
4+45	41.2206	1.19	Q | V|
5+ 0	41.2226	0.09	Q | V|

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C2
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      23.70(Ac.)  =      0.037 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      23.70(Ac.)  =      0.037 Sq. Mi.
Length along longest watercourse =    1900.00(Ft.)
Length along longest watercourse measured to centroid =     890.00(Ft.)
Length along longest watercourse =      0.360 Mi.
Length along longest watercourse measured to centroid =      0.169 Mi.
Difference in elevation =      58.00(Ft.)
Slope along watercourse =    161.1789 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.095 Hr.
Lag time =     5.67 Min.
25% of lag time =     1.42 Min.
40% of lag time =     2.27 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       23.70           0.85                 20.15

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       23.70           1.90                 45.03

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    18.700           66.00         0.000
     5.000           83.00         0.000
```

Total Area Entered = 23.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.789	0.320
83.0	83.0	0.210	0.000	0.210	0.211	0.044
					Sum (F) =	0.364

Area averaged mean soil loss (F) (In/Hr) = 0.364
Minimum soil loss rate ((In/Hr)) = 0.182
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	264.547	53.121	12.688
2	0.500	529.095	43.617	10.418
3	0.750	793.642	3.262	0.779
		Sum = 100.000	Sum=	23.885

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.364)	0.253	0.028
2	0.50	4.80	0.365	(0.364)	0.328	0.036
3	0.75	5.10	0.388	(0.364)	0.349	0.039
4	1.00	4.90	0.372	(0.364)	0.335	0.037
5	1.25	6.60	0.502	0.364	(0.451)	0.138
6	1.50	7.30	0.555	0.364	(0.499)	0.191
7	1.75	8.40	0.638	0.364	(0.575)	0.274
8	2.00	9.00	0.684	0.364	(0.616)	0.320
9	2.25	12.30	0.935	0.364	(0.841)	0.571
10	2.50	17.60	1.337	0.364	(1.204)	0.973
11	2.75	16.10	1.223	0.364	(1.101)	0.859
12	3.00	4.20	0.319	(0.364)	0.287	0.032
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	3.5

Flood volume = Effective rainfall 0.87(In)
times area 23.7(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)
Total soil loss = 1.03(In)
Total soil loss = 2.025(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 75252.6 Cubic Feet
Total soil loss = 88189.4 Cubic Feet

Peak flow rate of this hydrograph = 21.503(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+15	0.0074	0.36	Q	|	|	|	|
0+30	0.0230	0.76	VQ	|	|	|	|
0+45	0.0415	0.89	VQ	|	|	|	|
1+ 0	0.0602	0.91	|Q	|	|	|	|

```
   1+15       0.1049      2.16  | Q       |         |         |         |
   1+30       0.1852      3.88  |   VQ    |         |         |         |
   1+45       0.3004      5.58  |     VQ  |         |         |         |
   2+ 0       0.4465      7.07  |        QV         |         |         |
   2+15       0.6695     10.79  |         |   QV    |         |         |
   2+30       1.0529     18.56  |         |         |   Q     |         |
   2+45       1.4972     21.50  |         |         |       Q |   V     |
   3+ 0       1.7063     10.12  |         |  Q      |         |        V|
   3+15       1.7270      1.00  |Q        |         |         |        V|
   3+30       1.7276      0.02  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C21
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =     180.10(Ac.)  =      0.281 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     180.10(Ac.)  =      0.281 Sq. Mi.
Length along longest watercourse =    5800.00(Ft.)
Length along longest watercourse measured to centroid =    2200.00(Ft.)
Length along longest watercourse =      1.098 Mi.
Length along longest watercourse measured to centroid =      0.417 Mi.
Difference in elevation =     547.00(Ft.)
Slope along watercourse =    497.9586 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.164 Hr.
Lag time =     9.86 Min.
25% of lag time =     2.47 Min.
40% of lag time =     3.95 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      180.10           0.85                153.08

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      180.10           1.90                342.19

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    17.000           66.00         0.000
     1.300           77.00         0.000
```

```
   161.800          83.00         0.000
 Total Area Entered =    180.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       0.094      0.038
77.0  77.0      0.279     0.000        0.279       0.007      0.002
83.0  83.0      0.210     0.000        0.210       0.898      0.188
                                                  Sum (F) =   0.229
Area averaged mean soil loss (F) (In/Hr) =  0.229
Minimum soil loss rate ((In/Hr)) =  0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     FOOTHILL S-Curve
--------------------------------------------------------------------
              Unit Hydrograph Data
--------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
--------------------------------------------------------------------
    1   0.250        152.073         31.114             56.474
    2   0.500        304.146         54.171             98.324
    3   0.750        456.220         11.618             21.087
    4   1.000        608.293          2.287              4.152
    5   1.250        760.366          0.810              1.471
                              Sum = 100.000   Sum=     181.507
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.229    (  0.253)        0.052
   2   0.50     4.80      0.365          0.229    (  0.328)        0.136
   3   0.75     5.10      0.387          0.229    (  0.349)        0.159
   4   1.00     4.90      0.372          0.229    (  0.335)        0.143
   5   1.25     6.60      0.501          0.229    (  0.451)        0.272
   6   1.50     7.30      0.554          0.229    (  0.499)        0.326
   7   1.75     8.40      0.638          0.229    (  0.574)        0.409
   8   2.00     9.00      0.683          0.229    (  0.615)        0.455
   9   2.25    12.30      0.934          0.229    (  0.841)        0.705
  10   2.50    17.60      1.337          0.229    (  1.203)        1.108
  11   2.75    16.10      1.223          0.229    (  1.100)        0.994
  12   3.00     4.20      0.319          0.229    (  0.287)        0.090
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.8
       Flood volume = Effective rainfall      1.21(In)
        times area     180.1(Ac.)/[(In)/(Ft.)] =      18.2(Ac.Ft)
       Total soil loss =      0.69(In)
       Total soil loss =    10.299(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      792532.8 Cubic Feet
       Total soil loss =      448638.2 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =    182.509(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       --------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ---------------------------------------------------------------------
```

```
    0+15       0.0610      2.95  Q         |         |         |         |
    0+30       0.3256     12.81  V Q       |         |         |         |
    0+45       0.8094     23.42  |V  Q     |         |         |         |
    1+ 0       1.3627     26.78  | V  Q    |         |         |         |
    1+15       2.0545     33.48  |   V Q   |         |         |         |
    1+30       3.0687     49.08  |     V  Q|         |         |         |
    1+45       4.3440     61.73  |        V| Q       |         |         |
    2+ 0       5.8762     74.16  |           V Q     |         |         |
    2+15       7.8384     94.97  |         |      VQ |         |         |
    2+30      10.8084    143.75  |         |         |  V    Q |         |
    2+45      14.5793    182.51  |         |         |         | V   Q   |
    3+ 0      17.2620    129.84  |         |         |    Q    |      V  |
    3+15      17.9951     35.48  |      Q  |         |         |        V|
    3+30      18.1534      7.66  |Q        |         |         |        V|
    3+45      18.1913      1.84  Q         |         |         |        V|
    4+ 0      18.1940      0.13  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C22
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      17.90(Ac.)  =      0.028 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      17.90(Ac.)  =      0.028 Sq. Mi.
Length along longest watercourse =    1550.00(Ft.)
Length along longest watercourse measured to centroid =     940.00(Ft.)
Length along longest watercourse =      0.294 Mi.
Length along longest watercourse measured to centroid =      0.178 Mi.
Difference in elevation =      51.00(Ft.)
Slope along watercourse =    173.7290 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.088 Hr.
Lag time =     5.28 Min.
25% of lag time =     1.32 Min.
40% of lag time =     2.11 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.90           0.85                 15.21

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.90           1.90                 34.01

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    15.400           66.00         0.000
     2.500           83.00         0.000
```

Total Area Entered = 17.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.860	0.349
83.0	83.0	0.210	0.000	0.210	0.140	0.029
					Sum (F) =	0.378

Area averaged mean soil loss (F) (In/Hr) = 0.378
Minimum soil loss rate ((In/Hr)) = 0.189
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	283.969	55.732	10.054
2	0.500	567.937	41.728	7.528
3	0.750	851.906	2.539	0.458
		Sum = 100.000	Sum=	18.040

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.378)	0.253	0.028
2	0.50	4.80	0.365	(0.378)	0.328	0.036
3	0.75	5.10	0.388	(0.378)	0.349	0.039
4	1.00	4.90	0.372	(0.378)	0.335	0.037
5	1.25	6.60	0.502	0.378	(0.451)	0.124
6	1.50	7.30	0.555	0.378	(0.499)	0.177
7	1.75	8.40	0.638	0.378	(0.575)	0.260
8	2.00	9.00	0.684	0.378	(0.616)	0.306
9	2.25	12.30	0.935	0.378	(0.841)	0.557
10	2.50	17.60	1.337	0.378	(1.204)	0.960
11	2.75	16.10	1.224	0.378	(1.101)	0.846
12	3.00	4.20	0.319	(0.378)	0.287	0.032
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	3.4

Flood volume = Effective rainfall 0.85(In)
times area 17.9(Ac.)/[(In)/(Ft.)] = 1.3(Ac.Ft)
Total soil loss = 1.05(In)
Total soil loss = 1.565(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 55254.5 Cubic Feet
Total soil loss = 68192.1 Cubic Feet

Peak flow rate of this hydrograph = 15.988(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-----------------------------------------------------------------------
  0+15       0.0058      0.28  Q         |         |         |         |
  0+30       0.0178      0.58  VQ        |         |         |         |
  0+45       0.0318      0.68   Q        |         |         |         |
  1+ 0       0.0459      0.68  |Q        |         |         |         |
```

```
   1+15       0.0778      1.54  | VQ      |         |         |         |
   1+30       0.1341      2.73  |   VQ    |         |         |         |
   1+45       0.2169      4.01  |     V Q |         |         |         |
   2+ 0       0.3228      5.12  |         Q         |         |         |
   2+15       0.4886      8.03  |         |    VQ   |         |         |
   2+30       0.7775     13.99  |         |         |   V  Q  |         |
   2+45       1.1079     15.99  |         |         |         |Q  V      |
   3+ 0       1.2552      7.13  |         |   Q     |         |        V|
   3+15       1.2682      0.63  |Q        |         |         |        V|
   3+30       1.2685      0.01  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C1
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =      52.00(Ac.)  =      0.081 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      52.00(Ac.)  =      0.081 Sq. Mi.
Length along longest watercourse =     700.00(Ft.)
Length along longest watercourse measured to centroid =     600.00(Ft.)
Length along longest watercourse =      0.133 Mi.
Length along longest watercourse measured to centroid =      0.114 Mi.
Difference in elevation =      22.00(Ft.)
Slope along watercourse =    165.9429 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.055 Hr.
Lag time =     3.32 Min.
25% of lag time =     0.83 Min.
40% of lag time =     1.33 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       52.00           0.85                 44.20

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       52.00           1.90                 98.80

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    52.000           66.00         0.000
 Total Area Entered =     52.00(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       1.000      0.405
                                                  Sum (F) =   0.405
Area averaged mean soil loss (F) (In/Hr) =  0.405
Minimum soil loss rate ((In/Hr)) =  0.203
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     FOOTHILL S-Curve
--------------------------------------------------------------------
              Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        451.613         70.820             37.114
    2   0.500        903.227         29.180             15.292
                                Sum = 100.000   Sum=      52.406
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.405)	0.253	0.028
2	0.50	4.80	0.365	(0.405)	0.328	0.036
3	0.75	5.10	0.388	(0.405)	0.349	0.039
4	1.00	4.90	0.372	(0.405)	0.335	0.037
5	1.25	6.60	0.501	0.405	(0.451)	0.096
6	1.50	7.30	0.555	0.405	(0.499)	0.149
7	1.75	8.40	0.638	0.405	(0.574)	0.233
8	2.00	9.00	0.684	0.405	(0.615)	0.279
9	2.25	12.30	0.935	0.405	(0.841)	0.529
10	2.50	17.60	1.337	0.405	(1.204)	0.932
11	2.75	16.10	1.223	0.405	(1.101)	0.818
12	3.00	4.20	0.319	(0.405)	0.287	0.032
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	3.2

```
Flood volume = Effective rainfall      0.80(In)
 times area      52.0(Ac.)/[(In)/(Ft.)] =       3.5(Ac.Ft)
Total soil loss =      1.10(In)
Total soil loss =     4.754(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      151458.4 Cubic Feet
Total soil loss =      207104.0 Cubic Feet
--------------------------------------------------------------------
 Peak flow rate of this hydrograph =     44.641(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
              R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
--------------------------------------------------------------------
  0+15       0.0216      1.04  Q         |         |         |         |
  0+30       0.0584      1.78  VQ        |         |         |         |
  0+45       0.0997      2.00   Q        |         |         |         |
  1+ 0       0.1405      1.98  |Q        |         |         |         |
  1+15       0.2262      4.15  | VQ      |         |         |         |
  1+30       0.3713      7.02  |   VQ    |         |         |         |
  1+45       0.5973     10.94  |     V Q |         |         |         |
```

```
   2+ 0       0.8848     13.91  |         VQ        |         |         |
   2+15       1.3790     23.92  |         |    V   Q|         |         |
   2+30       2.2615     42.71  |         |         |     V   |   Q     |
   2+45       3.1838     44.64  |         |         |         |    QV   |
   3+ 0       3.4669     13.70  |         Q         |         |        V|
   3+15       3.4770      0.49  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Conidtion
Subarea C4
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =       6.60(Ac.)  =      0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       6.60(Ac.)  =      0.010 Sq. Mi.
Length along longest watercourse =    1050.00(Ft.)
Length along longest watercourse measured to centroid =     540.00(Ft.)
Length along longest watercourse =      0.199 Mi.
Length along longest watercourse measured to centroid =      0.102 Mi.
Difference in elevation =      20.00(Ft.)
Slope along watercourse =    100.5714 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.068 Hr.
Lag time =     4.09 Min.
25% of lag time =     1.02 Min.
40% of lag time =     1.64 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        6.60           0.85                  5.61

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        6.60           1.90                 12.54

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     5.200           85.00         0.000
     1.400           90.00         0.000
```

Total Area Entered = 6.60(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	0.788	0.147
90.0	90.0	0.130	0.000	0.130	0.212	0.028
					Sum (F) =	0.175

Area averaged mean soil loss (F) (In/Hr) = 0.175
Minimum soil loss rate ((In/Hr)) = 0.087
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	366.368	62.618	4.165
2	0.500	732.737	33.724	2.243
3	0.750	1099.105	3.658	0.243
		Sum = 100.000	Sum=	6.652

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.175	(0.253)	0.106
2	0.50	4.80	0.365	0.175	(0.328)	0.190
3	0.75	5.10	0.388	0.175	(0.349)	0.213
4	1.00	4.90	0.372	0.175	(0.335)	0.197
5	1.25	6.60	0.502	0.175	(0.451)	0.327
6	1.50	7.30	0.555	0.175	(0.499)	0.380
7	1.75	8.40	0.638	0.175	(0.575)	0.463
8	2.00	9.00	0.684	0.175	(0.616)	0.509
9	2.25	12.30	0.935	0.175	(0.841)	0.760
10	2.50	17.60	1.338	0.175	(1.204)	1.163
11	2.75	16.10	1.224	0.175	(1.101)	1.049
12	3.00	4.20	0.319	0.175	(0.287)	0.144
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.5

Flood volume = Effective rainfall 1.38(In)
times area 6.6(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 0.52(In)
Total soil loss = 0.289(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 32947.5 Cubic Feet
Total soil loss = 12571.4 Cubic Feet

Peak flow rate of this hydrograph = 7.164(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0092	0.44	VQ				
0+30	0.0304	1.03	V Q				
0+45	0.0581	1.34	| V Q				
1+ 0	0.0859	1.35	| VQ				

```
   1+15       0.1243      1.86  |     VQ  |         |         |         |
   1+30       0.1731      2.36  |        Q|         |         |         |
   1+45       0.2323      2.86  |          QV       |         |         |
   2+ 0       0.2995      3.25  |         |  Q V    |         |         |
   2+15       0.3909      4.42  |         |      Q  V         |         |
   2+30       0.5288      6.67  |         |         |     QV  |         |
   2+45       0.6768      7.16  |         |         |       Q      V    |
   3+ 0       0.7437      3.24  |         | Q       |         |        V|
   3+15       0.7556      0.58  | Q       |         |         |        V|
   3+30       0.7564      0.04  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C41
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      61.60(Ac.)  =      0.096 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      61.60(Ac.)  =      0.096 Sq. Mi.
Length along longest watercourse =    2300.00(Ft.)
Length along longest watercourse measured to centroid =    1340.00(Ft.)
Length along longest watercourse =      0.436 Mi.
Length along longest watercourse measured to centroid =      0.254 Mi.
Difference in elevation =     219.00(Ft.)
Slope along watercourse =    502.7478 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.096 Hr.
Lag time =     5.74 Min.
25% of lag time =     1.43 Min.
40% of lag time =     2.30 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       61.60           0.85                 52.36

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       61.60           1.90                117.04

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.200           66.00         0.000
    11.300           77.00         0.000
```

```
    42.100          83.00         0.000
 Total Area Entered =     61.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       0.133      0.054
77.0  77.0      0.279     0.000        0.279       0.183      0.051
83.0  83.0      0.210     0.000        0.210       0.683      0.143
                                                  Sum (F) =   0.249
Area averaged mean soil loss (F) (In/Hr) =  0.249
Minimum soil loss rate ((In/Hr)) =  0.124
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     FOOTHILL S-Curve
--------------------------------------------------------------------
              Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        261.402         52.675             32.701
    2   0.500        522.805         43.927             27.270
    3   0.750        784.207          3.398              2.110
                                Sum = 100.000   Sum=      62.081
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

 Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
      (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
  1   0.25     3.70      0.281          0.249    (  0.253)        0.033
  2   0.50     4.80      0.365          0.249    (  0.328)        0.116
  3   0.75     5.10      0.387          0.249    (  0.349)        0.139
  4   1.00     4.90      0.372          0.249    (  0.335)        0.124
  5   1.25     6.60      0.501          0.249    (  0.451)        0.253
  6   1.50     7.30      0.555          0.249    (  0.499)        0.306
  7   1.75     8.40      0.638          0.249    (  0.574)        0.390
  8   2.00     9.00      0.684          0.249    (  0.615)        0.435
  9   2.25    12.30      0.935          0.249    (  0.841)        0.686
 10   2.50    17.60      1.337          0.249    (  1.204)        1.089
 11   2.75    16.10      1.223          0.249    (  1.101)        0.975
 12   3.00     4.20      0.319          0.249    (  0.287)        0.071
               (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     4.6
       Flood volume = Effective rainfall      1.15(In)
        times area      61.6(Ac.)/[(In)/(Ft.)] =       5.9(Ac.Ft)
       Total soil loss =      0.75(In)
       Total soil loss =     3.828(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      257988.2 Cubic Feet
       Total soil loss =      166752.5 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =     63.042(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       --------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       --------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
 ----------------------------------------------------------------------
   0+15       0.0220      1.06  Q         |         |         |         |
   0+30       0.1188      4.69  V Q       |         |         |         |
```

```
    0+45       0.2796      7.78  |V  Q     |         |         |         |
    1+ 0       0.4466      8.08  |  VQ     |         |         |         |
    1+15       0.6934     11.94  |   V Q   |         |         |         |
    1+30       1.0483     17.18  |      V Q|         |         |         |
    1+45       1.4952     21.63  |         V Q       |         |         |
    2+ 0       2.0224     25.52  |         |  VQ     |         |         |
    2+15       2.7485     35.14  |         |       V Q         |         |
    2+30       3.8901     55.25  |         |         |     V   |Q        |
    2+45       5.1926     63.04  |         |         |         |    VQ   |
    3+ 0       5.8372     31.20  |         |      Q  |         |        V|
    3+15       5.9195      3.98  | Q       |         |         |        V|
    3+30       5.9226      0.15  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Conidtion
Subarea C42
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      28.00(Ac.)  =      0.044 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      28.00(Ac.)  =      0.044 Sq. Mi.
Length along longest watercourse =     920.00(Ft.)
Length along longest watercourse measured to centroid =     660.00(Ft.)
Length along longest watercourse =      0.174 Mi.
Length along longest watercourse measured to centroid =      0.125 Mi.
Difference in elevation =      49.00(Ft.)
Slope along watercourse =    281.2174 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.058 Hr.
Lag time =     3.46 Min.
25% of lag time =     0.86 Min.
40% of lag time =     1.38 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       28.00           0.85                 23.80

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       28.00           1.90                 53.20

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    21.900           66.00         0.000
     2.000           77.00         0.000
```

```
            4.100           83.00         0.000
        Total Area Entered =     28.00(Ac.)


       RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
       AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
       66.0  66.0      0.405     0.000        0.405       0.782      0.317
       77.0  77.0      0.279     0.000        0.279       0.071      0.020
       83.0  83.0      0.210     0.000        0.210       0.146      0.031
                                                          Sum (F) =   0.368
       Area averaged mean soil loss (F) (In/Hr) =  0.368
       Minimum soil loss rate ((In/Hr)) =  0.184
       (for 24 hour storm duration)
       Soil low loss rate (decimal) =   0.900
       ---------------------------------------------------------------------

                     U n i t  H y d r o g r a p h
                            FOOTHILL S-Curve
       ---------------------------------------------------------------------
                     Unit Hydrograph Data
       ---------------------------------------------------------------------
       Unit time period   Time % of lag   Distribution   Unit Hydrograph
           (hrs)                           Graph %            (CFS)
       ---------------------------------------------------------------------
           1   0.250        433.972         69.699             19.668
           2   0.500        867.943         30.301              8.551
                                      Sum = 100.000   Sum=      28.219
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281       (  0.368)       0.253        0.028
   2   0.50     4.80      0.365       (  0.368)       0.328        0.036
   3   0.75     5.10      0.388       (  0.368)       0.349        0.039
   4   1.00     4.90      0.372       (  0.368)       0.335        0.037
   5   1.25     6.60      0.502          0.368    (  0.451)        0.134
   6   1.50     7.30      0.555          0.368    (  0.499)        0.187
   7   1.75     8.40      0.638          0.368    (  0.574)        0.271
   8   2.00     9.00      0.684          0.368    (  0.616)        0.316
   9   2.25    12.30      0.935          0.368    (  0.841)        0.567
  10   2.50    17.60      1.337          0.368    (  1.204)        0.970
  11   2.75    16.10      1.223          0.368    (  1.101)        0.856
  12   3.00     4.20      0.319       (  0.368)       0.287        0.032
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     3.5
       Flood volume = Effective rainfall      0.87(In)
        times area      28.0(Ac.)/[(In)/(Ft.)] =       2.0(Ac.Ft)
       Total soil loss =      1.03(In)
       Total soil loss =     2.407(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =       88258.2 Cubic Feet
       Total soil loss =      104834.2 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     25.139(CFS)
       ---------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
  ---------------------------------------------------------------------
    0+15       0.0114      0.55  Q         |         |         |         |
    0+30       0.0312      0.96  VQ        |         |         |         |
    0+45       0.0534      1.07   Q        |         |         |         |
```

```
   1+ 0       0.0754      1.06  |Q        |         |         |         |
   1+15       0.1365      2.95  | VQ      |         |         |         |
   1+30       0.2362      4.83  |   V Q   |         |         |         |
   1+45       0.3794      6.93  |      V Q|         |         |         |
   2+ 0       0.5558      8.54  |         VQ        |         |         |
   2+15       0.8423     13.87  |         |     V Q |         |         |
   2+30       1.3368     23.94  |         |         |     V   |Q        |
   2+45       1.8562     25.14  |         |         |         |  Q  V   |
   3+ 0       2.0205      7.95  |         Q         |         |        V|
   3+15       2.0261      0.27  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C5
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =      25.00(Ac.)  =      0.039 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      25.00(Ac.)  =      0.039 Sq. Mi.
Length along longest watercourse =     790.00(Ft.)
Length along longest watercourse measured to centroid =     789.99(Ft.)
Length along longest watercourse =      0.150 Mi.
Length along longest watercourse measured to centroid =      0.150 Mi.
Difference in elevation =      12.00(Ft.)
Slope along watercourse =     80.2025 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.074 Hr.
Lag time =     4.43 Min.
25% of lag time =     1.11 Min.
40% of lag time =     1.77 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       25.00           0.85                 21.25

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       25.00           1.90                 47.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    22.100           85.00         0.000
     2.900           90.00         0.000
```

Total Area Entered = 25.00(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	0.884	0.165
90.0	90.0	0.130	0.000	0.130	0.116	0.015
					Sum (F) =	0.180

Area averaged mean soil loss (F) (In/Hr) = 0.180
Minimum soil loss rate ((In/Hr)) = 0.090
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	338.385	60.307	15.194
2	0.500	676.769	35.110	8.846
3	0.750	1015.154	4.583	1.155
		Sum = 100.000	Sum=	25.195

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.180	(0.253)	0.101
2	0.50	4.80	0.365	0.180	(0.328)	0.184
3	0.75	5.10	0.388	0.180	(0.349)	0.207
4	1.00	4.90	0.372	0.180	(0.335)	0.192
5	1.25	6.60	0.502	0.180	(0.451)	0.321
6	1.50	7.30	0.555	0.180	(0.499)	0.374
7	1.75	8.40	0.638	0.180	(0.574)	0.458
8	2.00	9.00	0.684	0.180	(0.616)	0.504
9	2.25	12.30	0.935	0.180	(0.841)	0.754
10	2.50	17.60	1.337	0.180	(1.204)	1.157
11	2.75	16.10	1.223	0.180	(1.101)	1.043
12	3.00	4.20	0.319	0.180	(0.287)	0.139
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.4

Flood volume = Effective rainfall 1.36(In)
times area 25.0(Ac.)/[(In)/(Ft.)] = 2.8(Ac.Ft)
Total soil loss = 0.54(In)
Total soil loss = 1.127(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 123295.5 Cubic Feet
Total soil loss = 49110.6 Cubic Feet

Peak flow rate of this hydrograph = 26.969(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-------------------------------------------------------------------------
  0+15       0.0317      1.53  V Q       |         |         |         |
  0+30       0.1080      3.69   V  Q     |         |         |         |
  0+45       0.2092      4.90  | V   Q   |         |         |         |
  1+ 0       0.3118      4.97  |   V Q   |         |         |         |
```

```
   1+15       0.4527      6.82  |     V  Q|         |         |         |
   1+30       0.6336      8.76  |       V |Q        |         |         |
   1+45       0.8535     10.65  |         | V Q     |         |         |
   2+ 0       1.1044     12.14  |         |    VQ   |         |         |
   2+15       1.4443     16.45  |         |         VQ        |         |
   2+30       1.9577     24.85  |         |         |      V  |  Q      |
   2+45       2.5149     26.97  |         |         |               Q    |
   3+ 0       2.7769     12.68  |         |     Q   |         |        V|
   3+15       2.8272      2.43  |  Q      |         |         |        V|
   3+30       2.8305      0.16  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Steam 1, Existing Condition
Subarea C51
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =      12.70(Ac.)  =      0.020 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      12.70(Ac.)  =      0.020 Sq. Mi.
Length along longest watercourse =    1160.00(Ft.)
Length along longest watercourse measured to centroid =     510.00(Ft.)
Length along longest watercourse =      0.220 Mi.
Length along longest watercourse measured to centroid =      0.097 Mi.
Difference in elevation =     129.00(Ft.)
Slope along watercourse =    587.1724 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.050 Hr.
Lag time =     2.98 Min.
25% of lag time =     0.74 Min.
40% of lag time =     1.19 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       12.70           0.85                 10.80

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       12.70           1.90                 24.13

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     4.000           66.00         0.000
     8.700           83.00         0.000
```

Total Area Entered = 12.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.315	0.128
83.0	83.0	0.210	0.000	0.210	0.685	0.144
					Sum (F) =	0.271

Area averaged mean soil loss (F) (In/Hr) = 0.271
Minimum soil loss rate ((In/Hr)) = 0.136
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	504.085	73.731	9.437
2	0.500	1008.171	26.269	3.362
			Sum = 100.000	Sum= 12.799

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.271)	0.253	0.028
2	0.50	4.80	0.365	0.271	(0.328)	0.093
3	0.75	5.10	0.388	0.271	(0.349)	0.116
4	1.00	4.90	0.372	0.271	(0.335)	0.101
5	1.25	6.60	0.502	0.271	(0.451)	0.230
6	1.50	7.30	0.555	0.271	(0.499)	0.283
7	1.75	8.40	0.638	0.271	(0.575)	0.367
8	2.00	9.00	0.684	0.271	(0.616)	0.413
9	2.25	12.30	0.935	0.271	(0.841)	0.663
10	2.50	17.60	1.338	0.271	(1.204)	1.066
11	2.75	16.10	1.224	0.271	(1.101)	0.952
12	3.00	4.20	0.319	0.271	(0.287)	0.048
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.4

Flood volume = Effective rainfall 1.09(In)
times area 12.7(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)
Total soil loss = 0.81(In)
Total soil loss = 0.857(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 50270.1 Cubic Feet
Total soil loss = 37316.9 Cubic Feet

Peak flow rate of this hydrograph = 12.577(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+15	0.0055	0.27	Q | | | |
0+30	0.0257	0.98	VQ | | | |
0+45	0.0548	1.41	|VQ | | | |
1+ 0	0.0826	1.34	| Q | | | |
1+15	0.1346	2.51	| VQ | | | |

```
    1+30       0.2059      3.45  |     QV  |         |         |         |
    1+45       0.2972      4.42  |       Q V         |         |         |
    2+ 0       0.4032      5.13  |         Q  V      |         |         |
    2+15       0.5612      7.65  |          |    Q   V|         |         |
    2+30       0.8153     12.30  |          |         |   Q   V |         |
    2+45       1.0752     12.58  |          |         |    Q    |      V  |
    3+ 0       1.1507      3.65  |      Q  |         |         |        V|
    3+15       1.1540      0.16  Q         |         |         |         V
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C52
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =       7.30(Ac.)  =      0.011 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       7.30(Ac.)  =      0.011 Sq. Mi.
Length along longest watercourse =     950.00(Ft.)
Length along longest watercourse measured to centroid =     590.00(Ft.)
Length along longest watercourse =      0.180 Mi.
Length along longest watercourse measured to centroid =      0.112 Mi.
Difference in elevation =      29.00(Ft.)
Slope along watercourse =    161.1789 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.062 Hr.
Lag time =     3.73 Min.
25% of lag time =     0.93 Min.
40% of lag time =     1.49 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        7.30           0.85                  6.21

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        7.30           1.90                 13.87

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     5.200           85.00         0.000
     1.100           90.00         0.000
```

```
          1.000           92.00         0.000
      Total Area Entered =      7.30(Ac.)


     RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
     AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
     85.0  85.0      0.187     0.000        0.187       0.712      0.133
     90.0  90.0      0.130     0.000        0.130       0.151      0.020
     92.0  92.0      0.104     0.000        0.104       0.137      0.014
                                                       Sum (F) =   0.167
     Area averaged mean soil loss (F) (In/Hr) =  0.167
     Minimum soil loss rate ((In/Hr)) =  0.084
     (for 24 hour storm duration)
     Soil low loss rate (decimal) =   0.900
     ---------------------------------------------------------------------

                    U n i t  H y d r o g r a p h
                           VALLEY S-Curve
     ---------------------------------------------------------------------
                    Unit Hydrograph Data
     ---------------------------------------------------------------------
     Unit time period   Time % of lag   Distribution   Unit Hydrograph
         (hrs)                           Graph %            (CFS)
     ---------------------------------------------------------------------
         1   0.250        402.475         65.255              4.801
         2   0.500        804.950         34.745              2.556
                                     Sum = 100.000   Sum=       7.357
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.167    (  0.253)        0.114
   2   0.50     4.80      0.365          0.167    (  0.328)        0.198
   3   0.75     5.10      0.388          0.167    (  0.349)        0.221
   4   1.00     4.90      0.372          0.167    (  0.335)        0.205
   5   1.25     6.60      0.502          0.167    (  0.451)        0.335
   6   1.50     7.30      0.555          0.167    (  0.499)        0.388
   7   1.75     8.40      0.638          0.167    (  0.575)        0.471
   8   2.00     9.00      0.684          0.167    (  0.616)        0.517
   9   2.25    12.30      0.935          0.167    (  0.841)        0.768
  10   2.50    17.60      1.338          0.167    (  1.204)        1.171
  11   2.75    16.10      1.224          0.167    (  1.101)        1.057
  12   3.00     4.20      0.319          0.167    (  0.287)        0.152
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     5.6
       Flood volume = Effective rainfall      1.40(In)
        times area       7.3(Ac.)/[(In)/(Ft.)] =       0.9(Ac.Ft)
       Total soil loss =      0.50(In)
       Total soil loss =     0.305(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =       37067.2 Cubic Feet
       Total soil loss =       13279.3 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =      8.068(CFS)
       ---------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
  ---------------------------------------------------------------------
    0+15       0.0113      0.55  V Q       |         |         |         |
    0+30       0.0370      1.24   V  Q     |         |         |         |
    0+45       0.0693      1.57  |  V  Q   |         |         |         |
```

```
   1+ 0       0.1014      1.55  |   V Q   |         |         |         |
   1+15       0.1454      2.13  |     V Q |         |         |         |
   1+30       0.2016      2.72  |        VQ         |         |         |
   1+45       0.2688      3.26  |           VQ      |         |         |
   2+ 0       0.3450      3.69  |          |   Q V  |         |         |
   2+15       0.4485      5.01  |          |         QV        |         |
   2+30       0.6053      7.59  |          |         |       V Q         |
   2+45       0.7720      8.07  |          |         |         | Q   V   |
   3+ 0       0.8429      3.43  |          |  Q      |         |        V|
   3+15       0.8509      0.39  |Q         |         |         |         V
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C6
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =      67.70(Ac.)  =      0.106 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      67.70(Ac.)  =      0.106 Sq. Mi.
Length along longest watercourse =    3400.00(Ft.)
Length along longest watercourse measured to centroid =    2410.00(Ft.)
Length along longest watercourse =      0.644 Mi.
Length along longest watercourse measured to centroid =      0.456 Mi.
Difference in elevation =      68.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.187 Hr.
Lag time =    11.19 Min.
25% of lag time =     2.80 Min.
40% of lag time =     4.48 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       67.70           0.85                 57.55

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       67.70           1.90                128.63

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    17.100           76.00         0.000
    49.100           85.00         0.000
```

```
     1.500          90.00         0.000
 Total Area Entered =     67.70(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
76.0  76.0      0.291     0.000        0.291       0.253      0.074
85.0  85.0      0.187     0.000        0.187       0.725      0.136
90.0  90.0      0.130     0.000        0.130       0.022      0.003
                                                  Sum (F) =   0.212
Area averaged mean soil loss (F) (In/Hr) =  0.212
Minimum soil loss rate ((In/Hr)) =  0.106
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        134.022         29.108             19.860
    2   0.500        268.045         48.072             32.799
    3   0.750        402.067         12.212              8.332
    4   1.000        536.089          5.424              3.700
    5   1.250        670.111          2.957              2.018
    6   1.500        804.134          2.226              1.519
                                Sum = 100.000   Sum=      68.229
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.212    (  0.253)        0.069
   2   0.50     4.80      0.365          0.212    (  0.328)        0.153
   3   0.75     5.10      0.387          0.212    (  0.349)        0.175
   4   1.00     4.90      0.372          0.212    (  0.335)        0.160
   5   1.25     6.60      0.501          0.212    (  0.451)        0.289
   6   1.50     7.30      0.555          0.212    (  0.499)        0.343
   7   1.75     8.40      0.638          0.212    (  0.574)        0.426
   8   2.00     9.00      0.684          0.212    (  0.615)        0.472
   9   2.25    12.30      0.935          0.212    (  0.841)        0.722
  10   2.50    17.60      1.337          0.212    (  1.203)        1.125
  11   2.75    16.10      1.223          0.212    (  1.101)        1.011
  12   3.00     4.20      0.319          0.212    (  0.287)        0.107
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     5.1
       Flood volume = Effective rainfall      1.26(In)
        times area      67.7(Ac.)/[(In)/(Ft.)] =       7.1(Ac.Ft)
       Total soil loss =      0.64(In)
       Total soil loss =     3.589(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      310449.4 Cubic Feet
       Total soil loss =      156339.2 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     66.166(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
```

```
 ---------------------------------------------------------------------
  0+15       0.0284      1.37  Q         |         |         |         |
  0+30       0.1378      5.30  V  Q      |         |         |         |
  0+45       0.3252      9.07  |V   Q    |         |         |         |
  1+ 0       0.5415     10.47  |  V Q    |         |         |         |
  1+15       0.8138     13.18  |   V  Q  |         |         |         |
  1+30       1.2002     18.70  |     V   Q         |         |         |
  1+45       1.6816     23.30  |        V|  Q      |         |         |
  2+ 0       2.2576     27.88  |           V  Q    |         |         |
  2+15       2.9907     35.49  |         |     V   Q         |         |
  2+30       4.0797     52.71  |         |           V       Q         |
  2+45       5.4468     66.17  |         |         |         V      Q  |
  3+ 0       6.4585     48.96  |         |         |      Q  |     V   |
  3+15       6.8363     18.28  |         Q         |         |       V |
  3+30       7.0017      8.01  |   Q     |         |         |        V|
  3+45       7.0874      4.15  | Q       |         |         |        V|
  4+ 0       7.1236      1.75  |Q        |         |         |        V|
  4+15       7.1269      0.16  Q         |         |         |        V|
---------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/25/12 File: SubC73100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C7
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      70.70(Ac.)  =      0.110 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      70.70(Ac.)  =      0.110 Sq. Mi.
Length along longest watercourse =    3100.00(Ft.)
Length along longest watercourse measured to centroid =    3020.00(Ft.)
Length along longest watercourse =      0.587 Mi.
Length along longest watercourse measured to centroid =      0.572 Mi.
Difference in elevation =      54.00(Ft.)
Slope along watercourse =     91.9742 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.201 Hr.
Lag time =    12.09 Min.
25% of lag time =     3.02 Min.
40% of lag time =     4.83 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       70.70           0.85                 60.09

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       70.70           1.90                134.33

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    38.300           76.00         0.000
    32.400           85.00         0.000
```

Total Area Entered = 70.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.542	0.158
85.0	85.0	0.187	0.000	0.187	0.458	0.086
					Sum (F) =	0.243

Area averaged mean soil loss (F) (In/Hr) = 0.243
Minimum soil loss rate ((In/Hr)) = 0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	124.104	26.376	18.793
2	0.500	248.208	48.571	34.608
3	0.750	372.312	12.961	9.235
4	1.000	496.416	5.838	4.160
5	1.250	620.520	3.254	2.318
6	1.500	744.624	1.813	1.292
7	1.750	868.728	1.188	0.847
		Sum = 100.000	Sum=	71.252

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.243	(0.253)	0.038
2	0.50	4.80	0.365	0.243	(0.328)	0.121
3	0.75	5.10	0.387	0.243	(0.349)	0.144
4	1.00	4.90	0.372	0.243	(0.335)	0.129
5	1.25	6.60	0.501	0.243	(0.451)	0.258
6	1.50	7.30	0.555	0.243	(0.499)	0.311
7	1.75	8.40	0.638	0.243	(0.574)	0.395
8	2.00	9.00	0.684	0.243	(0.615)	0.440
9	2.25	12.30	0.935	0.243	(0.841)	0.691
10	2.50	17.60	1.337	0.243	(1.203)	1.094
11	2.75	16.10	1.223	0.243	(1.101)	0.980
12	3.00	4.20	0.319	0.243	(0.287)	0.076
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.7

Flood volume = Effective rainfall 1.17(In)
times area 70.7(Ac.)/[(In)/(Ft.)] = 6.9(Ac.Ft)
Total soil loss = 0.73(In)
Total soil loss = 4.303(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 300031.0 Cubic Feet
Total soil loss = 187436.1 Cubic Feet

Peak flow rate of this hydrograph = 66.048(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m) Volume Ac.Ft Q(CFS) 0 17.5 35.0 52.5 70.0

```
    0+15       0.0146      0.71  Q         |         |         |         |
    0+30       0.0887      3.58  V Q       |         |         |         |
    0+45       0.2386      7.25   V  Q     |         |         |         |
    1+ 0       0.4180      8.69  | V Q     |         |         |         |
    1+15       0.6502     11.23  |  V  Q   |         |         |         |
    1+30       0.9994     16.90  |    V   Q|         |         |         |
    1+45       1.4465     21.64  |       V | Q       |         |         |
    2+ 0       1.9937     26.49  |          V   Q    |         |         |
    2+15       2.6977     34.07  |         |    V   Q|         |         |
    2+30       3.7591     51.37  |         |         |V       Q|         |
    2+45       5.1237     66.05  |         |         |        V|      Q  |
    3+ 0       6.1593     50.12  |         |         |       Q |    V    |
    3+15       6.5463     18.73  |         Q         |         |       V |
    3+30       6.7236      8.58  |   Q     |         |         |        V|
    3+45       6.8183      4.59  | Q       |         |         |        V|
    4+ 0       6.8673      2.37  |Q        |         |         |        V|
    4+15       6.8864      0.93  Q         |         |         |        V|
    4+30       6.8878      0.06  Q         |         |         |         V
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/07/12 File: SubC83100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 2, Existing Condition
Subarea C8
100 Yr. 3 Hr.

--------------------------------------------------------------------
Drainage Area =     116.90(Ac.)  =      0.183 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     116.90(Ac.)  =      0.183 Sq. Mi.
Length along longest watercourse =    5100.00(Ft.)
Length along longest watercourse measured to centroid =    2050.00(Ft.)
Length along longest watercourse =      0.966 Mi.
Length along longest watercourse measured to centroid =      0.388 Mi.
Difference in elevation =     122.00(Ft.)
Slope along watercourse =    126.3059 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.198 Hr.
Lag time =    11.87 Min.
25% of lag time =     2.97 Min.
40% of lag time =     4.75 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      116.90           0.85                 99.37

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      116.90           1.90                222.11

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    33.300           76.00         0.000
    83.600           85.00         0.000
```

Total Area Entered = 116.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.285	0.083
85.0	85.0	0.187	0.000	0.187	0.715	0.134
					Sum (F) =	0.217

Area averaged mean soil loss (F) (In/Hr) = 0.217
Minimum soil loss rate ((In/Hr)) = 0.108
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	126.397	27.023	31.837
2	0.500	252.794	48.469	57.102
3	0.750	379.191	12.777	15.053
4	1.000	505.588	5.742	6.765
5	1.250	631.985	3.180	3.747
6	1.500	758.382	1.756	2.069
7	1.750	884.779	1.053	1.241
		Sum = 100.000	Sum=	117.813

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.217	(0.253)	0.064
2	0.50	4.80	0.365	0.217	(0.328)	0.148
3	0.75	5.10	0.387	0.217	(0.349)	0.171
4	1.00	4.90	0.372	0.217	(0.335)	0.156
5	1.25	6.60	0.501	0.217	(0.451)	0.285
6	1.50	7.30	0.555	0.217	(0.499)	0.338
7	1.75	8.40	0.638	0.217	(0.574)	0.421
8	2.00	9.00	0.684	0.217	(0.615)	0.467
9	2.25	12.30	0.934	0.217	(0.841)	0.718
10	2.50	17.60	1.337	0.217	(1.203)	1.120
11	2.75	16.10	1.223	0.217	(1.101)	1.006
12	3.00	4.20	0.319	0.217	(0.287)	0.102
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.0

Flood volume = Effective rainfall 1.25(In)
times area 116.9(Ac.)/[(In)/(Ft.)] = 12.2(Ac.Ft)
Total soil loss = 0.65(In)
Total soil loss = 6.333(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 530001.5 Cubic Feet
Total soil loss = 275845.4 Cubic Feet

Peak flow rate of this hydrograph = 112.656(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0

```
    0+15       0.0424      2.05  Q         |         |         |         |
    0+30       0.2157      8.39  VQ        |         |         |         |
    0+45       0.5227     14.86  |VQ       |         |         |         |
    1+ 0       0.8816     17.37  | VQ      |         |         |         |
    1+15       1.3314     21.77  |   Q     |         |         |         |
    1+30       1.9762     31.21  |     Q   |         |         |         |
    1+45       2.7838     39.09  |      Q V|         |         |         |
    2+ 0       3.7566     47.08  |        Q  V       |         |         |
    2+15       4.9916     59.77  |         |Q    V   |         |         |
    2+30       6.8225     88.62  |         |      Q    V       |         |
    2+45       9.1501    112.66  |         |         | Q       V         |
    3+ 0      10.9171     85.52  |         |      Q  |         |    V    |
    3+15      11.5941     32.76  |     Q   |         |         |       V |
    3+30      11.8961     14.62  | Q       |         |         |        V|
    3+45      12.0546      7.67  |Q        |         |         |        V|
    4+ 0      12.1343      3.86  Q         |         |         |        V|
    4+15      12.1645      1.46  Q         |         |         |        V|
    4+30      12.1672      0.13  Q         |         |         |         V
-----------------------------------------------------------------------
```

WSD3St1

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/25/12

Watershed D, Stream 1
Existing Condition
100-year, 3-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubD13100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 22
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 373.436 (CFS)
Total volume = 42.431 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 51.000 to Point/Station 52.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 680.00 (Ft.)
Elevation difference = 14.00 (Ft.)
Slope of channel = 0.020588 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 680.00(Ft.) Elevation difference = 14.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 140.892(CFS)
Depth of flow = 1.429(Ft.)
Average velocity = 7.669(Ft/s)
Total flow rate = 140.892(CFS)
Channel flow top width = 15.715(Ft.)
Depth of flow in channel = 1.43(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 7.67(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =  140.892(CFS)
Total capacity of improved channels =    140.892(CFS)
Critical Depth in Channel =    1.63(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    373.436(CFS)
Depth of flow =     2.442(Ft.)
Average velocity =    10.272(Ft/s)
Total flow rate =   373.436(CFS)
Channel flow top width =   19.769(Ft.)
Depth of flow in channel =   2.44(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   10.27(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  373.436(CFS)
Total capacity of improved channels =    373.436(CFS)
Critical Depth in Channel =    2.88(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8580   Travel time =   1.10 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  10.8971
        dt(routing time-step) =   0.95 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       93.4     186.7     280.1     373.4
----------------------------------------------------------------------
  0+15       0.8565      0.91  O         |         |         |         |
  0+30       8.1531      8.64  O         |         |         |         |
  0+45      26.5292     27.73  | O       |         |         |         |
  1+ 0      43.2137     44.26  |   O     |         |         |         |
  1+15      53.1726     53.77  |    O    |         |         |         |
  1+30      77.5180     79.12  |       O |         |         |         |
  1+45     107.8435    109.78  |         |O        |         |         |
  2+ 0     137.8582    139.75  |         |   O     |         |         |
  2+15     170.8635    172.96  |         |       O |         |         |
  2+30     237.0897    241.41  |         |         |    O    |         |
  2+45     340.6177    347.30  |         |         |         |     OI  |
  3+ 0     371.7862    373.44  |         |         |         |        OI
  3+15     241.4238    232.53  |         |         |   IO    |         |
  3+30     114.8425    106.91  |         |IO       |         |         |
  3+45      59.7954     56.62  |     O   |         |         |         |
  4+ 0      30.7885     29.05  |  O      |         |         |         |
  4+15      14.6427     13.67  |O        |         |         |         |
  4+30       7.6918      7.29  O         |         |         |         |
  4+45       4.9263      4.77  O         |         |         |         |
  5+ 0       2.9131      2.79  O         |         |         |         |
  5+15       1.0416      0.92  O         |         |         |         |
  5+30       0.1116      0.06  O         |         |         |         |
```

```
  5+45       0.0036      0.00  O         |         |         |         |
  6+ 0       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA****************************
                      Number of intervals =    24
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      371.786 (CFS)
                      Total volume =      42.431 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station      520.000 to Point/Station       52.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ********************* HYDROGRAPH INFORMATION **********************

                      From study/file name: SubD23100.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      128.7     257.4     386.1     514.8
  ---------------------------------------------------------------------
  0+15       1.7742      2.63  Q         |         |         |         |
  0+30       6.7907     14.94  qQ        |         |         |         |
  0+45      12.2708     38.80  q  Q      |         |         |         |
  1+ 0      14.3332     57.55  |q  Q     |         |         |         |
  1+15      21.5676     74.74  |q   Q    |         |         |         |
  1+30      37.4948    115.01  | q     Q |         |         |         |
  1+45      50.4496    158.29  |  q      | Q       |         |         |
  2+ 0      63.0103    200.87  |   q     |    Q    |         |         |
  2+15      85.2339    256.10  |     q   |        Q|         |         |
  2+30     136.5971    373.69  |         q         |        Q|         |
  2+45     174.1599    514.78  |         |  q      |         |         Q
  3+ 0     115.2907    487.08  |       q |         |         |      Q  |
  3+15      24.8564    266.28  |q        |         Q         |         |
  3+30       4.7669    119.61  q         Q|        |         |         |
  3+45       1.0290     60.82  q   Q     |         |         |         |
  4+ 0       0.0319     30.82  q Q       |         |         |         |
  4+15       0.0000     14.64  qQ        |         |         |         |
  4+30       0.0000      7.69  Q         |         |         |         |
  4+45       0.0000      4.93  Q         |         |         |         |
  5+ 0       0.0000      2.91  Q         |         |         |         |
  5+15       0.0000      1.04  Q         |         |         |         |
  5+30       0.0000      0.11  Q         |         |         |         |
  5+45       0.0000      0.00  Q         |         |         |         |
  6+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA****************************
                      Number of intervals =    24
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      514.778 (CFS)
                      Total volume =      57.920 (Ac.Ft)
```

```
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       52.000 to Point/Station       53.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   4340.00 (Ft.)
Elevation difference =   74.00 (Ft.)
Slope of channel =  0.017051 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  4340.00(Ft.)     Elevation difference =  74.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    196.981(CFS)
Depth of flow =     1.815(Ft.)
Average velocity =     7.961(Ft/s)
Total flow rate =   196.981(CFS)
Channel flow top width =   17.261(Ft.)
Depth of flow in channel =   1.82(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.96(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  196.981(CFS)
Total capacity of improved channels =    196.981(CFS)
Critical Depth in Channel =    2.00(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    514.778(CFS)
Depth of flow =     3.043(Ft.)
Average velocity =    10.517(Ft/s)
Total flow rate =   514.778(CFS)
Channel flow top width =   22.172(Ft.)
Depth of flow in channel =   3.04(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   10.52(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  514.778(CFS)
Total capacity of improved channels =    514.778(CFS)
Critical Depth in Channel =    3.44(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8608   Travel time =   6.88 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   2.0223
```

WSD3St1

dt(routing time-step) = 5.92 (min.), c* = 0.9815

Output hydrograph delayed by 0 unit time increments

++

P R I N T O F S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

```
Time(h+m) Out = O(CFS) In = I  0      128.7     257.4     386.1     514.8
-----------------------------------------------------------------------
  0+15       1.5628      2.63  O         |         |         |         |
  0+30       9.9256     14.94  OI        |         |         |         |
  0+45      29.0228     38.80  | OI      |         |         |         |
  1+ 0      49.7556     57.55  |  OI     |         |         |         |
  1+15      67.6164     74.74  |    O    |         |         |         |
  1+30      98.5326    115.01  |      OI |         |         |         |
  1+45     140.4186    158.29  |         O I       |         |         |
  2+ 0     183.2543    200.87  |         |   OI    |         |         |
  2+15     233.3515    256.10  |         |       OI|         |         |
  2+30     325.5313    373.69  |         |         |    O   I|         |
  2+45     456.6111    514.78  |         |         |         |    O    I
  3+ 0     497.2438    487.08  |         |         |         |      IO |
  3+15     356.0984    266.28  |         |        I      O  |         |
  3+30     180.8130    119.61  |        I|   O     |         |         |
  3+45      85.8216     60.82  |   I O   |         |         |         |
  4+ 0      43.4634     30.82  | IO      |         |         |         |
  4+15      21.4441     14.64  |O        |         |         |         |
  4+30      10.6395      7.69  O         |         |         |         |
  4+45       6.1035      4.93  O         |         |         |         |
  5+ 0       3.7521      2.91  O         |         |         |         |
  5+15       1.8168      1.04  O         |         |         |         |
  5+30       0.5035      0.11  O         |         |         |         |
  5+45       0.0547      0.00  O         |         |         |         |
  6+ 0       0.0024      0.00  O         |         |         |         |
  6+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
```

**********HYDROGRAPH DATA**********

Number of intervals = 25

Time interval = 15.0 (Min.)

Maximum/Peak flow rate = 497.244 (CFS)

Total volume = 57.920 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++

Process from Point/Station 52.000 to Point/Station 53.000

**** ADD/COMBINE/RECOVER HYDROGRAPHS ****

********** HYDROGRAPH INFORMATION **********

From study/file name: SubD33100.rte

++

P R I N T O F S T O R M

WSD3St1

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0 149.8 299.6 449.3 599.1
0+15	0.9636	2.53	Q
0+30	5.6738	15.60	qQ
0+45	12.7359	41.76	q Q
1+ 0	15.8381	65.59	|q Q
1+15	20.1265	87.74	|q Q
1+30	31.0229	129.56	| q Q |
1+45	40.1482	180.57	| q | Q
2+ 0	49.7450	233.00	| q | Q
2+15	63.4552	296.81	| q | Q|
2+30	95.2505	420.78	| q | Q |
2+45	125.7421	582.35	| q | Q |
3+ 0	101.8570	599.10	| q | Q
3+15	40.9513	397.05	| q | Q |
3+30	19.7633	200.58	|q | Q |
3+45	11.1767	97.00	q Q |
4+ 0	6.5887	50.05	q Q |
4+15	3.6056	25.05	qQ |
4+30	1.4777	12.12	Q |
4+45	0.0962	6.20	Q |
5+ 0	0.0000	3.75	Q |
5+15	0.0000	1.82	Q |
5+30	0.0000	0.50	Q |
5+45	0.0000	0.05	Q |
6+ 0	0.0000	0.00	Q |
6+15	0.0000	0.00	Q |

**********HYDROGRAPH DATA**********

Number of intervals = 25
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 599.101 (CFS)
Total volume = 71.272 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++

Process from Point/Station 50.000 to Point/Station 53.000

**** STORE OR DELETE CURRENT HYDROGRAPH ****

Current stream hydrograph saved in file WSD3hrSt1.rte

**********HYDROGRAPH DATA**********

Number of intervals = 0
Time interval = 0.0 (Min.)
Maximum/Peak flow rate = 0.000 (CFS)
Total volume = 0.000 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

SubD13100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubD13100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed D, Stream 1, Subarea D1
Existing Condition
100-year, 3-hour

Drainage Area = 443.50(Ac.) = 0.693 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 443.50(Ac.) = 0.693 Sq. Mi.
Length along longest watercourse = 13900.00(Ft.)
Length along longest watercourse measured to centroid = 6600.00(Ft.)
Length along longest watercourse = 2.633 Mi.
Length along longest watercourse measured to centroid = 1.250 Mi.
Difference in elevation = 857.00(Ft.)
Slope along watercourse = 325.5367 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.377 Hr.
Lag time = 22.63 Min.
25% of lag time = 5.66 Min.
40% of lag time = 9.05 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
443.50	0.85	376.97

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
443.50	1.90	842.65

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubD13100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.81 %
Adjusted average point rain = 1.896(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
35.200	46.00	0.000
16.200	66.00	0.000
3.900	77.00	0.000
388.200	83.00	0.000

Total Area Entered = 443.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.079	0.049
66.0	66.0	0.405	0.000	0.405	0.037	0.015
77.0	77.0	0.279	0.000	0.279	0.009	0.002
83.0	83.0	0.210	0.000	0.210	0.875	0.184
					Sum (F) =	0.249

Area averaged mean soil loss (F) (In/Hr) = 0.249
Minimum soil loss rate ((In/Hr)) = 0.125
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	66.287	6.542	29.242
2	0.500	132.575	37.826	169.068
3	0.750	198.862	30.871	137.982
4	1.000	265.150	11.436	51.115
5	1.250	331.437	6.452	28.840
6	1.500	397.724	3.588	16.038
7	1.750	464.012	1.551	6.933
8	2.000	530.299	0.677	3.026
9	2.250	596.587	0.470	2.099
10	2.500	662.874	0.403	1.800
11	2.750	729.161	0.184	0.822
			Sum = 100.000	Sum= 446.965

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.249	(0.253)	0.031
2	0.50	4.80	0.364	0.249	(0.328)	0.115
3	0.75	5.10	0.387	0.249	(0.348)	0.137
4	1.00	4.90	0.372	0.249	(0.335)	0.122
5	1.25	6.60	0.501	0.249	(0.451)	0.251
6	1.50	7.30	0.554	0.249	(0.498)	0.304
7	1.75	8.40	0.637	0.249	(0.573)	0.388
8	2.00	9.00	0.683	0.249	(0.614)	0.433

```
 9   2.25    12.30      0.933          0.249    (  0.840)        0.684
10   2.50    17.60      1.335          0.249    (  1.202)        1.086
11   2.75    16.10      1.221          0.249    (  1.099)        0.972
12   3.00     4.20      0.319          0.249    (  0.287)        0.069
                (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     4.6
      Flood volume = Effective rainfall      1.15(In)
       times area     443.5(Ac.)/[(In)/(Ft.)] =      42.4(Ac.Ft)
      Total soil loss =      0.75(In)
      Total soil loss =    27.653(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =     1848314.3 Cubic Feet
      Total soil loss =     1204570.1 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    373.436(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0      100.0     200.0     300.0     400.0
 ---------------------------------------------------------------------
   0+15       0.0189      0.91  Q         |         |         |         |
   0+30       0.1974      8.64  Q         |         |         |         |
   0+45       0.7704     27.73  V Q       |         |         |         |
   1+ 0       1.6848     44.26  |V  Q     |         |         |         |
   1+15       2.7958     53.77  | V  Q    |         |         |         |
   1+30       4.4305     79.12  |   V  Q  |         |         |         |
   1+45       6.6986    109.78  |     V   Q         |         |         |
   2+ 0       9.5860    139.75  |        V|  Q      |         |         |
   2+15      13.1596    172.96  |           V    Q  |         |         |
   2+30      18.1474    241.41  |         |      V  |   Q     |         |
   2+45      25.3230    347.30  |         |         |  V      |   Q     |
   3+ 0      33.0386    373.44  |         |         |         |V     Q  |
   3+15      37.8430    232.53  |         |         |  Q      |    V    |
   3+30      40.0520    106.91  |         Q         |         |      V  |
   3+45      41.2218     56.62  |    Q    |         |         |       V |
   4+ 0      41.8220     29.05  | Q       |         |         |        V|
   4+15      42.1045     13.67  |Q        |         |         |        V|
   4+30      42.2551      7.29  Q         |         |         |        V|
   4+45      42.3536      4.77  Q         |         |         |        V|
   5+ 0      42.4112      2.79  Q         |         |         |        V|
   5+15      42.4303      0.92  Q         |         |         |        V|
   5+30      42.4315      0.06  Q         |         |         |         V
---------------------------------------------------------------------
```

SubD23100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubD23100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed D, Stream 1, Subarea D2
Existing Condition
100-year, 3-hour

Drainage Area = 183.80(Ac.) = 0.287 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 183.80(Ac.) = 0.287 Sq. Mi.
Length along longest watercourse = 4950.00(Ft.)
Length along longest watercourse measured to centroid = 2120.00(Ft.)
Length along longest watercourse = 0.938 Mi.
Length along longest watercourse measured to centroid = 0.402 Mi.
Difference in elevation = 461.00(Ft.)
Slope along watercourse = 491.7333 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.153 Hr.
Lag time = 9.18 Min.
25% of lag time = 2.29 Min.
40% of lag time = 3.67 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
183.80	0.85	156.23

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
183.80	1.90	349.22

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubD23100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.92 %
Adjusted average point rain = 1.898(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
22.800	46.00	0.000
35.900	66.00	0.000
8.300	77.00	0.000
116.800	83.00	0.000

Total Area Entered = 183.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.124	0.076
66.0	66.0	0.405	0.000	0.405	0.195	0.079
77.0	77.0	0.279	0.000	0.279	0.045	0.013
83.0	83.0	0.210	0.000	0.210	0.635	0.133
					Sum (F) =	0.301

Area averaged mean soil loss (F) (In/Hr) = 0.301
Minimum soil loss rate ((In/Hr)) = 0.150
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	163.411	34.070	63.110
2	0.500	326.821	53.280	98.693
3	0.750	490.232	10.282	19.046
4	1.000	653.643	1.829	3.388
5	1.250	817.053	0.539	0.999
			Sum = 100.000	Sum= 185.236

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.301)	0.253	0.028
2	0.50	4.80	0.365	0.301	(0.328)	0.064
3	0.75	5.10	0.387	0.301	(0.349)	0.086
4	1.00	4.90	0.372	0.301	(0.335)	0.071
5	1.25	6.60	0.501	0.301	(0.451)	0.200
6	1.50	7.30	0.554	0.301	(0.499)	0.253
7	1.75	8.40	0.638	0.301	(0.574)	0.337
8	2.00	9.00	0.683	0.301	(0.615)	0.383
9	2.25	12.30	0.934	0.301	(0.841)	0.633
10	2.50	17.60	1.337	0.301	(1.203)	1.036
11	2.75	16.10	1.223	0.301	(1.100)	0.922
12	3.00	4.20	0.319	(0.301)	0.287	0.032
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.0

SubD23100

```
Flood volume = Effective rainfall      1.01(In)
 times area     183.8(Ac.)/[(In)/(Ft.)] =      15.5(Ac.Ft)
Total soil loss =      0.89(In)
Total soil loss =    13.589(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      674691.2 Cubic Feet
Total soil loss =      591958.0 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    174.160(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
              R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------
  0+15       0.0367      1.77  Q         |         |         |         |
  0+30       0.1770      6.79  VQ        |         |         |         |
  0+45       0.4305     12.27   VQ       |         |         |         |
  1+ 0       0.7266     14.33  |VQ       |         |         |         |
  1+15       1.1722     21.57  |  VQ     |         |         |         |
  1+30       1.9469     37.49  |    V Q  |         |         |         |
  1+45       2.9893     50.45  |      V  Q         |         |         |
  2+ 0       4.2911     63.01  |         |VQ       |         |         |
  2+15       6.0522     85.23  |         |    V Q  |         |         |
  2+30       8.8744    136.60  |         |         V    Q    |         |
  2+45      12.4728    174.16  |         |         |         | V Q     |
  3+ 0      14.8548    115.29  |         |         |  Q      |       V |
  3+15      15.3684     24.86  |   Q     |         |         |        V|
  3+30      15.4669      4.77  Q         |         |         |        V|
  3+45      15.4881      1.03  Q         |         |         |        V|
  4+ 0      15.4888      0.03  Q         |         |         |         V
-------------------------------------------------------------------
```

SubD33100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubD33100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed D, Stream 1, Subarea D3
Existing Condition
100-year, 3-hour

Drainage Area = 139.20(Ac.) = 0.218 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 139.20(Ac.) = 0.218 Sq. Mi.
Length along longest watercourse = 4340.00(Ft.)
Length along longest watercourse measured to centroid = 3080.00(Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.583 Mi.
Difference in elevation = 74.00(Ft.)
Slope along watercourse = 90.0276 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.232 Hr.
Lag time = 13.89 Min.
25% of lag time = 3.47 Min.
40% of lag time = 5.56 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
139.20	0.85	118.32

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
139.20	1.90	264.48

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubD33100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 1.899(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
83.200	76.00	0.000
56.000	85.00	0.000

Total Area Entered = 139.20(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.598	0.174
85.0	85.0	0.187	0.000	0.187	0.402	0.075
					Sum (F) =	0.249

Area averaged mean soil loss (F) (In/Hr) = 0.249
Minimum soil loss rate ((In/Hr)) = 0.125
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	107.956	21.624	30.336
2 0.500	215.911	48.794	68.452
3 0.750	323.867	14.551	20.413
4 1.000	431.823	6.649	9.328
5 1.250	539.778	3.694	5.182
6 1.500	647.734	2.331	3.270
7 1.750	755.689	1.374	1.927
8 2.000	863.645	0.983	1.379
		Sum = 100.000	Sum= 140.287

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.249	(0.253)	0.032
2	0.50	4.80	0.365	0.249	(0.328)	0.115
3	0.75	5.10	0.387	0.249	(0.349)	0.138
4	1.00	4.90	0.372	0.249	(0.335)	0.123
5	1.25	6.60	0.501	0.249	(0.451)	0.252
6	1.50	7.30	0.554	0.249	(0.499)	0.305
7	1.75	8.40	0.638	0.249	(0.574)	0.389
8	2.00	9.00	0.684	0.249	(0.615)	0.434
9	2.25	12.30	0.934	0.249	(0.841)	0.685
10	2.50	17.60	1.337	0.249	(1.203)	1.088
11	2.75	16.10	1.223	0.249	(1.101)	0.974
12	3.00	4.20	0.319	0.249	(0.287)	0.070
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.6

Flood volume = Effective rainfall 1.15(In)

SubD33100

```
 times area     139.2(Ac.)/[(In)/(Ft.)] =      13.4(Ac.Ft)
Total soil loss =      0.75(In)
Total soil loss =     8.675(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      581596.5 Cubic Feet
Total soil loss =      377881.3 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    125.742(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
              R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------
  0+15       0.0199      0.96  Q         |         |         |         |
  0+30       0.1371      5.67  VQ        |         |         |         |
  0+45       0.4003     12.74   VQ       |         |         |         |
  1+ 0       0.7275     15.84  | VQ      |         |         |         |
  1+15       1.1433     20.13  |  VQ     |         |         |         |
  1+30       1.7843     31.02  |    VQ   |         |         |         |
  1+45       2.6138     40.15  |      VQ |         |         |         |
  2+ 0       3.6416     49.75  |        QV         |         |         |
  2+15       4.9527     63.46  |         | Q V     |         |         |
  2+30       6.9207     95.25  |         |         QV        |         |
  2+45       9.5186    125.74  |         |         |    Q  V |         |
  3+ 0      11.6231    101.86  |         |         Q            V      |
  3+15      12.4692     40.95  |       Q |         |         |      V  |
  3+30      12.8776     19.76  |  Q      |         |         |       V |
  3+45      13.1085     11.18  | Q       |         |         |        V|
  4+ 0      13.2446      6.59  |Q        |         |         |        V|
  4+15      13.3191      3.61  Q         |         |         |        V|
  4+30      13.3496      1.48  Q         |         |         |        V|
  4+45      13.3516      0.10  Q         |         |         |        V|
-------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/07/12 File: SUBD43100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed D, Stream 2, Subarea D4
Existing Condition
100 Yr. 3 Hr.

--------------------------------------------------------------------
Drainage Area =     211.30(Ac.)  =      0.330 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     211.30(Ac.)  =      0.330 Sq. Mi.
Length along longest watercourse =    4400.00(Ft.)
Length along longest watercourse measured to centroid =    1600.00(Ft.)
Length along longest watercourse =      0.833 Mi.
Length along longest watercourse measured to centroid =      0.303 Mi.
Difference in elevation =     110.00(Ft.)
Slope along watercourse =    132.0000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.169 Hr.
Lag time =    10.13 Min.
25% of lag time =     2.53 Min.
40% of lag time =     4.05 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      211.30           0.85                179.61

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      211.30           1.90                401.47

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.91 %
Adjusted average point rain =    1.898(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    20.800           76.00         0.000
   185.000           85.00         0.000
```

```
     5.500           92.00         0.000
 Total Area Entered =    211.30(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
76.0  76.0      0.291     0.000        0.291       0.098      0.029
85.0  85.0      0.187     0.000        0.187       0.876      0.164
92.0  92.0      0.104     0.000        0.104       0.026      0.003
                                                  Sum (F) =   0.195
Area averaged mean soil loss (F) (In/Hr) =  0.195
Minimum soil loss rate ((In/Hr)) =  0.098
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        148.129         32.719             69.676
    2   0.500        296.258         47.146            100.398
    3   0.750        444.388         11.292             24.047
    4   1.000        592.517          4.940             10.520
    5   1.250        740.646          2.523              5.372
    6   1.500        888.775          1.380              2.938
                              Sum = 100.000   Sum=     212.951
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.195    (  0.253)        0.086
   2   0.50     4.80      0.364          0.195    (  0.328)        0.169
   3   0.75     5.10      0.387          0.195    (  0.349)        0.192
   4   1.00     4.90      0.372          0.195    (  0.335)        0.177
   5   1.25     6.60      0.501          0.195    (  0.451)        0.306
   6   1.50     7.30      0.554          0.195    (  0.499)        0.359
   7   1.75     8.40      0.638          0.195    (  0.574)        0.443
   8   2.00     9.00      0.683          0.195    (  0.615)        0.488
   9   2.25    12.30      0.934          0.195    (  0.841)        0.739
  10   2.50    17.60      1.336          0.195    (  1.203)        1.141
  11   2.75    16.10      1.222          0.195    (  1.100)        1.027
  12   3.00     4.20      0.319          0.195    (  0.287)        0.124
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     5.3
       Flood volume = Effective rainfall      1.31(In)
        times area     211.3(Ac.)/[(In)/(Ft.)] =      23.1(Ac.Ft)
       Total soil loss =      0.59(In)
       Total soil loss =    10.306(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =     1007060.0 Cubic Feet
       Total soil loss =      448928.9 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    212.611(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
```

```
 ---------------------------------------------------------------------
  0+15       0.1236      5.98  Q         |         |         |         |
  0+30       0.5457     20.43  V Q       |         |         |         |
  0+45       1.2167     32.47  | V Q     |         |         |         |
  1+ 0       1.9732     36.62  |  VQ     |         |         |         |
  1+15       2.9231     45.98  |    VQ   |         |         |         |
  1+30       4.2294     63.22  |      VQ |         |         |         |
  1+45       5.8348     77.70  |         Q         |         |         |
  2+ 0       7.7333     91.89  |         | QV      |         |         |
  2+15      10.1537    117.15  |         |    Q V  |         |         |
  2+30      13.7284    173.01  |         |         |  Q      |         |
  2+45      18.1212    212.61  |         |         |       Q |V        |
  3+ 0      21.2408    150.99  |         |         Q         |     V   |
  3+15      22.3684     54.57  |      Q  |         |         |       V |
  3+30      22.8249     22.10  | Q       |         |         |        V|
  3+45      23.0353     10.18  |Q        |         |         |        V|
  4+ 0      23.1114      3.69  Q         |         |         |        V|
  4+15      23.1189      0.36  Q         |         |         |        V|
---------------------------------------------------------------------
```

WSE3hr

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed E
Existing Condition
100-your, 3-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubE13100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 24
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 1355.820 (CFS)
Total volume = 159.492 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 71.000 to Point/Station 72.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 1070.00 (Ft.)
Elevation difference = 51.00 (Ft.)
Slope of channel = 0.047664 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 1070.00(Ft.) Elevation difference = 51.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 20.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 10.000(Ft.)
Flow(q) thru subarea = 504.998(CFS)
Depth of flow = 1.620(Ft.)
Average velocity = 13.415(Ft/s)
Total flow rate = 504.998(CFS)
Channel flow top width = 26.479(Ft.)
Depth of flow in channel = 1.62(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 13.42(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =  504.998(CFS)
Total capacity of improved channels =    504.998(CFS)
Critical Depth in Channel =    2.47(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =   1355.820(CFS)
Depth of flow =     2.851(Ft.)
Average velocity =    18.501(Ft/s)
Total flow rate =  1355.820(CFS)
Channel flow top width =   31.405(Ft.)
Depth of flow in channel =   2.85(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   18.50(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1355.820(CFS)
Total capacity of improved channels =   1355.820(CFS)
Critical Depth in Channel =    4.47(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9158   Travel time =   0.96 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  11.6607
        dt(routing time-step) =   0.88 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      339.0     677.9    1016.9    1355.8
-------------------------------------------------------------------
  0+15       2.9246      3.11  O         |         |         |         |
  0+30      25.3138     26.70  O         |         |         |         |
  0+45      84.4960     88.11  | O       |         |         |         |
  1+ 0     151.1106    155.05  |   O     |         |         |         |
  1+15     193.1893    195.57  |    O    |         |         |         |
  1+30     262.5128    266.70  |      O  |         |         |         |
  1+45     375.4758    382.28  |         |O        |         |         |
  2+ 0     481.6486    487.86  |         |   O     |         |         |
  2+15     601.7301    608.85  |         |      O  |         |         |
  2+30     804.4456    816.68  |         |         |  OI     |         |
  2+45    1146.4785   1167.10  |         |         |         |  OI     |
  3+ 0    1344.7133   1355.82  |         |         |         |         OI
  3+15    1031.4273   1011.14  |         |         |        IO         |
  3+30     520.7342    490.07  |         |   IO    |         |         |
  3+45     292.8475    280.51  |       O |         |         |         |
  4+ 0     174.7917    168.18  |   IO    |         |         |         |
  4+15      99.1384     94.82  | O       |         |         |         |
  4+30      52.0453     49.37  |O        |         |         |         |
  4+45      28.9463     27.67  O         |         |         |         |
  5+ 0      19.9104     19.43  O         |         |         |         |
  5+15      14.1023     13.77  O         |         |         |         |
  5+30       8.0856      7.73  O         |         |         |         |
```

```
   5+45       3.0064      2.71  O         |         |         |         |
   6+ 0       0.3307      0.18  O         |         |         |         |
   6+15       0.0107      0.00  O         |         |         |         |
   6+30       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    26
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     1344.713 (CFS)
                      Total volume =     159.492 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *********************************************************************

       -------------------------------------------------------------------

       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       71.000 to Point/Station       72.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ___________________________________________________________________
       ********************* HYDROGRAPH INFORMATION **********************

                      From study/file name: E21and22N72.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f      H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      499.8     999.5    1499.3    1999.1
  -------------------------------------------------------------------
   0+15       2.2583      5.18  Q         |         |         |         |
   0+30      15.2969     40.61  Q         |         |         |         |
   0+45      45.8576    130.35  q Q       |         |         |         |
   1+ 0      76.5497    227.66  |q  Q     |         |         |         |
   1+15      97.0736    290.26  |q   Q    |         |         |         |
   1+30     135.7095    398.22  | q    Q  |         |         |         |
   1+45     189.9111    565.39  |  q      |Q        |         |         |
   2+ 0     242.8480    724.50  |   q     |   Q     |         |         |
   2+15     302.9647    904.69  |     q   |       Q |         |         |
   2+30     413.3531   1217.80  |       q |         |   Q     |         |
   2+45     585.2531   1731.73  |         |q        |         |   Q     |
   3+ 0     654.3731   1999.09  |         |  q      |         |         Q
   3+15     467.9556   1499.38  |        q|         |         Q         |
   3+30     234.7868    755.52  |   q     |    Q    |         |         |
   3+45     125.7609    418.61  | q     Q |         |         |         |
   4+ 0      69.9666    244.76  |q  Q     |         |         |         |
   4+15      36.1816    135.32  q Q       |         |         |         |
   4+30      18.1267     70.17  qQ        |         |         |         |
   4+45      11.1218     40.07  Q         |         |         |         |
   5+ 0       7.4454     27.36  Q         |         |         |         |
   5+15       4.2337     18.34  Q         |         |         |         |
   5+30       1.5493      9.63  Q         |         |         |         |
   5+45       0.2113      3.22  Q         |         |         |         |
   6+ 0       0.0089      0.34  Q         |         |         |         |
   6+15       0.0000      0.01  Q         |         |         |         |
   6+30       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
```

```
                    Number of intervals =    26
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =     1999.086 (CFS)
                    Total volume =     236.740 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
********************************************************************

--------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       71.000 to Point/Station       72.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubE23100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      500.5    1001.0    1501.5    2002.0
  ---------------------------------------------------------------------
    0+15       0.1598      5.34  Q         |         |         |         |
    0+30       0.6722     41.28  Q         |         |         |         |
    0+45       1.0081    131.36  q Q       |         |         |         |
    1+ 0       0.9829    228.64  q   Q     |         |         |         |
    1+15       1.6765    291.94  q    Q    |         |         |         |
    1+30       2.3258    400.55  q       Q |         |         |         |
    1+45       2.9438    568.33  q         |Q        |         |         |
    2+ 0       3.4274    727.92  q         |   Q     |         |         |
    2+15       4.9753    909.67  q         |       Q |         |         |
    2+30       7.9382   1225.74  q         |         |   Q     |         |
    2+45       8.3718   1740.10  q         |         |         |   Q     |
    3+ 0       2.9254   2002.01  q         |         |         |         Q
    3+15       0.1594   1499.54  q         |         |        Q|         |
    3+30       0.0000    755.52  q         |    Q    |         |         |
    3+45       0.0000    418.61  q       Q |         |         |         |
    4+ 0       0.0000    244.76  q   Q     |         |         |         |
    4+15       0.0000    135.32  q Q       |         |         |         |
    4+30       0.0000     70.17  qQ        |         |         |         |
    4+45       0.0000     40.07  Q         |         |         |         |
    5+ 0       0.0000     27.36  Q         |         |         |         |
    5+15       0.0000     18.34  Q         |         |         |         |
    5+30       0.0000      9.63  Q         |         |         |         |
    5+45       0.0000      3.22  Q         |         |         |         |
    6+ 0       0.0000      0.34  Q         |         |         |         |
    6+15       0.0000      0.01  Q         |         |         |         |
    6+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
********************************HYDROGRAPH DATA*************************
                    Number of intervals =    26
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =     2002.012 (CFS)
                    Total volume =     237.516 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
```

```
                                WSE3hr
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       72.000 to Point/Station       73.000
**** STREAM ROUTING SCS CONVEX METHOD ****
_____________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   2900.00 (Ft.)
Elevation difference =   53.00 (Ft.)
Slope of channel =  0.018276 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  2900.00(Ft.)     Elevation difference =  53.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    751.726(CFS)
Depth of flow =     2.679(Ft.)
Average velocity =    11.065(Ft/s)
Total flow rate =   751.726(CFS)
Channel flow top width =   30.716(Ft.)
Depth of flow in channel =   2.68(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.07(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  751.726(CFS)
Total capacity of improved channels =    751.726(CFS)
Critical Depth in Channel =    3.16(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =   2002.012(CFS)
Depth of flow =     4.605(Ft.)
Average velocity =    14.883(Ft/s)
Total flow rate =  2002.012(CFS)
Channel flow top width =   38.420(Ft.)
Depth of flow in channel =   4.61(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   14.88(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 2002.012(CFS)
Total capacity of improved channels =   2002.012(CFS)
Critical Depth in Channel =    5.56(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8975   Travel time =   3.25 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.7644
        dt(routing time-step) =   2.91 (min.),   c* =   0.9998
```

Output hydrograph delayed by 0 unit time increments

++
P R I N T O F S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Out = O(CFS)	In = I	0	500.5	1001.0	1501.5	2002.0
0+15	4.3038	5.34	O				
0+30	34.2939	41.28	O				
0+45	113.8440	131.36	| O				
1+ 0	209.7230	228.64	| O				
1+15	279.6276	291.94	| O				
1+30	379.4261	400.55	| OI				
1+45	535.7003	568.33	| OI				
2+ 0	696.8839	727.92	| OI				
2+15	874.3227	909.67	| OI				
2+30	1164.2692	1225.74	| OI				
2+45	1640.0701	1740.10	| O I				
3+ 0	1951.0632	2002.01	| O I				
3+15	1597.2410	1499.54	| I O				
3+30	900.2189	755.52	| I O				
3+45	484.1504	418.61	| IO				
4+ 0	278.5769	244.76	| IO				
4+15	156.6073	135.32	| IO				
4+30	82.8444	70.17	|O				
4+45	45.9244	40.07	O				
5+ 0	29.8289	27.36	O				
5+15	20.0904	18.34	O				
5+30	11.3272	9.63	O				
5+45	4.4658	3.22	O				
6+ 0	0.8995	0.34	O				
6+15	0.0748	0.01	O				
6+30	0.0021	0.00	O				
6+45	0.0000	0.00	O				

**********HYDROGRAPH DATA**********

Number of intervals = 27
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 1951.063 (CFS)
Total volume = 237.516 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 72.000 to Point/Station 73.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****

**********HYDROGRAPH INFORMATION**********

From study/file name: SubE33100.rte

++
P R I N T O F S T O R M

WSE3hr

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0 497.6 995.1 1492.7 1990.2
0+15	0.9099	5.21	Q
0+30	3.9226	38.22	Q
0+45	7.1388	120.98	q Q
1+ 0	8.1349	217.86	q Q
1+15	10.2172	289.84	q Q
1+30	14.9710	394.40	q Q
1+45	18.8248	554.53	q Q
2+ 0	22.5992	719.48	q Q
2+15	29.0074	903.33	q Q
2+30	43.9740	1208.24	q Q
2+45	55.6316	1695.70	|q Q
3+ 0	39.1610	1990.22	q Q
3+15	10.4931	1607.73	q Q
3+30	2.2013	902.42	q Q
3+45	0.5140	484.66	q Q|
4+ 0	0.0367	278.61	q Q
4+15	0.0000	156.61	q Q
4+30	0.0000	82.84	qQ
4+45	0.0000	45.92	Q
5+ 0	0.0000	29.83	Q
5+15	0.0000	20.09	Q
5+30	0.0000	11.33	Q
5+45	0.0000	4.47	Q
6+ 0	0.0000	0.90	Q
6+15	0.0000	0.07	Q
6+30	0.0000	0.00	Q
6+45	0.0000	0.00	Q

**********HYDROGRAPH DATA**********

Number of intervals = 27
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 1990.224 (CFS)
Total volume = 243.048 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++

Process from Point/Station 72.000 to Point/Station 73.000

**** STORE OR DELETE CURRENT HYDROGRAPH ****

Current stream hydrograph saved in file WSE3hr.rte

**********HYDROGRAPH DATA**********

Number of intervals = 0
Time interval = 0.0 (Min.)
Maximum/Peak flow rate = 0.000 (CFS)
Total volume = 0.000 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

E21and22N72

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed E, Node 720 to 72
Existing Condition
100-year, 3-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubE213100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 23
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 653.411 (CFS)
Total volume = 75.379 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 721.000 to Point/Station 72.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 1390.00 (Ft.)
Elevation difference = 39.00 (Ft.)
Slope of channel = 0.028058 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 1390.00(Ft.) Elevation difference = 39.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 20.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 10.000(Ft.)
Flow(q) thru subarea = 245.241(CFS)
Depth of flow = 1.240(Ft.)
Average velocity = 8.795(Ft/s)
Total flow rate = 245.241(CFS)
Channel flow top width = 24.961(Ft.)
Depth of flow in channel = 1.24(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 8.80(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =  245.241(CFS)
Total capacity of improved channels =    245.241(CFS)
Critical Depth in Channel =    1.58(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    653.411(CFS)
Depth of flow =     2.190(Ft.)
Average velocity =    12.240(Ft/s)
Total flow rate =   653.411(CFS)
Channel flow top width =   28.759(Ft.)
Depth of flow in channel =   2.19(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   12.24(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  653.411(CFS)
Total capacity of improved channels =    653.411(CFS)
Critical Depth in Channel =    2.91(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8780   Travel time =   1.89 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   6.3506
        dt(routing time-step) =   1.66 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      163.4     326.7     490.1     653.4
----------------------------------------------------------------------
  0+15       1.4194      1.60  O         |         |         |         |
  0+30      13.0466     14.47  O         |         |         |         |
  0+45      42.7875     46.32  | O       |         |         |         |
  1+ 0      73.4638     76.85  |   O     |         |         |         |
  1+15      92.7284     94.71  |    O    |         |         |         |
  1+30     129.9469    134.34  |      OI |         |         |         |
  1+45     182.8810    188.93  |         |O        |         |         |
  2+ 0     234.7665    240.48  |         |   O     |         |         |
  2+15     291.9259    298.34  |         |      OI |         |         |
  2+30     396.4020    408.62  |         |         |   OI    |         |
  2+45     566.7360    586.44  |         |         |         |   OI    |
  3+ 0     645.9907    653.41  |         |         |         |      OI |
  3+15     466.8877    443.65  |         |         |      IO |         |
  3+30     234.7546    208.73  |         | I O     |         |         |
  3+45     125.7609    115.42  |      O  |         |         |         |
  4+ 0      69.9666     64.30  |  IO     |         |         |         |
  4+15      36.1816     32.68  | O       |         |         |         |
  4+30      18.1267     16.31  IO        |         |         |         |
  4+45      11.1218     10.47  O         |         |         |         |
  5+ 0       7.4454      7.07  O         |         |         |         |
  5+15       4.2337      3.88  O         |         |         |         |
  5+30       1.5493      1.26  O         |         |         |         |
```

```
   5+45       0.2113      0.08  O         |         |         |         |
   6+ 0       0.0089      0.00  O         |         |         |         |
   6+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =    25
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      645.991 (CFS)
                      Total volume =      75.379 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       -----------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station      721.000 to Point/Station       72.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       _______________________________________________________________________
       ******************** HYDROGRAPH INFORMATION *********************

                      From study/file name: SubE223100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      163.6     327.2     490.8     654.4
  ----------------------------------------------------------------------
   0+15       0.8389      2.26  Q         |         |         |         |
   0+30       2.2503     15.30  Q         |         |         |         |
   0+45       3.0701     45.86  q Q       |         |         |         |
   1+ 0       3.0860     76.55  q   Q     |         |         |         |
   1+15       4.3452     97.07  q    Q    |         |         |         |
   1+30       5.7626    135.71  q       Q |         |         |         |
   1+45       7.0300    189.91  q         |Q        |         |         |
   2+ 0       8.0815    242.85  q         |   Q     |         |         |
   2+15      11.0388    302.96  q         |       Q |         |         |
   2+30      16.9512    413.35  |q        |         |    Q    |         |
   2+45      18.5171    585.25  |q        |         |         |    Q    |
   3+ 0       8.3824    654.37  q         |         |         |         Q
   3+15       1.0679    467.96  q         |         |       Q |         |
   3+30       0.0322    234.79  q         |   Q     |         |         |
   3+45       0.0000    125.76  q      Q  |         |         |         |
   4+ 0       0.0000     69.97  q   Q     |         |         |         |
   4+15       0.0000     36.18  q Q       |         |         |         |
   4+30       0.0000     18.13  qQ        |         |         |         |
   4+45       0.0000     11.12  Q         |         |         |         |
   5+ 0       0.0000      7.45  Q         |         |         |         |
   5+15       0.0000      4.23  Q         |         |         |         |
   5+30       0.0000      1.55  Q         |         |         |         |
   5+45       0.0000      0.21  Q         |         |         |         |
   6+ 0       0.0000      0.01  Q         |         |         |         |
   6+15       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =    25
                      Time interval =   15.0 (Min.)
```

```
                              E21and22N72
                Maximum/Peak flow rate =      654.373 (CFS)
                Total volume =      77.248 (Ac.Ft)
        Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      721.000 to Point/Station       72.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file E21and22N72.rte
****************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

SubE13100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubE13100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E1
Existing Condition
100-year, 3-hour

Drainage Area = 1648.50(Ac.) = 2.576 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1648.50(Ac.) = 2.576 Sq. Mi.
Length along longest watercourse = 14430.00(Ft.)
Length along longest watercourse measured to centroid = 9640.00(Ft.)
Length along longest watercourse = 2.733 Mi.
Length along longest watercourse measured to centroid = 1.826 Mi.
Difference in elevation = 815.00(Ft.)
Slope along watercourse = 298.2121 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.449 Hr.
Lag time = 26.95 Min.
25% of lag time = 6.74 Min.
40% of lag time = 10.78 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1648.50	0.85	1401.22

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1648.50	1.90	3132.15

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubE13100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.28 %
Adjusted average point rain = 1.886(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
105.000	46.00	0.000
47.400	66.00	0.000
18.500	77.00	0.000
1477.600	83.00	0.000

Total Area Entered = 1648.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.064	0.039
66.0	66.0	0.405	0.000	0.405	0.029	0.012
77.0	77.0	0.279	0.000	0.279	0.011	0.003
83.0	83.0	0.210	0.000	0.210	0.896	0.188
					Sum (F) =	0.242

Area averaged mean soil loss (F) (In/Hr) = 0.242
Minimum soil loss rate ((In/Hr)) = 0.121
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	55.654	4.998	83.034
2	0.500	111.309	26.859	446.222
3	0.750	166.963	36.143	600.478
4	1.000	222.617	13.228	219.760
5	1.250	278.271	7.651	127.110
6	1.500	333.926	4.833	80.291
7	1.750	389.580	2.918	48.473
8	2.000	445.234	1.465	24.333
9	2.250	500.889	0.637	10.581
10	2.500	556.543	0.443	7.358
11	2.750	612.197	0.397	6.588
12	3.000	667.851	0.285	4.731
13	3.250	723.506	0.146	2.419
		Sum = 100.000	Sum=	1661.379

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.279	0.242	(0.251)	0.037
2	0.50	4.80	0.362	0.242	(0.326)	0.120
3	0.75	5.10	0.385	0.242	(0.346)	0.143
4	1.00	4.90	0.370	0.242	(0.333)	0.128
5	1.25	6.60	0.498	0.242	(0.448)	0.256
6	1.50	7.30	0.551	0.242	(0.496)	0.309

```
  7   1.75     8.40      0.634          0.242    (  0.570)        0.392
  8   2.00     9.00      0.679          0.242    (  0.611)        0.437
  9   2.25    12.30      0.928          0.242    (  0.835)        0.686
 10   2.50    17.60      1.328          0.242    (  1.195)        1.086
 11   2.75    16.10      1.215          0.242    (  1.093)        0.973
 12   3.00     4.20      0.317          0.242    (  0.285)        0.075
                (Loss Rate Not Used)
    Sum =     100.0                                   Sum =     4.6
       Flood volume = Effective rainfall      1.16(In)
        times area    1648.5(Ac.)/[(In)/(Ft.)] =     159.5(Ac.Ft)
       Total soil loss =      0.73(In)
       Total soil loss =    99.638(Ac.Ft)
       Total rainfall =      1.89(In)
       Flood volume =     6947474.3 Cubic Feet
       Total soil loss =     4340229.8 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =   1355.820(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                            3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0      350.0     700.0    1050.0    1400.0
  ----------------------------------------------------------------------
    0+15       0.0642      3.11  Q         |         |         |         |
    0+30       0.6159     26.70  Q         |         |         |         |
    0+45       2.4364     88.11  V Q       |         |         |         |
    1+ 0       5.6399    155.05   V  Q     |         |         |         |
    1+15       9.6807    195.57  | V  Q    |         |         |         |
    1+30      15.1910    266.70  |  V   Q  |         |         |         |
    1+45      23.0893    382.28  |    V    Q         |         |         |
    2+ 0      33.1691    487.86  |       V |  Q      |         |         |
    2+15      45.7487    608.85  |         V     Q   |         |         |
    2+30      62.6222    816.68  |         |    V    |  Q      |         |
    2+45      86.7358   1167.10  |         |         |V        |  Q      |
    3+ 0     114.7487   1355.82  |         |         |       V |       Q |
    3+15     135.6400   1011.14  |         |         |       Q    V      |
    3+30     145.7654    490.07  |         |   Q     |         |     V   |
    3+45     151.5611    280.51  |       Q |         |         |       V |
    4+ 0     155.0359    168.18  |   Q     |         |         |       V |
    4+15     156.9950     94.82  | Q       |         |         |        V|
    4+30     158.0151     49.37  |Q        |         |         |        V|
    4+45     158.5867     27.67  Q         |         |         |        V|
    5+ 0     158.9881     19.43  Q         |         |         |        V|
    5+15     159.2726     13.77  Q         |         |         |        V|
    5+30     159.4323      7.73  Q         |         |         |        V|
    5+45     159.4883      2.71  Q         |         |         |        V|
    6+ 0     159.4921      0.18  Q         |         |         |        V|
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SubE23100

U n i t H y d r o g r a p h A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E2
Existing Condition
100-year, 3-hour

Drainage Area = 8.30(Ac.) = 0.013 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 8.30(Ac.) = 0.013 Sq. Mi.
Length along longest watercourse = 1070.00(Ft.)
Length along longest watercourse measured to centroid = 630.00(Ft.)
Length along longest watercourse = 0.203 Mi.
Length along longest watercourse measured to centroid = 0.119 Mi.
Difference in elevation = 51.00(Ft.)
Slope along watercourse = 251.6636 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.061 Hr.
Lag time = 3.67 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
8.30	0.85	7.06

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
8.30	1.90	15.77

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.800	76.00	0.000
2.500	85.00	0.000

Total Area Entered = 8.30(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.699	0.203
85.0	85.0	0.187	0.000	0.187	0.301	0.056
					Sum (F) =	0.260

Area averaged mean soil loss (F) (In/Hr) = 0.260
Minimum soil loss rate ((In/Hr)) = 0.130
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	408.366	67.914	5.681
2 0.500	816.733	32.086	2.684
		Sum = 100.000	Sum= 8.365

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	(0.260)	0.253	0.028
2 0.50	4.80	0.365	0.260	(0.328)	0.105
3 0.75	5.10	0.388	0.260	(0.349)	0.128
4 1.00	4.90	0.372	0.260	(0.335)	0.113
5 1.25	6.60	0.502	0.260	(0.451)	0.242
6 1.50	7.30	0.555	0.260	(0.499)	0.295
7 1.75	8.40	0.638	0.260	(0.575)	0.379
8 2.00	9.00	0.684	0.260	(0.616)	0.424
9 2.25	12.30	0.935	0.260	(0.841)	0.675
10 2.50	17.60	1.338	0.260	(1.204)	1.078
11 2.75	16.10	1.224	0.260	(1.101)	0.964
12 3.00	4.20	0.319	0.260	(0.287)	0.059
	(Loss Rate Not Used)				
Sum =	100.0			Sum =	4.5

Flood volume = Effective rainfall 1.12(In)
times area 8.3(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 0.78(In)
Total soil loss = 0.538(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 33810.0 Cubic Feet
Total soil loss = 23433.1 Cubic Feet

SubE23100

Peak flow rate of this hydrograph = 8.372(CFS)

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0033	0.16	Q				
0+30	0.0172	0.67	V Q				
0+45	0.0380	1.01	V Q				
1+ 0	0.0583	0.98	Q				
1+15	0.0930	1.68	V Q				
1+30	0.1410	2.33	V Q				
1+45	0.2018	2.94	VQ				
2+ 0	0.2727	3.43	QV				
2+15	0.3755	4.98		Q			
2+30	0.5395	7.94			V	Q	
2+45	0.7124	8.37				Q V	
3+ 0	0.7729	2.93	Q				V
3+15	0.7762	0.16	Q				V

SubE213100

U n i t H y d r o g r a p h A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E21
Existing Condition
100-year, 3-hour

Drainage Area = 780.80(Ac.) = 1.220 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 780.80(Ac.) = 1.220 Sq. Mi.
Length along longest watercourse = 14080.00(Ft.)
Length along longest watercourse measured to centroid = 8100.00(Ft.)
Length along longest watercourse = 2.667 Mi.
Length along longest watercourse measured to centroid = 1.534 Mi.
Difference in elevation = 877.00(Ft.)
Slope along watercourse = 328.8750 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.409 Hr.
Lag time = 24.53 Min.
25% of lag time = 6.13 Min.
40% of lag time = 9.81 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
780.80	0.85	663.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
780.80	1.90	1483.52

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubE213100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.66 %
Adjusted average point rain = 1.894(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
62.200	46.00	0.000
11.200	66.00	0.000
4.800	77.00	0.000
702.600	83.00	0.000

Total Area Entered = 780.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.080	0.049
66.0	66.0	0.405	0.000	0.405	0.014	0.006
77.0	77.0	0.279	0.000	0.279	0.006	0.002
83.0	83.0	0.210	0.000	0.210	0.900	0.189
					Sum (F) =	0.245

Area averaged mean soil loss (F) (In/Hr) = 0.245
Minimum soil loss rate ((In/Hr)) = 0.123
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	61.144	5.754	45.282
2	0.500	122.287	32.815	258.222
3	0.750	183.431	33.484	263.483
4	1.000	244.575	12.198	95.988
5	1.250	305.719	7.029	55.312
6	1.500	366.862	4.194	33.004
7	1.750	428.006	2.244	17.661
8	2.000	489.150	0.859	6.758
9	2.250	550.293	0.537	4.223
10	2.500	611.437	0.428	3.369
11	2.750	672.581	0.317	2.495
12	3.000	733.725	0.140	1.104
		Sum =	100.000	Sum= 786.900

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.280	0.245	(0.252)	0.035
2	0.50	4.80	0.364	0.245	(0.327)	0.119
3	0.75	5.10	0.386	0.245	(0.348)	0.141
4	1.00	4.90	0.371	0.245	(0.334)	0.126
5	1.25	6.60	0.500	0.245	(0.450)	0.255
6	1.50	7.30	0.553	0.245	(0.498)	0.308
7	1.75	8.40	0.636	0.245	(0.573)	0.391

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  8   2.00     9.00      0.682          0.245    (  0.613)        0.437
  9   2.25    12.30      0.932          0.245    (  0.838)        0.687
 10   2.50    17.60      1.333          0.245    (  1.200)        1.088
 11   2.75    16.10      1.219          0.245    (  1.097)        0.974
 12   3.00     4.20      0.318          0.245    (  0.286)        0.073
                (Loss Rate Not Used)
    Sum =     100.0                                   Sum =     4.6
       Flood volume = Effective rainfall      1.16(In)
        times area     780.8(Ac.)/[(In)/(Ft.)] =      75.4(Ac.Ft)
       Total soil loss =      0.74(In)
       Total soil loss =    47.825(Ac.Ft)
       Total rainfall =      1.89(In)
       Flood volume =     3283508.7 Cubic Feet
       Total soil loss =     2083273.1 Cubic Feet
       -------------------------------------------------------------------
        Peak flow rate of this hydrograph =    653.411(CFS)
       -------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                            3 - H O U R    S T O R M
                       R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       -------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0      175.0     350.0     525.0     700.0
  ----------------------------------------------------------------------
    0+15       0.0330      1.60  Q         |         |         |         |
    0+30       0.3320     14.47  Q         |         |         |         |
    0+45       1.2889     46.32  V Q       |         |         |         |
    1+ 0       2.8767     76.85   V  Q     |         |         |         |
    1+15       4.8334     94.71  | V  Q    |         |         |         |
    1+30       7.6090    134.34  |   V  Q  |         |         |         |
    1+45      11.5125    188.93  |     V   Q         |         |         |
    2+ 0      16.4811    240.48  |       V |  Q      |         |         |
    2+15      22.6450    298.34  |           V   Q   |         |         |
    2+30      31.0876    408.62  |         |     V   |  Q      |         |
    2+45      43.2041    586.44  |         |          V        |  Q      |
    3+ 0      56.7043    653.41  |         |         |        V      Q   |
    3+15      65.8706    443.65  |         |         |    Q    |   V     |
    3+30      70.1831    208.73  |         |Q        |         |      V  |
    3+45      72.5679    115.42  |     Q   |         |         |       V |
    4+ 0      73.8965     64.30  |  Q      |         |         |        V|
    4+15      74.5716     32.68  |Q        |         |         |        V|
    4+30      74.9087     16.31  Q         |         |         |        V|
    4+45      75.1251     10.47  Q         |         |         |        V|
    5+ 0      75.2711      7.07  Q         |         |         |        V|
    5+15      75.3513      3.88  Q         |         |         |        V|
    5+30      75.3773      1.26  Q         |         |         |        V|
    5+45      75.3790      0.08  Q         |         |         |        V|
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SubE223100

U n i t H y d r o g r a p h A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E22
Existing Condition
100-year, 3-hour

Drainage Area = 17.30(Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.30(Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1390.00(Ft.)
Length along longest watercourse measured to centroid = 700.00(Ft.)
Length along longest watercourse = 0.263 Mi.
Length along longest watercourse measured to centroid = 0.133 Mi.
Difference in elevation = 39.00(Ft.)
Slope along watercourse = 148.1439 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.078 Hr.
Lag time = 4.67 Min.
25% of lag time = 1.17 Min.
40% of lag time = 1.87 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.30	0.85	14.71

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.30	1.90	32.87

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubE223100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.900	76.00	0.000
13.400	85.00	0.000
1.000	90.00	0.000

Total Area Entered = 17.30(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.168	0.049
85.0	85.0	0.187	0.000	0.187	0.775	0.145
90.0	90.0	0.130	0.000	0.130	0.058	0.008
					Sum (F) =	0.201

Area averaged mean soil loss (F) (In/Hr) = 0.201
Minimum soil loss rate ((In/Hr)) = 0.101
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	321.186	60.110	10.480
2	0.500	642.372	38.326	6.682
3	0.750	963.557	1.564	0.273
		Sum = 100.000	Sum=	17.435

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.201	(0.253)	0.080
2	0.50	4.80	0.365	0.201	(0.328)	0.164
3	0.75	5.10	0.388	0.201	(0.349)	0.186
4	1.00	4.90	0.372	0.201	(0.335)	0.171
5	1.25	6.60	0.502	0.201	(0.451)	0.300
6	1.50	7.30	0.555	0.201	(0.499)	0.354
7	1.75	8.40	0.638	0.201	(0.575)	0.437
8	2.00	9.00	0.684	0.201	(0.616)	0.483
9	2.25	12.30	0.935	0.201	(0.841)	0.734
10	2.50	17.60	1.337	0.201	(1.204)	1.136
11	2.75	16.10	1.224	0.201	(1.101)	1.022
12	3.00	4.20	0.319	0.201	(0.287)	0.118
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.2

Flood volume = Effective rainfall 1.30(In)
times area 17.3(Ac.)/[(In)/(Ft.)] = 1.9(Ac.Ft)
Total soil loss = 0.60(In)
Total soil loss = 0.870(Ac.Ft)

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                                SubE223100
      Total rainfall =      1.90(In)
      Flood volume =       81408.8 Cubic Feet
      Total soil loss =       37900.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     18.517(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         3 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ---------------------------------------------------------------------
    0+15       0.0173      0.84  VQ        |         |         |         |
    0+30       0.0638      2.25   V  Q     |         |         |         |
    0+45       0.1273      3.07  | V   Q   |         |         |         |
    1+ 0       0.1910      3.09  |   V Q   |         |         |         |
    1+15       0.2808      4.35  |     V Q |         |         |         |
    1+30       0.3999      5.76  |       V |Q        |         |         |
    1+45       0.5451      7.03  |         V  Q      |         |         |
    2+ 0       0.7121      8.08  |         |    VQ   |         |         |
    2+15       0.9402     11.04  |         |         V Q       |         |
    2+30       1.2904     16.95  |         |         |      V  |  Q      |
    2+45       1.6730     18.52  |         |         |         |    V Q  |
    3+ 0       1.8462      8.38  |         |     Q   |         |        V|
    3+15       1.8682      1.07  | Q       |         |         |        V|
    3+30       1.8689      0.03  Q         |         |         |         V
  ---------------------------------------------------------------------
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SubE33100

U n i t H y d r o g r a p h A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E3
Existing Condition
100-year, 3-hour

Drainage Area = 54.80(Ac.) = 0.086 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 54.80(Ac.) = 0.086 Sq. Mi.
Length along longest watercourse = 2900.00(Ft.)
Length along longest watercourse measured to centroid = 1850.00(Ft.)
Length along longest watercourse = 0.549 Mi.
Length along longest watercourse measured to centroid = 0.350 Mi.
Difference in elevation = 53.00(Ft.)
Slope along watercourse = 96.4966 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.162 Hr.
Lag time = 9.69 Min.
25% of lag time = 2.42 Min.
40% of lag time = 3.88 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.80	0.85	46.58

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.80	1.90	104.12

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
22.300	76.00	0.000
32.500	85.00	0.000

Total Area Entered = 54.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.407	0.118
85.0	85.0	0.187	0.000	0.187	0.593	0.111
					Sum (F) =	0.229

Area averaged mean soil loss (F) (In/Hr) = 0.229
Minimum soil loss rate ((In/Hr)) = 0.115
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	154.750	31.833	17.581
2	0.500	309.500	53.965	29.804
3	0.750	464.249	11.299	6.240
4	1.000	618.999	2.163	1.194
5	1.250	773.749	0.741	0.409
			Sum = 100.000	Sum= 55.228

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.229	(0.253)	0.052
2	0.50	4.80	0.365	0.229	(0.328)	0.135
3	0.75	5.10	0.388	0.229	(0.349)	0.158
4	1.00	4.90	0.372	0.229	(0.335)	0.143
5	1.25	6.60	0.501	0.229	(0.451)	0.272
6	1.50	7.30	0.555	0.229	(0.499)	0.325
7	1.75	8.40	0.638	0.229	(0.574)	0.409
8	2.00	9.00	0.684	0.229	(0.615)	0.454
9	2.25	12.30	0.935	0.229	(0.841)	0.705
10	2.50	17.60	1.337	0.229	(1.204)	1.108
11	2.75	16.10	1.223	0.229	(1.101)	0.994
12	3.00	4.20	0.319	0.229	(0.287)	0.090
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.8

Flood volume = Effective rainfall 1.21(In)
times area 54.8(Ac.)/[(In)/(Ft.)] = 5.5(Ac.Ft)
Total soil loss = 0.69(In)
Total soil loss = 3.143(Ac.Ft)

```
                                   SubE33100
        Total rainfall =      1.90(In)
        Flood volume =      240964.0 Cubic Feet
        Total soil loss =      136901.0 Cubic Feet
        ---------------------------------------------------------------------
         Peak flow rate of this hydrograph =     55.632(CFS)
        ---------------------------------------------------------------------
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                            3 - H O U R    S T O R M
                       R u n o f f      H y d r o g r a p h
        ---------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals ((CFS))

        ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
  ---------------------------------------------------------------------
    0+15       0.0188      0.91  Q         |         |         |         |
    0+30       0.0998      3.92  V Q       |         |         |         |
    0+45       0.2473      7.14  |V  Q     |         |         |         |
    1+ 0       0.4154      8.13  |  V Q    |         |         |         |
    1+15       0.6265     10.22  |   V Q   |         |         |         |
    1+30       0.9358     14.97  |     V  Q|         |         |         |
    1+45       1.3248     18.82  |        V| Q       |         |         |
    2+ 0       1.7917     22.60  |           V  Q    |         |         |
    2+15       2.3910     29.01  |         |      V Q|         |         |
    2+30       3.2996     43.97  |         |         |  V     Q|         |
    2+45       4.4490     55.63  |         |         |         | V    Q  |
    3+ 0       5.2581     39.16  |         |         |     Q   |       V |
    3+15       5.4749     10.49  |     Q   |         |         |        V|
    3+30       5.5204      2.20  |Q        |         |         |        V|
    3+45       5.5310      0.51  Q         |         |         |        V|
    4+ 0       5.5318      0.04  Q         |         |         |         V
  ---------------------------------------------------------------------
```

SubF13100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubF13100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 1, Subarea F1
Existing Condition
100-year, 3-hour

Drainage Area = 98.90(Ac.) = 0.155 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 98.90(Ac.) = 0.155 Sq. Mi.
Length along longest watercourse = 3020.00(Ft.)
Length along longest watercourse measured to centroid = 1040.00(Ft.)
Length along longest watercourse = 0.572 Mi.
Length along longest watercourse measured to centroid = 0.197 Mi.
Difference in elevation = 85.00(Ft.)
Slope along watercourse = 148.6093 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.121 Hr.
Lag time = 7.29 Min.
25% of lag time = 1.82 Min.
40% of lag time = 2.91 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
98.90	0.85	84.06

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
98.90	1.90	187.91

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.96 %
Adjusted average point rain = 1.899(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
50.000	76.00	0.000
47.000	85.00	0.000
1.900	90.00	0.000

Total Area Entered = 98.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.506	0.147
85.0	85.0	0.187	0.000	0.187	0.475	0.089
90.0	90.0	0.130	0.000	0.130	0.019	0.002
					Sum (F) =	0.239

Area averaged mean soil loss (F) (In/Hr) = 0.239
Minimum soil loss rate ((In/Hr)) = 0.119
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	205.884	44.400	44.255
2	0.500	411.768	42.959	42.818
3	0.750	617.652	8.559	8.531
4	1.000	823.536	4.082	4.069
		Sum = 100.000	Sum=	99.673

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.239	(0.253)	0.042
2	0.50	4.80	0.365	0.239	(0.328)	0.126
3	0.75	5.10	0.387	0.239	(0.349)	0.149
4	1.00	4.90	0.372	0.239	(0.335)	0.134
5	1.25	6.60	0.501	0.239	(0.451)	0.263
6	1.50	7.30	0.555	0.239	(0.499)	0.316
7	1.75	8.40	0.638	0.239	(0.574)	0.400
8	2.00	9.00	0.684	0.239	(0.615)	0.445
9	2.25	12.30	0.934	0.239	(0.841)	0.696
10	2.50	17.60	1.337	0.239	(1.203)	1.098
11	2.75	16.10	1.223	0.239	(1.101)	0.984
12	3.00	4.20	0.319	0.239	(0.287)	0.080
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.7

Flood volume = Effective rainfall 1.18(In)
times area 98.9(Ac.)/[(In)/(Ft.)] = 9.8(Ac.Ft)
Total soil loss = 0.72(In)

```
                                   SubF13100
      Total soil loss =     5.899(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =      424857.7 Cubic Feet
      Total soil loss =      256960.4 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     98.399(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       25.0      50.0      75.0     100.0
  ---------------------------------------------------------------------
    0+15       0.0389      1.88  Q         |         |         |         |
    0+30       0.1918      7.40  V Q       |         |         |         |
    0+45       0.4471     12.35  |V  Q     |         |         |         |
    1+ 0       0.7269     13.54  | V  Q    |         |         |         |
    1+15       1.1224     19.15  |   V  Q  |         |         |         |
    1+30       1.6802     27.00  |     V   Q         |         |         |
    1+45       2.3830     34.01  |        V|  Q      |         |         |
    2+ 0       3.2217     40.59  |            V  Q   |         |         |
    2+15       4.3492     54.57  |         |      V  |Q        |         |
    2+30       6.0821     83.87  |         |            V      |  Q      |
    2+45       8.1151     98.40  |         |         |         V     Q|
    3+ 0       9.3124     57.95  |         |         |  Q      |       V |
    3+15       9.6496     16.32  |     Q   |         |         |        V|
    3+30       9.7466      4.69  |Q        |         |         |        V|
    3+45       9.7534      0.33  Q         |         |         |         V
---------------------------------------------------------------------
```

WSF3hrSt2

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed F, Stream 2
Existing Condition
100-year, 3-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF23100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 15
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 54.380 (CFS)
Total volume = 4.956 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 91.000 to Point/Station 92.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 3200.00 (Ft.)
Elevation difference = 330.00 (Ft.)
Slope of channel = 0.103125 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 3200.00(Ft.) Elevation difference = 330.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 20.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 10.000(Ft.)
Flow(q) thru subarea = 19.552(CFS)
Depth of flow = 0.187(Ft.)
Average velocity = 5.127(Ft/s)
Total flow rate = 19.552(CFS)
Channel flow top width = 20.749(Ft.)
Depth of flow in channel = 0.19(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 5.13(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =   19.552(CFS)
Total capacity of improved channels =     19.552(CFS)
Critical Depth in Channel =    0.30(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     54.380(CFS)
Depth of flow =     0.345(Ft.)
Average velocity =     7.617(Ft/s)
Total flow rate =    54.380(CFS)
Channel flow top width =   21.380(Ft.)
Depth of flow in channel =   0.35(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.62(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   54.380(CFS)
Total capacity of improved channels =     54.380(CFS)
Critical Depth in Channel =    0.60(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8175   Travel time =   7.00 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   2.0803
        dt(routing time-step) =   5.72 (min.),   c* =   0.9710

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f      H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       13.6      27.2      40.8      54.4
 ----------------------------------------------------------------------
   0+15       0.4184      0.70  O         |         |         |         |
   0+30       2.0979      3.04  |OI       |         |         |         |
   0+45       4.4426      5.42  |  O      |         |         |         |
   1+ 0       5.6581      5.86  |   O     |         |         |         |
   1+15       7.5953      8.76  |    OI   |         |         |         |
   1+30      11.5755     13.51  |       OI|         |         |         |
   1+45      15.7862     17.40  |         |OI       |         |         |
   2+ 0      19.5084     20.99  |         |   OI    |         |         |
   2+15      25.5840     28.71  |         |       O |I        |         |
   2+30      38.7633     45.60  |         |         |       O |  I      |
   2+45      50.6743     54.38  |         |         |         |      O  I
   3+ 0      39.7868     30.26  |         |         | I      O|         |
   3+15      15.1601      4.65  |  I      |O        |         |         |
   3+30       2.5091      0.57  IO        |         |         |         |
   3+45       0.2981      0.02  O         |         |         |         |
   4+ 0       0.0165      0.00  O         |         |         |         |
   4+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =    17
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =       50.674 (CFS)
```

```
                                WSF3hrSt2
                    Total volume =       4.956 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
********************************************************************************

--------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       92.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubF33100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       14.4      28.8      43.2      57.7
  ---------------------------------------------------------------------
    0+15       0.3974      0.82  Q         |         |         |         |
    0+30       0.9516      3.05  q Q       |         |         |         |
    0+45       1.2451      5.69  q  Q      |         |         |         |
    1+ 0       1.2461      6.90  q   Q     |         |         |         |
    1+15       1.7632      9.36  |q    Q   |         |         |         |
    1+30       2.2610     13.84  |q       Q|         |         |         |
    1+45       2.7528     18.54  |q        | Q       |         |         |
    2+ 0       3.1345     22.64  | q       |    Q    |         |         |
    2+15       4.3066     29.89  | q       |         Q         |         |
    2+30       6.5515     45.31  |   q     |         |         |Q        |
    2+45       6.9810     57.66  |   q     |         |         |         Q
    3+ 0       3.0001     42.79  | q       |         |        Q|         |
    3+15       0.4859     15.65  q         Q         |         |         |
    3+30       0.0259      2.53  qQ        |         |         |         |
    3+45       0.0000      0.30  Q         |         |         |         |
    4+ 0       0.0000      0.02  Q         |         |         |         |
    4+15       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
****************************HYDROGRAPH DATA***************************
                    Number of intervals =    17
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       57.655 (CFS)
                    Total volume =       5.681 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
********************************************************************************

--------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       92.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************
```

```
                    From study/file name: F31and32N92.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
              Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0       26.2      52.4      78.5     104.7
 ---------------------------------------------------------------------
   0+15       1.4434      2.26  Q         |         |         |         |
   0+30       4.2616      7.31  |qQ       |         |         |         |
   0+45       6.4749     12.16  | q Q     |         |         |         |
   1+ 0       7.2137     14.12  | q  Q    |         |         |         |
   1+15       9.4989     18.86  |  q   Q  |         |         |         |
   1+30      13.1284     26.96  |    q    Q         |         |         |
   1+45      16.5751     35.11  |     q   |  Q      |         |         |
   2+ 0      19.7538     42.40  |      q  |     Q   |         |         |
   2+15      25.8854     55.78  |        q|         |Q        |         |
   2+30      38.8749     84.19  |         |   q     |         | Q       |
   2+45      47.0712    104.73  |         |     q   |         |         Q
   3+ 0      31.5963     74.38  |         | q       |       Q |         |
   3+15      10.6590     26.30  |   q     Q         |         |         |
   3+30       2.5495      5.08  qQ        |         |         |         |
   3+45       0.3299      0.63  Q         |         |         |         |
   4+ 0       0.0288      0.05  Q         |         |         |         |
   4+15       0.0051      0.01  Q         |         |         |         |
   4+30       0.0000      0.00  Q         |         |         |         |
---------------------------------------------------------------------
++++++++++++++++++++++++++++HYDROGRAPH DATA++++++++++++++++++++++++++++
                 Number of intervals =    18
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =      104.727 (CFS)
                 Total volume =      10.544 (Ac.Ft)
          Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       92.000 to Point/Station       93.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    980.00 (Ft.)
Elevation difference =   25.00 (Ft.)
Slope of channel =  0.025510 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   980.00(Ft.)     Elevation difference =  25.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =     39.855(CFS)
```

```
Depth of flow =     0.435(Ft.)
Average velocity =     4.391(Ft/s)
Total flow rate =    39.855(CFS)
Channel flow top width =   21.739(Ft.)
Depth of flow in channel =   0.43(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    4.39(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   39.855(CFS)
Total capacity of improved channels =     39.855(CFS)
Critical Depth in Channel =    0.49(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    104.727(CFS)
Depth of flow =     0.772(Ft.)
Average velocity =     6.293(Ft/s)
Total flow rate =   104.727(CFS)
Channel flow top width =   23.090(Ft.)
Depth of flow in channel =   0.77(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.29(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  104.727(CFS)
Total capacity of improved channels =    104.727(CFS)
Critical Depth in Channel =    0.92(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.7873   Travel time =   2.60 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   5.2273
        dt(routing time-step) =   2.04 (min.),   c* =   0.9997

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       26.2      52.4      78.5     104.7
-----------------------------------------------------------------------
  0+15       1.9509      2.26  O         |         |         |         |
  0+30       6.6215      7.31  | O       |         |         |         |
  0+45      11.5002     12.16  |   O     |         |         |         |
  1+ 0      13.8508     14.12  |    O    |         |         |         |
  1+15      18.2104     18.86  |     OI  |         |         |         |
  1+30      25.8581     26.96  |        OI         |         |         |
  1+45      34.0015     35.11  |         | OI      |         |         |
  2+ 0      41.4024     42.40  |         |    OI   |         |         |
  2+15      53.9496     55.78  |         |         OI        |         |
  2+30      80.3110     84.19  |         |         |         O I       |
  2+45     101.9224    104.73  |         |         |         |       O I
  3+ 0      78.5238     74.38  |         |         |       IO|         |
  3+15      32.8683     26.30  |         I O       |         |         |
  3+30       7.9828      5.08  |I O      |         |         |         |
```

```
   3+45       1.2372      0.63  O         |         |         |         |
   4+ 0       0.1250      0.05  O         |         |         |         |
   4+15       0.0106      0.01  O         |         |         |         |
   4+30       0.0007      0.00  O         |         |         |         |
   4+45       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =    19
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      101.922 (CFS)
                        Total volume =      10.544 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       92.000 to Point/Station       93.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        _____________________________________________________________________
        ********************* HYDROGRAPH INFORMATION **********************

                        From study/file name: SubF43100.rte
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f     H y d r o g r a p h
        ---------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       28.9      57.8      86.7     115.5
  ----------------------------------------------------------------------
   0+15       0.7402      2.69  Q         |         |         |         |
   0+30       1.8131      8.43  q Q       |         |         |         |
   0+45       2.4114     13.91  q   Q     |         |         |         |
   1+ 0       2.4370     16.29  q    Q    |         |         |         |
   1+15       3.3974     21.61  |q     Q  |         |         |         |
   1+30       4.3778     30.24  |q        Q         |         |         |
   1+45       5.3383     39.34  |q        |  Q      |         |         |
   2+ 0       6.0941     47.50  | q       |     Q   |         |         |
   2+15       8.3108     62.26  | q       |         |Q        |         |
   2+30      12.6079     92.92  |   q     |         |         | Q       |
   2+45      13.6236    115.55  |   q     |         |         |         Q
   3+ 0       6.2266     84.75  | q       |         |        Q|         |
   3+15       1.1343     34.00  q         |Q        |         |         |
   3+30       0.0702      8.05  q Q       |         |         |         |
   3+45       0.0000      1.24  Q         |         |         |         |
   4+ 0       0.0000      0.12  Q         |         |         |         |
   4+15       0.0000      0.01  Q         |         |         |         |
   4+30       0.0000      0.00  Q         |         |         |         |
   4+45       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =    19
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      115.546 (CFS)
                        Total volume =      11.961 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
```

```
                              WSF3hrSt2
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       90.000 to Point/Station       93.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSF3hrSt2.rte
****************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

F31and32N92

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed F, Stream 2, Node 920 to 92
Existing Condition
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF313100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 13
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 17.105 (CFS)
Total volume = 1.507 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 921.000 to Point/Station 92.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 2360.00 (Ft.)
Elevation difference = 69.00 (Ft.)
Slope of channel = 0.029237 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 2360.00(Ft.) Elevation difference = 69.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 20.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 10.000(Ft.)
Flow(q) thru subarea = 6.074(CFS)
Depth of flow = 0.136(Ft.)
Average velocity = 2.211(Ft/s)
Total flow rate = 6.074(CFS)
Channel flow top width = 20.542(Ft.)
Depth of flow in channel = 0.14(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 2.21(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =    6.074(CFS)
Total capacity of improved channels =      6.074(CFS)
Critical Depth in Channel =    0.14(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     17.105(CFS)
Depth of flow =     0.252(Ft.)
Average velocity =     3.312(Ft/s)
Total flow rate =    17.105(CFS)
Channel flow top width =   21.008(Ft.)
Depth of flow in channel =   0.25(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    3.31(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   17.105(CFS)
Total capacity of improved channels =     17.105(CFS)
Critical Depth in Channel =    0.28(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.6608   Travel time =  11.88 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   1.6075
        dt(routing time-step) =   7.85 (min.),   c* =   0.8241

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        4.3       8.6      12.8      17.1
-----------------------------------------------------------------------
  0+15       0.1291      0.33  O         |         |         |         |
  0+30       0.5615      1.01  |OI       |         |         |         |
  0+45       1.1394      1.54  | OI      |         |         |         |
  1+ 0       1.4525      1.50  |  O      |         |         |         |
  1+15       2.0473      2.92  |   O I   |         |         |         |
  1+30       3.3108      4.31  |      O  I         |         |         |
  1+45       4.6414      5.60  |         O  I      |         |         |
  2+ 0       5.8384      6.63  |         |  O I    |         |         |
  2+15       7.7521      9.84  |         |       O |  I      |         |
  2+30      11.9066     16.04  |         |         |      O  |      I  |
  2+45      15.7307     17.10  |         |         |         |     O   I
  3+ 0      12.4675      5.92  |         |  I      |        O|         |
  3+15       4.8192      0.19  I         |O        |         |         |
  3+30       0.9297      0.00  I O       |         |         |         |
  3+45       0.1635      0.00  O         |         |         |         |
  4+ 0       0.0288      0.00  O         |         |         |         |
  4+15       0.0051      0.00  O         |         |         |         |
  4+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =    18
                        Time interval =   15.0 (Min.)
```

```
                Maximum/Peak flow rate =       15.731 (CFS)
                Total volume =       1.507 (Ac.Ft)
        Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      921.000 to Point/Station       92.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubF323100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
                R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0       11.8      23.5      35.3      47.1
 ---------------------------------------------------------------------
   0+15       1.3142      1.44  |Q        |         |         |         |
   0+30       3.7001      4.26  |  Q      |         |         |         |
   0+45       5.3356      6.47  |   qQ    |         |         |         |
   1+ 0       5.7612      7.21  |   q Q   |         |         |         |
   1+15       7.4516      9.50  |     q Q |         |         |         |
   1+30       9.8176     13.13  |       q |Q        |         |         |
   1+45      11.9337     16.58  |         q   Q     |         |         |
   2+ 0      13.9154     19.75  |         |q    Q   |         |         |
   2+15      18.1334     25.89  |         |    q    |Q        |         |
   2+30      26.9682     38.87  |         |         | q       |  Q      |
   2+45      31.3406     47.07  |         |         |     q   |         Q
   3+ 0      19.1288     31.60  |         |     q   |     Q   |         |
   3+15       5.8398     10.66  |   q    Q|         |         |         |
   3+30       1.6198      2.55  |qQ       |         |         |         |
   3+45       0.1664      0.33  Q         |         |         |         |
   4+ 0       0.0000      0.03  Q         |         |         |         |
   4+15       0.0000      0.01  Q         |         |         |         |
   4+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
*****************************HYDROGRAPH DATA***************************
                Number of intervals =    18
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =       47.071 (CFS)
                Total volume =       4.863 (Ac.Ft)
        Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      921.000 to Point/Station       92.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
```

```
Current stream hydrograph saved in file F31and32N92.rte
****************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

-----------------------------------------------------------------
```

SubF23100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF23100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F2
Existing Condition
100-year, 3-hour

Drainage Area = 54.70(Ac.) = 0.085 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 54.70(Ac.) = 0.085 Sq. Mi.
Length along longest watercourse = 3200.00(Ft.)
Length along longest watercourse measured to centroid = 1700.00(Ft.)
Length along longest watercourse = 0.606 Mi.
Length along longest watercourse measured to centroid = 0.322 Mi.
Difference in elevation = 330.00(Ft.)
Slope along watercourse = 544.5000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.117 Hr.
Lag time = 7.01 Min.
25% of lag time = 1.75 Min.
40% of lag time = 2.81 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.70	0.85	46.50

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.70	1.90	103.93

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.000	46.00	0.000
9.300	66.00	0.000
41.400	83.00	0.000

Total Area Entered = 54.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.073	0.045
66.0	66.0	0.405	0.000	0.405	0.170	0.069
83.0	83.0	0.210	0.000	0.210	0.757	0.159
					Sum (F) =	0.272

Area averaged mean soil loss (F) (In/Hr) = 0.272
Minimum soil loss rate ((In/Hr)) = 0.136
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	213.856	44.943	24.776
2	0.500	427.712	48.675	26.833
3	0.750	641.568	5.562	3.066
4	1.000	855.424	0.820	0.452
		Sum = 100.000	Sum=	55.127

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.272)	0.253	0.028
2	0.50	4.80	0.365	0.272	(0.328)	0.092
3	0.75	5.10	0.388	0.272	(0.349)	0.115
4	1.00	4.90	0.372	0.272	(0.335)	0.100
5	1.25	6.60	0.501	0.272	(0.451)	0.229
6	1.50	7.30	0.555	0.272	(0.499)	0.282
7	1.75	8.40	0.638	0.272	(0.574)	0.366
8	2.00	9.00	0.684	0.272	(0.615)	0.411
9	2.25	12.30	0.935	0.272	(0.841)	0.662
10	2.50	17.60	1.337	0.272	(1.204)	1.065
11	2.75	16.10	1.223	0.272	(1.101)	0.951
12	3.00	4.20	0.319	0.272	(0.287)	0.047
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.3

Flood volume = Effective rainfall 1.09(In)
times area 54.7(Ac.)/[(In)/(Ft.)] = 5.0(Ac.Ft)
Total soil loss = 0.81(In)

```
                                   SubF23100
      Total soil loss =     3.703(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =      215887.6 Cubic Feet
      Total soil loss =      161288.0 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     54.380(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
  ---------------------------------------------------------------------
    0+15       0.0144      0.70  Q         |         |         |         |
    0+30       0.0773      3.04  V Q       |         |         |         |
    0+45       0.1893      5.42   V Q      |         |         |         |
    1+ 0       0.3104      5.86  | VQ      |         |         |         |
    1+15       0.4913      8.76  |  V Q    |         |         |         |
    1+30       0.7704     13.51  |     V  Q|         |         |         |
    1+45       1.1298     17.40  |        V|Q        |         |         |
    2+ 0       1.5636     20.99  |           VQ      |         |         |
    2+15       2.1568     28.71  |         |      V Q|         |         |
    2+30       3.0990     45.60  |         |         |    V    Q         |
    2+45       4.2225     54.38  |         |         |         |   V Q   |
    3+ 0       4.8477     30.26  |         |         Q         |         V|
    3+15       4.9438      4.65  |  Q      |         |         |         V|
    3+30       4.9557      0.57  Q         |         |         |         V|
    3+45       4.9561      0.02  Q         |         |         |         V|
  ---------------------------------------------------------------------
```

SubF33100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF33100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F3
Existing Condition
100-year, 3-hour

Drainage Area = 6.50(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.50(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 950.00(Ft.)
Length along longest watercourse measured to centroid = 630.00(Ft.)
Length along longest watercourse = 0.180 Mi.
Length along longest watercourse measured to centroid = 0.119 Mi.
Difference in elevation = 28.00(Ft.)
Slope along watercourse = 155.6211 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.064 Hr.
Lag time = 3.85 Min.
25% of lag time = 0.96 Min.
40% of lag time = 1.54 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.50	0.85	5.52

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.50	1.90	12.35

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.500	85.00	0.000

Total Area Entered = 6.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	389.958	64.380	4.217
2	0.500	779.916	32.630	2.138
3	0.750	1169.874	2.990	0.196
		Sum =	100.000	Sum= 6.551

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.187	(0.253)	0.094
2	0.50	4.80	0.365	0.187	(0.328)	0.178
3	0.75	5.10	0.388	0.187	(0.349)	0.201
4	1.00	4.90	0.372	0.187	(0.335)	0.185
5	1.25	6.60	0.502	0.187	(0.451)	0.315
6	1.50	7.30	0.555	0.187	(0.499)	0.368
7	1.75	8.40	0.638	0.187	(0.575)	0.451
8	2.00	9.00	0.684	0.187	(0.616)	0.497
9	2.25	12.30	0.935	0.187	(0.841)	0.748
10	2.50	17.60	1.338	0.187	(1.204)	1.151
11	2.75	16.10	1.224	0.187	(1.101)	1.037
12	3.00	4.20	0.319	0.187	(0.287)	0.132
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.4

Flood volume = Effective rainfall 1.34(In)
times area 6.5(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 0.56(In)
Total soil loss = 0.304(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 31592.4 Cubic Feet
Total soil loss = 13236.8 Cubic Feet

SubF33100

Peak flow rate of this hydrograph = 6.981(CFS)

++

3 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0082	0.40	VQ				
0+30	0.0279	0.95	V Q				
0+45	0.0536	1.25	V Q				
1+ 0	0.0793	1.25	Q				
1+15	0.1158	1.76	VQ				
1+30	0.1625	2.26	VQ				
1+45	0.2194	2.75	QV				
2+ 0	0.2841	3.13	Q V				
2+15	0.3731	4.31	Q V				
2+30	0.5085	6.55	Q V				
2+45	0.6527	6.98	Q V				
3+ 0	0.7147	3.00	Q				V
3+15	0.7247	0.49	Q				V
3+30	0.7253	0.03	Q				V

SubF313100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF313100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F31
Existing Condition
100-year, 3-hour

Drainage Area = 17.50(Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.50(Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1610.00(Ft.)
Length along longest watercourse measured to centroid = 650.00(Ft.)
Length along longest watercourse = 0.305 Mi.
Length along longest watercourse measured to centroid = 0.123 Mi.
Difference in elevation = 139.00(Ft.)
Slope along watercourse = 455.8509 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.065 Hr.
Lag time = 3.88 Min.
25% of lag time = 0.97 Min.
40% of lag time = 1.55 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.50	0.85	14.88

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.50	1.90	33.25

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.200	46.00	0.000
2.900	66.00	0.000
12.400	83.00	0.000

Total Area Entered = 17.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.126	0.077
66.0	66.0	0.405	0.000	0.405	0.166	0.067
83.0	83.0	0.210	0.000	0.210	0.709	0.149
					Sum (F) =	0.293

Area averaged mean soil loss (F) (In/Hr) = 0.293
Minimum soil loss rate ((In/Hr)) = 0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	386.798	66.248	11.684
2	0.500	773.597	33.752	5.953
		Sum =	100.000	Sum= 17.637

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.293)	0.253	0.028
2	0.50	4.80	0.365	0.293	(0.328)	0.072
3	0.75	5.10	0.388	0.293	(0.349)	0.095
4	1.00	4.90	0.372	0.293	(0.335)	0.080
5	1.25	6.60	0.502	0.293	(0.451)	0.209
6	1.50	7.30	0.555	0.293	(0.499)	0.262
7	1.75	8.40	0.638	0.293	(0.575)	0.346
8	2.00	9.00	0.684	0.293	(0.616)	0.391
9	2.25	12.30	0.935	0.293	(0.841)	0.642
10	2.50	17.60	1.337	0.293	(1.204)	1.045
11	2.75	16.10	1.224	0.293	(1.101)	0.931
12	3.00	4.20	0.319	(0.293)	0.287	0.032
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.1

Flood volume = Effective rainfall 1.03(In)
times area 17.5(Ac.)/[(In)/(Ft.)] = 1.5(Ac.Ft)
Total soil loss = 0.87(In)
Total soil loss = 1.264(Ac.Ft)
Total rainfall = 1.90(In)

```
                                   SubF313100
        Flood volume =       65632.1 Cubic Feet
        Total soil loss =       55056.2 Cubic Feet
        ---------------------------------------------------------------------
         Peak flow rate of this hydrograph =     17.105(CFS)
        ---------------------------------------------------------------------
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                            3 - H O U R    S T O R M
                       R u n o f f      H y d r o g r a p h
        ---------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals ((CFS))

        ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ---------------------------------------------------------------------
    0+15       0.0068      0.33  Q         |         |         |         |
    0+30       0.0277      1.01  V Q       |         |         |         |
    0+45       0.0595      1.54  |V Q      |         |         |         |
    1+ 0       0.0904      1.50  | Q       |         |         |         |
    1+15       0.1507      2.92  |   VQ    |         |         |         |
    1+30       0.2397      4.31  |     V Q |         |         |         |
    1+45       0.3555      5.60  |        V|Q        |         |         |
    2+ 0       0.4925      6.63  |           Q       |         |         |
    2+15       0.6957      9.84  |         |       VQ|         |         |
    2+30       1.0271     16.04  |         |         |      V  | Q       |
    2+45       1.3805     17.10  |         |         |           Q V   |
    3+ 0       1.5028      5.92  |         |Q        |         |        V|
    3+15       1.5067      0.19  Q         |         |         |         V
  ---------------------------------------------------------------------
```

SubF323100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF323100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F32
Existing Condition
100-year, 3-hour

Drainage Area = 29.80(Ac.) = 0.047 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 29.80(Ac.) = 0.047 Sq. Mi.
Length along longest watercourse = 2360.00(Ft.)
Length along longest watercourse measured to centroid = 1350.00(Ft.)
Length along longest watercourse = 0.447 Mi.
Length along longest watercourse measured to centroid = 0.256 Mi.
Difference in elevation = 69.00(Ft.)
Slope along watercourse = 154.3729 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.121 Hr.
Lag time = 7.27 Min.
25% of lag time = 1.82 Min.
40% of lag time = 2.91 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
29.80	0.85	25.33

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
29.80	1.90	56.62

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
27.600	85.00	0.000
2.200	90.00	0.000

Total Area Entered = 29.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	0.926	0.173
90.0	90.0	0.130	0.000	0.130	0.074	0.010
					Sum (F) =	0.183

Area averaged mean soil loss (F) (In/Hr) = 0.183
Minimum soil loss rate ((In/Hr)) = 0.091
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	206.255	44.462	13.353
2 0.500	412.510	42.933	12.894
3 0.750	618.765	8.544	2.566
4 1.000	825.020	4.061	1.219
		Sum = 100.000	Sum= 30.033

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.183	(0.253)	0.098
2 0.50	4.80	0.365	0.183	(0.328)	0.182
3 0.75	5.10	0.388	0.183	(0.349)	0.205
4 1.00	4.90	0.372	0.183	(0.335)	0.190
5 1.25	6.60	0.502	0.183	(0.451)	0.319
6 1.50	7.30	0.555	0.183	(0.499)	0.372
7 1.75	8.40	0.638	0.183	(0.574)	0.456
8 2.00	9.00	0.684	0.183	(0.616)	0.501
9 2.25	12.30	0.935	0.183	(0.841)	0.752
10 2.50	17.60	1.337	0.183	(1.204)	1.155
11 2.75	16.10	1.223	0.183	(1.101)	1.041
12 3.00	4.20	0.319	0.183	(0.287)	0.136
	(Loss Rate Not Used)				
Sum =	100.0			Sum =	5.4

Flood volume = Effective rainfall 1.35(In)
times area 29.8(Ac.)/[(In)/(Ft.)] = 3.4(Ac.Ft)
Total soil loss = 0.55(In)
Total soil loss = 1.362(Ac.Ft)
Total rainfall = 1.90(In)

```
                                   SubF323100
        Flood volume =      146183.8 Cubic Feet
        Total soil loss =       59320.0 Cubic Feet
        ---------------------------------------------------------------------
         Peak flow rate of this hydrograph =     31.341(CFS)
        ---------------------------------------------------------------------
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                            3 - H O U R    S T O R M
                       R u n o f f      H y d r o g r a p h
        ---------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals ((CFS))

        ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
  ---------------------------------------------------------------------
    0+15       0.0272      1.31  VQ        |         |         |         |
    0+30       0.1036      3.70   V Q      |         |         |         |
    0+45       0.2138      5.34  | V  Q    |         |         |         |
    1+ 0       0.3329      5.76  |  V Q    |         |         |         |
    1+15       0.4868      7.45  |    V Q  |         |         |         |
    1+30       0.6897      9.82  |       VQ|         |         |         |
    1+45       0.9362     11.93  |          Q        |         |         |
    2+ 0       1.2237     13.92  |         |  QV     |         |         |
    2+15       1.5984     18.13  |         |       QV|         |         |
    2+30       2.1556     26.97  |         |         |    VQ   |         |
    2+45       2.8031     31.34  |         |         |         Q V       |
    3+ 0       3.1984     19.13  |         |        Q|         |       V |
    3+15       3.3190      5.84  |    Q    |         |         |        V|
    3+30       3.3525      1.62  |Q        |         |         |        V|
    3+45       3.3559      0.17  Q         |         |         |         V
---------------------------------------------------------------------
```

SubF43100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF43100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F4
Existing Condition
100-year, 3-hour

Drainage Area = 12.70(Ac.) = 0.020 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 12.70(Ac.) = 0.020 Sq. Mi.
Length along longest watercourse = 980.00(Ft.)
Length along longest watercourse measured to centroid = 750.00(Ft.)
Length along longest watercourse = 0.186 Mi.
Length along longest watercourse measured to centroid = 0.142 Mi.
Difference in elevation = 25.00(Ft.)
Slope along watercourse = 134.6939 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.071 Hr.
Lag time = 4.27 Min.
25% of lag time = 1.07 Min.
40% of lag time = 1.71 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	0.85	10.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	1.90	24.13

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
12.700	85.00	0.000

Total Area Entered = 12.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	350.910	61.373	7.855
2	0.500	701.821	34.479	4.413
3	0.750	1052.731	4.148	0.531
		Sum =	100.000	Sum= 12.799

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.187	(0.253)	0.094
2	0.50	4.80	0.365	0.187	(0.328)	0.178
3	0.75	5.10	0.388	0.187	(0.349)	0.201
4	1.00	4.90	0.372	0.187	(0.335)	0.185
5	1.25	6.60	0.502	0.187	(0.451)	0.315
6	1.50	7.30	0.555	0.187	(0.499)	0.368
7	1.75	8.40	0.638	0.187	(0.575)	0.451
8	2.00	9.00	0.684	0.187	(0.616)	0.497
9	2.25	12.30	0.935	0.187	(0.841)	0.748
10	2.50	17.60	1.338	0.187	(1.204)	1.151
11	2.75	16.10	1.224	0.187	(1.101)	1.037
12	3.00	4.20	0.319	0.187	(0.287)	0.132
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.4

Flood volume = Effective rainfall 1.34(In)
times area 12.7(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.56(In)
Total soil loss = 0.594(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 61724.4 Cubic Feet
Total soil loss = 25862.7 Cubic Feet

SubF43100

Peak flow rate of this hydrograph = 13.624(CFS)

++

3 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+15	0.0153	0.74	VQ	|	|	|	|
0+30	0.0528	1.81	V Q	|	|	|	|
0+45	0.1026	2.41	| V Q	|	|	|	|
1+ 0	0.1529	2.44	| Q	|	|	|	|
1+15	0.2231	3.40	| Q	|	|	|	|
1+30	0.3136	4.38	| Q	|	|	|	|
1+45	0.4239	5.34	| QV	|	|	|	|
2+ 0	0.5498	6.09	| Q V	|	|	|	|
2+15	0.7215	8.31	| Q	V	|	|	|
2+30	0.9820	12.61	|	|	Q V	|	|
2+45	1.2635	13.62	|	|	Q	V	|
3+ 0	1.3921	6.23	| Q	|	|	|	V|
3+15	1.4155	1.13	| Q	|	|	|	V|
3+30	1.4170	0.07	Q	|	|	|	V

WSF3hrSt3

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed F, Stream 3
Existing Condition
100-year, 3-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF53100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 17
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 140.178 (CFS)
Total volume = 13.472 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 101.000 to Point/Station 102.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 980.00 (Ft.)
Elevation difference = 29.00 (Ft.)
Slope of channel = 0.029592 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 980.00(Ft.) Elevation difference = 29.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 50.671(CFS)
Depth of flow = 0.716(Ft.)
Average velocity = 6.194(Ft/s)
Total flow rate = 50.671(CFS)
Channel flow top width = 12.863(Ft.)
Depth of flow in channel = 0.72(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 6.19(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =   50.671(CFS)
Total capacity of improved channels =     50.671(CFS)
Critical Depth in Channel =    0.88(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    140.178(CFS)
Depth of flow =     1.286(Ft.)
Average velocity =     8.670(Ft/s)
Total flow rate =   140.178(CFS)
Channel flow top width =   15.144(Ft.)
Depth of flow in channel =   1.29(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.67(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  140.178(CFS)
Total capacity of improved channels =    140.178(CFS)
Critical Depth in Channel =    1.63(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8361   Travel time =   1.88 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   6.6825
        dt(routing time-step) =   1.58 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       35.0      70.1     105.1     140.2
-----------------------------------------------------------------------
  0+15       0.9177      1.03  O         |         |         |         |
  0+30       5.3794      5.89  |O        |         |         |         |
  0+45      12.3164     13.07  |  O      |         |         |         |
  1+ 0      15.7183     16.03  |   O     |         |         |         |
  1+15      19.9599     20.42  |    O    |         |         |         |
  1+30      31.6058     32.92  |        O|         |         |         |
  1+45      41.9897     43.05  |         |OI       |         |         |
  2+ 0      52.3594     53.45  |         |   OI    |         |         |
  2+15      67.0113     68.60  |         |        O|         |         |
  2+30     101.6403    105.52  |         |         |        OI         |
  2+45     136.5385    140.18  |         |         |         |       O I
  3+ 0     111.2895    107.90  |         |         |         IO        |
  3+15      39.9732     32.00  |        I|O        |         |         |
  3+30      11.1920      8.75  | IO      |         |         |         |
  3+45       3.1402      2.48  O         |         |         |         |
  4+ 0       0.9007      0.72  O         |         |         |         |
  4+15       0.1063      0.03  O         |         |         |         |
  4+30       0.0037      0.00  O         |         |         |         |
  4+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    19
```

```
                                WSF3hrSt3
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      136.539 (CFS)
                    Total volume =      13.472 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
********************************************************************************

--------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubF63100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f      H y d r o g r a p h
--------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0       35.5      70.9     106.4     141.8
 ----------------------------------------------------------------------
   0+15       0.3113      1.23  Q         |         |         |         |
   0+30       0.7417      6.12  qQ        |         |         |         |
   0+45       0.9538     13.27  q  Q      |         |         |         |
   1+ 0       0.9408     16.66  q   Q     |         |         |         |
   1+15       1.3430     21.30  q     Q   |         |         |         |
   1+30       1.7302     33.34  q        Q|         |         |         |
   1+45       2.0935     44.08  q         | Q       |         |         |
   2+ 0       2.3809     54.74  q         |    Q    |         |         |
   2+15       3.2845     70.30  q         |        Q|         |         |
   2+30       5.0260    106.67  |q        |         |         Q         |
   2+45       5.3080    141.85  |q        |         |         |         Q
   3+ 0       2.1322    113.42  q         |         |         |Q        |
   3+15       0.2162     40.19  q         |Q        |         |         |
   3+30       0.0000     11.19  q  Q      |         |         |         |
   3+45       0.0000      3.14  Q         |         |         |         |
   4+ 0       0.0000      0.90  Q         |         |         |         |
   4+15       0.0000      0.11  Q         |         |         |         |
   4+30       0.0000      0.00  Q         |         |         |         |
   4+45       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
****************************HYDROGRAPH DATA****************************
                    Number of intervals =    19
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      141.847 (CFS)
                    Total volume =      14.019 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
********************************************************************************

--------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
                              WSF3hrSt3
Process from Point/Station      100.000 to Point/Station      102.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
____________________________________________________________________
Current stream hydrograph saved in file WSF3hrSt3.rte
****************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

SubF53100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream3/SubF53100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 3, Subarea F5
Existing Condition
100-year, 3-hour

Drainage Area = 146.60(Ac.) = 0.229 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 146.60(Ac.) = 0.229 Sq. Mi.
Length along longest watercourse = 5600.00(Ft.)
Length along longest watercourse measured to centroid = 3020.00(Ft.)
Length along longest watercourse = 1.061 Mi.
Length along longest watercourse measured to centroid = 0.572 Mi.
Difference in elevation = 408.00(Ft.)
Slope along watercourse = 384.6857 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.192 Hr.
Lag time = 11.53 Min.
25% of lag time = 2.88 Min.
40% of lag time = 4.61 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
146.60	0.85	124.61

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
146.60	1.90	278.54

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubF53100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.94 %
Adjusted average point rain = 1.899(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
15.100	46.00	0.000
11.500	66.00	0.000
120.000	83.00	0.000

Total Area Entered = 146.60(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.103	0.063
66.0	66.0	0.405	0.000	0.405	0.078	0.032
83.0	83.0	0.210	0.000	0.210	0.819	0.172
					Sum (F) =	0.266

Area averaged mean soil loss (F) (In/Hr) = 0.266
Minimum soil loss rate ((In/Hr)) = 0.133
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	130.096	24.683	36.468
2	0.500	260.193	55.636	82.200
3	0.750	390.289	14.262	21.072
4	1.000	520.386	3.932	5.809
5	1.250	650.482	1.037	1.532
6	1.500	780.579	0.449	0.663
		Sum =	100.000	Sum= 147.745

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.266)	0.253	0.028
2	0.50	4.80	0.365	0.266	(0.328)	0.098
3	0.75	5.10	0.387	0.266	(0.349)	0.121
4	1.00	4.90	0.372	0.266	(0.335)	0.106
5	1.25	6.60	0.501	0.266	(0.451)	0.235
6	1.50	7.30	0.554	0.266	(0.499)	0.288
7	1.75	8.40	0.638	0.266	(0.574)	0.372
8	2.00	9.00	0.684	0.266	(0.615)	0.417
9	2.25	12.30	0.934	0.266	(0.841)	0.668
10	2.50	17.60	1.337	0.266	(1.203)	1.070
11	2.75	16.10	1.223	0.266	(1.101)	0.956
12	3.00	4.20	0.319	0.266	(0.287)	0.053
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.4

Flood volume = Effective rainfall 1.10(In)

```
                                   SubF53100
        times area     146.6(Ac.)/[(In)/(Ft.)] =      13.5(Ac.Ft)
       Total soil loss =      0.80(In)
       Total soil loss =     9.725(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      586838.1 Cubic Feet
       Total soil loss =      423613.6 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    140.178(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ---------------------------------------------------------------------
    0+15       0.0212      1.03  Q         |         |         |         |
    0+30       0.1429      5.89  VQ        |         |         |         |
    0+45       0.4129     13.07   VQ       |         |         |         |
    1+ 0       0.7441     16.03  | VQ      |         |         |         |
    1+15       1.1660     20.42  |  VQ     |         |         |         |
    1+30       1.8462     32.92  |    VQ   |         |         |         |
    1+45       2.7357     43.05  |       Q |         |         |         |
    2+ 0       3.8401     53.45  |         QV        |         |         |
    2+15       5.2575     68.60  |         |  Q V    |         |         |
    2+30       7.4376    105.52  |         |         |QV       |         |
    2+45      10.3338    140.18  |         |         |       Q V         |
    3+ 0      12.5631    107.90  |         |         |Q        |      V  |
    3+15      13.2244     32.00  |     Q   |         |         |        V|
    3+30      13.4052      8.75  |Q        |         |         |        V|
    3+45      13.4565      2.48  Q         |         |         |        V|
    4+ 0      13.4712      0.72  Q         |         |         |        V|
    4+15      13.4719      0.03  Q         |         |         |         V
---------------------------------------------------------------------
```

SubF63100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream3/SubF63100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 3, Subarea F6
Existing Condition
100-year, 3-hour

Drainage Area = 4.90(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.90(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 980.00(Ft.)
Length along longest watercourse measured to centroid = 480.00(Ft.)
Length along longest watercourse = 0.186 Mi.
Length along longest watercourse measured to centroid = 0.091 Mi.
Difference in elevation = 29.00(Ft.)
Slope along watercourse = 156.2449 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.058 Hr.
Lag time = 3.51 Min.
25% of lag time = 0.88 Min.
40% of lag time = 1.40 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.90	0.85	4.17

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.90	1.90	9.31

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

SubF63100

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.900	85.00	0.000

Total Area Entered = 4.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	427.656	66.899	3.304
2	0.500	855.313	33.101	1.635
		Sum = 100.000	Sum=	4.938

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.187	(0.253)	0.094
2	0.50	4.80	0.365	0.187	(0.328)	0.178
3	0.75	5.10	0.388	0.187	(0.349)	0.201
4	1.00	4.90	0.372	0.187	(0.335)	0.185
5	1.25	6.60	0.502	0.187	(0.451)	0.315
6	1.50	7.30	0.555	0.187	(0.499)	0.368
7	1.75	8.40	0.638	0.187	(0.575)	0.451
8	2.00	9.00	0.684	0.187	(0.616)	0.497
9	2.25	12.30	0.935	0.187	(0.841)	0.748
10	2.50	17.60	1.338	0.187	(1.204)	1.151
11	2.75	16.10	1.224	0.187	(1.101)	1.037
12	3.00	4.20	0.319	0.187	(0.287)	0.132
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.4

Flood volume = Effective rainfall 1.34(In)
times area 4.9(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 0.56(In)
Total soil loss = 0.229(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 23816.1 Cubic Feet
Total soil loss = 9978.5 Cubic Feet

Peak flow rate of this hydrograph = 5.308(CFS)

SubF63100

```
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ---------------------------------------------------------------------
   0+15       0.0064      0.31  VQ        |         |         |         |
   0+30       0.0218      0.74   VQ       |         |         |         |
   0+45       0.0415      0.95  |  Q      |         |         |         |
   1+ 0       0.0609      0.94  |  QV     |         |         |         |
   1+15       0.0887      1.34  |    QV   |         |         |         |
   1+30       0.1244      1.73  |     Q  V|         |         |         |
   1+45       0.1677      2.09  |       Q   V       |         |         |
   2+ 0       0.2168      2.38  |        Q|    V    |         |         |
   2+15       0.2847      3.28  |         |  Q      V         |         |
   2+30       0.3886      5.03  |         |         Q       V |         |
   2+45       0.4982      5.31  |         |         |Q        |     V   |
   3+ 0       0.5423      2.13  |       Q |         |         |        V|
   3+15       0.5467      0.22  Q         |         |         |         V
---------------------------------------------------------------------
```

WSF3hrSt4

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 05/02/12

Watershed F, Stream 4
Existing Condition
100-year, 3-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF73100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 15
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 67.992 (CFS)
Total volume = 6.165 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 111.000 to Point/Station 112.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 350.00 (Ft.)
Elevation difference = 11.00 (Ft.)
Slope of channel = 0.031429 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 350.00(Ft.) Elevation difference = 11.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 24.118(CFS)
Depth of flow = 0.455(Ft.)
Average velocity = 4.863(Ft/s)
Total flow rate = 24.118(CFS)
Channel flow top width = 11.818(Ft.)
Depth of flow in channel = 0.45(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 4.86(Ft/s)
Travel time = 0.00 min.
Individual channel flow = 24.118(CFS)

```
Total capacity of improved channels =     24.118(CFS)
Critical Depth in Channel =    0.55(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     67.992(CFS)
Depth of flow =     0.834(Ft.)
Average velocity =     6.983(Ft/s)
Total flow rate =    67.992(CFS)
Channel flow top width =   13.338(Ft.)
Depth of flow in channel =   0.83(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.98(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   67.992(CFS)
Total capacity of improved channels =     67.992(CFS)
Critical Depth in Channel =    1.05(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8042   Travel time =   0.84 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  15.2181
        dt(routing time-step) =   0.67 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f      H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       17.0      34.0      51.0      68.0
 ----------------------------------------------------------------------
   0+15       0.7371      0.77  O         |         |         |         |
   0+30       3.2060      3.32  |O        |         |         |         |
   0+45       5.9928      6.12  |  O      |         |         |         |
   1+ 0       6.8299      6.86  |   O     |         |         |         |
   1+15       9.9040     10.05  |    O    |         |         |         |
   1+30      15.8257     16.10  |        O|         |         |         |
   1+45      20.7911     21.01  |         | O       |         |         |
   2+ 0      25.4927     25.70  |         |   OI    |         |         |
   2+15      34.3431     34.75  |         |         O         |         |
   2+30      54.2570     55.17  |         |         |         |OI       |
   2+45      67.4175     67.99  |         |         |         |        OI
   3+ 0      42.7603     41.58  |         |         |   IO    |         |
   3+15       9.2569      7.74  |   IO    |         |         |         |
   3+30       1.4843      1.19  O         |         |         |         |
   3+45       0.0914      0.04  O         |         |         |         |
   4+ 0       0.0018      0.00  O         |         |         |         |
   4+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =    17
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       67.418 (CFS)
                     Total volume =       6.165 (Ac.Ft)
```

```
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      112.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
********************* HYDROGRAPH INFORMATION **********************

                From study/file name: SubF83100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0       17.9      35.9      53.8      71.7
 ---------------------------------------------------------------------
   0+15       0.3894      1.13  Q         |         |         |         |
   0+30       0.7350      3.94  q Q       |         |         |         |
   0+45       0.8293      6.82  q  Q      |         |         |         |
   1+ 0       0.7664      7.60  q   Q     |         |         |         |
   1+15       1.3006     11.20  q     Q   |         |         |         |
   1+30       1.5205     17.35  q        Q|         |         |         |
   1+45       1.8661     22.66  |q         | Q       |         |         |
   2+ 0       2.0546     27.55  |q         |    Q    |         |         |
   2+15       3.0915     37.43  |q         |         Q         |         |
   2+30       4.7567     59.01  | q       |         |         | Q       |
   2+45       4.2854     71.70  | q       |         |         |         Q
   3+ 0       0.5465     43.31  q         |         |   Q     |         |
   3+15       0.0000      9.26  q    Q    |         |         |         |
   3+30       0.0000      1.48  Q         |         |         |         |
   3+45       0.0000      0.09  Q         |         |         |         |
   4+ 0       0.0000      0.00  Q         |         |         |         |
   4+15       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    17
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =       71.703 (CFS)
                Total volume =       6.623 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      112.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSF3hrSt4.rte
****************************HYDROGRAPH DATA***************************
```

```
                                WSF3hrSt4
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

SubF73100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream4/SubF73100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 4, Subarea F7
Existing Condition
100-year, 24-hour

Drainage Area = 69.50(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.50(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3750.00(Ft.)
Length along longest watercourse measured to centroid = 1820.00(Ft.)
Length along longest watercourse = 0.710 Mi.
Length along longest watercourse measured to centroid = 0.345 Mi.
Difference in elevation = 285.00(Ft.)
Slope along watercourse = 401.2800 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.135 Hr.
Lag time = 8.10 Min.
25% of lag time = 2.03 Min.
40% of lag time = 3.24 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.50	0.85	59.07

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.50	1.90	132.05

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.899(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.300	46.00	0.000
14.300	66.00	0.000
49.900	83.00	0.000

Total Area Entered = 69.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.076	0.047
66.0	66.0	0.405	0.000	0.405	0.206	0.083
83.0	83.0	0.210	0.000	0.210	0.718	0.151
					Sum (F) =	0.281

Area averaged mean soil loss (F) (In/Hr) = 0.281
Minimum soil loss rate ((In/Hr)) = 0.140
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	185.142	39.169	27.435
2	0.500	370.284	51.389	35.994
3	0.750	555.426	7.965	5.579
4	1.000	740.569	1.478	1.035
		Sum = 100.000	Sum=	70.043

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.281)	0.253	0.028
2	0.50	4.80	0.365	0.281	(0.328)	0.084
3	0.75	5.10	0.387	0.281	(0.349)	0.107
4	1.00	4.90	0.372	0.281	(0.335)	0.092
5	1.25	6.60	0.501	0.281	(0.451)	0.221
6	1.50	7.30	0.555	0.281	(0.499)	0.274
7	1.75	8.40	0.638	0.281	(0.574)	0.358
8	2.00	9.00	0.684	0.281	(0.615)	0.403
9	2.25	12.30	0.935	0.281	(0.841)	0.654
10	2.50	17.60	1.337	0.281	(1.203)	1.057
11	2.75	16.10	1.223	0.281	(1.101)	0.943
12	3.00	4.20	0.319	0.281	(0.287)	0.038
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.3

Flood volume = Effective rainfall 1.06(In)
times area 69.5(Ac.)/[(In)/(Ft.)] = 6.2(Ac.Ft)
Total soil loss = 0.83(In)

```
                                   SubF73100
      Total soil loss =     4.836(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =      268552.4 Cubic Feet
      Total soil loss =      210643.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     67.992(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
  ---------------------------------------------------------------------
    0+15       0.0159      0.77  Q         |         |         |         |
    0+30       0.0845      3.32  VQ        |         |         |         |
    0+45       0.2109      6.12   V Q      |         |         |         |
    1+ 0       0.3528      6.86  | VQ      |         |         |         |
    1+15       0.5603     10.05  |  V Q    |         |         |         |
    1+30       0.8929     16.10  |    V   Q|         |         |         |
    1+45       1.3270     21.01  |       V | Q       |         |         |
    2+ 0       1.8581     25.70  |           V Q     |         |         |
    2+15       2.5760     34.75  |         |     V  Q|         |         |
    2+30       3.7159     55.17  |         |         |   V     |Q        |
    2+45       5.1207     67.99  |         |         |           V    Q |
    3+ 0       5.9797     41.58  |         |         |  Q      |       V |
    3+15       6.1397      7.74  |   Q     |         |         |        V|
    3+30       6.1643      1.19  Q         |         |         |        V|
    3+45       6.1651      0.04  Q         |         |         |         V
  ---------------------------------------------------------------------
```

SubF83100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream4/SubF83100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 4, Subarea F8
Existing Condition
100-year, 3-hour

Drainage Area = 4.10(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.10(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 350.00(Ft.)
Length along longest watercourse measured to centroid = 200.00(Ft.)
Length along longest watercourse = 0.066 Mi.
Length along longest watercourse measured to centroid = 0.038 Mi.
Difference in elevation = 11.00(Ft.)
Slope along watercourse = 165.9429 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.028 Hr.
Lag time = 1.68 Min.
25% of lag time = 0.42 Min.
40% of lag time = 0.67 Min.
Unit time = 15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.10	0.85	3.48

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.10	1.90	7.79

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.100	85.00	0.000

Total Area Entered = 4.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	892.204	100.000	4.132
		Sum =	100.000	Sum= 4.132

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.187	(0.253)	0.094
2	0.50	4.80	0.365	0.187	(0.328)	0.178
3	0.75	5.10	0.388	0.187	(0.349)	0.201
4	1.00	4.90	0.372	0.187	(0.335)	0.185
5	1.25	6.60	0.502	0.187	(0.451)	0.315
6	1.50	7.30	0.555	0.187	(0.499)	0.368
7	1.75	8.40	0.638	0.187	(0.575)	0.451
8	2.00	9.00	0.684	0.187	(0.616)	0.497
9	2.25	12.30	0.935	0.187	(0.841)	0.748
10	2.50	17.60	1.338	0.187	(1.204)	1.151
11	2.75	16.10	1.224	0.187	(1.101)	1.037
12	3.00	4.20	0.319	0.187	(0.287)	0.132
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.4

Flood volume = Effective rainfall 1.34(In)
times area 4.1(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 0.56(In)
Total soil loss = 0.192(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 19927.8 Cubic Feet
Total soil loss = 8349.4 Cubic Feet

Peak flow rate of this hydrograph = 4.757(CFS)

SubF83100

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3 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0080	0.39	VQ	|	|	|	|
0+30	0.0232	0.74	| Q	|	|	|	|
0+45	0.0404	0.83	| Q	|	|	|	|
1+ 0	0.0562	0.77	| QV	|	|	|	|
1+15	0.0831	1.30	| Q V	|	|	|	|
1+30	0.1145	1.52	| Q V	|	|	|	|
1+45	0.1530	1.87	| Q | V	|	|	|	|
2+ 0	0.1955	2.05	| Q | V	|	|	|	|
2+15	0.2594	3.09	| | Q	V	|	|	|
2+30	0.3576	4.76	| |	Q|	|	V	|
2+45	0.4462	4.29	| |	Q |	|	|	V|
3+ 0	0.4575	0.55	| Q	|	|	|	V|

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                          Study date: 05/07/12

     ---------------------------------------------------------------------


     Watershed A, Routed,
     Existing Condition, 100 yr 24 hr


     --------------------------------------------------------------------


     Program License Serial Number 6097

     ---------------------------------------------------------------------
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: SUBA124100.rte
     ****************************HYDROGRAPH DATA****************************
                   Number of intervals =    99
                   Time interval =   15.0 (Min.)
                   Maximum/Peak flow rate =      386.405 (CFS)
                   Total volume =     135.620 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     **********************************************************************



     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station       76.000 to Point/Station       76.000
     **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
     ______________________________________________________________________
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: A2A3RT.rte
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

     ---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      181.9     363.9     545.8     727.7
-----------------------------------------------------------------------
  0+15       1.1161      2.34  Q         |         |         |         |
  0+30       3.0807      6.55  Q         |         |         |         |
  0+45       4.0122      8.55  Q         |         |         |         |
  1+ 0       4.7243     10.06  Q         |         |         |         |
  1+15       4.8903     10.45  Q         |         |         |         |
  1+30       4.3016      9.17  Q         |         |         |         |
  1+45       4.2075      8.98  Q         |         |         |         |
  2+ 0       4.7459     10.10  Q         |         |         |         |
  2+15       5.4488     11.62  Q         |         |         |         |
  2+30       5.5629     11.86  Q         |         |         |         |
  2+45       6.1409     13.08  Q         |         |         |         |
  3+ 0       6.8446     14.60  Q         |         |         |         |
  3+15       6.9587     14.84  Q         |         |         |         |
  3+30       6.9787     14.88  Q         |         |         |         |
  3+45       6.9791     14.88  Q         |         |         |         |
  4+ 0       7.5372     16.05  Q         |         |         |         |
  4+15       8.2404     17.57  Q         |         |         |         |
  4+30       8.9126     18.99  qQ        |         |         |         |
  4+45       9.6359     20.55  qQ        |         |         |         |
  5+ 0      10.3084     21.96  qQ        |         |         |         |
```

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 5+15       9.9156     21.19  qQ        |         |         |         |
 5+30       9.1816     19.56  qQ        |         |         |         |
 5+45      10.2347     21.81  qQ        |         |         |         |
 6+ 0      11.0125     23.48  qQ        |         |         |         |
 6+15      11.7038     24.94  qQ        |         |         |         |
 6+30      12.4275     26.50  qQ        |         |         |         |
 6+45      13.1001     27.92  qQ        |         |         |         |
 7+ 0      13.8233     29.48  qQ        |         |         |         |
 7+15      13.9378     29.72  qQ        |         |         |         |
 7+30      14.5159     30.94  qQ        |         |         |         |
 7+45      15.7776     33.63  qQ        |         |         |         |
 8+ 0      17.1530     36.56  q Q       |         |         |         |
 8+15      26.4120     55.96  |q Q      |         |         |         |
 8+30      38.1058     81.06  | q Q     |         |         |         |
 8+45      47.5627    101.02  | q  Q    |         |         |         |
 9+ 0      62.7882    133.50  |  q   Q  |         |         |         |
 9+15      84.4524    179.49  |   q    Q|         |         |         |
 9+30     107.7425    229.36  |    q    | Q       |         |         |
 9+45     125.1234    266.43  |     q   |   Q     |         |         |
10+ 0     141.5420    301.46  |      q  |     Q   |         |         |
10+15     113.0991    242.41  |     q   |  Q      |         |         |
10+30      67.4312    143.71  |  q   Q  |         |         |         |
10+45      89.7460    190.31  |   q     Q         |         |         |
11+ 0     125.6870    267.78  |     q   |   Q     |         |         |
11+15     127.9335    272.81  |      q  |   Q     |         |         |
11+30     124.0283    264.38  |     q   |   Q     |         |         |
11+45     113.8516    243.06  |     q   |  Q      |         |         |
12+ 0     107.2488    228.38  |    q    | Q       |         |         |
12+15     153.1181    324.99  |       q |      Q  |         |         |
12+30     210.7049    448.90  |         |q        |   Q     |         |
12+45     239.0893    509.25  |         |  q      |      Q  |         |
13+ 0     263.2685    561.11  |         |   q     |         Q         |
13+15     302.6778    644.33  |         |     q   |         |    Q    |
13+30     341.3269    727.73  |         |       q |         |       Q
13+45     287.7698    615.74  |         |    q    |         |  Q      |
14+ 0     213.3034    454.93  |         |q        |    Q    |         |
14+15     224.9607    478.96  |         | q       |     Q   |         |
14+30     247.1520    527.06  |         |  q      |       Q |         |
14+45     246.4534    525.43  |         |  q      |       Q |         |
15+ 0     242.3203    516.89  |         |  q      |       Q |         |
15+15     231.2855    493.34  |         | q       |      Q  |         |
15+30     219.2631    467.72  |         | q       |    Q    |         |
15+45     190.2764    406.50  |         q         | Q       |         |
16+ 0     162.4819    346.45  |       q |        Q|         |         |
16+15      97.7460    210.65  |    q    |Q        |         |         |
16+30      20.2679     43.34  |qQ       |         |         |         |
16+45       7.2536     15.63  Q         |         |         |         |
17+ 0       4.3660      9.26  Q         |         |         |         |
17+15       5.3242     11.32  Q         |         |         |         |
17+30       6.7105     14.31  Q         |         |         |         |
17+45       6.9383     14.79  Q         |         |         |         |
18+ 0       6.4203     13.71  Q         |         |         |         |
18+15       5.7178     12.20  Q         |         |         |         |
18+30       5.6037     11.95  Q         |         |         |         |
18+45       5.0256     10.74  Q         |         |         |         |
19+ 0       3.7639      8.05  Q         |         |         |         |
19+15       3.5046      7.46  Q         |         |         |         |
19+30       4.6318      9.86  Q         |         |         |         |
19+45       4.8708     10.41  Q         |         |         |         |
20+ 0       3.7431      8.00  Q         |         |         |         |
20+15       3.5042      7.46  Q         |         |         |         |
20+30       4.0738      8.69  Q         |         |         |         |
20+45       4.1675      8.89  Q         |         |         |         |
21+ 0       3.6290      7.76  Q         |         |         |         |
21+15       3.4842      7.41  Q         |         |         |         |
21+30       3.5153      7.52  Q         |         |         |         |
21+45       3.4642      7.37  Q         |         |         |         |
22+ 0       3.5149      7.52  Q         |         |         |         |
22+15       3.4642      7.37  Q         |         |         |         |
22+30       3.5149      7.52  Q         |         |         |         |
22+45       2.9061      6.20  Q         |         |         |         |
```

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  23+ 0       2.8116      6.00  Q         |         |         |         |
  23+15       2.7920      5.95  Q         |         |         |         |
  23+30       2.7916      5.95  Q         |         |         |         |
  23+45       2.7916      5.95  Q         |         |         |         |
  24+ 0       2.7916      5.95  Q         |         |         |         |
  24+15       1.6756      3.61  Q         |         |         |         |
  24+30       0.2690      0.58  Q         |         |         |         |
  24+45       0.0408      0.09  Q         |         |         |         |
  25+ 0       0.0004      0.00  Q         |         |         |         |
  25+15       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   101
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      727.732 (CFS)
                      Total volume =     255.428 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       76.000 to Point/Station       76.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ______________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =    700.00 (Ft.)
       Elevation difference =   14.00 (Ft.)
       Slope of channel =  0.020000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =   700.00(Ft.)     Elevation difference =  14.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =    8.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =   10.000(Ft.)
       Flow(q) thru subarea =    182.953(CFS)
       Depth of flow =     1.342(Ft.)
       Average velocity =    14.592(Ft/s)
       Total flow rate =   182.953(CFS)
       Channel flow top width =   10.684(Ft.)
       Depth of flow in channel =   1.34(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   14.59(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =  182.953(CFS)
       Total capacity of improved channels =    182.953(CFS)
       Critical Depth in Channel =    2.28(Ft.)


       Channel evaluation using maximum flow rate of hydrograph
       Covered channel
       Flow(q) thru subarea =    727.732(CFS)
       Depth of flow =     2.985(Ft.)
       Average velocity =    22.196(Ft/s)
       Total flow rate =   727.732(CFS)
       Channel flow top width =   13.970(Ft.)
       Depth of flow in channel =   2.98(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   22.20(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =  727.732(CFS)
       Total capacity of improved channels =    727.732(CFS)
```

```
Critical Depth in Channel =    5.13(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9289   Travel time =   0.53 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  20.8154
        dt(routing time-step) =   0.49 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      181.9     363.9     545.8     727.7
----------------------------------------------------------------------
  0+15       2.2638      2.34  O         |         |         |         |
  0+30       6.4106      6.55  O         |         |         |         |
  0+45       8.4877      8.55  O         |         |         |         |
  1+ 0      10.0062     10.06  O         |         |         |         |
  1+15      10.4362     10.45  O         |         |         |         |
  1+30       9.2155      9.17  O         |         |         |         |
  1+45       8.9815      8.98  O         |         |         |         |
  2+ 0      10.0644     10.10  O         |         |         |         |
  2+15      11.5700     11.62  O         |         |         |         |
  2+30      11.8549     11.86  O         |         |         |         |
  2+45      13.0376     13.08  O         |         |         |         |
  3+ 0      14.5469     14.60  O         |         |         |         |
  3+15      14.8318     14.84  O         |         |         |         |
  3+30      14.8826     14.88  O         |         |         |         |
  3+45      14.8844     14.88  O         |         |         |         |
  4+ 0      16.0164     16.05  O         |         |         |         |
  4+15      17.5238     17.57  O         |         |         |         |
  4+30      18.9406     18.99  |O        |         |         |         |
  4+45      20.4988     20.55  |O        |         |         |         |
  5+ 0      21.9174     21.96  |O        |         |         |         |
  5+15      21.2119     21.19  |O        |         |         |         |
  5+30      19.6157     19.56  |O        |         |         |         |
  5+45      21.7362     21.81  |O        |         |         |         |
  6+ 0      23.4286     23.48  |O        |         |         |         |
  6+15      24.8925     24.94  |O        |         |         |         |
  6+30      26.4526     26.50  |O        |         |         |         |
  6+45      27.8712     27.92  |O        |         |         |         |
  7+ 0      29.4295     29.48  |O        |         |         |         |
  7+15      29.7162     29.72  |O        |         |         |         |
  7+30      30.8990     30.94  |O        |         |         |         |
  7+45      33.5402     33.63  |O        |         |         |         |
  8+ 0      36.4644     36.56  | O       |         |         |         |
  8+15      55.3258     55.96  |  O      |         |         |         |
  8+30      80.2476     81.06  |   O     |         |         |         |
  8+45     100.3713    101.02  |    O    |         |         |         |
  9+ 0     132.4460    133.50  |      O  |         |         |         |
  9+15     177.9923    179.49  |        O|         |         |         |
  9+30     227.7331    229.36  |         | O       |         |         |
  9+45     265.2208    266.43  |         |   O     |         |         |
 10+ 0     300.3229    301.46  |         |     O   |         |         |
 10+15     244.3359    242.41  |         |  O      |         |         |
 10+30     146.9237    143.71  |      IO |         |         |         |
 10+45     188.7914    190.31  |         O         |         |         |
 11+ 0     265.2594    267.78  |         |   O     |         |         |
 11+15     272.6452    272.81  |         |   O     |         |         |
 11+30     264.6546    264.38  |         |   O     |         |         |
 11+45     243.7531    243.06  |         |  O      |         |         |
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  12+ 0     228.8606    228.38  |         | O       |         |         |
  12+15     321.8484    324.99  |         |      O  |         |         |
  12+30     444.8643    448.90  |         |         |   O     |         |
  12+45     507.2838    509.25  |         |         |      O  |         |
  13+ 0     559.4222    561.11  |         |         |         O         |
  13+15     641.6192    644.33  |         |         |         |    O    |
  13+30     725.0169    727.73  |         |         |         |        OI
  13+45     619.3840    615.74  |         |         |         |  IO     |
  14+ 0     460.1644    454.93  |         |         |    O    |         |
  14+15     478.1811    478.96  |         |         |     O   |         |
  14+30     525.4946    527.06  |         |         |       O |         |
  14+45     525.4869    525.43  |         |         |       O |         |
  15+ 0     517.1704    516.89  |         |         |       O |         |
  15+15     494.1044    493.34  |         |         |      O  |         |
  15+30     468.5507    467.72  |         |         |    O    |         |
  15+45     408.4914    406.50  |         |         | O       |         |
  16+ 0     348.4093    346.45  |         |        O|         |         |
  16+15     215.0684    210.65  |         |O        |         |         |
  16+30      48.7829     43.34  | O       |         |         |         |
  16+45      16.5297     15.63  O         |         |         |         |
  17+ 0       9.4700      9.26  O         |         |         |         |
  17+15      11.2489     11.32  O         |         |         |         |
  17+30      14.2112     14.31  O         |         |         |         |
  17+45      14.7791     14.79  O         |         |         |         |
  18+ 0      13.7489     13.71  O         |         |         |         |
  18+15      12.2451     12.20  O         |         |         |         |
  18+30      11.9603     11.95  O         |         |         |         |
  18+45      10.7775     10.74  O         |         |         |         |
  19+ 0       8.1363      8.05  O         |         |         |         |
  19+15       7.4760      7.46  O         |         |         |         |
  19+30       9.7796      9.86  O         |         |         |         |
  19+45      10.3873     10.41  O         |         |         |         |
  20+ 0       8.0818      8.00  O         |         |         |         |
  20+15       7.4741      7.46  O         |         |         |         |
  20+30       8.6477      8.69  O         |         |         |         |
  20+45       8.8798      8.89  O         |         |         |         |
  21+ 0       7.7969      7.76  O         |         |         |         |
  21+15       7.4232      7.41  O         |         |         |         |
  21+30       7.5139      7.52  O         |         |         |         |
  21+45       7.3724      7.37  O         |         |         |         |
  22+ 0       7.5121      7.52  O         |         |         |         |
  22+15       7.3724      7.37  O         |         |         |         |
  22+30       7.5121      7.52  O         |         |         |         |
  22+45       6.2405      6.20  O         |         |         |         |
  23+ 0       6.0047      6.00  O         |         |         |         |
  23+15       5.9556      5.95  O         |         |         |         |
  23+30       5.9538      5.95  O         |         |         |         |
  23+45       5.9538      5.95  O         |         |         |         |
  24+ 0       5.9538      5.95  O         |         |         |         |
  24+15       3.6900      3.61  O         |         |         |         |
  24+30       0.6751      0.58  O         |         |         |         |
  24+45       0.1054      0.09  O         |         |         |         |
  25+ 0       0.0033      0.00  O         |         |         |         |
  25+15       0.0000      0.00  O         |         |         |         |
  25+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   102
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      725.017 (CFS)
                     Total volume =     255.428 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ************************************************************************

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Process from Point/Station       76.000 to Point/Station       76.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
____________________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: SketcherRT.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                  R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      189.5     378.9     568.4     757.8
----------------------------------------------------------------------
  0+15       0.0839      2.35  Q         |         |         |         |
  0+30       0.3630      6.77  Q         |         |         |         |
  0+45       0.7640      9.25  Q         |         |         |         |
  1+ 0       1.2228     11.23  Q         |         |         |         |
  1+15       1.6799     12.12  Q         |         |         |         |
  1+30       2.0602     11.28  Q         |         |         |         |
  1+45       2.3808     11.36  Q         |         |         |         |
  2+ 0       2.7162     12.78  Q         |         |         |         |
  2+15       3.1000     14.67  Q         |         |         |         |
  2+30       3.4878     15.34  Q         |         |         |         |
  2+45       3.8951     16.93  Q         |         |         |         |
  3+ 0       4.3450     18.89  Q         |         |         |         |
  3+15       4.7937     19.63  qQ        |         |         |         |
  3+30       5.2118     20.09  qQ        |         |         |         |
  3+45       5.5966     20.48  qQ        |         |         |         |
  4+ 0       5.9962     22.01  qQ        |         |         |         |
  4+15       6.4390     23.96  qQ        |         |         |         |
  4+30       6.9265     25.87  qQ        |         |         |         |
  4+45       7.4552     27.95  qQ        |         |         |         |
  5+ 0       8.0217     29.94  qQ        |         |         |         |
  5+15       8.5326     29.74  qQ        |         |         |         |
  5+30       8.9329     28.55  qQ        |         |         |         |
  5+45       9.3574     31.09  qQ        |         |         |         |
  6+ 0       9.8479     33.28  qQ        |         |         |         |
  6+15      10.3842     35.28  qQ        |         |         |         |
  6+30      10.9578     37.41  qQ        |         |         |         |
  6+45      11.5657     39.44  q Q       |         |         |         |
  7+ 0      12.2052     41.63  q Q       |         |         |         |
  7+15      12.8286     42.54  q Q       |         |         |         |
  7+30      13.4526     44.35  q Q       |         |         |         |
  7+45      14.1473     47.69  q Q       |         |         |         |
  8+ 0      14.9417     51.41  q Q       |         |         |         |
  8+15      15.8780     71.20  q  Q      |         |         |         |
  8+30      16.9294     97.18  q    Q    |         |         |         |
  8+45      18.0166    118.39  q     Q   |         |         |         |
  9+ 0      19.1477    151.59  |q      Q |         |         |         |
  9+15      20.1984    198.19  |q        Q         |         |         |
  9+30      20.9085    248.64  |q        |  Q      |         |         |
  9+45      21.6889    286.91  |q        |    Q    |         |         |
 10+ 0      22.5218    322.84  |q        |      Q  |         |         |
 10+15      23.2175    267.55  |q        |   Q     |         |         |
 10+30      23.6378    170.56  |q       Q|         |         |         |
 10+45      24.0357    212.83  |q        |Q        |         |         |
 11+ 0      24.5909    289.85  |q        |    Q    |         |         |
 11+15      25.1887    297.83  |q        |    Q    |         |         |
 11+30      25.7366    290.39  |q        |    Q    |         |         |
 11+45      26.1985    269.95  |q        |   Q     |         |         |
 12+ 0      26.5859    255.45  |q        |  Q      |         |         |
 12+15      27.1223    348.97  |q        |       Q |         |         |
 12+30      27.9401    472.80  |q        |         |   Q     |         |
 12+45      28.9351    536.22  |q        |         |       Q |         |
 13+ 0      30.0246    589.45  |q        |         |         |Q        |
 13+15      31.2982    672.92  |q        |         |         |    Q    |
 13+30      32.7995    757.82  |q        |         |         |         Q
 13+45      34.0708    653.45  |q        |         |         |   Q     |
 14+ 0      34.8219    494.99  |q        |         |     Q   |         |
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14+15      35.4100    513.59  |q         |          |      Q  |          |
14+30      36.0720    561.57  |q         |          |        Q|          |
14+45      36.7394    562.23  |q         |          |        Q|          |
15+ 0      37.3491    554.52  |q         |          |        Q|          |
15+15      37.8703    531.97  |q         |          |       Q |          |
15+30      38.2915    506.84  | q        |          |     Q   |          |
15+45      38.5449    447.04  | q        |          |  Q      |          |
16+ 0      38.6150    387.02  | q        |          Q         |          |
16+15      38.2628    253.33  | q        |  Q       |          |          |
16+30      37.3417     86.12  |q  Q      |          |          |          |
16+45      36.1703     52.70  |qQ        |          |          |          |
17+ 0      34.9704     44.44  |qQ        |          |          |          |
17+15      33.8477     45.10  |qQ        |          |          |          |
17+30      32.8443     47.06  |qQ        |          |          |          |
17+45      31.9168     46.70  |qQ        |          |          |          |
18+ 0      31.0088     44.76  |qQ        |          |          |          |
18+15      30.0993     42.34  |qQ        |          |          |          |
18+30      29.2090     41.17  |qQ        |          |          |          |
18+45      28.3292     39.11  |qQ        |          |          |          |
19+ 0      27.4236     35.56  |Q         |          |          |          |
19+15      26.5220     34.00  |Q         |          |          |          |
19+30      25.6981     35.48  |Q         |          |          |          |
19+45      24.9377     35.32  |Q         |          |          |          |
20+ 0      24.1670     32.25  |Q         |          |          |          |
20+15      23.3972     30.87  |Q         |          |          |          |
20+30      22.6767     31.32  |Q         |          |          |          |
20+45      22.0004     30.88  |Q         |          |          |          |
21+ 0      21.3310     29.13  |Q         |          |          |          |
21+15      20.6735     28.10  |Q         |          |          |          |
21+30      20.0402     27.55  |Q         |          |          |          |
21+45      18.8871     26.26  qQ         |          |          |          |
22+ 0      17.7869     25.30  qQ         |          |          |          |
22+15      16.7741     24.15  qQ         |          |          |          |
22+30      15.8417     23.35  qQ         |          |          |          |
22+45      14.9380     21.18  qQ         |          |          |          |
23+ 0      14.0764     20.08  qQ         |          |          |          |
23+15      13.2783     19.23  qQ         |          |          |          |
23+30      12.5436     18.50  Q          |          |          |          |
23+45      11.8672     17.82  Q          |          |          |          |
24+ 0      11.2445     17.20  Q          |          |          |          |
24+15      10.5806     14.27  Q          |          |          |          |
24+30       9.8196     10.49  Q          |          |          |          |
24+45       9.0499      9.16  Q          |          |          |          |
25+ 0       8.3314      8.33  Q          |          |          |          |
25+15       7.6699      7.67  Q          |          |          |          |
25+30       7.0610      7.06  Q          |          |          |          |
25+45       6.5004      6.50  Q          |          |          |          |
26+ 0       5.9843      5.98  Q          |          |          |          |
26+15       5.5092      5.51  Q          |          |          |          |
26+30       5.0718      5.07  Q          |          |          |          |
26+45       4.6692      4.67  Q          |          |          |          |
27+ 0       4.2985      4.30  Q          |          |          |          |
27+15       3.9572      3.96  Q          |          |          |          |
27+30       3.6430      3.64  Q          |          |          |          |
27+45       3.3538      3.35  Q          |          |          |          |
28+ 0       3.0876      3.09  Q          |          |          |          |
28+15       2.8424      2.84  Q          |          |          |          |
28+30       2.6168      2.62  Q          |          |          |          |
28+45       2.4090      2.41  Q          |          |          |          |
29+ 0       2.2178      2.22  Q          |          |          |          |
29+15       2.0417      2.04  Q          |          |          |          |
29+30       1.8796      1.88  Q          |          |          |          |
29+45       1.7304      1.73  Q          |          |          |          |
30+ 0       1.5930      1.59  Q          |          |          |          |
30+15       1.4665      1.47  Q          |          |          |          |
30+30       1.3501      1.35  Q          |          |          |          |
30+45       1.2429      1.24  Q          |          |          |          |
31+ 0       1.1442      1.14  Q          |          |          |          |
31+15       1.0534      1.05  Q          |          |          |          |
31+30       0.9698      0.97  Q          |          |          |          |
31+45       0.8928      0.89  Q          |          |          |          |
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32+ 0	0.8219	0.82	Q	|	|	|	|
32+15	0.7566	0.76	Q	|	|	|	|
32+30	0.6966	0.70	Q	|	|	|	|
32+45	0.6413	0.64	Q	|	|	|	|
33+ 0	0.5904	0.59	Q	|	|	|	|
33+15	0.5435	0.54	Q	|	|	|	|
33+30	0.5003	0.50	Q	|	|	|	|
33+45	0.4606	0.46	Q	|	|	|	|
34+ 0	0.4240	0.42	Q	|	|	|	|
34+15	0.3904	0.39	Q	|	|	|	|
34+30	0.3594	0.36	Q	|	|	|	|
34+45	0.3309	0.33	Q	|	|	|	|
35+ 0	0.3046	0.30	Q	|	|	|	|
35+15	0.2804	0.28	Q	|	|	|	|
35+30	0.2581	0.26	Q	|	|	|	|
35+45	0.2376	0.24	Q	|	|	|	|
36+ 0	0.2188	0.22	Q	|	|	|	|
36+15	0.2014	0.20	Q	|	|	|	|
36+30	0.1854	0.19	Q	|	|	|	|
36+45	0.1707	0.17	Q	|	|	|	|
37+ 0	0.1571	0.16	Q	|	|	|	|
37+15	0.1447	0.14	Q	|	|	|	|
37+30	0.1332	0.13	Q	|	|	|	|
37+45	0.1226	0.12	Q	|	|	|	|
38+ 0	0.1129	0.11	Q	|	|	|	|
38+15	0.1039	0.10	Q	|	|	|	|
38+30	0.0957	0.10	Q	|	|	|	|
38+45	0.0881	0.09	Q	|	|	|	|
39+ 0	0.0811	0.08	Q	|	|	|	|
39+15	0.0746	0.07	Q	|	|	|	|
39+30	0.0687	0.07	Q	|	|	|	|
39+45	0.0633	0.06	Q	|	|	|	|
40+ 0	0.0582	0.06	Q	|	|	|	|
40+15	0.0536	0.05	Q	|	|	|	|
40+30	0.0494	0.05	Q	|	|	|	|
40+45	0.0454	0.05	Q	|	|	|	|
41+ 0	0.0418	0.04	Q	|	|	|	|
41+15	0.0385	0.04	Q	|	|	|	|
41+30	0.0355	0.04	Q	|	|	|	|
41+45	0.0326	0.03	Q	|	|	|	|
42+ 0	0.0300	0.03	Q	|	|	|	|
42+15	0.0277	0.03	Q	|	|	|	|
42+30	0.0255	0.03	Q	|	|	|	|
42+45	0.0234	0.02	Q	|	|	|	|
43+ 0	0.0216	0.02	Q	|	|	|	|
43+15	0.0199	0.02	Q	|	|	|	|
43+30	0.0183	0.02	Q	|	|	|	|
43+45	0.0168	0.02	Q	|	|	|	|
44+ 0	0.0155	0.02	Q	|	|	|	|
44+15	0.0143	0.01	Q	|	|	|	|
44+30	0.0131	0.01	Q	|	|	|	|
44+45	0.0121	0.01	Q	|	|	|	|
45+ 0	0.0111	0.01	Q	|	|	|	|
45+15	0.0103	0.01	Q	|	|	|	|
45+30	0.0094	0.01	Q	|	|	|	|
45+45	0.0087	0.01	Q	|	|	|	|
46+ 0	0.0080	0.01	Q	|	|	|	|
46+15	0.0074	0.01	Q	|	|	|	|
46+30	0.0068	0.01	Q	|	|	|	|
46+45	0.0062	0.01	Q	|	|	|	|
47+ 0	0.0057	0.01	Q	|	|	|	|
47+15	0.0053	0.01	Q	|	|	|	|
47+30	0.0049	0.00	Q	|	|	|	|
47+45	0.0045	0.00	Q	|	|	|	|
48+ 0	0.0041	0.00	Q	|	|	|	|
48+15	0.0038	0.00	Q	|	|	|	|
48+30	0.0035	0.00	Q	|	|	|	|
48+45	0.0032	0.00	Q	|	|	|	|
49+ 0	0.0030	0.00	Q	|	|	|	|
49+15	0.0027	0.00	Q	|	|	|	|
49+30	0.0025	0.00	Q	|	|	|	|

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   49+45       0.0023      0.00  Q         |         |         |         |
   50+ 0       0.0021      0.00  Q         |         |         |         |
   50+15       0.0020      0.00  Q         |         |         |         |
   50+30       0.0018      0.00  Q         |         |         |         |
   50+45       0.0017      0.00  Q         |         |         |         |
   51+ 0       0.0015      0.00  Q         |         |         |         |
   51+15       0.0014      0.00  Q         |         |         |         |
   51+30       0.0013      0.00  Q         |         |         |         |
   51+45       0.0012      0.00  Q         |         |         |         |
   52+ 0       0.0011      0.00  Q         |         |         |         |
   52+15       0.0010      0.00  Q         |         |         |         |
   52+30       0.0010      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   210
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      757.816 (CFS)
                      Total volume =     297.134 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       76.000 to Point/Station       77.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       _____________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   1600.00 (Ft.)
       Elevation difference =   32.00 (Ft.)
       Slope of channel =  0.020000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  1600.00(Ft.)     Elevation difference =  32.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =   10.000(Ft.)
       Slope or 'Z' of left channel bank =   2.000
       Slope or 'Z' of right channel bank =   2.000
       Manning's 'N'    = 0.030
       Maximum depth of channel  =   10.000(Ft.)
       Flow(q) thru subarea =    202.126(CFS)
       Depth of flow =     1.762(Ft.)
       Average velocity =     8.483(Ft/s)
       Total flow rate =   202.126(CFS)
       Channel flow top width =   17.047(Ft.)
       Depth of flow in channel =   1.76(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =    8.48(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =  202.126(CFS)
       Total capacity of improved channels =    202.126(CFS)
       Critical Depth in Channel =    2.03(Ft.)


       Channel evaluation using maximum flow rate of hydrograph
       Covered channel
       Flow(q) thru subarea =    757.816(CFS)
       Depth of flow =     3.567(Ft.)
       Average velocity =    12.400(Ft/s)
       Total flow rate =   757.816(CFS)
       Channel flow top width =   24.268(Ft.)
       Depth of flow in channel =   3.57(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   12.40(Ft/s)
       Travel time  =    0.00 min.
```

```
Individual channel flow =  757.816(CFS)
Total capacity of improved channels =    757.816(CFS)
Critical Depth in Channel =    4.25(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8794   Travel time =   2.15 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   5.6206
        dt(routing time-step) =   1.89 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      189.5     378.9     568.4     757.8
----------------------------------------------------------------------
  0+15       2.0517      2.35  O         |         |         |         |
  0+30       6.2155      6.77  O         |         |         |         |
  0+45       8.9392      9.25  O         |         |         |         |
  1+ 0      10.9797     11.23  O         |         |         |         |
  1+15      12.0042     12.12  O         |         |         |         |
  1+30      11.3817     11.28  O         |         |         |         |
  1+45      11.3514     11.36  O         |         |         |         |
  2+ 0      12.6018     12.78  O         |         |         |         |
  2+15      14.4318     14.67  O         |         |         |         |
  2+30      15.2579     15.34  O         |         |         |         |
  2+45      16.7323     16.93  O         |         |         |         |
  3+ 0      18.6449     18.89  O         |         |         |         |
  3+15      19.5330     19.63  |O        |         |         |         |
  3+30      20.0353     20.09  |O        |         |         |         |
  3+45      20.4323     20.48  |O        |         |         |         |
  4+ 0      21.8195     22.01  |O        |         |         |         |
  4+15      23.7169     23.96  |O        |         |         |         |
  4+30      25.6270     25.87  |O        |         |         |         |
  4+45      27.6909     27.95  |O        |         |         |         |
  5+ 0      29.6889     29.94  |O        |         |         |         |
  5+15      29.7690     29.74  |O        |         |         |         |
  5+30      28.6993     28.55  |O        |         |         |         |
  5+45      30.7726     31.09  |O        |         |         |         |
  6+ 0      33.0012     33.28  |O        |         |         |         |
  6+15      35.0245     35.28  |O        |         |         |         |
  6+30      37.1414     37.41  |O        |         |         |         |
  6+45      39.1814     39.44  | O       |         |         |         |
  7+ 0      41.3576     41.63  | O       |         |         |         |
  7+15      42.4300     42.54  | O       |         |         |         |
  7+30      44.1238     44.35  | O       |         |         |         |
  7+45      47.2669     47.69  | O       |         |         |         |
  8+ 0      50.9372     51.41  | O       |         |         |         |
  8+15      68.7075     71.20  |  O      |         |         |         |
  8+30      93.9019     97.18  |   OI    |         |         |         |
  8+45     115.7134    118.39  |     O   |         |         |         |
  9+ 0     147.4066    151.59  |      OI |         |         |         |
  9+15     192.3150    198.19  |         O         |         |         |
  9+30     242.2800    248.64  |         | OI      |         |         |
  9+45     282.0843    286.91  |         |   OI    |         |         |
 10+ 0     318.3135    322.84  |         |     OI  |         |         |
 10+15     274.5253    267.55  |         |   O     |         |         |
 10+30     182.7916    170.56  |        O|         |         |         |
 10+45     207.4977    212.83  |         OI        |         |         |
 11+ 0     280.1381    289.85  |         |   OI    |         |         |
 11+15     296.8271    297.83  |         |    O    |         |         |
```

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11+30     291.3297    290.39  |         |    O    |         |         |
11+45     272.5290    269.95  |         |   O     |         |         |
12+ 0     257.2755    255.45  |         |  O      |         |         |
12+15     337.1779    348.97  |         |      OI |         |         |
12+30     457.1896    472.80  |         |         |   O     |         |
12+45     528.2226    536.22  |         |         |      OI |         |
13+ 0     582.7350    589.45  |         |         |         OI        |
13+15     662.3922    672.92  |         |         |         |   OI    |
13+30     747.1111    757.82  |         |         |         |       OI
13+45     666.6141    653.45  |         |         |         |   IO    |
14+ 0     514.9683    494.99  |         |         |     IO  |         |
14+15     511.2453    513.59  |         |         |     OI  |         |
14+30     555.5171    561.57  |         |         |        O|         |
14+45     562.1431    562.23  |         |         |        O|         |
15+ 0     555.4913    554.52  |         |         |        O|         |
15+15     534.8175    531.97  |         |         |       O |         |
15+30     510.0113    506.84  |         |         |     O   |         |
15+45     454.5775    447.04  |         |         |  O      |         |
16+ 0     394.5915    387.02  |         |         O         |         |
16+15     270.1892    253.33  |         |  IO     |         |         |
16+30     107.2084     86.12  |   IO    |         |         |         |
16+45      56.9148     52.70  | IO      |         |         |         |
17+ 0      45.4819     44.44  | O       |         |         |         |
17+15      45.0138     45.10  | O       |         |         |         |
17+30      46.8085     47.06  | O       |         |         |         |
17+45      46.7412     46.70  | O       |         |         |         |
18+ 0      45.0020     44.76  | O       |         |         |         |
18+15      42.6487     42.34  | O       |         |         |         |
18+30      41.3175     41.17  | O       |         |         |         |
18+45      39.3668     39.11  | O       |         |         |         |
19+ 0      36.0072     35.56  |O        |         |         |         |
19+15      34.1949     34.00  |O        |         |         |         |
19+30      35.2911     35.48  |O        |         |         |         |
19+45      35.3442     35.32  |O        |         |         |         |
20+ 0      32.6367     32.25  |O        |         |         |         |
20+15      31.0450     30.87  |O        |         |         |         |
20+30      31.2672     31.32  |O        |         |         |         |
20+45      30.9363     30.88  |O        |         |         |         |
21+ 0      29.3489     29.13  |O        |         |         |         |
21+15      28.2268     28.10  |O        |         |         |         |
21+30      27.6225     27.55  |O        |         |         |         |
21+45      26.4227     26.26  |O        |         |         |         |
22+ 0      25.4201     25.30  |O        |         |         |         |
22+15      24.2918     24.15  |O        |         |         |         |
22+30      23.4537     23.35  |O        |         |         |         |
22+45      21.4528     21.18  |O        |         |         |         |
23+ 0      20.2194     20.08  |O        |         |         |         |
23+15      19.3408     19.23  |O        |         |         |         |
23+30      18.5903     18.50  O         |         |         |         |
23+45      17.9062     17.82  O         |         |         |         |
24+ 0      17.2768     17.20  O         |         |         |         |
24+15      14.6397     14.27  O         |         |         |         |
24+30      10.9708     10.49  O         |         |         |         |
24+45       9.3242      9.16  O         |         |         |         |
25+ 0       8.4382      8.33  O         |         |         |         |
25+15       7.7538      7.67  O         |         |         |         |
25+30       7.1378      7.06  O         |         |         |         |
25+45       6.5711      6.50  O         |         |         |         |
26+ 0       6.0494      5.98  O         |         |         |         |
26+15       5.5691      5.51  O         |         |         |         |
26+30       5.1270      5.07  O         |         |         |         |
26+45       4.7200      4.67  O         |         |         |         |
27+ 0       4.3452      4.30  O         |         |         |         |
27+15       4.0003      3.96  O         |         |         |         |
27+30       3.6827      3.64  O         |         |         |         |
27+45       3.3903      3.35  O         |         |         |         |
28+ 0       3.1211      3.09  O         |         |         |         |
28+15       2.8733      2.84  O         |         |         |         |
28+30       2.6452      2.62  O         |         |         |         |
28+45       2.4352      2.41  O         |         |         |         |
29+ 0       2.2419      2.22  O         |         |         |         |
```

29+15	2.0639	2.04	O	|	|	|	|
29+30	1.9000	1.88	O	|	|	|	|
29+45	1.7492	1.73	O	|	|	|	|
30+ 0	1.6103	1.59	O	|	|	|	|
30+15	1.4825	1.47	O	|	|	|	|
30+30	1.3648	1.35	O	|	|	|	|
30+45	1.2564	1.24	O	|	|	|	|
31+ 0	1.1567	1.14	O	|	|	|	|
31+15	1.0648	1.05	O	|	|	|	|
31+30	0.9803	0.97	O	|	|	|	|
31+45	0.9025	0.89	O	|	|	|	|
32+ 0	0.8308	0.82	O	|	|	|	|
32+15	0.7649	0.76	O	|	|	|	|
32+30	0.7041	0.70	O	|	|	|	|
32+45	0.6482	0.64	O	|	|	|	|
33+ 0	0.5968	0.59	O	|	|	|	|
33+15	0.5494	0.54	O	|	|	|	|
33+30	0.5058	0.50	O	|	|	|	|
33+45	0.4656	0.46	O	|	|	|	|
34+ 0	0.4287	0.42	O	|	|	|	|
34+15	0.3946	0.39	O	|	|	|	|
34+30	0.3633	0.36	O	|	|	|	|
34+45	0.3345	0.33	O	|	|	|	|
35+ 0	0.3079	0.30	O	|	|	|	|
35+15	0.2835	0.28	O	|	|	|	|
35+30	0.2610	0.26	O	|	|	|	|
35+45	0.2402	0.24	O	|	|	|	|
36+ 0	0.2212	0.22	O	|	|	|	|
36+15	0.2036	0.20	O	|	|	|	|
36+30	0.1874	0.19	O	|	|	|	|
36+45	0.1726	0.17	O	|	|	|	|
37+ 0	0.1589	0.16	O	|	|	|	|
37+15	0.1462	0.14	O	|	|	|	|
37+30	0.1346	0.13	O	|	|	|	|
37+45	0.1239	0.12	O	|	|	|	|
38+ 0	0.1141	0.11	O	|	|	|	|
38+15	0.1050	0.10	O	|	|	|	|
38+30	0.0967	0.10	O	|	|	|	|
38+45	0.0890	0.09	O	|	|	|	|
39+ 0	0.0820	0.08	O	|	|	|	|
39+15	0.0755	0.07	O	|	|	|	|
39+30	0.0695	0.07	O	|	|	|	|
39+45	0.0639	0.06	O	|	|	|	|
40+ 0	0.0589	0.06	O	|	|	|	|
40+15	0.0542	0.05	O	|	|	|	|
40+30	0.0499	0.05	O	|	|	|	|
40+45	0.0459	0.05	O	|	|	|	|
41+ 0	0.0423	0.04	O	|	|	|	|
41+15	0.0389	0.04	O	|	|	|	|
41+30	0.0358	0.04	O	|	|	|	|
41+45	0.0330	0.03	O	|	|	|	|
42+ 0	0.0304	0.03	O	|	|	|	|
42+15	0.0280	0.03	O	|	|	|	|
42+30	0.0257	0.03	O	|	|	|	|
42+45	0.0237	0.02	O	|	|	|	|
43+ 0	0.0218	0.02	O	|	|	|	|
43+15	0.0201	0.02	O	|	|	|	|
43+30	0.0185	0.02	O	|	|	|	|
43+45	0.0170	0.02	O	|	|	|	|
44+ 0	0.0157	0.02	O	|	|	|	|
44+15	0.0144	0.01	O	|	|	|	|
44+30	0.0133	0.01	O	|	|	|	|
44+45	0.0122	0.01	O	|	|	|	|
45+ 0	0.0113	0.01	O	|	|	|	|
45+15	0.0104	0.01	O	|	|	|	|
45+30	0.0095	0.01	O	|	|	|	|
45+45	0.0088	0.01	O	|	|	|	|
46+ 0	0.0081	0.01	O	|	|	|	|
46+15	0.0074	0.01	O	|	|	|	|
46+30	0.0069	0.01	O	|	|	|	|
46+45	0.0063	0.01	O	|	|	|	|

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  47+ 0       0.0058      0.01  O         |         |         |         |
  47+15       0.0053      0.01  O         |         |         |         |
  47+30       0.0049      0.00  O         |         |         |         |
  47+45       0.0045      0.00  O         |         |         |         |
  48+ 0       0.0042      0.00  O         |         |         |         |
  48+15       0.0038      0.00  O         |         |         |         |
  48+30       0.0035      0.00  O         |         |         |         |
  48+45       0.0033      0.00  O         |         |         |         |
  49+ 0       0.0030      0.00  O         |         |         |         |
  49+15       0.0028      0.00  O         |         |         |         |
  49+30       0.0025      0.00  O         |         |         |         |
  49+45       0.0023      0.00  O         |         |         |         |
  50+ 0       0.0022      0.00  O         |         |         |         |
  50+15       0.0020      0.00  O         |         |         |         |
  50+30       0.0018      0.00  O         |         |         |         |
  50+45       0.0017      0.00  O         |         |         |         |
  51+ 0       0.0015      0.00  O         |         |         |         |
  51+15       0.0014      0.00  O         |         |         |         |
  51+30       0.0013      0.00  O         |         |         |         |
  51+45       0.0012      0.00  O         |         |         |         |
  52+ 0       0.0011      0.00  O         |         |         |         |
  52+15       0.0010      0.00  O         |         |         |         |
  52+30       0.0010      0.00  O         |         |         |         |
  52+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   211
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      747.111 (CFS)
                      Total volume =     297.134 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       -----------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       76.000 to Point/Station       77.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: SUBA424100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      295.6     591.3     886.9    1182.5
  ----------------------------------------------------------------------
    0+15       1.1843      3.24  Q         |         |         |         |
    0+30       3.5155      9.73  Q         |         |         |         |
    0+45       4.8049     13.74  Q         |         |         |         |
    1+ 0       5.7910     16.77  Q         |         |         |         |
    1+15       6.2555     18.26  Q         |         |         |         |
    1+30       5.6982     17.08  Q         |         |         |         |
    1+45       5.6077     16.96  Q         |         |         |         |
    2+ 0       6.1554     18.76  Q         |         |         |         |
    2+15       7.0048     21.44  Q         |         |         |         |
    2+30       7.1873     22.45  Q         |         |         |         |
    2+45       7.8715     24.60  Q         |         |         |         |
    3+ 0       8.7886     27.43  Q         |         |         |         |
    3+15       9.0259     28.56  Q         |         |         |         |
    3+30       9.1179     29.15  Q         |         |         |         |
    3+45       9.1655     29.60  qQ        |         |         |         |
    4+ 0       9.7850     31.60  qQ        |         |         |         |
```

```
 4+15      10.6546     34.37  qQ        |         |         |         |
 4+30      11.4566     37.08  qQ        |         |         |         |
 4+45      12.4182     40.11  qQ        |         |         |         |
 5+ 0      13.2678     42.96  qQ        |         |         |         |
 5+15      13.0725     42.84  qQ        |         |         |         |
 5+30      12.1830     40.88  qQ        |         |         |         |
 5+45      13.3442     44.12  qQ        |         |         |         |
 6+ 0      14.2872     47.29  qQ        |         |         |         |
 6+15      15.1137     50.14  qQ        |         |         |         |
 6+30      16.0679     53.21  qQ        |         |         |         |
 6+45      16.9450     56.13  qQ        |         |         |         |
 7+ 0      17.9339     59.29  q Q       |         |         |         |
 7+15      18.1914     60.62  q Q       |         |         |         |
 7+30      18.9029     63.03  q Q       |         |         |         |
 7+45      20.4122     67.68  q Q       |         |         |         |
 8+ 0      22.1112     73.05  q Q       |         |         |         |
 8+15      32.1353    100.84  |q Q      |         |         |         |
 8+30      46.4917    140.39  |q  Q     |         |         |         |
 8+45      58.1966    173.91  |q   Q    |         |         |         |
 9+ 0      77.0773    224.48  | q    Q  |         |         |         |
 9+15     103.3977    295.71  |  q      Q         |         |         |
 9+30     133.1379    375.42  |   q     | Q       |         |         |
 9+45     156.3668    438.45  |    q    |   Q     |         |         |
10+ 0     178.6623    496.98  |     q   |     Q   |         |         |
10+15     153.1125    427.64  |    q    |   Q     |         |         |
10+30      99.2200    282.01  |  q     Q|         |         |         |
10+45     118.7054    326.20  |   q     |Q        |         |         |
11+ 0     159.3653    439.50  |    q    |   Q     |         |         |
11+15     163.7320    460.56  |    q    |    Q    |         |         |
11+30     160.5344    451.86  |    q    |    Q    |         |         |
11+45     151.7544    424.28  |    q    |   Q     |         |         |
12+ 0     143.4904    400.77  |   q     |  Q      |         |         |
12+15     191.6873    528.87  |     q   |      Q  |         |         |
12+30     261.1558    718.35  |       q |         |   Q     |         |
12+45     299.0220    827.24  |         q         |      Q  |         |
13+ 0     333.4337    916.17  |         |q        |         Q         |
13+15     383.0572   1045.45  |         | q       |         |    Q    |
13+30     435.4356   1182.55  |         |   q     |         |       Q |
13+45     385.4766   1052.09  |         |  q      |         |    Q    |
14+ 0     297.9547    812.92  |         q         |      Q  |         |
14+15     303.6696    814.91  |         q         |      Q  |         |
14+30     326.2156    881.73  |         |q        |        Q|         |
14+45     323.0922    885.24  |         q         |        Q|         |
15+ 0     318.1070    873.60  |         q         |        Q|         |
15+15     306.8064    841.62  |         q         |       Q |         |
15+30     293.0110    803.02  |        q|         |      Q  |         |
15+45     259.6008    714.18  |       q |         |   Q     |         |
16+ 0     223.5533    618.14  |      q  |         Q         |         |
16+15     150.3431    420.53  |    q    |   Q     |         |         |
16+30      51.4446    158.65  |q   Q    |         |         |         |
16+45      25.9609     82.88  q Q       |         |         |         |
17+ 0      14.0405     59.52  q Q       |         |         |         |
17+15       9.8584     54.87  qQ        |         |         |         |
17+30       8.5140     55.32  qQ        |         |         |         |
17+45       8.8864     55.63  qQ        |         |         |         |
18+ 0       8.4508     53.45  qQ        |         |         |         |
18+15       7.6764     50.33  qQ        |         |         |         |
18+30       7.5212     48.84  qQ        |         |         |         |
18+45       6.8371     46.20  qQ        |         |         |         |
19+ 0       5.3279     41.34  qQ        |         |         |         |
19+15       4.8131     39.01  qQ        |         |         |         |
19+30       5.9729     41.26  qQ        |         |         |         |
19+45       6.3206     41.66  qQ        |         |         |         |
20+ 0       5.0860     37.72  qQ        |         |         |         |
20+15       4.7108     35.76  qQ        |         |         |         |
20+30       5.3533     36.62  qQ        |         |         |         |
20+45       5.4511     36.39  qQ        |         |         |         |
21+ 0       4.8760     34.22  qQ        |         |         |         |
21+15       4.6188     32.85  qQ        |         |         |         |
21+30       4.7136     32.34  qQ        |         |         |         |
21+45       4.5542     30.98  qQ        |         |         |         |
```

22+ 0	4.6661	30.09	qQ	|	|	|	|
22+15	4.5268	28.82	Q	|	|	|	|
22+30	4.6661	28.12	Q	|	|	|	|
22+45	3.9346	25.39	Q	|	|	|	|
23+ 0	3.7966	24.02	Q	|	|	|	|
23+15	3.7247	23.07	Q	|	|	|	|
23+30	3.7045	22.29	Q	|	|	|	|
23+45	3.6771	21.58	Q	|	|	|	|
24+ 0	3.6771	20.95	Q	|	|	|	|
24+15	2.4928	17.13	Q	|	|	|	|
24+30	0.7538	11.72	Q	|	|	|	|
24+45	0.3339	9.66	Q	|	|	|	|
25+ 0	0.1499	8.59	Q	|	|	|	|
25+15	0.0548	7.81	Q	|	|	|	|
25+30	0.0000	7.14	Q	|	|	|	|
25+45	0.0000	6.57	Q	|	|	|	|
26+ 0	0.0000	6.05	Q	|	|	|	|
26+15	0.0000	5.57	Q	|	|	|	|
26+30	0.0000	5.13	Q	|	|	|	|
26+45	0.0000	4.72	Q	|	|	|	|
27+ 0	0.0000	4.35	Q	|	|	|	|
27+15	0.0000	4.00	Q	|	|	|	|
27+30	0.0000	3.68	Q	|	|	|	|
27+45	0.0000	3.39	Q	|	|	|	|
28+ 0	0.0000	3.12	Q	|	|	|	|
28+15	0.0000	2.87	Q	|	|	|	|
28+30	0.0000	2.65	Q	|	|	|	|
28+45	0.0000	2.44	Q	|	|	|	|
29+ 0	0.0000	2.24	Q	|	|	|	|
29+15	0.0000	2.06	Q	|	|	|	|
29+30	0.0000	1.90	Q	|	|	|	|
29+45	0.0000	1.75	Q	|	|	|	|
30+ 0	0.0000	1.61	Q	|	|	|	|
30+15	0.0000	1.48	Q	|	|	|	|
30+30	0.0000	1.36	Q	|	|	|	|
30+45	0.0000	1.26	Q	|	|	|	|
31+ 0	0.0000	1.16	Q	|	|	|	|
31+15	0.0000	1.06	Q	|	|	|	|
31+30	0.0000	0.98	Q	|	|	|	|
31+45	0.0000	0.90	Q	|	|	|	|
32+ 0	0.0000	0.83	Q	|	|	|	|
32+15	0.0000	0.76	Q	|	|	|	|
32+30	0.0000	0.70	Q	|	|	|	|
32+45	0.0000	0.65	Q	|	|	|	|
33+ 0	0.0000	0.60	Q	|	|	|	|
33+15	0.0000	0.55	Q	|	|	|	|
33+30	0.0000	0.51	Q	|	|	|	|
33+45	0.0000	0.47	Q	|	|	|	|
34+ 0	0.0000	0.43	Q	|	|	|	|
34+15	0.0000	0.39	Q	|	|	|	|
34+30	0.0000	0.36	Q	|	|	|	|
34+45	0.0000	0.33	Q	|	|	|	|
35+ 0	0.0000	0.31	Q	|	|	|	|
35+15	0.0000	0.28	Q	|	|	|	|
35+30	0.0000	0.26	Q	|	|	|	|
35+45	0.0000	0.24	Q	|	|	|	|
36+ 0	0.0000	0.22	Q	|	|	|	|
36+15	0.0000	0.20	Q	|	|	|	|
36+30	0.0000	0.19	Q	|	|	|	|
36+45	0.0000	0.17	Q	|	|	|	|
37+ 0	0.0000	0.16	Q	|	|	|	|
37+15	0.0000	0.15	Q	|	|	|	|
37+30	0.0000	0.13	Q	|	|	|	|
37+45	0.0000	0.12	Q	|	|	|	|
38+ 0	0.0000	0.11	Q	|	|	|	|
38+15	0.0000	0.11	Q	|	|	|	|
38+30	0.0000	0.10	Q	|	|	|	|
38+45	0.0000	0.09	Q	|	|	|	|
39+ 0	0.0000	0.08	Q	|	|	|	|
39+15	0.0000	0.08	Q	|	|	|	|
39+30	0.0000	0.07	Q	|	|	|	|

```
   39+45       0.0000      0.06  Q          |          |          |          |
   40+ 0       0.0000      0.06  Q          |          |          |          |
   40+15       0.0000      0.05  Q          |          |          |          |
   40+30       0.0000      0.05  Q          |          |          |          |
   40+45       0.0000      0.05  Q          |          |          |          |
   41+ 0       0.0000      0.04  Q          |          |          |          |
   41+15       0.0000      0.04  Q          |          |          |          |
   41+30       0.0000      0.04  Q          |          |          |          |
   41+45       0.0000      0.03  Q          |          |          |          |
   42+ 0       0.0000      0.03  Q          |          |          |          |
   42+15       0.0000      0.03  Q          |          |          |          |
   42+30       0.0000      0.03  Q          |          |          |          |
   42+45       0.0000      0.02  Q          |          |          |          |
   43+ 0       0.0000      0.02  Q          |          |          |          |
   43+15       0.0000      0.02  Q          |          |          |          |
   43+30       0.0000      0.02  Q          |          |          |          |
   43+45       0.0000      0.02  Q          |          |          |          |
   44+ 0       0.0000      0.02  Q          |          |          |          |
   44+15       0.0000      0.01  Q          |          |          |          |
   44+30       0.0000      0.01  Q          |          |          |          |
   44+45       0.0000      0.01  Q          |          |          |          |
   45+ 0       0.0000      0.01  Q          |          |          |          |
   45+15       0.0000      0.01  Q          |          |          |          |
   45+30       0.0000      0.01  Q          |          |          |          |
   45+45       0.0000      0.01  Q          |          |          |          |
   46+ 0       0.0000      0.01  Q          |          |          |          |
   46+15       0.0000      0.01  Q          |          |          |          |
   46+30       0.0000      0.01  Q          |          |          |          |
   46+45       0.0000      0.01  Q          |          |          |          |
   47+ 0       0.0000      0.01  Q          |          |          |          |
   47+15       0.0000      0.01  Q          |          |          |          |
   47+30       0.0000      0.00  Q          |          |          |          |
   47+45       0.0000      0.00  Q          |          |          |          |
   48+ 0       0.0000      0.00  Q          |          |          |          |
   48+15       0.0000      0.00  Q          |          |          |          |
   48+30       0.0000      0.00  Q          |          |          |          |
   48+45       0.0000      0.00  Q          |          |          |          |
   49+ 0       0.0000      0.00  Q          |          |          |          |
   49+15       0.0000      0.00  Q          |          |          |          |
   49+30       0.0000      0.00  Q          |          |          |          |
   49+45       0.0000      0.00  Q          |          |          |          |
   50+ 0       0.0000      0.00  Q          |          |          |          |
   50+15       0.0000      0.00  Q          |          |          |          |
   50+30       0.0000      0.00  Q          |          |          |          |
   50+45       0.0000      0.00  Q          |          |          |          |
   51+ 0       0.0000      0.00  Q          |          |          |          |
   51+15       0.0000      0.00  Q          |          |          |          |
   51+30       0.0000      0.00  Q          |          |          |          |
   51+45       0.0000      0.00  Q          |          |          |          |
   52+ 0       0.0000      0.00  Q          |          |          |          |
   52+15       0.0000      0.00  Q          |          |          |          |
   52+30       0.0000      0.00  Q          |          |          |          |
   52+45       0.0000      0.00  Q          |          |          |          |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   211
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     1182.547 (CFS)
                      Total volume =     454.809 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       77.000 to Point/Station       78.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
```

```
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1600.00 (Ft.)
Elevation difference =   30.00 (Ft.)
Slope of channel =  0.018750 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1600.00(Ft.)     Elevation difference =  30.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    314.332(CFS)
Depth of flow =     2.283(Ft.)
Average velocity =     9.453(Ft/s)
Total flow rate =   314.332(CFS)
Channel flow top width =   19.132(Ft.)
Depth of flow in channel =   2.28(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.45(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  314.332(CFS)
Total capacity of improved channels =    314.332(CFS)
Critical Depth in Channel =    2.63(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1182.547(CFS)
Depth of flow =     4.538(Ft.)
Average velocity =    13.659(Ft/s)
Total flow rate =  1182.547(CFS)
Channel flow top width =   28.154(Ft.)
Depth of flow in channel =   4.54(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   13.66(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1182.547(CFS)
Total capacity of improved channels =   1182.547(CFS)
Critical Depth in Channel =    5.38(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8893   Travel time =   1.95 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   6.0929
       dt(routing time-step) =   1.74 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      295.6     591.3     886.9    1182.5
----------------------------------------------------------------------
  0+15       2.8614      3.24  O         |         |         |         |
  0+30       8.9792      9.73  O         |         |         |         |
  0+45      13.2796     13.74  O         |         |         |         |
  1+ 0      16.4204     16.77  O         |         |         |         |
```

```
 1+15      18.0874     18.26  O         |         |         |         |
 1+30      17.2165     17.08  O         |         |         |         |
 1+45      16.9731     16.96  O         |         |         |         |
 2+ 0      18.5491     18.76  O         |         |         |         |
 2+15      21.1264     21.44  O         |         |         |         |
 2+30      22.3285     22.45  O         |         |         |         |
 2+45      24.3539     24.60  O         |         |         |         |
 3+ 0      27.1059     27.43  O         |         |         |         |
 3+15      28.4286     28.56  O         |         |         |         |
 3+30      29.0844     29.15  O         |         |         |         |
 3+45      29.5463     29.60  OI        |         |         |         |
 4+ 0      31.3722     31.60  |O        |         |         |         |
 4+15      34.0512     34.37  |O        |         |         |         |
 4+30      36.7697     37.08  |O        |         |         |         |
 4+45      39.7589     40.11  |O        |         |         |         |
 5+ 0      42.6271     42.96  |O        |         |         |         |
 5+15      42.8548     42.84  |O        |         |         |         |
 5+30      41.1091     40.88  |O        |         |         |         |
 5+45      43.7425     44.12  |O        |         |         |         |
 6+ 0      46.9213     47.29  |O        |         |         |         |
 6+15      49.8083     50.14  |O        |         |         |         |
 6+30      52.8538     53.21  |O        |         |         |         |
 6+45      55.7887     56.13  |O        |         |         |         |
 7+ 0      58.9252     59.29  |OI       |         |         |         |
 7+15      60.4675     60.62  | O       |         |         |         |
 7+30      62.7483     63.03  | O       |         |         |         |
 7+45      67.1405     67.68  | O       |         |         |         |
 8+ 0      72.4269     73.05  | O       |         |         |         |
 8+15      97.6255    100.84  |  O      |         |         |         |
 8+30     135.8155    140.39  |   O     |         |         |         |
 8+45     170.0303    173.91  |    O    |         |         |         |
 9+ 0     218.6298    224.48  |      O  |         |         |         |
 9+15     287.4679    295.71  |        OI         |         |         |
 9+30     366.1919    375.42  |         | O       |         |         |
 9+45     431.1549    438.45  |         |   O     |         |         |
10+ 0     490.2014    496.98  |         |     O   |         |         |
10+15     435.6637    427.64  |         |   O     |         |         |
10+30     298.8681    282.01  |        IO         |         |         |
10+45     321.0879    326.20  |         OI        |         |         |
11+ 0     426.3886    439.50  |         |   O     |         |         |
11+15     458.1218    460.56  |         |    O    |         |         |
11+30     452.8706    451.86  |         |    O    |         |         |
11+45     427.4758    424.28  |         |   O     |         |         |
12+ 0     403.4881    400.77  |         |  O      |         |         |
12+15     514.0375    528.87  |         |      O  |         |         |
12+30     696.4128    718.35  |         |         |  OI     |         |
12+45     814.6393    827.24  |         |         |      O  |         |
13+ 0     905.8756    916.17  |         |         |        O         |
13+15    1030.4849   1045.45  |         |         |         |   OI    |
13+30    1166.6774   1182.55  |         |         |         |       OI
13+45    1067.1912   1052.09  |         |         |         |    IO   |
14+ 0     840.6071    812.92  |         |         |      IO |         |
14+15     814.6844    814.91  |         |         |      O  |         |
14+30     873.9985    881.73  |         |         |        O|         |
14+45     884.8298    885.24  |         |         |        O|         |
15+ 0     874.9453    873.60  |         |         |        O|         |
15+15     845.3249    841.62  |         |         |       O |         |
15+30     807.4905    803.02  |         |         |      O  |         |
15+45     724.4621    714.18  |         |         |   O     |         |
16+ 0     629.2609    618.14  |         |        IO         |         |
16+15     443.4063    420.53  |         |   O     |         |         |
16+30     188.9660    158.65  |    IO   |         |         |         |
16+45      91.6470     82.88  | IO      |         |         |         |
17+ 0      62.2256     59.52  | O       |         |         |         |
17+15      55.4104     54.87  |O        |         |         |         |
17+30      55.2704     55.32  |O        |         |         |         |
17+45      55.5923     55.63  |O        |         |         |         |
18+ 0      53.7046     53.45  |O        |         |         |         |
18+15      50.6871     50.33  |O        |         |         |         |
18+30      49.0108     48.84  |O        |         |         |         |
18+45      46.5088     46.20  |O        |         |         |         |
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19+ 0      41.8986     41.34  |O        |         |         |         |
19+15      39.2774     39.01  |O        |         |         |         |
19+30      41.0028     41.26  |O        |         |         |         |
19+45      41.6185     41.66  |O        |         |         |         |
20+ 0      38.1790     37.72  |O        |         |         |         |
20+15      35.9835     35.76  |O        |         |         |         |
20+30      36.5205     36.62  |O        |         |         |         |
20+45      36.4144     36.39  |O        |         |         |         |
21+ 0      34.4752     34.22  |O        |         |         |         |
21+15      33.0052     32.85  |O        |         |         |         |
21+30      32.3951     32.34  |O        |         |         |         |
21+45      31.1342     30.98  |O        |         |         |         |
22+ 0      30.1893     30.09  |O        |         |         |         |
22+15      28.9653     28.82  O         |         |         |         |
22+30      28.2007     28.12  O         |         |         |         |
22+45      25.7037     25.39  O         |         |         |         |
23+ 0      24.1747     24.02  O         |         |         |         |
23+15      23.1755     23.07  O         |         |         |         |
23+30      22.3840     22.29  O         |         |         |         |
23+45      21.6657     21.58  O         |         |         |         |
24+ 0      21.0268     20.95  O         |         |         |         |
24+15      17.5749     17.13  O         |         |         |         |
24+30      12.3506     11.72  O         |         |         |         |
24+45       9.8973      9.66  O         |         |         |         |
25+ 0       8.7119      8.59  O         |         |         |         |
25+15       7.8988      7.81  O         |         |         |         |
25+30       7.2154      7.14  O         |         |         |         |
25+45       6.6367      6.57  O         |         |         |         |
26+ 0       6.1098      6.05  O         |         |         |         |
26+15       5.6247      5.57  O         |         |         |         |
26+30       5.1782      5.13  O         |         |         |         |
26+45       4.7671      4.72  O         |         |         |         |
27+ 0       4.3886      4.35  O         |         |         |         |
27+15       4.0402      4.00  O         |         |         |         |
27+30       3.7194      3.68  O         |         |         |         |
27+45       3.4241      3.39  O         |         |         |         |
28+ 0       3.1523      3.12  O         |         |         |         |
28+15       2.9020      2.87  O         |         |         |         |
28+30       2.6716      2.65  O         |         |         |         |
28+45       2.4595      2.44  O         |         |         |         |
29+ 0       2.2643      2.24  O         |         |         |         |
29+15       2.0845      2.06  O         |         |         |         |
29+30       1.9190      1.90  O         |         |         |         |
29+45       1.7666      1.75  O         |         |         |         |
30+ 0       1.6264      1.61  O         |         |         |         |
30+15       1.4973      1.48  O         |         |         |         |
30+30       1.3784      1.36  O         |         |         |         |
30+45       1.2690      1.26  O         |         |         |         |
31+ 0       1.1682      1.16  O         |         |         |         |
31+15       1.0755      1.06  O         |         |         |         |
31+30       0.9901      0.98  O         |         |         |         |
31+45       0.9115      0.90  O         |         |         |         |
32+ 0       0.8391      0.83  O         |         |         |         |
32+15       0.7725      0.76  O         |         |         |         |
32+30       0.7112      0.70  O         |         |         |         |
32+45       0.6547      0.65  O         |         |         |         |
33+ 0       0.6027      0.60  O         |         |         |         |
33+15       0.5549      0.55  O         |         |         |         |
33+30       0.5108      0.51  O         |         |         |         |
33+45       0.4703      0.47  O         |         |         |         |
34+ 0       0.4329      0.43  O         |         |         |         |
34+15       0.3986      0.39  O         |         |         |         |
34+30       0.3669      0.36  O         |         |         |         |
34+45       0.3378      0.33  O         |         |         |         |
35+ 0       0.3110      0.31  O         |         |         |         |
35+15       0.2863      0.28  O         |         |         |         |
35+30       0.2636      0.26  O         |         |         |         |
35+45       0.2426      0.24  O         |         |         |         |
36+ 0       0.2234      0.22  O         |         |         |         |
36+15       0.2056      0.20  O         |         |         |         |
36+30       0.1893      0.19  O         |         |         |         |
```

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   36+45       0.1743      0.17  O         |         |         |         |
   37+ 0       0.1604      0.16  O         |         |         |         |
   37+15       0.1477      0.15  O         |         |         |         |
   37+30       0.1360      0.13  O         |         |         |         |
   37+45       0.1252      0.12  O         |         |         |         |
   38+ 0       0.1152      0.11  O         |         |         |         |
   38+15       0.1061      0.11  O         |         |         |         |
   38+30       0.0977      0.10  O         |         |         |         |
   38+45       0.0899      0.09  O         |         |         |         |
   39+ 0       0.0828      0.08  O         |         |         |         |
   39+15       0.0762      0.08  O         |         |         |         |
   39+30       0.0702      0.07  O         |         |         |         |
   39+45       0.0646      0.06  O         |         |         |         |
   40+ 0       0.0595      0.06  O         |         |         |         |
   40+15       0.0547      0.05  O         |         |         |         |
   40+30       0.0504      0.05  O         |         |         |         |
   40+45       0.0464      0.05  O         |         |         |         |
   41+ 0       0.0427      0.04  O         |         |         |         |
   41+15       0.0393      0.04  O         |         |         |         |
   41+30       0.0362      0.04  O         |         |         |         |
   41+45       0.0333      0.03  O         |         |         |         |
   42+ 0       0.0307      0.03  O         |         |         |         |
   42+15       0.0282      0.03  O         |         |         |         |
   42+30       0.0260      0.03  O         |         |         |         |
   42+45       0.0239      0.02  O         |         |         |         |
   43+ 0       0.0220      0.02  O         |         |         |         |
   43+15       0.0203      0.02  O         |         |         |         |
   43+30       0.0187      0.02  O         |         |         |         |
   43+45       0.0172      0.02  O         |         |         |         |
   44+ 0       0.0158      0.02  O         |         |         |         |
   44+15       0.0146      0.01  O         |         |         |         |
   44+30       0.0134      0.01  O         |         |         |         |
   44+45       0.0123      0.01  O         |         |         |         |
   45+ 0       0.0114      0.01  O         |         |         |         |
   45+15       0.0105      0.01  O         |         |         |         |
   45+30       0.0096      0.01  O         |         |         |         |
   45+45       0.0089      0.01  O         |         |         |         |
   46+ 0       0.0082      0.01  O         |         |         |         |
   46+15       0.0075      0.01  O         |         |         |         |
   46+30       0.0069      0.01  O         |         |         |         |
   46+45       0.0064      0.01  O         |         |         |         |
   47+ 0       0.0059      0.01  O         |         |         |         |
   47+15       0.0054      0.01  O         |         |         |         |
   47+30       0.0050      0.00  O         |         |         |         |
   47+45       0.0046      0.00  O         |         |         |         |
   48+ 0       0.0042      0.00  O         |         |         |         |
   48+15       0.0039      0.00  O         |         |         |         |
   48+30       0.0036      0.00  O         |         |         |         |
   48+45       0.0033      0.00  O         |         |         |         |
   49+ 0       0.0030      0.00  O         |         |         |         |
   49+15       0.0028      0.00  O         |         |         |         |
   49+30       0.0026      0.00  O         |         |         |         |
   49+45       0.0024      0.00  O         |         |         |         |
   50+ 0       0.0022      0.00  O         |         |         |         |
   50+15       0.0020      0.00  O         |         |         |         |
   50+30       0.0018      0.00  O         |         |         |         |
   50+45       0.0017      0.00  O         |         |         |         |
   51+ 0       0.0016      0.00  O         |         |         |         |
   51+15       0.0014      0.00  O         |         |         |         |
   51+30       0.0013      0.00  O         |         |         |         |
   51+45       0.0012      0.00  O         |         |         |         |
   52+ 0       0.0011      0.00  O         |         |         |         |
   52+15       0.0010      0.00  O         |         |         |         |
   52+30       0.0010      0.00  O         |         |         |         |
   52+45       0.0001      0.00  O         |         |         |         |
   53+ 0       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   212
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =     1166.677 (CFS)
```

```
                Total volume =     454.809 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       78.000 to Point/Station       78.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSA24hr.rte
****************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 02/13/12

      ------------------------------------------------------------------


      Watershed A, Offsite, Sketcher Site, routed
      Exist condition, 100 yr 24 hr


      -------------------------------------------------------------------


      Program License Serial Number 6097

      --------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: Sketcher24100.rte
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       71.015 (CFS)
                    Total volume =      41.708 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        0.000 to Point/Station        1.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      --------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.00(Ft.)
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Initial basin depth =   0.00 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      --------------------------------------------------------------------
      --------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      --------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000      5.000     20.000      4.793        5.207
         4.000     10.000     30.000      9.690       10.310
      --------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      --------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      --------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      17.8   35.51   53.26   71.01 (Ft.)
 0.250    2.28    0.08      0.023  OI      |       |       |       |     2.00
 0.500    4.92    0.36      0.092  O I     |       |       |       |     2.02
```

```
 0.750    5.91    0.76      0.193  O I     |       |       |       |     2.04
 1.000    7.18    1.22      0.307  O  I    |       |       |       |     2.06
 1.250    6.78    1.68      0.422  O  I    |       |       |       |     2.08
 1.500    6.16    2.06      0.517  O I     |       |       |       |     2.10
 1.750    6.04    2.38      0.597  |OI     |       |       |       |     2.12
 2.000    7.18    2.72      0.681  |O I    |       |       |       |     2.14
 2.250    7.92    3.10      0.776  |O I    |       |       |       |     2.15
 2.500    8.05    3.49      0.873  |O I    |       |       |       |     2.17
 2.750    9.19    3.90      0.975  |O  I   |       |       |       |     2.19
 3.000    9.94    4.35      1.088  |O  I   |       |       |       |     2.22
 3.250   10.06    4.79      1.200  | O I   |       |       |       |     2.24
 3.500   10.06    5.21      1.304  | O I   |       |       |       |     2.26
 3.750   10.06    5.60      1.400  | O I   |       |       |       |     2.28
 4.000   11.20    6.00      1.500  | O  I  |       |       |       |     2.30
 4.250   11.95    6.44      1.611  | O  I  |       |       |       |     2.32
 4.500   13.21    6.93      1.733  |  O I  |       |       |       |     2.35
 4.750   13.96    7.46      1.865  |  O  I |       |       |       |     2.37
 5.000   15.22    8.02      2.006  |  O  I |       |       |       |     2.40
 5.250   13.69    8.53      2.134  |  O  I |       |       |       |     2.43
 5.500   13.46    8.93      2.234  |   O I |       |       |       |     2.45
 5.750   15.10    9.36      2.340  |   O I |       |       |       |     2.47
 6.000   15.97    9.85      2.463  |   O  I|       |       |       |     2.49
 6.250   17.24   10.38      2.597  |   O  I|       |       |       |     2.52
 6.500   17.98   10.96      2.740  |   O   I       |       |       |     2.55
 6.750   19.25   11.57      2.892  |    O  I       |       |       |     2.58
 7.000   19.99   12.21      3.052  |    O  |I      |       |       |     2.61
 7.250   20.12   12.83      3.208  |    O  |I      |       |       |     2.64
 7.500   21.26   13.45      3.364  |     O |I      |       |       |     2.67
 7.750   23.15   14.15      3.537  |     O | I     |       |       |     2.71
 8.000   25.16   14.94      3.736  |     O |  I    |       |       |     2.75
 8.250   28.31   15.88      3.970  |      O|   I   |       |       |     2.79
 8.500   29.93   16.93      4.233  |      O|    I  |       |       |     2.85
 8.750   31.32   18.02      4.504  |       O     I |       |       |     2.90
 9.000   33.21   19.15      4.787  |       O     I |       |       |     2.96
 9.250   36.36   20.20      5.099  |       |O      I       |       |     3.02
 9.500   39.12   20.91      5.454  |       |O      |I      |       |     3.09
 9.750   41.25   21.69      5.844  |       |O      | I     |       |     3.17
10.000   43.27   22.52      6.261  |       | O     |  I    |       |     3.25
10.250   36.15   23.22      6.609  |       | O     I       |       |     3.32
10.500   31.05   23.64      6.819  |       | O  I  |       |       |     3.36
10.750   35.88   24.04      7.018  |       | O     I       |       |     3.40
11.000   39.62   24.59      7.295  |       |  O    |I      |       |     3.46
11.250   39.10   25.19      7.594  |       |  O    |I      |       |     3.52
11.500   38.35   25.74      7.868  |       |  O    |I      |       |     3.57
11.750   35.94   26.20      8.099  |       |  O    I       |       |     3.62
12.000   35.59   26.59      8.293  |       |  O    I       |       |     3.66
12.250   44.08   27.12      8.561  |       |   O   |  I    |       |     3.71
12.500   50.57   27.94      8.970  |       |   O   |     I |       |     3.79
12.750   54.47   28.94      9.468  |       |    O  |       I       |     3.89
       Warning: Basin depth limit exceeded, the data here is an estimation
13.000   57.22   30.02     10.012  |       |    O  |       |I      |     4.00
       Warning: Basin depth limit exceeded, the data here is an estimation
13.250   65.74   31.30     10.649  |       |     O |       |    I  |     4.13
       Warning: Basin depth limit exceeded, the data here is an estimation
13.500   71.01   32.80     11.400  |       |     O |       |       I     4.28
       Warning: Basin depth limit exceeded, the data here is an estimation
13.750   57.39   34.07     12.035  |       |      O|       |I      |     4.41
       Warning: Basin depth limit exceeded, the data here is an estimation
14.000   47.86   34.82     12.411  |       |      O|    I  |       |     4.48
       Warning: Basin depth limit exceeded, the data here is an estimation
14.250   50.84   35.41     12.705  |       |      O|     I |       |     4.54
       Warning: Basin depth limit exceeded, the data here is an estimation
14.500   52.68   36.07     13.036  |       |       O      I|       |     4.61
       Warning: Basin depth limit exceeded, the data here is an estimation
14.750   52.43   36.74     13.370  |       |       O      I|       |     4.67
       Warning: Basin depth limit exceeded, the data here is an estimation
15.000   51.17   37.35     13.675  |       |       O      I|       |     4.73
       Warning: Basin depth limit exceeded, the data here is an estimation
15.250   49.28   37.87     13.935  |       |       |O    I |       |     4.79
       Warning: Basin depth limit exceeded, the data here is an estimation
15.500   47.27   38.29     14.146  |       |       |O   I  |       |     4.83
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      Warning: Basin depth limit exceeded, the data here is an estimation
15.750   41.83   38.54     14.272  |        |        |OI     |        |     4.85
      Warning: Basin depth limit exceeded, the data here is an estimation
16.000   38.72   38.62     14.308  |        |        |O      |        |     4.86
      Warning: Basin depth limit exceeded, the data here is an estimation
16.250   21.11   38.26     14.131  |        |I      |O      |        |     4.83
      Warning: Basin depth limit exceeded, the data here is an estimation
16.500    9.91   37.34     13.671  |   I    |       O       |        |     4.73
      Warning: Basin depth limit exceeded, the data here is an estimation
16.750    6.91   36.17     13.085  |  I     |       O       |        |     4.62
      Warning: Basin depth limit exceeded, the data here is an estimation
17.000    6.16   34.97     12.485  | I      |      O|       |        |     4.50
      Warning: Basin depth limit exceeded, the data here is an estimation
17.250    8.32   33.85     11.924  |  I     |      O|       |        |     4.38
      Warning: Basin depth limit exceeded, the data here is an estimation
17.500    9.81   32.84     11.422  |   I    |     O |       |        |     4.28
      Warning: Basin depth limit exceeded, the data here is an estimation
17.750   10.06   31.92     10.958  |   I    |     O |       |        |     4.19
      Warning: Basin depth limit exceeded, the data here is an estimation
18.000    8.92   31.01     10.504  |   I    |    O  |       |        |     4.10
      Warning: Basin depth limit exceeded, the data here is an estimation
18.250    8.17   30.10     10.050  |  I     |    O  |       |        |     4.01
18.500    8.05   29.21      9.605  |  I     |    O  |       |        |     3.92
18.750    6.91   28.33      9.165  |  I     |   O   |       |        |     3.83
19.000    5.02   27.42      8.712  | I      |   O   |       |        |     3.74
19.250    5.29   26.52      8.261  | I      |  O    |       |        |     3.65
19.500    7.05   25.70      7.849  |  I     |  O    |       |        |     3.57
19.750    6.78   24.94      7.469  |  I     |  O    |       |        |     3.49
20.000    5.02   24.17      7.083  | I      | O     |       |        |     3.42
20.250    5.29   23.40      6.699  | I      | O     |       |        |     3.34
20.500    5.91   22.68      6.338  | I      | O     |       |        |     3.27
20.750    6.04   22.00      6.000  | I     |O      |       |        |     3.20
21.000    4.89   21.33      5.665  | I     |O      |       |        |     3.13
21.250    5.29   20.67      5.337  | I     |O      |       |        |     3.07
21.500    4.77   20.04      5.020  | I     |O      |       |        |     3.00
21.750    5.29   18.89      4.722  | I     O       |       |        |     2.94
22.000    4.77   17.79      4.447  | I     O       |       |        |     2.89
22.250    5.29   16.77      4.194  | I    O|       |       |        |     2.84
22.500    4.77   15.84      3.961  | I    O|       |       |        |     2.79
22.750    4.15   14.94      3.735  |I    O |       |       |        |     2.75
23.000    4.02   14.08      3.520  |I    O |       |       |        |     2.70
23.250    4.02   13.28      3.320  |I   O  |       |       |        |     2.66
23.500    4.02   12.54      3.137  |I   O  |       |       |        |     2.63
23.750    4.02   11.87      2.968  |I   O  |       |       |        |     2.59
24.000    4.02   11.24      2.812  |I   O  |       |       |        |     2.56
24.250    1.74   10.58      2.646  I   O   |       |       |        |     2.53
24.500    0.25    9.82      2.456  I   O   |       |       |        |     2.49
24.750    0.00    9.05      2.263  I   O   |       |       |        |     2.45
25.000    0.00    8.33      2.084  I  O    |       |       |        |     2.42
25.250    0.00    7.67      1.919  I  O    |       |       |        |     2.38
25.500    0.00    7.06      1.766  I  O    |       |       |        |     2.35
25.750    0.00    6.50      1.626  I O     |       |       |        |     2.32
26.000    0.00    5.98      1.497  I O     |       |       |        |     2.30
26.250    0.00    5.51      1.379  I O     |       |       |        |     2.28
26.500    0.00    5.07      1.269  I O     |       |       |        |     2.25
26.750    0.00    4.67      1.169  I O     |       |       |        |     2.23
27.000    0.00    4.30      1.076  IO      |       |       |        |     2.21
27.250    0.00    3.96      0.991  IO      |       |       |        |     2.20
27.500    0.00    3.64      0.912  IO      |       |       |        |     2.18
27.750    0.00    3.35      0.840  IO      |       |       |        |     2.17
28.000    0.00    3.09      0.773  IO      |       |       |        |     2.15
28.250    0.00    2.84      0.712  IO      |       |       |        |     2.14
28.500    0.00    2.62      0.656  IO      |       |       |        |     2.13
28.750    0.00    2.41      0.604  IO      |       |       |        |     2.12
29.000    0.00    2.22      0.556  O       |       |       |        |     2.11
29.250    0.00    2.04      0.512  O       |       |       |        |     2.10
29.500    0.00    1.88      0.471  O       |       |       |        |     2.09
29.750    0.00    1.73      0.434  O       |       |       |        |     2.09
30.000    0.00    1.59      0.400  O       |       |       |        |     2.08
30.250    0.00    1.47      0.368  O       |       |       |        |     2.07
30.500    0.00    1.35      0.339  O       |       |       |        |     2.07
```

30.750	0.00	1.24	0.312	O	|	|	|	|	2.06
31.000	0.00	1.14	0.288	O	|	|	|	|	2.06
31.250	0.00	1.05	0.265	O	|	|	|	|	2.05
31.500	0.00	0.97	0.244	O	|	|	|	|	2.05
31.750	0.00	0.89	0.225	O	|	|	|	|	2.04
32.000	0.00	0.82	0.207	O	|	|	|	|	2.04
32.250	0.00	0.76	0.191	O	|	|	|	|	2.04
32.500	0.00	0.70	0.176	O	|	|	|	|	2.03
32.750	0.00	0.64	0.162	O	|	|	|	|	2.03
33.000	0.00	0.59	0.149	O	|	|	|	|	2.03
33.250	0.00	0.54	0.138	O	|	|	|	|	2.03
33.500	0.00	0.50	0.127	O	|	|	|	|	2.02
33.750	0.00	0.46	0.117	O	|	|	|	|	2.02
34.000	0.00	0.42	0.108	O	|	|	|	|	2.02
34.250	0.00	0.39	0.099	O	|	|	|	|	2.02
34.500	0.00	0.36	0.092	O	|	|	|	|	2.02
34.750	0.00	0.33	0.084	O	|	|	|	|	2.02
35.000	0.00	0.30	0.078	O	|	|	|	|	2.02
35.250	0.00	0.28	0.072	O	|	|	|	|	2.01
35.500	0.00	0.26	0.066	O	|	|	|	|	2.01
35.750	0.00	0.24	0.061	O	|	|	|	|	2.01
36.000	0.00	0.22	0.056	O	|	|	|	|	2.01
36.250	0.00	0.20	0.052	O	|	|	|	|	2.01
36.500	0.00	0.19	0.048	O	|	|	|	|	2.01
36.750	0.00	0.17	0.044	O	|	|	|	|	2.01
37.000	0.00	0.16	0.041	O	|	|	|	|	2.01
37.250	0.00	0.14	0.038	O	|	|	|	|	2.01
37.500	0.00	0.13	0.035	O	|	|	|	|	2.01
37.750	0.00	0.12	0.032	O	|	|	|	|	2.01
38.000	0.00	0.11	0.030	O	|	|	|	|	2.01
38.250	0.00	0.10	0.028	O	|	|	|	|	2.01
38.500	0.00	0.10	0.026	O	|	|	|	|	2.00
38.750	0.00	0.09	0.024	O	|	|	|	|	2.00
39.000	0.00	0.08	0.022	O	|	|	|	|	2.00
39.250	0.00	0.07	0.020	O	|	|	|	|	2.00
39.500	0.00	0.07	0.019	O	|	|	|	|	2.00
39.750	0.00	0.06	0.018	O	|	|	|	|	2.00
40.000	0.00	0.06	0.016	O	|	|	|	|	2.00
40.250	0.00	0.05	0.015	O	|	|	|	|	2.00
40.500	0.00	0.05	0.014	O	|	|	|	|	2.00
40.750	0.00	0.05	0.013	O	|	|	|	|	2.00
41.000	0.00	0.04	0.012	O	|	|	|	|	2.00
41.250	0.00	0.04	0.011	O	|	|	|	|	2.00
41.500	0.00	0.04	0.011	O	|	|	|	|	2.00
41.750	0.00	0.03	0.010	O	|	|	|	|	2.00
42.000	0.00	0.03	0.009	O	|	|	|	|	2.00
42.250	0.00	0.03	0.009	O	|	|	|	|	2.00
42.500	0.00	0.03	0.008	O	|	|	|	|	2.00
42.750	0.00	0.02	0.008	O	|	|	|	|	2.00
43.000	0.00	0.02	0.007	O	|	|	|	|	2.00
43.250	0.00	0.02	0.007	O	|	|	|	|	2.00
43.500	0.00	0.02	0.006	O	|	|	|	|	2.00
43.750	0.00	0.02	0.006	O	|	|	|	|	2.00
44.000	0.00	0.02	0.006	O	|	|	|	|	2.00
44.250	0.00	0.01	0.005	O	|	|	|	|	2.00
44.500	0.00	0.01	0.005	O	|	|	|	|	2.00
44.750	0.00	0.01	0.005	O	|	|	|	|	2.00
45.000	0.00	0.01	0.005	O	|	|	|	|	2.00
45.250	0.00	0.01	0.004	O	|	|	|	|	2.00
45.500	0.00	0.01	0.004	O	|	|	|	|	2.00
45.750	0.00	0.01	0.004	O	|	|	|	|	2.00
46.000	0.00	0.01	0.004	O	|	|	|	|	2.00
46.250	0.00	0.01	0.004	O	|	|	|	|	2.00
46.500	0.00	0.01	0.003	O	|	|	|	|	2.00
46.750	0.00	0.01	0.003	O	|	|	|	|	2.00
47.000	0.00	0.01	0.003	O	|	|	|	|	2.00
47.250	0.00	0.01	0.003	O	|	|	|	|	2.00
47.500	0.00	0.00	0.003	O	|	|	|	|	2.00
47.750	0.00	0.00	0.003	O	|	|	|	|	2.00
48.000	0.00	0.00	0.003	O	|	|	|	|	2.00
48.250	0.00	0.00	0.003	O	|	|	|	|	2.00

```
48.500    0.00    0.00      0.003  O       |       |       |       |     2.00
48.750    0.00    0.00      0.003  O       |       |       |       |     2.00
49.000    0.00    0.00      0.002  O       |       |       |       |     2.00
49.250    0.00    0.00      0.002  O       |       |       |       |     2.00
49.500    0.00    0.00      0.002  O       |       |       |       |     2.00
49.750    0.00    0.00      0.002  O       |       |       |       |     2.00
50.000    0.00    0.00      0.002  O       |       |       |       |     2.00
50.250    0.00    0.00      0.002  O       |       |       |       |     2.00
50.500    0.00    0.00      0.002  O       |       |       |       |     2.00
50.750    0.00    0.00      0.002  O       |       |       |       |     2.00
51.000    0.00    0.00      0.002  O       |       |       |       |     2.00
51.250    0.00    0.00      0.002  O       |       |       |       |     2.00
51.500    0.00    0.00      0.002  O       |       |       |       |     2.00
51.750    0.00    0.00      0.002  O       |       |       |       |     2.00
52.000    0.00    0.00      0.002  O       |       |       |       |     2.00
52.250    0.00    0.00      0.002  O       |       |       |       |     2.00
52.500    0.00    0.00      0.002  O       |       |       |       |     1.98

       Remaining water in basin =    0.00 (Ac.Ft)

       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   210
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       38.615 (CFS)
                      Total volume =      41.706 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        0.000 to Point/Station        1.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ______________________________________________________________________
       Current stream hydrograph saved in file SketcherRT.rte
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------
```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 02/13/12

------------------------------------------------------------------


Watershed A, Offsite, north of 60fwy, subdrain area A2, A3 Routed
Exist condition, 100 yr 24 hr


-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SUBA324100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    99
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      231.104 (CFS)
               Total volume =      81.134 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       81.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    200.00 (Ft.)
Elevation difference =    4.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   200.00(Ft.)     Elevation difference =   4.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    8.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =     58.102(CFS)
Depth of flow =     0.677(Ft.)
Average velocity =     9.886(Ft/s)
Total flow rate =    58.102(CFS)
Channel flow top width =    9.355(Ft.)
Depth of flow in channel =   0.68(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.89(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   58.102(CFS)
Total capacity of improved channels =     58.102(CFS)
Critical Depth in Channel =    1.13(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    231.104(CFS)
```

```
Depth of flow =     1.540(Ft.)
Average velocity =    15.726(Ft/s)
Total flow rate =   231.104(CFS)
Channel flow top width =   11.081(Ft.)
Depth of flow in channel =   1.54(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   15.73(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  231.104(CFS)
Total capacity of improved channels =    231.104(CFS)
Critical Depth in Channel =    2.63(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9024   Travel time =   0.21 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  52.6123
       dt(routing time-step) =   0.19 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       57.8     115.6     173.3     231.1
----------------------------------------------------------------------
  0+15       0.7225      0.73  O         |         |         |         |
  0+30       2.0558      2.07  O         |         |         |         |
  0+45       2.7069      2.72  O         |         |         |         |
  1+ 0       3.1814      3.19  O         |         |         |         |
  1+15       3.3220      3.32  O         |         |         |         |
  1+30       2.9186      2.91  O         |         |         |         |
  1+45       2.8515      2.85  O         |         |         |         |
  2+ 0       3.1976      3.20  O         |         |         |         |
  2+15       3.6834      3.69  O         |         |         |         |
  2+30       3.7659      3.77  O         |         |         |         |
  2+45       4.1426      4.15  O         |         |         |         |
  3+ 0       4.6288      4.64  O         |         |         |         |
  3+15       4.7113      4.71  O         |         |         |         |
  3+30       4.7267      4.73  O         |         |         |         |
  3+45       4.7269      4.73  O         |         |         |         |
  4+ 0       5.0881      5.09  O         |         |         |         |
  4+15       5.5742      5.58  O         |         |         |         |
  4+30       6.0179      6.02  |O        |         |         |         |
  4+45       6.5194      6.53  |O        |         |         |         |
  5+ 0       6.9633      6.97  |O        |         |         |         |
  5+15       6.7423      6.74  |O        |         |         |         |
  5+30       6.2141      6.21  |O        |         |         |         |
  5+45       6.9117      6.92  |O        |         |         |         |
  6+ 0       7.4497      7.46  |O        |         |         |         |
  6+15       7.9085      7.91  |O        |         |         |         |
  6+30       8.4101      8.42  |O        |         |         |         |
  6+45       8.8541      8.86  |O        |         |         |         |
  7+ 0       9.3555      9.36  |O        |         |         |         |
  7+15       9.4382      9.44  |O        |         |         |         |
  7+30       9.8148      9.82  |O        |         |         |         |
  7+45      10.6623     10.67  |O        |         |         |         |
  8+ 0      11.5921     11.60  | O       |         |         |         |
  8+15      17.6191     17.70  |  O      |         |         |         |
  8+30      25.6550     25.76  |   O     |         |         |         |
  8+45      31.9610     32.04  |    O    |         |         |         |
  9+ 0      42.2282     42.36  |      O  |         |         |         |
  9+15      56.7160     56.90  |        O|         |         |         |
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  9+30      72.5890     72.79  |         | O       |         |         |
  9+45      84.4140     84.56  |         |   O     |         |         |
 10+ 0      95.5531     95.70  |         |     O   |         |         |
 10+15      77.6267     77.39  |         |  O      |         |         |
 10+30      46.0852     45.68  |      O  |         |         |         |
 10+45      60.0138     60.20  |         O         |         |         |
 11+ 0      84.7147     85.03  |         |   O     |         |         |
 11+15      86.6722     86.69  |         |    O    |         |         |
 11+30      84.0222     83.99  |         |   O     |         |         |
 11+45      77.4081     77.32  |         |  O      |         |         |
 12+ 0      72.5563     72.49  |         | O       |         |         |
 12+15     102.4466    102.83  |         |      O  |         |         |
 12+30     141.9804    142.49  |         |         |   O     |         |
 12+45     161.3553    161.60  |         |         |      O  |         |
 13+ 0     177.9397    178.15  |         |         |         O         |
 13+15     204.0102    204.34  |         |         |         |    O    |
 13+30     230.7625    231.10  |         |         |         |       OI
 13+45     196.6077    196.16  |         |         |         |  IO     |
 14+ 0     145.1926    144.53  |         |         |    O    |         |
 14+15     151.8389    151.93  |         |         |     O   |         |
 14+30     167.2247    167.42  |         |         |       O |         |
 14+45     166.8739    166.87  |         |         |       O |         |
 15+ 0     164.2635    164.23  |         |         |       O |         |
 15+15     156.8385    156.74  |         |         |      O  |         |
 15+30     148.7149    148.61  |         |         |    O    |         |
 15+45     129.5840    129.34  |         |         | O       |         |
 16+ 0     110.3003    110.05  |         |        O|         |         |
 16+15      68.0809     67.54  |         |O        |         |         |
 16+30      14.4841     13.80  | O       |         |         |         |
 16+45       5.1201      5.01  O         |         |         |         |
 17+ 0       2.9545      2.93  O         |         |         |         |
 17+15       3.5742      3.58  O         |         |         |         |
 17+30       4.5309      4.54  O         |         |         |         |
 17+45       4.6958      4.70  O         |         |         |         |
 18+ 0       4.3653      4.36  O         |         |         |         |
 18+15       3.8796      3.87  O         |         |         |         |
 18+30       3.7971      3.80  O         |         |         |         |
 18+45       3.4205      3.42  O         |         |         |         |
 19+ 0       2.5730      2.56  O         |         |         |         |
 19+15       2.3656      2.36  O         |         |         |         |
 19+30       3.1150      3.12  O         |         |         |         |
 19+45       3.3068      3.31  O         |         |         |         |
 20+ 0       2.5572      2.55  O         |         |         |         |
 20+15       2.3654      2.36  O         |         |         |         |
 20+30       2.7538      2.76  O         |         |         |         |
 20+45       2.8208      2.82  O         |         |         |         |
 21+ 0       2.4747      2.47  O         |         |         |         |
 21+15       2.3501      2.35  O         |         |         |         |
 21+30       2.3924      2.39  O         |         |         |         |
 21+45       2.3347      2.33  O         |         |         |         |
 22+ 0       2.3922      2.39  O         |         |         |         |
 22+15       2.3347      2.33  O         |         |         |         |
 22+30       2.3922      2.39  O         |         |         |         |
 22+45       1.9735      1.97  O         |         |         |         |
 23+ 0       1.9061      1.91  O         |         |         |         |
 23+15       1.8909      1.89  O         |         |         |         |
 23+30       1.8908      1.89  O         |         |         |         |
 23+45       1.8908      1.89  O         |         |         |         |
 24+ 0       1.8908      1.89  O         |         |         |         |
 24+15       1.1683      1.16  O         |         |         |         |
 24+30       0.1962      0.18  O         |         |         |         |
 24+45       0.0311      0.03  O         |         |         |         |
 25+ 0       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                     Number of intervals =   100
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      230.763 (CFS)
                     Total volume =      81.134 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
```

```
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       81.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SUBA224100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       85.4     170.9     256.3     341.8
----------------------------------------------------------------------
  0+15       0.4065      1.13  Q         |         |         |         |
  0+30       1.0474      3.10  Q         |         |         |         |
  0+45       1.3157      4.02  Q         |         |         |         |
  1+ 0       1.5510      4.73  Q         |         |         |         |
  1+15       1.5702      4.89  Q         |         |         |         |
  1+30       1.3761      4.29  Q         |         |         |         |
  1+45       1.3550      4.21  Q         |         |         |         |
  2+ 0       1.5546      4.75  Q         |         |         |         |
  2+15       1.7734      5.46  Q         |         |         |         |
  2+30       1.7982      5.56  Q         |         |         |         |
  2+45       2.0050      6.15  Q         |         |         |         |
  3+ 0       2.2239      6.85  Q         |         |         |         |
  3+15       2.2486      6.96  Q         |         |         |         |
  3+30       2.2522      6.98  Q         |         |         |         |
  3+45       2.2522      6.98  Q         |         |         |         |
  4+ 0       2.4555      7.54  Q         |         |         |         |
  4+15       2.6743      8.25  Q         |         |         |         |
  4+30       2.9023      8.92  qQ        |         |         |         |
  4+45       3.1248      9.64  qQ        |         |         |         |
  5+ 0       3.3528     10.32  qQ        |         |         |         |
  5+15       3.1687      9.91  qQ        |         |         |         |
  5+30       2.9591      9.17  qQ        |         |         |         |
  5+45       3.3352     10.25  qQ        |         |         |         |
  6+ 0       3.5716     11.02  qQ        |         |         |         |
  6+15       3.8032     11.71  qQ        |         |         |         |
  6+30       4.0256     12.44  qQ        |         |         |         |
  6+45       4.2537     13.11  qQ        |         |         |         |
  7+ 0       4.4761     13.83  qQ        |         |         |         |
  7+15       4.5008     13.94  qQ        |         |         |         |
  7+30       4.7077     14.52  qQ        |         |         |         |
  7+45       5.1298     15.79  qQ        |         |         |         |
  8+ 0       5.5766     17.17  q Q       |         |         |         |
  8+15       8.8996     26.52  |q Q      |         |         |         |
  8+30      12.5847     38.24  |q  Q     |         |         |         |
  8+45      15.7094     47.67  |q   Q    |         |         |         |
  9+ 0      20.7346     62.96  | q    Q  |         |         |         |
  9+15      27.9846     84.70  |  q     Q|         |         |         |
  9+30      35.4196    108.01  |   q     | Q       |         |         |
  9+45      40.9071    125.32  |   q     |   Q     |         |         |
 10+ 0      46.1762    141.73  |    q    |     Q   |         |         |
 10+15      35.1418    112.77  |   q     |  Q      |         |         |
 10+30      20.8224     66.91  | q    Q  |         |         |         |
 10+45      29.9959     90.01  |  q      Q         |         |         |
 11+ 0      41.3843    126.10  |   q     |   Q     |         |         |
 11+15      41.2825    127.95  |   q     |   Q     |         |         |
 11+30      39.9608    123.98  |   q     |   Q     |         |         |
 11+45      36.3265    113.73  |   q     |  Q      |         |         |
 12+ 0      34.6175    107.17  |   q     | Q       |         |         |
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   12+15      51.2021    153.65  |    q    |      Q  |         |         |
   12+30      69.3835    211.36  |       q |         |   Q     |         |
   12+45      78.0542    239.41  |        q|         |       Q |         |
   13+ 0      85.6044    263.54  |         q         |         Q         |
   13+15      99.1196    303.13  |         |q        |         |    Q    |
   13+30     111.0056    341.77  |         | q       |         |         Q
   13+45      90.5385    287.15  |         q         |         |  Q      |
   14+ 0      67.2580    212.45  |      q  |         |   Q     |         |
   14+15      73.2663    225.11  |       q |         |     Q   |         |
   14+30      80.1819    247.41  |        q|         |       Q |         |
   14+45      79.5685    246.44  |        q|         |       Q |         |
   15+ 0      78.0092    242.27  |        q|         |       Q |         |
   15+15      74.3200    231.16  |       q |         |      Q  |         |
   15+30      70.4109    219.13  |       q |         |    Q    |         |
   15+45      60.3592    189.94  |      q  |         | Q       |         |
   16+ 0      51.8644    162.16  |     q   |       Q |         |         |
   16+15      28.9211     97.00  |  q      |Q        |         |         |
   16+30       4.8976     19.38  q Q       |         |         |         |
   16+45       1.9935      7.11  Q         |         |         |         |
   17+ 0       1.3797      4.33  Q         |         |         |         |
   17+15       1.7615      5.34  Q         |         |         |         |
   17+30       2.1955      6.73  Q         |         |         |         |
   17+45       2.2450      6.94  Q         |         |         |         |
   18+ 0       2.0490      6.41  Q         |         |         |         |
   18+15       1.8302      5.71  Q         |         |         |         |
   18+30       1.8054      5.60  Q         |         |         |         |
   18+45       1.5985      5.02  Q         |         |         |         |
   19+ 0       1.1765      3.75  Q         |         |         |         |
   19+15       1.1361      3.50  Q         |         |         |         |
   19+30       1.5298      4.64  Q         |         |         |         |
   19+45       1.5665      4.87  Q         |         |         |         |
   20+ 0       1.1728      3.73  Q         |         |         |         |
   20+15       1.1361      3.50  Q         |         |         |         |
   20+30       1.3266      4.08  Q         |         |         |         |
   20+45       1.3477      4.17  Q         |         |         |         |
   21+ 0       1.1481      3.62  Q         |         |         |         |
   21+15       1.1325      3.48  Q         |         |         |         |
   21+30       1.1233      3.52  Q         |         |         |         |
   21+45       1.1289      3.46  Q         |         |         |         |
   22+ 0       1.1233      3.52  Q         |         |         |         |
   22+15       1.1289      3.46  Q         |         |         |         |
   22+30       1.1233      3.52  Q         |         |         |         |
   22+45       0.9256      2.90  Q         |         |         |         |
   23+ 0       0.9045      2.81  Q         |         |         |         |
   23+15       0.9009      2.79  Q         |         |         |         |
   23+30       0.9009      2.79  Q         |         |         |         |
   23+45       0.9009      2.79  Q         |         |         |         |
   24+ 0       0.9009      2.79  Q         |         |         |         |
   24+15       0.4944      1.66  Q         |         |         |         |
   24+30       0.0567      0.25  Q         |         |         |         |
   24+45       0.0072      0.04  Q         |         |         |         |
   25+ 0       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   100
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      341.768 (CFS)
                       Total volume =     119.808 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       81.000 to Point/Station       76.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
```

```
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    200.00 (Ft.)
Elevation difference =    4.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   200.00(Ft.)     Elevation difference =   4.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    8.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =     85.877(CFS)
Depth of flow =     0.856(Ft.)
Average velocity =    11.331(Ft/s)
Total flow rate =    85.877(CFS)
Channel flow top width =    9.712(Ft.)
Depth of flow in channel =   0.86(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.33(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   85.877(CFS)
Total capacity of improved channels =     85.877(CFS)
Critical Depth in Channel =    1.44(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    341.768(CFS)
Depth of flow =     1.936(Ft.)
Average velocity =    17.763(Ft/s)
Total flow rate =   341.768(CFS)
Channel flow top width =   11.873(Ft.)
Depth of flow in channel =   1.94(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.76(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  341.768(CFS)
Total capacity of improved channels =    341.768(CFS)
Critical Depth in Channel =    3.31(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9127   Travel time =   0.19 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  58.7232
       dt(routing time-step) =   0.17 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       85.4     170.9     256.3     341.8
----------------------------------------------------------------------
  0+15       1.1161      1.13  O         |         |         |         |
  0+30       3.0807      3.10  O         |         |         |         |
  0+45       4.0122      4.02  O         |         |         |         |
  1+ 0       4.7243      4.73  O         |         |         |         |
  1+15       4.8903      4.89  O         |         |         |         |
```

```
 1+30       4.3016      4.29  O         |         |         |         |
 1+45       4.2075      4.21  O         |         |         |         |
 2+ 0       4.7459      4.75  O         |         |         |         |
 2+15       5.4488      5.46  O         |         |         |         |
 2+30       5.5629      5.56  O         |         |         |         |
 2+45       6.1409      6.15  O         |         |         |         |
 3+ 0       6.8446      6.85  O         |         |         |         |
 3+15       6.9587      6.96  O         |         |         |         |
 3+30       6.9787      6.98  O         |         |         |         |
 3+45       6.9791      6.98  O         |         |         |         |
 4+ 0       7.5372      7.54  O         |         |         |         |
 4+15       8.2404      8.25  O         |         |         |         |
 4+30       8.9126      8.92  |O        |         |         |         |
 4+45       9.6359      9.64  |O        |         |         |         |
 5+ 0      10.3084     10.32  |O        |         |         |         |
 5+15       9.9156      9.91  |O        |         |         |         |
 5+30       9.1816      9.17  |O        |         |         |         |
 5+45      10.2347     10.25  |O        |         |         |         |
 6+ 0      11.0125     11.02  |O        |         |         |         |
 6+15      11.7038     11.71  |O        |         |         |         |
 6+30      12.4275     12.44  |O        |         |         |         |
 6+45      13.1001     13.11  |O        |         |         |         |
 7+ 0      13.8233     13.83  |O        |         |         |         |
 7+15      13.9378     13.94  |O        |         |         |         |
 7+30      14.5159     14.52  |O        |         |         |         |
 7+45      15.7776     15.79  |O        |         |         |         |
 8+ 0      17.1530     17.17  | O       |         |         |         |
 8+15      26.4120     26.52  |  O      |         |         |         |
 8+30      38.1058     38.24  |   O     |         |         |         |
 8+45      47.5627     47.67  |    O    |         |         |         |
 9+ 0      62.7882     62.96  |      O  |         |         |         |
 9+15      84.4524     84.70  |        O|         |         |         |
 9+30     107.7425    108.01  |         | O       |         |         |
 9+45     125.1234    125.32  |         |   O     |         |         |
10+ 0     141.5420    141.73  |         |     O   |         |         |
10+15     113.0991    112.77  |         |  O      |         |         |
10+30      67.4312     66.91  |      O  |         |         |         |
10+45      89.7460     90.01  |         O         |         |         |
11+ 0     125.6870    126.10  |         |   O     |         |         |
11+15     127.9335    127.95  |         |   O     |         |         |
11+30     124.0283    123.98  |         |   O     |         |         |
11+45     113.8516    113.73  |         |  O      |         |         |
12+ 0     107.2488    107.17  |         | O       |         |         |
12+15     153.1181    153.65  |         |      O  |         |         |
12+30     210.7049    211.36  |         |         |   O     |         |
12+45     239.0893    239.41  |         |         |      OI |         |
13+ 0     263.2685    263.54  |         |         |       O         |
13+15     302.6778    303.13  |         |         |         |    O    |
13+30     341.3269    341.77  |         |         |         |       OI
13+45     287.7698    287.15  |         |         |         |  O      |
14+ 0     213.3034    212.45  |         |         |   O     |         |
14+15     224.9607    225.11  |         |         |     O   |         |
14+30     247.1520    247.41  |         |         |       O |         |
14+45     246.4534    246.44  |         |         |       O |         |
15+ 0     242.3203    242.27  |         |         |       O |         |
15+15     231.2855    231.16  |         |         |      O  |         |
15+30     219.2631    219.13  |         |         |    O    |         |
15+45     190.2764    189.94  |         |         | O       |         |
16+ 0     162.4819    162.16  |         |       IO|         |         |
16+15      97.7460     97.00  |         |O        |         |         |
16+30      20.2679     19.38  | O       |         |         |         |
16+45       7.2536      7.11  O         |         |         |         |
17+ 0       4.3660      4.33  O         |         |         |         |
17+15       5.3242      5.34  O         |         |         |         |
17+30       6.7105      6.73  O         |         |         |         |
17+45       6.9383      6.94  O         |         |         |         |
18+ 0       6.4203      6.41  O         |         |         |         |
18+15       5.7178      5.71  O         |         |         |         |
18+30       5.6037      5.60  O         |         |         |         |
18+45       5.0256      5.02  O         |         |         |         |
19+ 0       3.7639      3.75  O         |         |         |         |
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  19+15       3.5046      3.50  O         |         |         |         |
  19+30       4.6318      4.64  O         |         |         |         |
  19+45       4.8708      4.87  O         |         |         |         |
  20+ 0       3.7431      3.73  O         |         |         |         |
  20+15       3.5042      3.50  O         |         |         |         |
  20+30       4.0738      4.08  O         |         |         |         |
  20+45       4.1675      4.17  O         |         |         |         |
  21+ 0       3.6290      3.62  O         |         |         |         |
  21+15       3.4842      3.48  O         |         |         |         |
  21+30       3.5153      3.52  O         |         |         |         |
  21+45       3.4642      3.46  O         |         |         |         |
  22+ 0       3.5149      3.52  O         |         |         |         |
  22+15       3.4642      3.46  O         |         |         |         |
  22+30       3.5149      3.52  O         |         |         |         |
  22+45       2.9061      2.90  O         |         |         |         |
  23+ 0       2.8116      2.81  O         |         |         |         |
  23+15       2.7920      2.79  O         |         |         |         |
  23+30       2.7916      2.79  O         |         |         |         |
  23+45       2.7916      2.79  O         |         |         |         |
  24+ 0       2.7916      2.79  O         |         |         |         |
  24+15       1.6756      1.66  O         |         |         |         |
  24+30       0.2690      0.25  O         |         |         |         |
  24+45       0.0408      0.04  O         |         |         |         |
  25+ 0       0.0004      0.00  O         |         |         |         |
  25+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   101
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      341.327 (CFS)
                      Total volume =     119.808 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       -----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       81.000 to Point/Station       76.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ______________________________________________________________________
       Current stream hydrograph saved in file A2A3RT.rte
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       -----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  02/13/12 File: Sketcher24100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed A, Offsite, Sketcher site,
Exist condition, 100 yr 24 hr


--------------------------------------------------------------------
Drainage Area =     158.40(Ac.)  =      0.248 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     158.40(Ac.)  =      0.248 Sq. Mi.
Length along longest watercourse =    1400.00(Ft.)
Length along longest watercourse measured to centroid =     700.00(Ft.)
Length along longest watercourse =      0.265 Mi.
Length along longest watercourse measured to centroid =      0.133 Mi.
Difference in elevation =      28.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.083 Hr.
Lag time =     4.99 Min.
25% of lag time =     1.25 Min.
40% of lag time =     2.00 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.40           1.80                 285.12

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.40           4.50                 712.80

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   158.400           85.00         0.000
 Total Area Entered =    158.40(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	300.358	56.717	90.541
2	0.500	600.716	37.109	59.239
3	0.750	901.075	6.175	9.857
			Sum = 100.000	Sum= 159.637

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.011	0.025
2	0.50	0.30	0.054	(0.326)	0.016	0.038
3	0.75	0.30	0.054	(0.323)	0.016	0.038
4	1.00	0.40	0.072	(0.319)	0.022	0.050
5	1.25	0.30	0.054	(0.315)	0.016	0.038
6	1.50	0.30	0.054	(0.311)	0.016	0.038
7	1.75	0.30	0.054	(0.308)	0.016	0.038
8	2.00	0.40	0.072	(0.304)	0.022	0.050
9	2.25	0.40	0.072	(0.300)	0.022	0.050
10	2.50	0.40	0.072	(0.297)	0.022	0.050
11	2.75	0.50	0.090	(0.293)	0.027	0.063
12	3.00	0.50	0.090	(0.289)	0.027	0.063
13	3.25	0.50	0.090	(0.286)	0.027	0.063
14	3.50	0.50	0.090	(0.282)	0.027	0.063
15	3.75	0.50	0.090	(0.279)	0.027	0.063
16	4.00	0.60	0.108	(0.275)	0.032	0.076
17	4.25	0.60	0.108	(0.272)	0.032	0.076
18	4.50	0.70	0.126	(0.268)	0.038	0.088
19	4.75	0.70	0.126	(0.265)	0.038	0.088
20	5.00	0.80	0.144	(0.261)	0.043	0.101
21	5.25	0.60	0.108	(0.258)	0.032	0.076
22	5.50	0.70	0.126	(0.255)	0.038	0.088
23	5.75	0.80	0.144	(0.251)	0.043	0.101
24	6.00	0.80	0.144	(0.248)	0.043	0.101
25	6.25	0.90	0.162	(0.245)	0.049	0.113
26	6.50	0.90	0.162	(0.241)	0.049	0.113
27	6.75	1.00	0.180	(0.238)	0.054	0.126
28	7.00	1.00	0.180	(0.235)	0.054	0.126
29	7.25	1.00	0.180	(0.232)	0.054	0.126
30	7.50	1.10	0.198	(0.229)	0.059	0.139
31	7.75	1.20	0.216	(0.225)	0.065	0.151
32	8.00	1.30	0.234	(0.222)	0.070	0.164
33	8.25	1.50	0.270	(0.219)	0.081	0.189
34	8.50	1.50	0.270	(0.216)	0.081	0.189
35	8.75	1.60	0.288	(0.213)	0.086	0.202
36	9.00	1.70	0.306	(0.210)	0.092	0.214
37	9.25	1.90	0.342	(0.207)	0.103	0.239
38	9.50	2.00	0.360	(0.204)	0.108	0.252
39	9.75	2.10	0.378	(0.201)	0.113	0.265

40	10.00	2.20	0.396	(	0.198)	0.119	0.277
41	10.25	1.50	0.270	(	0.196)	0.081	0.189
42	10.50	1.50	0.270	(	0.193)	0.081	0.189
43	10.75	2.00	0.360	(	0.190)	0.108	0.252
44	11.00	2.00	0.360	(	0.187)	0.108	0.252
45	11.25	1.90	0.342	(	0.184)	0.103	0.239
46	11.50	1.90	0.342	(	0.182)	0.103	0.239
47	11.75	1.70	0.306	(	0.179)	0.092	0.214
48	12.00	1.80	0.324	(	0.176)	0.097	0.227
49	12.25	2.50	0.450	(	0.174)	0.135	0.315
50	12.50	2.60	0.468	(	0.171)	0.140	0.327
51	12.75	2.80	0.504	(	0.169)	0.151	0.353
52	13.00	2.90	0.522	(	0.166)	0.157	0.365
53	13.25	3.40	0.612		0.163	(0.184)	0.448
54	13.50	3.40	0.612		0.161	(0.184)	0.451
55	13.75	2.30	0.414	(	0.159)	0.124	0.290
56	14.00	2.30	0.414	(	0.156)	0.124	0.290
57	14.25	2.70	0.486	(	0.154)	0.146	0.340
58	14.50	2.60	0.468	(	0.151)	0.140	0.327
59	14.75	2.60	0.468	(	0.149)	0.140	0.327
60	15.00	2.50	0.450	(	0.147)	0.135	0.315
61	15.25	2.40	0.432	(	0.145)	0.130	0.302
62	15.50	2.30	0.414	(	0.142)	0.124	0.290
63	15.75	1.90	0.342	(	0.140)	0.103	0.239
64	16.00	1.90	0.342	(	0.138)	0.103	0.239
65	16.25	0.40	0.072	(	0.136)	0.022	0.050
66	16.50	0.40	0.072	(	0.134)	0.022	0.050
67	16.75	0.30	0.054	(	0.132)	0.016	0.038
68	17.00	0.30	0.054	(	0.130)	0.016	0.038
69	17.25	0.50	0.090	(	0.128)	0.027	0.063
70	17.50	0.50	0.090	(	0.126)	0.027	0.063
71	17.75	0.50	0.090	(	0.124)	0.027	0.063
72	18.00	0.40	0.072	(	0.122)	0.022	0.050
73	18.25	0.40	0.072	(	0.120)	0.022	0.050
74	18.50	0.40	0.072	(	0.119)	0.022	0.050
75	18.75	0.30	0.054	(	0.117)	0.016	0.038
76	19.00	0.20	0.036	(	0.115)	0.011	0.025
77	19.25	0.30	0.054	(	0.114)	0.016	0.038
78	19.50	0.40	0.072	(	0.112)	0.022	0.050
79	19.75	0.30	0.054	(	0.111)	0.016	0.038
80	20.00	0.20	0.036	(	0.109)	0.011	0.025
81	20.25	0.30	0.054	(	0.108)	0.016	0.038
82	20.50	0.30	0.054	(	0.106)	0.016	0.038
83	20.75	0.30	0.054	(	0.105)	0.016	0.038
84	21.00	0.20	0.036	(	0.104)	0.011	0.025
85	21.25	0.30	0.054	(	0.102)	0.016	0.038
86	21.50	0.20	0.036	(	0.101)	0.011	0.025
87	21.75	0.30	0.054	(	0.100)	0.016	0.038
88	22.00	0.20	0.036	(	0.099)	0.011	0.025
89	22.25	0.30	0.054	(	0.098)	0.016	0.038
90	22.50	0.20	0.036	(	0.097)	0.011	0.025
91	22.75	0.20	0.036	(	0.096)	0.011	0.025
92	23.00	0.20	0.036	(	0.096)	0.011	0.025
93	23.25	0.20	0.036	(	0.095)	0.011	0.025
94	23.50	0.20	0.036	(	0.094)	0.011	0.025
95	23.75	0.20	0.036	(	0.094)	0.011	0.025
96	24.00	0.20	0.036	(	0.094)	0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 12.6

Flood volume = Effective rainfall 3.16(In)
times area 158.4(Ac.)/[(In)/(Ft.)] = 41.7(Ac.Ft)
Total soil loss = 1.34(In)
Total soil loss = 17.674(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1816792.8 Cubic Feet
Total soil loss = 769870.7 Cubic Feet

Peak flow rate of this hydrograph = 71.015(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 20.0 40.0 60.0 80.0
0+15	0.0472	2.28	VQ | | | |
0+30	0.1487	4.92	V Q | | | |
0+45	0.2709	5.91	V Q | | | |
1+ 0	0.4191	7.18	V Q | | | |
1+15	0.5593	6.78	V Q | | | |
1+30	0.6865	6.16	V Q | | | |
1+45	0.8112	6.04	V Q | | | |
2+ 0	0.9595	7.18	V Q | | | |
2+15	1.1232	7.92	V Q | | | |
2+30	1.2895	8.05	|V Q | | | |
2+45	1.4793	9.19	|V Q | | | |
3+ 0	1.6846	9.94	|V Q | | | |
3+15	1.8924	10.06	|V Q | | | |
3+30	2.1003	10.06	| V Q | | | |
3+45	2.3081	10.06	| V Q | | | |
4+ 0	2.5395	11.20	| V Q | | | |
4+15	2.7864	11.95	| V Q | | | |
4+30	3.0593	13.21	| V Q | | | |
4+45	3.3477	13.96	| V Q | | | |
5+ 0	3.6623	15.22	| V Q | | | |
5+15	3.9451	13.69	| V Q | | | |
5+30	4.2232	13.46	| V Q | | | |
5+45	4.5352	15.10	| V Q | | | |
6+ 0	4.8652	15.97	| V Q | | | |
6+15	5.2213	17.24	| V Q | | | |
6+30	5.5928	17.98	| V Q | | | |
6+45	5.9905	19.25	| V Q| | | |
7+ 0	6.4036	19.99	| V Q| | | |
7+15	6.8193	20.12	| V Q | | |
7+30	7.2585	21.26	| V Q | | |
7+45	7.7368	23.15	| V |Q | | |
8+ 0	8.2566	25.16	| V | Q | | |
8+15	8.8415	28.31	| V | Q | | |
8+30	9.4599	29.93	| V| Q | | |
8+45	10.1070	31.32	| V| Q | | |
9+ 0	10.7931	33.21	| V Q | | |
9+15	11.5443	36.36	| V Q | | |
9+30	12.3525	39.12	| |V Q| | |
9+45	13.2049	41.25	| | V Q | |
10+ 0	14.0988	43.27	| | V |Q | |
10+15	14.8457	36.15	| | V Q | | |
10+30	15.4871	31.05	| | VQ | | |
10+45	16.2285	35.88	| | V Q | | |
11+ 0	17.0470	39.62	| | V Q| | |
11+15	17.8548	39.10	| | V Q| | |
11+30	18.6471	38.35	| | V Q| | |
11+45	19.3898	35.94	| | QV | | |
12+ 0	20.1251	35.59	| | Q V| | |
12+15	21.0358	44.08	| | V Q | |
12+30	22.0806	50.57	| | V Q | |
12+45	23.2059	54.47	| | | V Q | |
13+ 0	24.3882	57.22	| | | V Q | |
13+15	25.7466	65.74	| | | V | Q |
13+30	27.2138	71.01	| | | V | Q |
13+45	28.3995	57.39	| | | VQ | |
14+ 0	29.3884	47.86	| | | Q V | |
14+15	30.4387	50.84	| | | Q V| |
14+30	31.5272	52.68	| | | Q V |
14+45	32.6105	52.43	| | | Q V |
15+ 0	33.6677	51.17	| | | Q | V |
15+15	34.6858	49.28	| | | Q | V |
15+30	35.6624	47.27	| | | Q | V |
15+45	36.5267	41.83	| | Q | V |
16+ 0	37.3268	38.72	| | Q| | V |

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   16+15      37.7629     21.11  |         Q         |         |     V   |
   16+30      37.9677      9.91  |   Q     |         |         |     V   |
   16+45      38.1104      6.91  |  Q      |         |         |     V   |
   17+ 0      38.2376      6.16  |  Q      |         |         |     V   |
   17+15      38.4095      8.32  |   Q     |         |         |     V   |
   17+30      38.6122      9.81  |   Q     |         |         |      V  |
   17+45      38.8200     10.06  |    Q    |         |         |      V  |
   18+ 0      39.0043      8.92  |   Q     |         |         |      V  |
   18+15      39.1731      8.17  |   Q     |         |         |      V  |
   18+30      39.3394      8.05  |   Q     |         |         |      V  |
   18+45      39.4821      6.91  |  Q      |         |         |      V  |
   19+ 0      39.5858      5.02  | Q       |         |         |      V  |
   19+15      39.6951      5.29  | Q       |         |         |       V |
   19+30      39.8408      7.05  |  Q      |         |         |       V |
   19+45      39.9809      6.78  |  Q      |         |         |       V |
   20+ 0      40.0846      5.02  | Q       |         |         |       V |
   20+15      40.1939      5.29  | Q       |         |         |       V |
   20+30      40.3160      5.91  | Q       |         |         |       V |
   20+45      40.4407      6.04  |  Q      |         |         |       V |
   21+ 0      40.5418      4.89  | Q       |         |         |       V |
   21+15      40.6511      5.29  | Q       |         |         |       V |
   21+30      40.7497      4.77  | Q       |         |         |        V|
   21+45      40.8589      5.29  | Q       |         |         |        V|
   22+ 0      40.9575      4.77  | Q       |         |         |        V|
   22+15      41.0668      5.29  | Q       |         |         |        V|
   22+30      41.1653      4.77  | Q       |         |         |        V|
   22+45      41.2510      4.15  | Q       |         |         |        V|
   23+ 0      41.3342      4.02  | Q       |         |         |        V|
   23+15      41.4173      4.02  | Q       |         |         |        V|
   23+30      41.5004      4.02  | Q       |         |         |        V|
   23+45      41.5836      4.02  | Q       |         |         |        V|
   24+ 0      41.6667      4.02  | Q       |         |         |        V|
   24+15      41.7027      1.74  Q         |         |         |        V|
   24+30      41.7078      0.25  Q         |         |         |        V|
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  02/13/12 File: SUBA124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Offsite, north of 60fwy, subdrain area A1
Exist condition, 100 yr 3 hr


-------------------------------------------------------------------
Drainage Area =     872.60(Ac.)  =      1.363 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     872.60(Ac.)  =      1.363 Sq. Mi.
Length along longest watercourse =   10000.00(Ft.)
Length along longest watercourse measured to centroid =    5000.00(Ft.)
Length along longest watercourse =      1.894 Mi.
Length along longest watercourse measured to centroid =      0.947 Mi.
Difference in elevation =    1000.00(Ft.)
Slope along watercourse =    528.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.137 Hr.
Lag time =     8.20 Min.
25% of lag time =     2.05 Min.
40% of lag time =     3.28 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      872.60           1.80                1570.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      872.60           4.50                3926.70

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.83 %
Adjusted average point rain =    4.492(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   872.600           85.00         0.000
 Total Area Entered =    872.60(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	183.034	38.704	340.373
2	0.500	366.067	51.579	453.594
3	0.750	549.101	8.175	71.890
4	1.000	732.135	1.542	13.560
			Sum = 100.000	Sum= 879.417

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.129	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013
23	5.75	0.80	0.144	(0.251)	0.129	0.014
24	6.00	0.80	0.144	(0.248)	0.129	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.210	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.050
34	8.50	1.50	0.270	0.216	(0.243)	0.053
35	8.75	1.60	0.288	0.213	(0.259)	0.074
36	9.00	1.70	0.305	0.210	(0.275)	0.095
37	9.25	1.90	0.341	0.207	(0.307)	0.134
38	9.50	2.00	0.359	0.204	(0.323)	0.155

39	9.75	2.10	0.377	0.201	(	0.340)	0.176
40	10.00	2.20	0.395	0.198	(	0.356)	0.197
41	10.25	1.50	0.270	0.196	(	0.243)	0.074
42	10.50	1.50	0.270	0.193	(	0.243)	0.077
43	10.75	2.00	0.359	0.190	(	0.323)	0.169
44	11.00	2.00	0.359	0.187	(	0.323)	0.172
45	11.25	1.90	0.341	0.184	(	0.307)	0.157
46	11.50	1.90	0.341	0.182	(	0.307)	0.160
47	11.75	1.70	0.305	0.179	(	0.275)	0.126
48	12.00	1.80	0.323	0.176	(	0.291)	0.147
49	12.25	2.50	0.449	0.174	(	0.404)	0.276
50	12.50	2.60	0.467	0.171	(	0.420)	0.296
51	12.75	2.80	0.503	0.169	(	0.453)	0.335
52	13.00	2.90	0.521	0.166	(	0.469)	0.355
53	13.25	3.40	0.611	0.163	(	0.550)	0.447
54	13.50	3.40	0.611	0.161	(	0.550)	0.450
55	13.75	2.30	0.413	0.159	(	0.372)	0.255
56	14.00	2.30	0.413	0.156	(	0.372)	0.257
57	14.25	2.70	0.485	0.154	(	0.437)	0.331
58	14.50	2.60	0.467	0.151	(	0.420)	0.316
59	14.75	2.60	0.467	0.149	(	0.420)	0.318
60	15.00	2.50	0.449	0.147	(	0.404)	0.302
61	15.25	2.40	0.431	0.145	(	0.388)	0.287
62	15.50	2.30	0.413	0.142	(	0.372)	0.271
63	15.75	1.90	0.341	0.140	(	0.307)	0.201
64	16.00	1.90	0.341	0.138	(	0.307)	0.203
65	16.25	0.40	0.072	(0.136)		0.065	0.007
66	16.50	0.40	0.072	(0.134)		0.065	0.007
67	16.75	0.30	0.054	(0.132)		0.049	0.005
68	17.00	0.30	0.054	(0.130)		0.049	0.005
69	17.25	0.50	0.090	(0.128)		0.081	0.009
70	17.50	0.50	0.090	(0.126)		0.081	0.009
71	17.75	0.50	0.090	(0.124)		0.081	0.009
72	18.00	0.40	0.072	(0.122)		0.065	0.007
73	18.25	0.40	0.072	(0.120)		0.065	0.007
74	18.50	0.40	0.072	(0.119)		0.065	0.007
75	18.75	0.30	0.054	(0.117)		0.049	0.005
76	19.00	0.20	0.036	(0.115)		0.032	0.004
77	19.25	0.30	0.054	(0.114)		0.049	0.005
78	19.50	0.40	0.072	(0.112)		0.065	0.007
79	19.75	0.30	0.054	(0.111)		0.049	0.005
80	20.00	0.20	0.036	(0.109)		0.032	0.004
81	20.25	0.30	0.054	(0.108)		0.049	0.005
82	20.50	0.30	0.054	(0.106)		0.049	0.005
83	20.75	0.30	0.054	(0.105)		0.049	0.005
84	21.00	0.20	0.036	(0.104)		0.032	0.004
85	21.25	0.30	0.054	(0.102)		0.049	0.005
86	21.50	0.20	0.036	(0.101)		0.032	0.004
87	21.75	0.30	0.054	(0.100)		0.049	0.005
88	22.00	0.20	0.036	(0.099)		0.032	0.004
89	22.25	0.30	0.054	(0.098)		0.049	0.005
90	22.50	0.20	0.036	(0.097)		0.032	0.004
91	22.75	0.20	0.036	(0.096)		0.032	0.004
92	23.00	0.20	0.036	(0.096)		0.032	0.004
93	23.25	0.20	0.036	(0.095)		0.032	0.004
94	23.50	0.20	0.036	(0.094)		0.032	0.004
95	23.75	0.20	0.036	(0.094)		0.032	0.004
96	24.00	0.20	0.036	(0.094)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.87(In)
times area 872.6(Ac.)/[(In)/(Ft.)] = 135.6(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 191.047(Ac.Ft)
Total rainfall = 4.49(In)
Flood volume = 5907618.6 Cubic Feet
Total soil loss = 8322009.4 Cubic Feet

Peak flow rate of this hydrograph = 386.405(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 100.0 200.0 300.0 400.0
0+15	0.0253	1.22	Q
0+30	0.0969	3.47	Q
0+45	0.1907	4.54	Q
1+ 0	0.3009	5.33	Q
1+15	0.4157	5.56	Q
1+30	0.5164	4.87	Q
1+45	0.6149	4.77	Q
2+ 0	0.7255	5.36	Q
2+15	0.8530	6.17	Q
2+30	0.9832	6.30	Q
2+45	1.1265	6.94	Q
3+ 0	1.2867	7.75	Q
3+15	1.4495	7.88	Q
3+30	1.6128	7.91	Q
3+45	1.7762	7.91	Q
4+ 0	1.9521	8.52	Q
4+15	2.1450	9.33	Q
4+30	2.3531	10.07	VQ
4+45	2.5786	10.91	VQ
5+ 0	2.8194	11.66	VQ
5+15	3.0523	11.27	VQ
5+30	3.2668	10.38	VQ
5+45	3.5059	11.57	Q
6+ 0	3.7636	12.47	|Q
6+15	4.0370	13.24	|Q
6+30	4.3279	14.08	|Q
6+45	4.6340	14.82	|Q
7+ 0	4.9575	15.66	|Q
7+15	5.2837	15.79	|Q
7+30	5.6230	16.42	|Q
7+45	5.9918	17.85	|Q
8+ 0	6.3927	19.41	|Q
8+15	7.0032	29.55	| Q
8+30	7.8908	42.96	| V Q
8+45	8.9953	53.46	| V Q
9+ 0	10.4563	70.72	| V Q |
9+15	12.4199	95.04	| V Q|
9+30	14.9326	121.61	| V | Q
9+45	17.8521	141.30	| V | Q
10+ 0	21.1562	159.92	| V | Q
10+15	23.8280	129.31	| V | Q
10+30	25.4041	76.28	| Q |
10+45	27.4818	100.56	| V Q
11+ 0	30.4176	142.09	| V | Q
11+15	33.4109	144.88	| V| Q
11+30	36.3107	140.35	| V Q
11+45	38.9803	129.21	| VQ
12+ 0	41.4831	121.13	| Q
12+15	45.0342	171.87	| V Q |
12+30	49.9556	238.19	| V | Q |
12+45	55.5374	270.16	| V | Q |
13+ 0	61.6911	297.84	| V | Q|
13+15	68.7500	341.65	| V | Q
13+30	76.7336	386.40	| | V | Q |
13+45	83.5098	327.97	| | V | Q |
14+ 0	88.5021	241.63	| | Q V |
14+15	93.7501	254.00	| | Q V |
14+30	99.5333	279.91	| | Q V|
14+45	105.2973	278.98	| | Q V
15+ 0	110.9703	274.57	| | Q | V
15+15	116.3846	262.05	| | Q | V
15+30	121.5180	248.45	| | Q | V |
15+45	125.9854	216.22	| | |Q | V |

```
  16+ 0     129.7865    183.97  |         |       Q |         |       V |
  16+15     132.1192    112.90  |         |Q        |         |       V |
  16+30     132.5958     23.07  | Q       |         |         |        V|
  16+45     132.7688      8.37  Q         |         |         |        V|
  17+ 0     132.8700      4.90  Q         |         |         |        V|
  17+15     132.9938      5.99  Q         |         |         |        V|
  17+30     133.1508      7.60  Q         |         |         |        V|
  17+45     133.3131      7.86  Q         |         |         |        V|
  18+ 0     133.4638      7.29  Q         |         |         |        V|
  18+15     133.5976      6.48  Q         |         |         |        V|
  18+30     133.7288      6.35  Q         |         |         |        V|
  18+45     133.8468      5.71  Q         |         |         |        V|
  19+ 0     133.9353      4.28  Q         |         |         |        V|
  19+15     134.0170      3.95  Q         |         |         |        V|
  19+30     134.1250      5.23  Q         |         |         |        V|
  19+45     134.2393      5.53  Q         |         |         |        V|
  20+ 0     134.3273      4.26  Q         |         |         |        V|
  20+15     134.4090      3.95  Q         |         |         |        V|
  20+30     134.5043      4.61  Q         |         |         |        V|
  20+45     134.6018      4.72  Q         |         |         |        V|
  21+ 0     134.6872      4.13  Q         |         |         |        V|
  21+15     134.7683      3.93  Q         |         |         |        V|
  21+30     134.8510      4.00  Q         |         |         |        V|
  21+45     134.9317      3.90  Q         |         |         |        V|
  22+ 0     135.0144      4.00  Q         |         |         |        V|
  22+15     135.0950      3.90  Q         |         |         |        V|
  22+30     135.1777      4.00  Q         |         |         |        V|
  22+45     135.2457      3.29  Q         |         |         |        V|
  23+ 0     135.3115      3.19  Q         |         |         |        V|
  23+15     135.3769      3.16  Q         |         |         |        V|
  23+30     135.4422      3.16  Q         |         |         |        V|
  23+45     135.5075      3.16  Q         |         |         |        V|
  24+ 0     135.5729      3.16  Q         |         |         |        V|
  24+15     135.6129      1.94  Q         |         |         |        V|
  24+30     135.6193      0.31  Q         |         |         |        V|
  24+45     135.6203      0.05  Q         |         |         |        V|
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  02/13/12 File: SUBA224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Offsite, subdrain Area A2, north of 60 fwy
Exist condition, 100 yr 24 hr


-------------------------------------------------------------------
Drainage Area =     248.30(Ac.)  =      0.388 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     248.30(Ac.)  =      0.388 Sq. Mi.
Length along longest watercourse =    8200.00(Ft.)
Length along longest watercourse measured to centroid =    4000.00(Ft.)
Length along longest watercourse =      1.553 Mi.
Length along longest watercourse measured to centroid =      0.758 Mi.
Difference in elevation =     820.00(Ft.)
Slope along watercourse =    528.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.116 Hr.
Lag time =     6.98 Min.
25% of lag time =     1.75 Min.
40% of lag time =     2.79 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      248.30           1.80                446.94

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      248.30           4.50               1117.35

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    4.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   248.300           85.00         0.000
 Total Area Entered =    248.30(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	214.836	45.123	112.916
2	0.500	429.673	48.579	121.564
3	0.750	644.509	5.496	13.752
4	1.000	859.345	0.802	2.008
			Sum = 100.000	Sum= 250.240

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.130	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013
23	5.75	0.80	0.144	(0.251)	0.130	0.014
24	6.00	0.80	0.144	(0.248)	0.130	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.210	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.051
34	8.50	1.50	0.270	0.216	(0.243)	0.054
35	8.75	1.60	0.288	0.213	(0.259)	0.075
36	9.00	1.70	0.306	0.210	(0.275)	0.096
37	9.25	1.90	0.342	0.207	(0.308)	0.135
38	9.50	2.00	0.360	0.204	(0.324)	0.156

39	9.75	2.10	0.378	0.201	(	0.340)	0.176
40	10.00	2.20	0.396	0.198	(	0.356)	0.197
41	10.25	1.50	0.270	0.196	(	0.243)	0.074
42	10.50	1.50	0.270	0.193	(	0.243)	0.077
43	10.75	2.00	0.360	0.190	(	0.324)	0.170
44	11.00	2.00	0.360	0.187	(	0.324)	0.173
45	11.25	1.90	0.342	0.184	(	0.308)	0.157
46	11.50	1.90	0.342	0.182	(	0.308)	0.160
47	11.75	1.70	0.306	0.179	(	0.275)	0.127
48	12.00	1.80	0.324	0.176	(	0.291)	0.148
49	12.25	2.50	0.450	0.174	(	0.405)	0.276
50	12.50	2.60	0.468	0.171	(	0.421)	0.297
51	12.75	2.80	0.504	0.169	(	0.453)	0.335
52	13.00	2.90	0.522	0.166	(	0.470)	0.356
53	13.25	3.40	0.612	0.163	(	0.551)	0.448
54	13.50	3.40	0.612	0.161	(	0.551)	0.451
55	13.75	2.30	0.414	0.159	(	0.372)	0.255
56	14.00	2.30	0.414	0.156	(	0.372)	0.258
57	14.25	2.70	0.486	0.154	(	0.437)	0.332
58	14.50	2.60	0.468	0.151	(	0.421)	0.316
59	14.75	2.60	0.468	0.149	(	0.421)	0.319
60	15.00	2.50	0.450	0.147	(	0.405)	0.303
61	15.25	2.40	0.432	0.145	(	0.389)	0.287
62	15.50	2.30	0.414	0.142	(	0.372)	0.271
63	15.75	1.90	0.342	0.140	(	0.308)	0.202
64	16.00	1.90	0.342	0.138	(	0.308)	0.204
65	16.25	0.40	0.072	(0.136)		0.065	0.007
66	16.50	0.40	0.072	(0.134)		0.065	0.007
67	16.75	0.30	0.054	(0.132)		0.049	0.005
68	17.00	0.30	0.054	(0.130)		0.049	0.005
69	17.25	0.50	0.090	(0.128)		0.081	0.009
70	17.50	0.50	0.090	(0.126)		0.081	0.009
71	17.75	0.50	0.090	(0.124)		0.081	0.009
72	18.00	0.40	0.072	(0.122)		0.065	0.007
73	18.25	0.40	0.072	(0.120)		0.065	0.007
74	18.50	0.40	0.072	(0.119)		0.065	0.007
75	18.75	0.30	0.054	(0.117)		0.049	0.005
76	19.00	0.20	0.036	(0.115)		0.032	0.004
77	19.25	0.30	0.054	(0.114)		0.049	0.005
78	19.50	0.40	0.072	(0.112)		0.065	0.007
79	19.75	0.30	0.054	(0.111)		0.049	0.005
80	20.00	0.20	0.036	(0.109)		0.032	0.004
81	20.25	0.30	0.054	(0.108)		0.049	0.005
82	20.50	0.30	0.054	(0.106)		0.049	0.005
83	20.75	0.30	0.054	(0.105)		0.049	0.005
84	21.00	0.20	0.036	(0.104)		0.032	0.004
85	21.25	0.30	0.054	(0.102)		0.049	0.005
86	21.50	0.20	0.036	(0.101)		0.032	0.004
87	21.75	0.30	0.054	(0.100)		0.049	0.005
88	22.00	0.20	0.036	(0.099)		0.032	0.004
89	22.25	0.30	0.054	(0.098)		0.049	0.005
90	22.50	0.20	0.036	(0.097)		0.032	0.004
91	22.75	0.20	0.036	(0.096)		0.032	0.004
92	23.00	0.20	0.036	(0.096)		0.032	0.004
93	23.25	0.20	0.036	(0.095)		0.032	0.004
94	23.50	0.20	0.036	(0.094)		0.032	0.004
95	23.75	0.20	0.036	(0.094)		0.032	0.004
96	24.00	0.20	0.036	(0.094)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.87(In)
times area 248.3(Ac.)/[(In)/(Ft.)] = 38.7(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 54.394(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1684630.0 Cubic Feet
Total soil loss = 2369383.5 Cubic Feet

Peak flow rate of this hydrograph = 111.006(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 50.0 100.0 150.0 200.0
0+15	0.0084	0.41	Q
0+30	0.0300	1.05	Q
0+45	0.0572	1.32	Q
1+ 0	0.0893	1.55	Q
1+15	0.1217	1.57	Q
1+30	0.1501	1.38	Q
1+45	0.1781	1.35	Q
2+ 0	0.2103	1.55	Q
2+15	0.2469	1.77	Q
2+30	0.2841	1.80	Q
2+45	0.3255	2.01	Q
3+ 0	0.3714	2.22	Q
3+15	0.4179	2.25	Q
3+30	0.4644	2.25	Q
3+45	0.5110	2.25	Q
4+ 0	0.5617	2.46	Q
4+15	0.6169	2.67	Q
4+30	0.6769	2.90	Q
4+45	0.7415	3.12	Q
5+ 0	0.8107	3.35	Q
5+15	0.8762	3.17	Q
5+30	0.9373	2.96	Q
5+45	1.0063	3.34	QV
6+ 0	1.0800	3.57	QV
6+15	1.1586	3.80	QV
6+30	1.2418	4.03	QV
6+45	1.3297	4.25	QV
7+ 0	1.4222	4.48	QV
7+15	1.5152	4.50	QV
7+30	1.6124	4.71	QV
7+45	1.7184	5.13	|Q
8+ 0	1.8336	5.58	|Q
8+15	2.0175	8.90	|QV
8+30	2.2775	12.58	| Q
8+45	2.6021	15.71	| VQ
9+ 0	3.0305	20.73	| VQ
9+15	3.6087	27.98	| V Q
9+30	4.3405	35.42	| V Q |
9+45	5.1857	40.91	| V Q |
10+ 0	6.1397	46.18	| V Q|
10+15	6.8658	35.14	| Q |
10+30	7.2960	20.82	| Q V |
10+45	7.9158	30.00	| Q V |
11+ 0	8.7708	41.38	| QV|
11+15	9.6238	41.28	| QV|
11+30	10.4494	39.96	| Q V
11+45	11.2000	36.33	| Q |V
12+ 0	11.9152	34.62	| Q | V
12+15	12.9731	51.20	| Q V
12+30	14.4066	69.38	| | QV
12+45	16.0193	78.05	| | QV |
13+ 0	17.7880	85.60	| | QV |
13+15	19.8359	99.12	| | QV
13+30	22.1294	111.01	| | | Q
13+45	24.0001	90.54	| | Q | V
14+ 0	25.3897	67.26	| | Q | V |
14+15	26.9035	73.27	| | Q | V |
14+30	28.5601	80.18	| | Q | V|
14+45	30.2041	79.57	| | Q | V
15+ 0	31.8158	78.01	| | Q | | V
15+15	33.3514	74.32	| | Q | | V
15+30	34.8062	70.41	| | Q | | V |
15+45	36.0532	60.36	| | Q | | V |

```
  16+ 0      37.1248     51.86  |         Q         |         |       V |
  16+15      37.7224     28.92  |    Q    |         |         |        V|
  16+30      37.8236      4.90  Q         |         |         |        V|
  16+45      37.8647      1.99  Q         |         |         |        V|
  17+ 0      37.8933      1.38  Q         |         |         |        V|
  17+15      37.9296      1.76  Q         |         |         |        V|
  17+30      37.9750      2.20  Q         |         |         |        V|
  17+45      38.0214      2.25  Q         |         |         |        V|
  18+ 0      38.0637      2.05  Q         |         |         |        V|
  18+15      38.1015      1.83  Q         |         |         |        V|
  18+30      38.1388      1.81  Q         |         |         |        V|
  18+45      38.1719      1.60  Q         |         |         |        V|
  19+ 0      38.1962      1.18  Q         |         |         |        V|
  19+15      38.2196      1.14  Q         |         |         |        V|
  19+30      38.2513      1.53  Q         |         |         |        V|
  19+45      38.2836      1.57  Q         |         |         |        V|
  20+ 0      38.3079      1.17  Q         |         |         |        V|
  20+15      38.3313      1.14  Q         |         |         |        V|
  20+30      38.3587      1.33  Q         |         |         |        V|
  20+45      38.3866      1.35  Q         |         |         |        V|
  21+ 0      38.4103      1.15  Q         |         |         |        V|
  21+15      38.4337      1.13  Q         |         |         |        V|
  21+30      38.4569      1.12  Q         |         |         |        V|
  21+45      38.4802      1.13  Q         |         |         |        V|
  22+ 0      38.5034      1.12  Q         |         |         |        V|
  22+15      38.5268      1.13  Q         |         |         |        V|
  22+30      38.5500      1.12  Q         |         |         |        V|
  22+45      38.5691      0.93  Q         |         |         |        V|
  23+ 0      38.5878      0.90  Q         |         |         |        V|
  23+15      38.6064      0.90  Q         |         |         |        V|
  23+30      38.6250      0.90  Q         |         |         |        V|
  23+45      38.6436      0.90  Q         |         |         |        V|
  24+ 0      38.6622      0.90  Q         |         |         |        V|
  24+15      38.6725      0.49  Q         |         |         |        V|
  24+30      38.6736      0.06  Q         |         |         |        V|
  24+45      38.6738      0.01  Q         |         |         |         V
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  02/13/12 File: SUBA324100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Offsite, subdrain area A3, north of 60fwy
Exist condition, 100 yr 24 hr


-------------------------------------------------------------------
Drainage Area =     521.40(Ac.)  =      0.815 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     521.40(Ac.)  =      0.815 Sq. Mi.
Length along longest watercourse =   10000.00(Ft.)
Length along longest watercourse measured to centroid =    5000.00(Ft.)
Length along longest watercourse =      1.894 Mi.
Length along longest watercourse measured to centroid =      0.947 Mi.
Difference in elevation =    1000.00(Ft.)
Slope along watercourse =    528.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.137 Hr.
Lag time =     8.20 Min.
25% of lag time =     2.05 Min.
40% of lag time =     3.28 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      521.40           1.80                938.52

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      521.40           4.50               2346.30

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.90 %
Adjusted average point rain =    4.495(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   521.400           85.00         0.000
 Total Area Entered =    521.40(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	183.034	38.704	203.381
2	0.500	366.067	51.579	271.033
3	0.750	549.101	8.175	42.956
4	1.000	732.135	1.542	8.102
			Sum = 100.000	Sum= 525.473

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.129	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013
23	5.75	0.80	0.144	(0.251)	0.129	0.014
24	6.00	0.80	0.144	(0.248)	0.129	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.210	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.050
34	8.50	1.50	0.270	0.216	(0.243)	0.054
35	8.75	1.60	0.288	0.213	(0.259)	0.075
36	9.00	1.70	0.306	0.210	(0.275)	0.096
37	9.25	1.90	0.342	0.207	(0.307)	0.134
38	9.50	2.00	0.360	0.204	(0.324)	0.155

39	9.75	2.10	0.378	0.201	(	0.340)	0.176
40	10.00	2.20	0.396	0.198	(	0.356)	0.197
41	10.25	1.50	0.270	0.196	(	0.243)	0.074
42	10.50	1.50	0.270	0.193	(	0.243)	0.077
43	10.75	2.00	0.360	0.190	(	0.324)	0.170
44	11.00	2.00	0.360	0.187	(	0.324)	0.172
45	11.25	1.90	0.342	0.184	(	0.307)	0.157
46	11.50	1.90	0.342	0.182	(	0.307)	0.160
47	11.75	1.70	0.306	0.179	(	0.275)	0.127
48	12.00	1.80	0.324	0.176	(	0.291)	0.147
49	12.25	2.50	0.450	0.174	(	0.405)	0.276
50	12.50	2.60	0.468	0.171	(	0.421)	0.296
51	12.75	2.80	0.503	0.169	(	0.453)	0.335
52	13.00	2.90	0.521	0.166	(	0.469)	0.355
53	13.25	3.40	0.611	0.163	(	0.550)	0.448
54	13.50	3.40	0.611	0.161	(	0.550)	0.450
55	13.75	2.30	0.414	0.159	(	0.372)	0.255
56	14.00	2.30	0.414	0.156	(	0.372)	0.257
57	14.25	2.70	0.486	0.154	(	0.437)	0.332
58	14.50	2.60	0.468	0.151	(	0.421)	0.316
59	14.75	2.60	0.468	0.149	(	0.421)	0.318
60	15.00	2.50	0.450	0.147	(	0.405)	0.303
61	15.25	2.40	0.432	0.145	(	0.388)	0.287
62	15.50	2.30	0.414	0.142	(	0.372)	0.271
63	15.75	1.90	0.342	0.140	(	0.307)	0.201
64	16.00	1.90	0.342	0.138	(	0.307)	0.204
65	16.25	0.40	0.072	(0.136)		0.065	0.007
66	16.50	0.40	0.072	(0.134)		0.065	0.007
67	16.75	0.30	0.054	(0.132)		0.049	0.005
68	17.00	0.30	0.054	(0.130)		0.049	0.005
69	17.25	0.50	0.090	(0.128)		0.081	0.009
70	17.50	0.50	0.090	(0.126)		0.081	0.009
71	17.75	0.50	0.090	(0.124)		0.081	0.009
72	18.00	0.40	0.072	(0.122)		0.065	0.007
73	18.25	0.40	0.072	(0.120)		0.065	0.007
74	18.50	0.40	0.072	(0.119)		0.065	0.007
75	18.75	0.30	0.054	(0.117)		0.049	0.005
76	19.00	0.20	0.036	(0.115)		0.032	0.004
77	19.25	0.30	0.054	(0.114)		0.049	0.005
78	19.50	0.40	0.072	(0.112)		0.065	0.007
79	19.75	0.30	0.054	(0.111)		0.049	0.005
80	20.00	0.20	0.036	(0.109)		0.032	0.004
81	20.25	0.30	0.054	(0.108)		0.049	0.005
82	20.50	0.30	0.054	(0.106)		0.049	0.005
83	20.75	0.30	0.054	(0.105)		0.049	0.005
84	21.00	0.20	0.036	(0.104)		0.032	0.004
85	21.25	0.30	0.054	(0.102)		0.049	0.005
86	21.50	0.20	0.036	(0.101)		0.032	0.004
87	21.75	0.30	0.054	(0.100)		0.049	0.005
88	22.00	0.20	0.036	(0.099)		0.032	0.004
89	22.25	0.30	0.054	(0.098)		0.049	0.005
90	22.50	0.20	0.036	(0.097)		0.032	0.004
91	22.75	0.20	0.036	(0.096)		0.032	0.004
92	23.00	0.20	0.036	(0.096)		0.032	0.004
93	23.25	0.20	0.036	(0.095)		0.032	0.004
94	23.50	0.20	0.036	(0.094)		0.032	0.004
95	23.75	0.20	0.036	(0.094)		0.032	0.004
96	24.00	0.20	0.036	(0.094)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.87(In)
times area 521.4(Ac.)/[(In)/(Ft.)] = 81.1(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 114.192(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 3534207.2 Cubic Feet
Total soil loss = 4974188.3 Cubic Feet

Peak flow rate of this hydrograph = 231.104(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	75.0	150.0	225.0	300.0
0+15	0.0151	0.73	Q	|	|	|	|
0+30	0.0579	2.07	Q	|	|	|	|
0+45	0.1140	2.72	Q	|	|	|	|
1+ 0	0.1799	3.19	Q	|	|	|	|
1+15	0.2486	3.32	Q	|	|	|	|
1+30	0.3088	2.91	Q	|	|	|	|
1+45	0.3677	2.85	Q	|	|	|	|
2+ 0	0.4338	3.20	Q	|	|	|	|
2+15	0.5101	3.69	Q	|	|	|	|
2+30	0.5879	3.77	Q	|	|	|	|
2+45	0.6736	4.15	Q	|	|	|	|
3+ 0	0.7693	4.64	Q	|	|	|	|
3+15	0.8667	4.71	Q	|	|	|	|
3+30	0.9644	4.73	Q	|	|	|	|
3+45	1.0620	4.73	Q	|	|	|	|
4+ 0	1.1673	5.09	Q	|	|	|	|
4+15	1.2826	5.58	Q	|	|	|	|
4+30	1.4070	6.02	Q	|	|	|	|
4+45	1.5418	6.53	Q	|	|	|	|
5+ 0	1.6858	6.97	Q	|	|	|	|
5+15	1.8251	6.74	Q	|	|	|	|
5+30	1.9533	6.21	Q	|	|	|	|
5+45	2.0963	6.92	QV	|	|	|	|
6+ 0	2.2504	7.46	QV	|	|	|	|
6+15	2.4139	7.91	|Q	|	|	|	|
6+30	2.5878	8.42	|Q	|	|	|	|
6+45	2.7708	8.86	|Q	|	|	|	|
7+ 0	2.9643	9.36	|Q	|	|	|	|
7+15	3.1593	9.44	|Q	|	|	|	|
7+30	3.3622	9.82	|Q	|	|	|	|
7+45	3.5827	10.67	|Q	|	|	|	|
8+ 0	3.8224	11.60	|Q	|	|	|	|
8+15	4.1881	17.70	| Q	|	|	|	|
8+30	4.7203	25.76	| VQ	|	|	|	|
8+45	5.3823	32.04	| V Q	|	|	|	|
9+ 0	6.2575	42.36	| V Q	|	|	|	|
9+15	7.4331	56.90	| V Q |	|	|	|	|
9+30	8.9371	72.79	| V Q|	|	|	|	|
9+45	10.6843	84.56	| V |Q	|	|	|	|
10+ 0	12.6614	95.70	| V | Q	|	|	|	|
10+15	14.2605	77.39	| V Q	|	|	|	|
10+30	15.2043	45.68	| QV |	|	|	|	|
10+45	16.4481	60.20	| Q |	|	|	|	|
11+ 0	18.2049	85.03	| V |Q	|	|	|	|
11+15	19.9961	86.69	| V|Q	|	|	|	|
11+30	21.7314	83.99	| VQ	|	|	|	|
11+45	23.3290	77.32	| QV	|	|	|	|
12+ 0	24.8268	72.49	| Q| V	|	|	|	|
12+15	26.9515	102.83	| | Q	|	|	|	|
12+30	29.8954	142.49	| | V Q |	|	|	|	|
12+45	33.2342	161.60	| | V |Q	|	|	|	|
13+ 0	36.9150	178.15	| | V | Q	|	|	|	|
13+15	41.1370	204.34	| | V Q |	|	|	|	|
13+30	45.9119	231.10	| | | V Q	|	|	|	|
13+45	49.9648	196.16	| | | V Q |	|	|	|	|
14+ 0	52.9511	144.53	| | Q| V |	|	|	|	|
14+15	56.0902	151.93	| | Q V |	|	|	|	|
14+30	59.5493	167.42	| | | Q V|	|	|	|	|
14+45	62.9970	166.87	| | | Q V	|	|	|	|
15+ 0	66.3902	164.23	| | |Q | V	|	|	|	|
15+15	69.6286	156.74	| | Q | V	|	|	|	|
15+30	72.6991	148.61	| | Q| | V	|	|	|	|
15+45	75.3714	129.34	| | Q | | V	|	|	|	|

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  16+ 0      77.6453    110.05  |         |   Q     |         |       V |
  16+15      79.0407     67.54  |        Q|         |         |       V |
  16+30      79.3258     13.80  |Q        |         |         |        V|
  16+45      79.4292      5.01  Q         |         |         |        V|
  17+ 0      79.4897      2.93  Q         |         |         |        V|
  17+15      79.5638      3.58  Q         |         |         |        V|
  17+30      79.6576      4.54  Q         |         |         |        V|
  17+45      79.7547      4.70  Q         |         |         |        V|
  18+ 0      79.8448      4.36  Q         |         |         |        V|
  18+15      79.9248      3.87  Q         |         |         |        V|
  18+30      80.0033      3.80  Q         |         |         |        V|
  18+45      80.0738      3.42  Q         |         |         |        V|
  19+ 0      80.1268      2.56  Q         |         |         |        V|
  19+15      80.1756      2.36  Q         |         |         |        V|
  19+30      80.2401      3.12  Q         |         |         |        V|
  19+45      80.3085      3.31  Q         |         |         |        V|
  20+ 0      80.3612      2.55  Q         |         |         |        V|
  20+15      80.4100      2.36  Q         |         |         |        V|
  20+30      80.4670      2.76  Q         |         |         |        V|
  20+45      80.5253      2.82  Q         |         |         |        V|
  21+ 0      80.5763      2.47  Q         |         |         |        V|
  21+15      80.6248      2.35  Q         |         |         |        V|
  21+30      80.6743      2.39  Q         |         |         |        V|
  21+45      80.7225      2.33  Q         |         |         |        V|
  22+ 0      80.7719      2.39  Q         |         |         |        V|
  22+15      80.8202      2.33  Q         |         |         |        V|
  22+30      80.8696      2.39  Q         |         |         |        V|
  22+45      80.9103      1.97  Q         |         |         |        V|
  23+ 0      80.9496      1.91  Q         |         |         |        V|
  23+15      80.9887      1.89  Q         |         |         |        V|
  23+30      81.0278      1.89  Q         |         |         |        V|
  23+45      81.0668      1.89  Q         |         |         |        V|
  24+ 0      81.1059      1.89  Q         |         |         |        V|
  24+15      81.1298      1.16  Q         |         |         |        V|
  24+30      81.1336      0.18  Q         |         |         |        V|
  24+45      81.1342      0.03  Q         |         |         |        V|
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/07/12 File: SUBA424100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed A, Onsite, Subdrain Area A4
Exist condition, 100 yr 24 hr
.

-------------------------------------------------------------------
Drainage Area =    1015.00(Ac.)  =      1.586 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =    1015.00(Ac.)  =      1.586 Sq. Mi.
Length along longest watercourse =    9000.00(Ft.)
Length along longest watercourse measured to centroid =    4500.00(Ft.)
Length along longest watercourse =      1.705 Mi.
Length along longest watercourse measured to centroid =      0.852 Mi.
Difference in elevation =     180.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.171 Hr.
Lag time =    10.27 Min.
25% of lag time =     2.57 Min.
40% of lag time =     4.11 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1015.00           1.80                1827.00

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1015.00           4.50                4567.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.80 %
Adjusted average point rain =    4.491(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
  1015.000           85.00         0.000
 Total Area Entered =   1015.00(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	146.050	32.207	329.456
2	0.500	292.101	47.294	483.787
3	0.750	438.151	11.418	116.800
4	1.000	584.201	5.005	51.193
5	1.250	730.252	2.585	26.447
6	1.500	876.302	1.490	15.246
			Sum = 100.000	Sum= 1022.930

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.129	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013
23	5.75	0.80	0.144	(0.251)	0.129	0.014
24	6.00	0.80	0.144	(0.248)	0.129	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.210	0.023
33	8.25	1.50	0.269	0.219	(0.243)	0.050
34	8.50	1.50	0.269	0.216	(0.243)	0.053
35	8.75	1.60	0.287	0.213	(0.259)	0.074
36	9.00	1.70	0.305	0.210	(0.275)	0.095

37	9.25	1.90	0.341	0.207	(	0.307)	0.134
38	9.50	2.00	0.359	0.204	(	0.323)	0.155
39	9.75	2.10	0.377	0.201	(	0.340)	0.176
40	10.00	2.20	0.395	0.198	(	0.356)	0.197
41	10.25	1.50	0.269	0.196	(	0.243)	0.074
42	10.50	1.50	0.269	0.193	(	0.243)	0.077
43	10.75	2.00	0.359	0.190	(	0.323)	0.169
44	11.00	2.00	0.359	0.187	(	0.323)	0.172
45	11.25	1.90	0.341	0.184	(	0.307)	0.157
46	11.50	1.90	0.341	0.182	(	0.307)	0.160
47	11.75	1.70	0.305	0.179	(	0.275)	0.126
48	12.00	1.80	0.323	0.176	(	0.291)	0.147
49	12.25	2.50	0.449	0.174	(	0.404)	0.275
50	12.50	2.60	0.467	0.171	(	0.420)	0.296
51	12.75	2.80	0.503	0.169	(	0.453)	0.334
52	13.00	2.90	0.521	0.166	(	0.469)	0.355
53	13.25	3.40	0.611	0.163	(	0.550)	0.447
54	13.50	3.40	0.611	0.161	(	0.550)	0.450
55	13.75	2.30	0.413	0.159	(	0.372)	0.255
56	14.00	2.30	0.413	0.156	(	0.372)	0.257
57	14.25	2.70	0.485	0.154	(	0.437)	0.331
58	14.50	2.60	0.467	0.151	(	0.420)	0.316
59	14.75	2.60	0.467	0.149	(	0.420)	0.318
60	15.00	2.50	0.449	0.147	(	0.404)	0.302
61	15.25	2.40	0.431	0.145	(	0.388)	0.287
62	15.50	2.30	0.413	0.142	(	0.372)	0.271
63	15.75	1.90	0.341	0.140	(	0.307)	0.201
64	16.00	1.90	0.341	0.138	(	0.307)	0.203
65	16.25	0.40	0.072	(0.136)		0.065	0.007
66	16.50	0.40	0.072	(0.134)		0.065	0.007
67	16.75	0.30	0.054	(0.132)		0.049	0.005
68	17.00	0.30	0.054	(0.130)		0.049	0.005
69	17.25	0.50	0.090	(0.128)		0.081	0.009
70	17.50	0.50	0.090	(0.126)		0.081	0.009
71	17.75	0.50	0.090	(0.124)		0.081	0.009
72	18.00	0.40	0.072	(0.122)		0.065	0.007
73	18.25	0.40	0.072	(0.120)		0.065	0.007
74	18.50	0.40	0.072	(0.119)		0.065	0.007
75	18.75	0.30	0.054	(0.117)		0.049	0.005
76	19.00	0.20	0.036	(0.115)		0.032	0.004
77	19.25	0.30	0.054	(0.114)		0.049	0.005
78	19.50	0.40	0.072	(0.112)		0.065	0.007
79	19.75	0.30	0.054	(0.111)		0.049	0.005
80	20.00	0.20	0.036	(0.109)		0.032	0.004
81	20.25	0.30	0.054	(0.108)		0.049	0.005
82	20.50	0.30	0.054	(0.106)		0.049	0.005
83	20.75	0.30	0.054	(0.105)		0.049	0.005
84	21.00	0.20	0.036	(0.104)		0.032	0.004
85	21.25	0.30	0.054	(0.102)		0.049	0.005
86	21.50	0.20	0.036	(0.101)		0.032	0.004
87	21.75	0.30	0.054	(0.100)		0.049	0.005
88	22.00	0.20	0.036	(0.099)		0.032	0.004
89	22.25	0.30	0.054	(0.098)		0.049	0.005
90	22.50	0.20	0.036	(0.097)		0.032	0.004
91	22.75	0.20	0.036	(0.096)		0.032	0.004
92	23.00	0.20	0.036	(0.096)		0.032	0.004
93	23.25	0.20	0.036	(0.095)		0.032	0.004
94	23.50	0.20	0.036	(0.094)		0.032	0.004
95	23.75	0.20	0.036	(0.094)		0.032	0.004
96	24.00	0.20	0.036	(0.094)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.86(In)
times area 1015.0(Ac.)/[(In)/(Ft.)] = 157.7(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 222.195(Ac.Ft)
Total rainfall = 4.49(In)
Flood volume = 6868323.6 Cubic Feet
Total soil loss = 9678832.8 Cubic Feet

Peak flow rate of this hydrograph = 435.436(CFS)

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      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

      ------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      125.0     250.0     375.0     500.0
-----------------------------------------------------------------------
  0+15       0.0245      1.18  Q         |         |         |         |
  0+30       0.0971      3.52  Q         |         |         |         |
  0+45       0.1964      4.80  Q         |         |         |         |
  1+ 0       0.3160      5.79  Q         |         |         |         |
  1+15       0.4453      6.26  Q         |         |         |         |
  1+30       0.5630      5.70  Q         |         |         |         |
  1+45       0.6789      5.61  Q         |         |         |         |
  2+ 0       0.8060      6.16  Q         |         |         |         |
  2+15       0.9508      7.00  Q         |         |         |         |
  2+30       1.0993      7.19  Q         |         |         |         |
  2+45       1.2619      7.87  Q         |         |         |         |
  3+ 0       1.4435      8.79  Q         |         |         |         |
  3+15       1.6300      9.03  Q         |         |         |         |
  3+30       1.8184      9.12  Q         |         |         |         |
  3+45       2.0077      9.17  Q         |         |         |         |
  4+ 0       2.2099      9.79  Q         |         |         |         |
  4+15       2.4300     10.65  Q         |         |         |         |
  4+30       2.6667     11.46  Q         |         |         |         |
  4+45       2.9233     12.42  Q         |         |         |         |
  5+ 0       3.1974     13.27  VQ        |         |         |         |
  5+15       3.4675     13.07  VQ        |         |         |         |
  5+30       3.7193     12.18  Q         |         |         |         |
  5+45       3.9950     13.34   Q        |         |         |         |
  6+ 0       4.2902     14.29  |Q        |         |         |         |
  6+15       4.6024     15.11  |Q        |         |         |         |
  6+30       4.9344     16.07  |Q        |         |         |         |
  6+45       5.2845     16.94  |Q        |         |         |         |
  7+ 0       5.6550     17.93  |Q        |         |         |         |
  7+15       6.0309     18.19  |Q        |         |         |         |
  7+30       6.4214     18.90  |Q        |         |         |         |
  7+45       6.8432     20.41  |Q        |         |         |         |
  8+ 0       7.3000     22.11  |Q        |         |         |         |
  8+15       7.9640     32.14  | Q       |         |         |         |
  8+30       8.9246     46.49  | VQ      |         |         |         |
  8+45      10.1270     58.20  | V Q     |         |         |         |
  9+ 0      11.7195     77.08  | V   Q   |         |         |         |
  9+15      13.8558    103.40  |  V    Q |         |         |         |
  9+30      16.6066    133.14  |   V     Q         |         |         |
  9+45      19.8373    156.37  |    V    | Q       |         |         |
 10+ 0      23.5287    178.66  |    V    |   Q     |         |         |
 10+15      26.6921    153.11  |     V   | Q       |         |         |
 10+30      28.7421     99.22  |      Q  |         |         |         |
 10+45      31.1947    118.71  |      V Q|         |         |         |
 11+ 0      34.4874    159.37  |       V | Q       |         |         |
 11+15      37.8703    163.73  |        V|  Q      |         |         |
 11+30      41.1871    160.53  |         V Q       |         |         |
 11+45      44.3225    151.75  |          VQ       |         |         |
 12+ 0      47.2872    143.49  |         |Q        |         |         |
 12+15      51.2477    191.69  |         |  V Q    |         |         |
 12+30      56.6435    261.16  |         |   V     Q         |         |
 12+45      62.8216    299.02  |         |    V    |  Q      |         |
 13+ 0      69.7107    333.43  |         |      V  |     Q   |         |
 13+15      77.6251    383.06  |         |        V|         Q         |
 13+30      86.6218    435.44  |         |          V        |   Q     |
 13+45      94.5861    385.48  |         |         |  V      Q         |
 14+ 0     100.7422    297.95  |         |         |  Q V    |         |
 14+15     107.0164    303.67  |         |         |   Q  V  |         |
 14+30     113.7564    326.22  |         |         |     Q V |         |
 14+45     120.4319    323.09  |         |         |    Q    V         |
 15+ 0     127.0043    318.11  |         |         |    Q    | V       |
 15+15     133.3433    306.81  |         |         |   Q     |  V      |
```

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  15+30     139.3972    293.01  |         |         |  Q      |    V    |
  15+45     144.7609    259.60  |         |         Q         |     V   |
  16+ 0     149.3798    223.55  |         |      Q  |         |      V  |
  16+15     152.4860    150.34  |         | Q       |         |       V |
  16+30     153.5489     51.44  |   Q     |         |         |       V |
  16+45     154.0853     25.96  | Q       |         |         |        V|
  17+ 0     154.3754     14.04  |Q        |         |         |        V|
  17+15     154.5791      9.86  Q         |         |         |        V|
  17+30     154.7550      8.51  Q         |         |         |        V|
  17+45     154.9386      8.89  Q         |         |         |        V|
  18+ 0     155.1132      8.45  Q         |         |         |        V|
  18+15     155.2718      7.68  Q         |         |         |        V|
  18+30     155.4272      7.52  Q         |         |         |        V|
  18+45     155.5685      6.84  Q         |         |         |        V|
  19+ 0     155.6785      5.33  Q         |         |         |        V|
  19+15     155.7780      4.81  Q         |         |         |        V|
  19+30     155.9014      5.97  Q         |         |         |        V|
  19+45     156.0320      6.32  Q         |         |         |        V|
  20+ 0     156.1371      5.09  Q         |         |         |        V|
  20+15     156.2344      4.71  Q         |         |         |        V|
  20+30     156.3450      5.35  Q         |         |         |        V|
  20+45     156.4576      5.45  Q         |         |         |        V|
  21+ 0     156.5584      4.88  Q         |         |         |        V|
  21+15     156.6538      4.62  Q         |         |         |        V|
  21+30     156.7512      4.71  Q         |         |         |        V|
  21+45     156.8453      4.55  Q         |         |         |        V|
  22+ 0     156.9417      4.67  Q         |         |         |        V|
  22+15     157.0352      4.53  Q         |         |         |        V|
  22+30     157.1316      4.67  Q         |         |         |        V|
  22+45     157.2129      3.93  Q         |         |         |        V|
  23+ 0     157.2914      3.80  Q         |         |         |        V|
  23+15     157.3683      3.72  Q         |         |         |        V|
  23+30     157.4449      3.70  Q         |         |         |        V|
  23+45     157.5208      3.68  Q         |         |         |        V|
  24+ 0     157.5968      3.68  Q         |         |         |        V|
  24+15     157.6483      2.49  Q         |         |         |        V|
  24+30     157.6639      0.75  Q         |         |         |        V|
  24+45     157.6708      0.33  Q         |         |         |        V|
  25+ 0     157.6739      0.15  Q         |         |         |        V|
  25+15     157.6750      0.05  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/02/12


      ------------------------------------------------------------------
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      Watershed B, Stream 1
      Existing Condition
      100-year, 24-hour

      ------------------------------------------------------------------
-


      Program License Serial Number 6097

      ------------------------------------------------------------------
-
      ******************** HYDROGRAPH INFORMATION *********************

                 From study/file name: SubB124100.rte
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =   106
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =      153.693 (CFS)
                 Total volume =      60.499 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****



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+++
      Process from Point/Station       11.000 to Point/Station
12.000
      **** STREAM ROUTING SCS CONVEX METHOD ****
      ____________________________________________________________________
___
      HYDROGRAPH STREAM ROUTING DATA:
      Length of stream =   2500.00 (Ft.)
      Elevation difference =   50.00 (Ft.)
      Slope of channel =  0.020000 (Vert/Horiz)
      Channel type - Improved Channel
```

```
      Channel length =  2500.00(Ft.)     Elevation difference =
50.00(Ft.)
      Channel evaluation using mean flow rate of hydrograph
      Channel base width  =   10.000(Ft.)
      Slope or 'Z' of left channel bank =   2.000
      Slope or 'Z' of right channel bank =   2.000
      Manning's 'N'    = 0.030
      Maximum depth of channel  =    5.000(Ft.)
      Flow(q) thru subarea =     42.408(CFS)
      Depth of flow =     0.723(Ft.)
      Average velocity =     5.123(Ft/s)
      Total flow rate =    42.408(CFS)
      Channel flow top width =   12.893(Ft.)
      Depth of flow in channel =   0.72(Ft.)
      Total number of channels (same dimensions) = 1
      Flow Velocity =    5.12(Ft/s)
      Travel time  =    0.00 min.
      Individual channel flow =   42.408(CFS)
      Total capacity of improved channels =     42.408(CFS)
      Critical Depth in Channel =    0.78(Ft.)


      Channel evaluation using maximum flow rate of hydrograph
      Flow(q) thru subarea =    153.693(CFS)
      Depth of flow =     1.513(Ft.)
      Average velocity =     7.801(Ft/s)
      Total flow rate =   153.693(CFS)
      Channel flow top width =   16.050(Ft.)
      Depth of flow in channel =   1.51(Ft.)
      Total number of channels (same dimensions) = 1
      Flow Velocity =    7.80(Ft/s)
      Travel time  =    0.00 min.
      Individual channel flow =  153.693(CFS)
      Total capacity of improved channels =    153.693(CFS)
      Critical Depth in Channel =    1.72(Ft.)


      ********************** SCS CONVEX CHANNEL ROUTING
********************
      Convex method of stream routing  data items:
      Using equation: Outflow =
      O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
              where c* = 1 - (1-c)^e and dt = c(length)/velocity
              c(v/v+1.7) =   0.8211   Travel time =   5.34 (min.)
            dt*(unit time interval) =  15.00(min.),  e=   2.6136
            dt(routing time-step) =   4.39 (min.),   c* =   0.9889

      Output hydrograph delayed by 0  unit time increments


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                        P R I N T  O F  S T O R M
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R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

```
  Time(h+m) Out = O(CFS) In = I  0       38.4      76.8     115.3
153.7
  ----------------------------------------------------------------------
    0+15       0.1212      0.17  O         |         |         |
|
    0+30       0.6616      0.87  O         |         |         |
|
    0+45       1.2972      1.48  O         |         |         |
|
    1+ 0       1.7340      1.84  O         |         |         |
|
    1+15       2.0917      2.20  O         |         |         |
|
    1+30       2.1502      2.13  O         |         |         |
|
    1+45       2.1072      2.10  O         |         |         |
|
    2+ 0       2.1693      2.20  O         |         |         |
|
    2+15       2.4252      2.52  O         |         |         |
|
    2+30       2.6368      2.69  O         |         |         |
|
    2+45       2.7996      2.85  O         |         |         |
|
    3+ 0       3.0895      3.19  O         |         |         |
|
    3+15       3.3142      3.37  O         |         |         |
|
    3+30       3.4215      3.45  O         |         |         |
|
    3+45       3.4756      3.49  O         |         |         |
|
    4+ 0       3.5719      3.61  O         |         |         |
|
    4+15       3.8373      3.94  OI        |         |         |
|
    4+30       4.1152      4.19  |O        |         |         |
|
    4+45       4.4556      4.57  |O        |         |         |
|
    5+ 0       4.7653      4.85  |O        |         |         |
|
    5+15       5.0070      5.08  |O        |         |         |
|
    5+30       4.8509      4.76  |O        |         |         |
|
```

```
   5+45       4.8864      4.94  |O        |         |         |
|
   6+ 0       5.2189      5.34  |O        |         |         |
|
   6+15       5.5254      5.61  |O        |         |         |
|
   6+30       5.8776      5.99  |O        |         |         |
|
   6+45       6.1927      6.28  |O        |         |         |
|
   7+ 0       6.5570      6.68  |O        |         |         |
|
   7+15       6.8211      6.88  |O        |         |         |
|
   7+30       7.0146      7.07  |O        |         |         |
|
   7+45       7.3849      7.52  |O        |         |         |
|
   8+ 0       7.9337      8.11  | O       |         |         |
|
   8+15       9.2536      9.75  | O       |         |         |
|
   8+30      12.7091     13.99  |  O      |         |         |
|
   8+45      16.4844     17.58  |   O     |         |         |
|
   9+ 0      21.5625     23.29  |    OI   |         |         |
|
   9+15      28.7823     31.17  |      OI |         |         |
|
   9+30      38.5245     41.72  |         O         |         |
|
   9+45      48.2042     51.04  |         | OI      |         |
|
  10+ 0      57.0241     59.64  |         |   OI    |         |
|
  10+15      60.6954     61.19  |         |    O    |         |
|
  10+30      49.3462     44.27  |         |IO       |         |
|
  10+45      41.9827     40.92  |         O         |         |
|
  11+ 0      50.2604     54.25  |         |  OI     |         |
|
  11+15      58.4902     60.37  |         |    O    |         |
|
  11+30      60.3561     60.38  |         |    O    |         |
|
  11+45      59.6272     59.31  |         |    O    |         |
|
  12+ 0      56.3581     55.09  |         |   O     |         |
|
  12+15      60.1118     62.25  |         |    OI   |         |
|
```

```
   12+30      78.8050     85.94  |         |         O I       |
|
   12+45      97.2366    102.20  |         |         |    OI   |
|
   13+ 0     111.8816    116.12  |         |         |        OI
|
   13+15     126.4289    130.92  |         |         |         | O I
|
   13+30     145.5652    151.92  |         |         |         |      O
I|
   13+45     153.0897    153.69  |         |         |         |
OI
   14+ 0     134.2569    125.93  |         |         |         | I O
|
   14+15     119.5575    116.69  |         |         |         IO
|
   14+30     122.1644    124.47  |         |         |         |OI
|
   14+45     125.5101    125.99  |         |         |         | O
|
   15+ 0     125.4651    125.25  |         |         |         | O
|
   15+15     122.8996    121.89  |         |         |         |O
|
   15+30     118.4532    116.96  |         |         |         O
|
   15+45     111.4124    109.01  |         |         |       O |
|
   16+ 0      99.1174     94.84  |         |         |   IO    |
|
   16+15      83.4853     78.55  |         |         IO        |
|
   16+30      53.6772     42.93  |         |I O      |         |
|
   16+45      30.3735     24.82  |     IO  |         |         |
|
   17+ 0      19.1735     16.66  |   O     |         |         |
|
   17+15      13.3302     11.86  |  O      |         |         |
|
   17+30      10.0218      9.21  | O       |         |         |
|
   17+45       7.8590      7.27  |IO       |         |         |
|
   18+ 0       6.1795      5.70  |O        |         |         |
|
   18+15       4.7445      4.33  |O        |         |         |
|
   18+30       3.8162      3.59  O         |         |         |
|
   18+45       3.0652      2.84  O         |         |         |
|
   19+ 0       2.5507      2.42  O         |         |         |
|
```

19+15	2.1568	2.04	O			
19+30	2.1628	2.21	O			
19+45	2.4044	2.49	O			
20+ 0	2.3123	2.24	O			
20+15	2.0155	1.92	O			
20+30	2.0026	2.04	O			
20+45	2.0886	2.11	O			
21+ 0	2.0609	2.04	O			
21+15	1.8900	1.83	O			
21+30	1.8755	1.90	O			
21+45	1.8113	1.78	O			
22+ 0	1.8423	1.87	O			
22+15	1.7873	1.75	O			
22+30	1.8213	1.85	O			
22+45	1.7162	1.66	O			
23+ 0	1.5776	1.54	O			
23+15	1.5135	1.50	O			
23+30	1.4826	1.47	O			
23+45	1.4671	1.46	O			
24+ 0	1.4547	1.45	O			
24+15	1.3270	1.27	O			
24+30	0.8401	0.65	O			
24+45	0.4419	0.35	O			
25+ 0	0.2594	0.22	O			
25+15	0.1685	0.15	O			
25+30	0.1126	0.10	O			
25+45	0.0748	0.06	O			

```
   26+ 0       0.0477      0.04  O         |         |         |
|
   26+15       0.0285      0.02  O         |         |         |
|
   26+30       0.0153      0.01  O         |         |         |
|
   26+45       0.0036      0.00  O         |         |         |
|
   27+ 0       0.0000      0.00  O         |         |         |
|
----------------------------------------------------------------------
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =   108
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =      153.090 (CFS)
                 Total volume =      60.499 (Ac.Ft)
           Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ********************************************************************
****

      ---------------------------------------------------------------------
-


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station       11.000 to Point/Station
12.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ____________________________________________________________________
___
      ******************** HYDROGRAPH INFORMATION **********************

                 From study/file name: SubB224100.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
-
                  Hydrograph in  15   Minute intervals (CFS)

      ---------------------------------------------------------------------
-
  Time(h+m) Add q(CFS)  Tot. Q   0       46.7      93.4     140.2
186.9
  ---------------------------------------------------------------------
    0+15       0.1547      0.28  Q         |         |         |
|
```

0+30	0.4243	1.09	Q			
0+45	0.5479	1.85	Q			
1+ 0	0.6438	2.38	Q			
1+15	0.6650	2.76	Q			
1+30	0.5826	2.73	Q			
1+45	0.5713	2.68	Q			
2+ 0	0.6462	2.82	Q			
2+15	0.7424	3.17	Q			
2+30	0.7561	3.39	Q			
2+45	0.8359	3.64	Q			
3+ 0	0.9320	4.02	Q			
3+15	0.9457	4.26	Q			
3+30	0.9481	4.37	Q			
3+45	0.9481	4.42	Q			
4+ 0	1.0255	4.60	Q			
4+15	1.1216	4.96	qQ			
4+30	1.2127	5.33	qQ			
4+45	1.3113	5.77	qQ			
5+ 0	1.4023	6.17	qQ			
5+15	1.3462	6.35	qQ			
5+30	1.2450	6.10	qQ			
5+45	1.3934	6.28	qQ			
6+ 0	1.4985	6.72	qQ			
6+15	1.5920	7.12	qQ			
6+30	1.6905	7.57	qQ			
6+45	1.7816	7.97	qQ			
7+ 0	1.8801	8.44	qQ			

```
    7+15       1.8939      8.71  qQ        |         |         |
|
    7+30       1.9736      8.99  qQ        |         |         |
|
    7+45       2.1471      9.53  q Q       |         |         |
|
    8+ 0       2.3343     10.27  q Q       |         |         |
|
    8+15       2.6013     11.85  q Q       |         |         |
|
    8+30       2.8097     15.52  q  Q      |         |         |
|
    8+45       2.9170     19.40  q   Q     |         |         |
|
    9+ 0       3.1333     24.70  q    Q    |         |         |
|
    9+15       5.0044     33.79  |q     Q  |         |         |
|
    9+30       8.0966     46.62  |q       Q|         |         |
|
    9+45      10.5089     58.71  | q       | Q       |         |
|
   10+ 0      12.8299     69.85  | q       |   Q     |         |
|
   10+15       9.4700     70.17  | q       |    Q    |         |
|
   10+30       3.8002     53.15  q         |Q        |         |
|
   10+45       6.6410     48.62  |q        Q         |         |
|
   11+ 0      11.1859     61.45  | q       |  Q      |         |
|
   11+15      11.4086     69.90  | q       |   Q     |         |
|
   11+30      10.9333     71.29  | q       |    Q    |         |
|
   11+45       9.6222     69.25  | q       |   Q     |         |
|
   12+ 0       8.8179     65.18  |q        |  Q      |         |
|
   12+15      15.2838     75.40  |  q      |     Q   |         |
|
   12+30      23.2369    102.04  |   q     |         |Q        |
|
   12+45      27.0873    124.32  |    q    |         |     Q   |
|
   13+ 0      30.4421    142.32  |     q   |         |         Q
|
   13+15      35.9177    162.35  |      q  |         |         |   Q
|
   13+30      41.2540    186.82  |       q |         |         |
Q|
   13+45      33.7962    186.89  |      q  |         |         |
Q
```

```
  14+ 0      23.6767    157.93  |    q    |         |         |  Q
|
  14+15      25.5906    145.15  |    q    |         |         |Q
|
  14+30      28.7236    150.89  |     q   |         |         | Q
|
  14+45      28.6331    154.14  |     q   |         |         | Q
|
  15+ 0      28.1358    153.60  |     q   |         |         | Q
|
  15+15      26.6892    149.59  |    q    |         |         | Q
|
  15+30      25.1247    143.58  |    q    |         |         Q
|
  15+45      21.2109    132.62  |   q     |         |       Q |
|
  16+ 0      17.5020    116.62  |  q      |         |   Q     |
|
  16+15      10.4642     93.95  | q       |         Q         |
|
  16+30       2.1406     55.82  q         |Q        |         |
|
  16+45       0.8882     31.26  q     Q   |         |         |
|
  17+ 0       0.5850     19.76  q   Q     |         |         |
|
  17+15       0.7260     14.06  q  Q      |         |         |
|
  17+30       0.9159     10.94  q Q       |         |         |
|
  17+45       0.9433      8.80  qQ        |         |         |
|
  18+ 0       0.8708      7.05  qQ        |         |         |
|
  18+15       0.7747      5.52  qQ        |         |         |
|
  18+30       0.7609      4.58  Q         |         |         |
|
  18+45       0.6812      3.75  Q         |         |         |
|
  19+ 0       0.5077      3.06  Q         |         |         |
|
  19+15       0.4752      2.63  Q         |         |         |
|
  19+30       0.6325      2.80  Q         |         |         |
|
  19+45       0.6626      3.07  Q         |         |         |
|
  20+ 0       0.5053      2.82  Q         |         |         |
|
  20+15       0.4752      2.49  Q         |         |         |
|
  20+30       0.5552      2.56  Q         |         |         |
|
```

20+45	0.5665	2.66	Q			
21+ 0	0.4915	2.55	Q			
21+15	0.4727	2.36	Q			
21+30	0.4778	2.35	Q			
21+45	0.4703	2.28	Q			
22+ 0	0.4778	2.32	Q			
22+15	0.4703	2.26	Q			
22+30	0.4778	2.30	Q			
22+45	0.3930	2.11	Q			
23+ 0	0.3817	1.96	Q			
23+15	0.3793	1.89	Q			
23+30	0.3793	1.86	Q			
23+45	0.3793	1.85	Q			
24+ 0	0.3793	1.83	Q			
24+15	0.2246	1.55	Q			
24+30	0.0323	0.87	Q			
24+45	0.0048	0.45	Q			
25+ 0	0.0000	0.26	Q			
25+15	0.0000	0.17	Q			
25+30	0.0000	0.11	Q			
25+45	0.0000	0.07	Q			
26+ 0	0.0000	0.05	Q			
26+15	0.0000	0.03	Q			
26+30	0.0000	0.02	Q			
26+45	0.0000	0.00	Q			
27+ 0	0.0000	0.00	Q			

```
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =   108
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =      186.886 (CFS)
                 Total volume =      73.295 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****

      ------------------------------------------------------------------
-


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station       11.000 to Point/Station
12.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ___________________________________________________________________
___
      Current stream hydrograph saved in file WSB24hr.rte
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =     0
                 Time interval =    0.0 (Min.)
                 Maximum/Peak flow rate =        0.000 (CFS)
                 Total volume =       0.000 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****

      ------------------------------------------------------------------
-
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/27/12

------------------------------------------------------------------


Watershed B, Stream 2
Existing Condition
100-year, 24-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubB324100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    99
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       27.237 (CFS)
               Total volume =       7.185 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       21.000 to Point/Station       22.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =  11400.00 (Ft.)
Elevation difference =  239.00 (Ft.)
Slope of channel =  0.020965 (Vert/Horiz)
Channel type - Improved Channel


Channel length = 11400.00(Ft.)     Elevation difference = 239.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      4.827(CFS)
Depth of flow =     0.197(Ft.)
Average velocity =     2.356(Ft/s)
Total flow rate =     4.827(CFS)
Channel flow top width =   10.788(Ft.)
Depth of flow in channel =   0.20(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    2.36(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    4.827(CFS)
Total capacity of improved channels =      4.827(CFS)
Critical Depth in Channel =    0.19(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     27.237(CFS)
Depth of flow =     0.550(Ft.)
Average velocity =     4.459(Ft/s)
```

```
Total flow rate =    27.237(CFS)
Channel flow top width =   12.201(Ft.)
Depth of flow in channel =   0.55(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    4.46(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   27.237(CFS)
Total capacity of improved channels =     27.237(CFS)
Critical Depth in Channel =    0.59(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.7240   Travel time =  42.61 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   0.6575
        dt(routing time-step) =  30.85 (min.),   c* =   0.5710

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        6.8      13.6      20.4      27.2
----------------------------------------------------------------------
  0+15       0.0367      0.13  O         |         |         |         |
  0+30       0.1566      0.36  O         |         |         |         |
  0+45       0.3078      0.48  O         |         |         |         |
  1+ 0       0.4294      0.56  O         |         |         |         |
  1+15       0.5126      0.59  O         |         |         |         |
  1+30       0.5347      0.52  O         |         |         |         |
  1+45       0.5206      0.50  O         |         |         |         |
  2+ 0       0.5288      0.56  O         |         |         |         |
  2+15       0.5744      0.65  O         |         |         |         |
  2+30       0.6224      0.67  O         |         |         |         |
  2+45       0.6663      0.73  OI        |         |         |         |
  3+ 0       0.7288      0.82  |O        |         |         |         |
  3+15       0.7841      0.83  |O        |         |         |         |
  3+30       0.8127      0.84  |O        |         |         |         |
  3+45       0.8258      0.84  |O        |         |         |         |
  4+ 0       0.8498      0.90  |O        |         |         |         |
  4+15       0.9030      0.99  |O        |         |         |         |
  4+30       0.9726      1.06  |O        |         |         |         |
  4+45       1.0503      1.15  |O        |         |         |         |
  5+ 0       1.1312      1.23  |O        |         |         |         |
  5+15       1.1771      1.19  |O        |         |         |         |
  5+30       1.1586      1.10  |O        |         |         |         |
  5+45       1.1598      1.22  |O        |         |         |         |
  6+ 0       1.2227      1.32  |O        |         |         |         |
  6+15       1.2998      1.40  |OI       |         |         |         |
  6+30       1.3815      1.49  | O       |         |         |         |
  6+45       1.4642      1.56  | O       |         |         |         |
  7+ 0       1.5475      1.65  | O       |         |         |         |
  7+15       1.6125      1.67  | O       |         |         |         |
  7+30       1.6636      1.73  | O       |         |         |         |
  7+45       1.7476      1.88  | O       |         |         |         |
  8+ 0       1.8733      2.05  | OI      |         |         |         |
  8+15       2.0403      2.28  | OI      |         |         |         |
  8+30       2.2319      2.47  |  O      |         |         |         |
  8+45       2.3950      2.56  |  O      |         |         |         |
  9+ 0       2.5369      2.72  |  O      |         |         |         |
  9+15       2.7075      2.95  |  OI     |         |         |         |
  9+30       2.9182      3.20  |   O     |         |         |         |
  9+45       3.1325      3.38  |   O     |         |         |         |
```

```
  10+ 0       3.3247      3.55  |   OI    |         |         |         |
  10+15       3.3567      3.22  |   O     |         |         |         |
  10+30       3.1043      2.63  |  IO     |         |         |         |
  10+45       2.8942      2.84  |   O     |         |         |         |
  11+ 0       2.9849      3.25  |   O     |         |         |         |
  11+15       3.1422      3.27  |   O     |         |         |         |
  11+30       3.1914      3.19  |   O     |         |         |         |
  11+45       3.1513      3.05  |   O     |         |         |         |
  12+ 0       3.0618      2.94  |   O     |         |         |         |
  12+15       3.9068      6.06  |    O  I |         |         |         |
  12+30       6.6222     11.13  |        O|     I   |         |         |
  12+45      10.1475     14.38  |         |   O     |I        |         |
  13+ 0      13.4708     17.47  |         |        O|    I    |         |
  13+15      17.1545     22.24  |         |         |    O    | I       |
  13+30      21.5240     27.24  |         |         |         |O       I
  13+45      23.1190     21.55  |         |         |         |I O      |
  14+ 0      19.5844     12.55  |         |       I |       O |         |
  14+15      15.9544     13.87  |         |         I  O      |         |
  14+30      15.6292     16.82  |         |         | O I     |         |
  14+45      16.3476     16.95  |         |         |   O     |         |
  15+ 0      16.6179     16.70  |         |         |   O     |         |
  15+15      16.3346     15.57  |         |         | IO      |         |
  15+30      15.5346     14.33  |         |         |IO       |         |
  15+45      13.9181     11.17  |         |     I   O         |         |
  16+ 0      11.3864      7.89  |         |I    O   |         |         |
  16+15       8.5363      4.98  |      I  | O       |         |         |
  16+30       5.4471      1.37  | I    O  |         |         |         |
  16+45       2.9302      0.72  |I  O     |         |         |         |
  17+ 0       1.6102      0.52  I O       |         |         |         |
  17+15       1.0194      0.63  IO        |         |         |         |
  17+30       0.8469      0.80  |O        |         |         |         |
  17+45       0.8290      0.83  |O        |         |         |         |
  18+ 0       0.8129      0.77  |O        |         |         |         |
  18+15       0.7646      0.69  |O        |         |         |         |
  18+30       0.7155      0.67  IO        |         |         |         |
  18+45       0.6711      0.61  O         |         |         |         |
  19+ 0       0.5900      0.46  O         |         |         |         |
  19+15       0.5022      0.42  O         |         |         |         |
  19+30       0.4924      0.55  O         |         |         |         |
  19+45       0.5355      0.59  O         |         |         |         |
  20+ 0       0.5254      0.45  O         |         |         |         |
  20+15       0.4737      0.42  O         |         |         |         |
  20+30       0.4618      0.49  O         |         |         |         |
  20+45       0.4795      0.50  O         |         |         |         |
  21+ 0       0.4729      0.44  O         |         |         |         |
  21+15       0.4463      0.41  O         |         |         |         |
  21+30       0.4309      0.42  O         |         |         |         |
  21+45       0.4233      0.41  O         |         |         |         |
  22+ 0       0.4203      0.42  O         |         |         |         |
  22+15       0.4188      0.41  O         |         |         |         |
  22+30       0.4183      0.42  O         |         |         |         |
  22+45       0.3996      0.35  O         |         |         |         |
  23+ 0       0.3672      0.34  O         |         |         |         |
  23+15       0.3492      0.33  O         |         |         |         |
  23+30       0.3407      0.33  O         |         |         |         |
  23+45       0.3370      0.33  O         |         |         |         |
  24+ 0       0.3354      0.33  O         |         |         |         |
  24+15       0.2981      0.21  O         |         |         |         |
  24+30       0.1962      0.04  O         |         |         |         |
  24+45       0.0956      0.01  O         |         |         |         |
  25+ 0       0.0426      0.00  O         |         |         |         |
  25+15       0.0183      0.00  O         |         |         |         |
  25+30       0.0078      0.00  O         |         |         |         |
  25+45       0.0034      0.00  O         |         |         |         |
  26+ 0       0.0014      0.00  O         |         |         |         |
  26+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   105
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       23.119 (CFS)
```

```
                Total volume =       7.185 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       21.000 to Point/Station       22.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubB424100.rte
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       79.5     158.9     238.4     317.9
----------------------------------------------------------------------
  0+15       0.2399      0.28  Q         |         |         |         |
  0+30       1.3379      1.49  Q         |         |         |         |
  0+45       2.5465      2.85  Q         |         |         |         |
  1+ 0       3.3033      3.73  Q         |         |         |         |
  1+15       3.9767      4.49  Q         |         |         |         |
  1+30       4.0418      4.58  Q         |         |         |         |
  1+45       3.9547      4.48  Q         |         |         |         |
  2+ 0       4.1144      4.64  Q         |         |         |         |
  2+15       4.6501      5.22  Q         |         |         |         |
  2+30       5.0495      5.67  Q         |         |         |         |
  2+45       5.3384      6.00  Q         |         |         |         |
  3+ 0       5.9355      6.66  Q         |         |         |         |
  3+15       6.3783      7.16  Q         |         |         |         |
  3+30       6.5640      7.38  Q         |         |         |         |
  3+45       6.6716      7.50  Q         |         |         |         |
  4+ 0       6.8734      7.72  Q         |         |         |         |
  4+15       7.4060      8.31  qQ        |         |         |         |
  4+30       7.9263      8.90  qQ        |         |         |         |
  4+45       8.5857      9.64  |Q        |         |         |         |
  5+ 0       9.1772     10.31  |Q        |         |         |         |
  5+15       9.6331     10.81  |Q        |         |         |         |
  5+30       9.2658     10.42  |Q        |         |         |         |
  5+45       9.3899     10.55  |Q        |         |         |         |
  6+ 0      10.1066     11.33  |Q        |         |         |         |
  6+15      10.6595     11.96  |Q        |         |         |         |
  6+30      11.3330     12.71  |Q        |         |         |         |
  6+45      11.9267     13.39  |Q        |         |         |         |
  7+ 0      12.6405     14.19  |Q        |         |         |         |
  7+15      13.1304     14.74  |Q        |         |         |         |
  7+30      13.4869     15.15  |Q        |         |         |         |
  7+45      14.2417     15.99  |qQ       |         |         |         |
  8+ 0      15.3176     17.19  |qQ       |         |         |         |
  8+15      18.0652     20.11  | Q       |         |         |         |
  8+30      25.8543     28.09  |  Q      |         |         |         |
  8+45      33.5222     35.92  |   Q     |         |         |         |
  9+ 0      43.4281     45.97  |    Q    |         |         |         |
  9+15      57.5087     60.22  |      Q  |         |         |         |
  9+30      76.3567     79.27  |        Q|         |         |         |
  9+45      94.5648     97.70  |         |qQ       |         |         |
 10+ 0     110.9805    114.31  |         |  qQ     |         |         |
 10+15     117.5769    120.93  |         |   qQ    |         |         |
 10+30      93.3816     96.49  |         |qQ       |         |         |
 10+45      80.6325     83.53  |         Q         |         |         |
 11+ 0     100.4362    103.42  |         | qQ      |         |         |
 11+15     115.7418    118.88  |         |   Q     |         |         |
```

```
   11+30     117.4954    120.69  |          |   qQ    |         |         |
   11+45     116.1815    119.33  |          |   qQ    |         |         |
   12+ 0     109.9773    113.04  |          |  qQ     |         |         |
   12+15     118.3236    122.23  |          |   qQ    |         |         |
   12+30     156.6774    163.30  |          |         qQ        |         |
   12+45     191.0256    201.17  |          |         |   qQ    |         |
   13+ 0     217.0894    230.56  |          |         |      q Q|         |
   13+15     243.6764    260.83  |          |         |         q Q       |
   13+30     281.3223    302.85  |          |         |         |    q  Q |
   13+45     294.7322    317.85  |          |         |         |      q  Q
   14+ 0     253.9080    273.49  |          |         |         |q  Q     |
   14+15     228.2045    244.16  |          |         |       q Q         |
   14+30     238.2882    253.92  |          |         |        q|Q        |
   14+45     244.1075    260.46  |          |         |         q Q       |
   15+ 0     243.4014    260.02  |          |         |         q Q       |
   15+15     239.2411    255.58  |          |         |         q Q       |
   15+30     230.9027    246.44  |          |         |        q|Q        |
   15+45     217.4382    231.36  |          |         |      q Q|         |
   16+ 0     193.2663    204.65  |          |         |   qQ    |         |
   16+15     164.5081    173.04  |          |         qQ        |         |
   16+30     104.4426    109.89  |          |  Q      |         |         |
   16+45      60.1790     63.11  |      Q   |         |         |         |
   17+ 0      42.0850     43.70  |    Q     |         |         |         |
   17+15      31.3522     32.37  |  qQ      |         |         |         |
   17+30      24.5449     25.39  |  Q       |         |         |         |
   17+45      19.7498     20.58  | Q        |         |         |         |
   18+ 0      15.8842     16.70  |qQ        |         |         |         |
   18+15      12.3895     13.15  |Q         |         |         |         |
   18+30       9.8614     10.58  |Q         |         |         |         |
   18+45       7.8461      8.52  qQ         |         |         |         |
   19+ 0       6.2289      6.82  Q          |         |         |         |
   19+15       4.1489      4.65  Q          |         |         |         |
   19+30       4.2447      4.74  Q          |         |         |         |
   19+45       4.7366      5.27  Q          |         |         |         |
   20+ 0       4.4825      5.01  Q          |         |         |         |
   20+15       3.8879      4.36  Q          |         |         |         |
   20+30       3.9375      4.40  Q          |         |         |         |
   20+45       4.1108      4.59  Q          |         |         |         |
   21+ 0       4.0063      4.48  Q          |         |         |         |
   21+15       3.6471      4.09  Q          |         |         |         |
   21+30       3.6630      4.09  Q          |         |         |         |
   21+45       3.5112      3.93  Q          |         |         |         |
   22+ 0       3.5739      3.99  Q          |         |         |         |
   22+15       3.4683      3.89  Q          |         |         |         |
   22+30       3.5572      3.98  Q          |         |         |         |
   22+45       3.3188      3.72  Q          |         |         |         |
   23+ 0       3.0332      3.40  Q          |         |         |         |
   23+15       2.9514      3.30  Q          |         |         |         |
   23+30       2.8945      3.24  Q          |         |         |         |
   23+45       2.8595      3.20  Q          |         |         |         |
   24+ 0       2.8266      3.16  Q          |         |         |         |
   24+15       2.5804      2.88  Q          |         |         |         |
   24+30       1.5805      1.78  Q          |         |         |         |
   24+45       0.8600      0.96  Q          |         |         |         |
   25+ 0       0.5672      0.61  Q          |         |         |         |
   25+15       0.4046      0.42  Q          |         |         |         |
   25+30       0.2810      0.29  Q          |         |         |         |
   25+45       0.2025      0.21  Q          |         |         |         |
   26+ 0       0.1463      0.15  Q          |         |         |         |
   26+15       0.1006      0.10  Q          |         |         |         |
   26+30       0.0673      0.07  Q          |         |         |         |
   26+45       0.0425      0.04  Q          |         |         |         |
   27+ 0       0.0245      0.02  Q          |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   108
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      317.851 (CFS)
                     Total volume =     125.518 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
```

```
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       22.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSB24hrSt2.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/02/12 File: SubB124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Stream 1, Subarea B1
Existing Condition
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =     395.00(Ac.)  =      0.617 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     395.00(Ac.)  =      0.617 Sq. Mi.
Length along longest watercourse =    9460.00(Ft.)
Length along longest watercourse measured to centroid =    4140.00(Ft.)
Length along longest watercourse =      1.792 Mi.
Length along longest watercourse measured to centroid =      0.784 Mi.
Difference in elevation =     212.00(Ft.)
Slope along watercourse =    118.3256 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.331 Hr.
Lag time =    19.85 Min.
25% of lag time =     4.96 Min.
40% of lag time =     7.94 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      395.00           1.80                711.00

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      395.00           4.50               1777.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    4.497(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     6.800           76.00         0.000
   350.000           85.00         0.000
```

38.200 83.00 0.000
Total Area Entered = 395.00(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.017	0.005
85.0	85.0	0.187	0.000	0.187	0.886	0.166
83.0	83.0	0.210	0.000	0.210	0.097	0.020
					Sum (F) =	0.191

Area averaged mean soil loss (F) (In/Hr) = 0.191
Minimum soil loss rate ((In/Hr)) = 0.095
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	75.578	12.088	48.122
2	0.500	151.156	42.731	170.105
3	0.750	226.734	21.283	84.724
4	1.000	302.312	8.554	34.052
5	1.250	377.890	5.168	20.573
6	1.500	453.468	3.339	13.292
7	1.750	529.046	2.330	9.277
8	2.000	604.624	1.698	6.759
9	2.250	680.202	1.179	4.693
10	2.500	755.780	0.810	3.226
11	2.750	831.358	0.820	3.265
			Sum = 100.000	Sum= 398.086

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.337)	0.032	0.004
2	0.50	0.30	0.054	(0.333)	0.049	0.005
3	0.75	0.30	0.054	(0.329)	0.049	0.005
4	1.00	0.40	0.072	(0.326)	0.065	0.007
5	1.25	0.30	0.054	(0.322)	0.049	0.005
6	1.50	0.30	0.054	(0.318)	0.049	0.005
7	1.75	0.30	0.054	(0.314)	0.049	0.005
8	2.00	0.40	0.072	(0.310)	0.065	0.007
9	2.25	0.40	0.072	(0.307)	0.065	0.007
10	2.50	0.40	0.072	(0.303)	0.065	0.007
11	2.75	0.50	0.090	(0.299)	0.081	0.009
12	3.00	0.50	0.090	(0.296)	0.081	0.009
13	3.25	0.50	0.090	(0.292)	0.081	0.009
14	3.50	0.50	0.090	(0.288)	0.081	0.009
15	3.75	0.50	0.090	(0.285)	0.081	0.009
16	4.00	0.60	0.108	(0.281)	0.097	0.011
17	4.25	0.60	0.108	(0.277)	0.097	0.011
18	4.50	0.70	0.126	(0.274)	0.113	0.013
19	4.75	0.70	0.126	(0.270)	0.113	0.013
20	5.00	0.80	0.144	(0.267)	0.130	0.014
21	5.25	0.60	0.108	(0.263)	0.097	0.011
22	5.50	0.70	0.126	(0.260)	0.113	0.013
23	5.75	0.80	0.144	(0.257)	0.130	0.014
24	6.00	0.80	0.144	(0.253)	0.130	0.014
25	6.25	0.90	0.162	(0.250)	0.146	0.016
26	6.50	0.90	0.162	(0.247)	0.146	0.016
27	6.75	1.00	0.180	(0.243)	0.162	0.018

28	7.00	1.00	0.180	(	0.240)	0.162	0.018
29	7.25	1.00	0.180	(	0.237)	0.162	0.018
30	7.50	1.10	0.198	(	0.233)	0.178	0.020
31	7.75	1.20	0.216	(	0.230)	0.194	0.022
32	8.00	1.30	0.234	(	0.227)	0.210	0.023
33	8.25	1.50	0.270		0.224	(0.243)	0.046
34	8.50	1.50	0.270		0.221	(0.243)	0.049
35	8.75	1.60	0.288		0.218	(0.259)	0.070
36	9.00	1.70	0.306		0.215	(0.275)	0.091
37	9.25	1.90	0.342		0.212	(0.308)	0.130
38	9.50	2.00	0.360		0.209	(0.324)	0.151
39	9.75	2.10	0.378		0.206	(0.340)	0.172
40	10.00	2.20	0.396		0.203	(0.356)	0.193
41	10.25	1.50	0.270		0.200	(0.243)	0.070
42	10.50	1.50	0.270		0.197	(0.243)	0.073
43	10.75	2.00	0.360		0.194	(0.324)	0.166
44	11.00	2.00	0.360		0.191	(0.324)	0.169
45	11.25	1.90	0.342		0.188	(0.308)	0.153
46	11.50	1.90	0.342		0.186	(0.308)	0.156
47	11.75	1.70	0.306		0.183	(0.275)	0.123
48	12.00	1.80	0.324		0.180	(0.291)	0.144
49	12.25	2.50	0.450		0.177	(0.405)	0.272
50	12.50	2.60	0.468		0.175	(0.421)	0.293
51	12.75	2.80	0.504		0.172	(0.453)	0.331
52	13.00	2.90	0.522		0.170	(0.469)	0.352
53	13.25	3.40	0.612		0.167	(0.550)	0.445
54	13.50	3.40	0.612		0.164	(0.550)	0.447
55	13.75	2.30	0.414		0.162	(0.372)	0.252
56	14.00	2.30	0.414		0.159	(0.372)	0.254
57	14.25	2.70	0.486		0.157	(0.437)	0.329
58	14.50	2.60	0.468		0.155	(0.421)	0.313
59	14.75	2.60	0.468		0.152	(0.421)	0.315
60	15.00	2.50	0.450		0.150	(0.405)	0.300
61	15.25	2.40	0.432		0.148	(0.389)	0.284
62	15.50	2.30	0.414		0.145	(0.372)	0.268
63	15.75	1.90	0.342		0.143	(0.308)	0.199
64	16.00	1.90	0.342		0.141	(0.308)	0.201
65	16.25	0.40	0.072	(	0.139)	0.065	0.007
66	16.50	0.40	0.072	(	0.137)	0.065	0.007
67	16.75	0.30	0.054	(	0.135)	0.049	0.005
68	17.00	0.30	0.054	(	0.133)	0.049	0.005
69	17.25	0.50	0.090	(	0.131)	0.081	0.009
70	17.50	0.50	0.090	(	0.129)	0.081	0.009
71	17.75	0.50	0.090	(	0.127)	0.081	0.009
72	18.00	0.40	0.072	(	0.125)	0.065	0.007
73	18.25	0.40	0.072	(	0.123)	0.065	0.007
74	18.50	0.40	0.072	(	0.121)	0.065	0.007
75	18.75	0.30	0.054	(	0.119)	0.049	0.005
76	19.00	0.20	0.036	(	0.118)	0.032	0.004
77	19.25	0.30	0.054	(	0.116)	0.049	0.005
78	19.50	0.40	0.072	(	0.114)	0.065	0.007
79	19.75	0.30	0.054	(	0.113)	0.049	0.005
80	20.00	0.20	0.036	(	0.111)	0.032	0.004
81	20.25	0.30	0.054	(	0.110)	0.049	0.005
82	20.50	0.30	0.054	(	0.109)	0.049	0.005
83	20.75	0.30	0.054	(	0.107)	0.049	0.005
84	21.00	0.20	0.036	(	0.106)	0.032	0.004
85	21.25	0.30	0.054	(	0.105)	0.049	0.005
86	21.50	0.20	0.036	(	0.103)	0.032	0.004
87	21.75	0.30	0.054	(	0.102)	0.049	0.005
88	22.00	0.20	0.036	(	0.101)	0.032	0.004
89	22.25	0.30	0.054	(	0.100)	0.049	0.005
90	22.50	0.20	0.036	(	0.099)	0.032	0.004
91	22.75	0.20	0.036	(	0.098)	0.032	0.004
92	23.00	0.20	0.036	(	0.098)	0.032	0.004
93	23.25	0.20	0.036	(	0.097)	0.032	0.004
94	23.50	0.20	0.036	(	0.096)	0.032	0.004
95	23.75	0.20	0.036	(	0.096)	0.032	0.004
96	24.00	0.20	0.036	(	0.096)	0.032	0.004
		(Loss Rate Not Used)					
Sum =		100.0				Sum =	7.4

```
Flood volume = Effective rainfall      1.84(In)
 times area     395.0(Ac.)/[(In)/(Ft.)] =      60.5(Ac.Ft)
Total soil loss =      2.66(In)
Total soil loss =    87.511(Ac.Ft)
Total rainfall =      4.50(In)
Flood volume =     2635349.3 Cubic Feet
Total soil loss =     3811997.8 Cubic Feet
--------------------------------------------------------------------
 Peak flow rate of this hydrograph =    153.693(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
--------------------------------------------------------------------
  0+15       0.0036      0.17  Q         |         |         |         |
  0+30       0.0216      0.87  Q         |         |         |         |
  0+45       0.0522      1.48  Q         |         |         |         |
  1+ 0       0.0903      1.84  Q         |         |         |         |
  1+15       0.1358      2.20  Q         |         |         |         |
  1+30       0.1798      2.13  Q         |         |         |         |
  1+45       0.2231      2.10  Q         |         |         |         |
  2+ 0       0.2686      2.20  Q         |         |         |         |
  2+15       0.3207      2.52  Q         |         |         |         |
  2+30       0.3762      2.69  Q         |         |         |         |
  2+45       0.4351      2.85  Q         |         |         |         |
  3+ 0       0.5011      3.19  Q         |         |         |         |
  3+15       0.5707      3.37  Q         |         |         |         |
  3+30       0.6418      3.45  Q         |         |         |         |
  3+45       0.7139      3.49  Q         |         |         |         |
  4+ 0       0.7885      3.61  Q         |         |         |         |
  4+15       0.8698      3.94  Q         |         |         |         |
  4+30       0.9564      4.19  Q         |         |         |         |
  4+45       1.0508      4.57  Q         |         |         |         |
  5+ 0       1.1511      4.85  Q         |         |         |         |
  5+15       1.2559      5.08  VQ        |         |         |         |
  5+30       1.3542      4.76  Q         |         |         |         |
  5+45       1.4563      4.94  Q         |         |         |         |
  6+ 0       1.5666      5.34   Q        |         |         |         |
  6+15       1.6824      5.61  |Q        |         |         |         |
  6+30       1.8063      5.99  |Q        |         |         |         |
  6+45       1.9361      6.28  |Q        |         |         |         |
  7+ 0       2.0740      6.68  |Q        |         |         |         |
  7+15       2.2163      6.88  |Q        |         |         |         |
  7+30       2.3624      7.07  |Q        |         |         |         |
  7+45       2.5177      7.52  |Q        |         |         |         |
  8+ 0       2.6854      8.11  |Q        |         |         |         |
  8+15       2.8867      9.75  |Q        |         |         |         |
  8+30       3.1757     13.99  | Q       |         |         |         |
  8+45       3.5389     17.58  | VQ      |         |         |         |
  9+ 0       4.0201     23.29  | V Q     |         |         |         |
  9+15       4.6640     31.17  |  V  Q   |         |         |         |
  9+30       5.5260     41.72  |  V    Q |         |         |         |
  9+45       6.5805     51.04  |   V     Q         |         |         |
 10+ 0       7.8127     59.64  |    V    |Q        |         |         |
 10+15       9.0769     61.19  |     V   | Q       |         |         |
 10+30       9.9917     44.27  |     V Q |         |         |         |
 10+45      10.8371     40.92  |      VQ |         |         |         |
 11+ 0      11.9580     54.25  |      V  Q         |         |         |
 11+15      13.2054     60.37  |       V | Q       |         |         |
 11+30      14.4529     60.38  |        V| Q       |         |         |
 11+45      15.6782     59.31  |         VQ        |         |         |
 12+ 0      16.8164     55.09  |          Q        |         |         |
 12+15      18.1025     62.25  |         |VQ       |         |         |
 12+30      19.8782     85.94  |         |  V   Q  |         |         |
 12+45      21.9896    102.20  |         |   V     Q         |         |
 13+ 0      24.3887    116.12  |         |     V   |  Q      |         |
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13+15      27.0937    130.92  |         |      V  |     Q   |         |
13+30      30.2326    151.92  |         |        V|         Q         |
13+45      33.4080    153.69  |         |           V       Q         |
14+ 0      36.0098    125.93  |         |         |  V Q    |         |
14+15      38.4208    116.69  |         |         |  Q V    |         |
14+30      40.9925    124.47  |         |         |   Q  V  |         |
14+45      43.5956    125.99  |         |         |    Q  V |         |
15+ 0      46.1834    125.25  |         |         |    Q    V         |
15+15      48.7017    121.89  |         |         |   Q     | V       |
15+30      51.1183    116.96  |         |         |  Q      |  V      |
15+45      53.3705    109.01  |         |         |Q        |    V    |
16+ 0      55.3300     94.84  |         |       Q |         |     V   |
16+15      56.9528     78.55  |         |    Q    |         |      V  |
16+30      57.8398     42.93  |       Q |         |         |       V |
16+45      58.3525     24.82  |   Q     |         |         |       V |
17+ 0      58.6968     16.66  |  Q      |         |         |       V |
17+15      58.9418     11.86  | Q       |         |         |       V |
17+30      59.1321      9.21  |Q        |         |         |        V|
17+45      59.2822      7.27  |Q        |         |         |        V|
18+ 0      59.4001      5.70  |Q        |         |         |        V|
18+15      59.4894      4.33  Q         |         |         |        V|
18+30      59.5636      3.59  Q         |         |         |        V|
18+45      59.6222      2.84  Q         |         |         |        V|
19+ 0      59.6723      2.42  Q         |         |         |        V|
19+15      59.7145      2.04  Q         |         |         |        V|
19+30      59.7602      2.21  Q         |         |         |        V|
19+45      59.8116      2.49  Q         |         |         |        V|
20+ 0      59.8579      2.24  Q         |         |         |        V|
20+15      59.8975      1.92  Q         |         |         |        V|
20+30      59.9396      2.04  Q         |         |         |        V|
20+45      59.9832      2.11  Q         |         |         |        V|
21+ 0      60.0253      2.04  Q         |         |         |        V|
21+15      60.0631      1.83  Q         |         |         |        V|
21+30      60.1022      1.90  Q         |         |         |        V|
21+45      60.1389      1.78  Q         |         |         |        V|
22+ 0      60.1776      1.87  Q         |         |         |        V|
22+15      60.2138      1.75  Q         |         |         |        V|
22+30      60.2520      1.85  Q         |         |         |        V|
22+45      60.2863      1.66  Q         |         |         |        V|
23+ 0      60.3181      1.54  Q         |         |         |        V|
23+15      60.3491      1.50  Q         |         |         |        V|
23+30      60.3796      1.47  Q         |         |         |        V|
23+45      60.4098      1.46  Q         |         |         |        V|
24+ 0      60.4398      1.45  Q         |         |         |        V|
24+15      60.4661      1.27  Q         |         |         |        V|
24+30      60.4796      0.65  Q         |         |         |        V|
24+45      60.4868      0.35  Q         |         |         |        V|
25+ 0      60.4914      0.22  Q         |         |         |        V|
25+15      60.4944      0.15  Q         |         |         |        V|
25+30      60.4964      0.10  Q         |         |         |        V|
25+45      60.4977      0.06  Q         |         |         |        V|
26+ 0      60.4986      0.04  Q         |         |         |        V|
26+15      60.4991      0.02  Q         |         |         |        V|
26+30      60.4993      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  05/02/12 File: SubB224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Subdrain Area B2
Existing Conditions
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     104.50(Ac.)  =      0.163 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     104.50(Ac.)  =      0.163 Sq. Mi.
Length along longest watercourse =    2120.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.402 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      30.00(Ft.)
Slope along watercourse =     74.7170 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.130 Hr.
Lag time =     7.78 Min.
25% of lag time =     1.95 Min.
40% of lag time =     3.11 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      104.50           1.80                 188.10

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      104.50           4.50                 470.25

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    18.400           66.00         0.000
    86.100           83.00         0.000
```

Total Area Entered = 104.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.176	0.071
83.0	83.0	0.210	0.000	0.210	0.824	0.173
					Sum (F) =	0.244

Area averaged mean soil loss (F) (In/Hr) = 0.244
Minimum soil loss rate ((In/Hr)) = 0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	192.719	40.788	42.957
2	0.500	385.439	50.698	53.393
3	0.750	578.158	7.242	7.627
4	1.000	770.878	1.272	1.339
			Sum = 100.000	Sum= 105.316

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.431)	0.032	0.004
2	0.50	0.30	0.054	(0.426)	0.049	0.005
3	0.75	0.30	0.054	(0.421)	0.049	0.005
4	1.00	0.40	0.072	(0.416)	0.065	0.007
5	1.25	0.30	0.054	(0.411)	0.049	0.005
6	1.50	0.30	0.054	(0.407)	0.049	0.005
7	1.75	0.30	0.054	(0.402)	0.049	0.005
8	2.00	0.40	0.072	(0.397)	0.065	0.007
9	2.25	0.40	0.072	(0.392)	0.065	0.007
10	2.50	0.40	0.072	(0.387)	0.065	0.007
11	2.75	0.50	0.090	(0.383)	0.081	0.009
12	3.00	0.50	0.090	(0.378)	0.081	0.009
13	3.25	0.50	0.090	(0.373)	0.081	0.009
14	3.50	0.50	0.090	(0.369)	0.081	0.009
15	3.75	0.50	0.090	(0.364)	0.081	0.009
16	4.00	0.60	0.108	(0.359)	0.097	0.011
17	4.25	0.60	0.108	(0.355)	0.097	0.011
18	4.50	0.70	0.126	(0.350)	0.113	0.013
19	4.75	0.70	0.126	(0.346)	0.113	0.013
20	5.00	0.80	0.144	(0.341)	0.130	0.014
21	5.25	0.60	0.108	(0.337)	0.097	0.011
22	5.50	0.70	0.126	(0.332)	0.113	0.013
23	5.75	0.80	0.144	(0.328)	0.130	0.014
24	6.00	0.80	0.144	(0.324)	0.130	0.014
25	6.25	0.90	0.162	(0.319)	0.146	0.016
26	6.50	0.90	0.162	(0.315)	0.146	0.016
27	6.75	1.00	0.180	(0.311)	0.162	0.018
28	7.00	1.00	0.180	(0.307)	0.162	0.018
29	7.25	1.00	0.180	(0.303)	0.162	0.018
30	7.50	1.10	0.198	(0.299)	0.178	0.020
31	7.75	1.20	0.216	(0.294)	0.194	0.022
32	8.00	1.30	0.234	(0.290)	0.211	0.023
33	8.25	1.50	0.270	(0.286)	0.243	0.027
34	8.50	1.50	0.270	(0.282)	0.243	0.027
35	8.75	1.60	0.288	(0.278)	0.259	0.029
36	9.00	1.70	0.306	0.274	(0.275)	0.031

37	9.25	1.90	0.342	0.271	(	0.308)	0.071
38	9.50	2.00	0.360	0.267	(	0.324)	0.093
39	9.75	2.10	0.378	0.263	(	0.340)	0.115
40	10.00	2.20	0.396	0.259	(	0.356)	0.137
41	10.25	1.50	0.270	(0.255)		0.243	0.027
42	10.50	1.50	0.270	(0.252)		0.243	0.027
43	10.75	2.00	0.360	0.248	(	0.324)	0.112
44	11.00	2.00	0.360	0.244	(	0.324)	0.116
45	11.25	1.90	0.342	0.241	(	0.308)	0.101
46	11.50	1.90	0.342	0.237	(	0.308)	0.105
47	11.75	1.70	0.306	0.234	(	0.275)	0.072
48	12.00	1.80	0.324	0.230	(	0.292)	0.094
49	12.25	2.50	0.450	0.227	(	0.405)	0.223
50	12.50	2.60	0.468	0.223	(	0.421)	0.244
51	12.75	2.80	0.504	0.220	(	0.454)	0.284
52	13.00	2.90	0.522	0.217	(	0.470)	0.305
53	13.25	3.40	0.612	0.213	(	0.551)	0.398
54	13.50	3.40	0.612	0.210	(	0.551)	0.402
55	13.75	2.30	0.414	0.207	(	0.373)	0.207
56	14.00	2.30	0.414	0.204	(	0.373)	0.210
57	14.25	2.70	0.486	0.201	(	0.437)	0.285
58	14.50	2.60	0.468	0.198	(	0.421)	0.270
59	14.75	2.60	0.468	0.195	(	0.421)	0.273
60	15.00	2.50	0.450	0.192	(	0.405)	0.258
61	15.25	2.40	0.432	0.189	(	0.389)	0.243
62	15.50	2.30	0.414	0.186	(	0.373)	0.228
63	15.75	1.90	0.342	0.183	(	0.308)	0.159
64	16.00	1.90	0.342	0.180	(	0.308)	0.162
65	16.25	0.40	0.072	(0.178)		0.065	0.007
66	16.50	0.40	0.072	(0.175)		0.065	0.007
67	16.75	0.30	0.054	(0.172)		0.049	0.005
68	17.00	0.30	0.054	(0.170)		0.049	0.005
69	17.25	0.50	0.090	(0.167)		0.081	0.009
70	17.50	0.50	0.090	(0.164)		0.081	0.009
71	17.75	0.50	0.090	(0.162)		0.081	0.009
72	18.00	0.40	0.072	(0.160)		0.065	0.007
73	18.25	0.40	0.072	(0.157)		0.065	0.007
74	18.50	0.40	0.072	(0.155)		0.065	0.007
75	18.75	0.30	0.054	(0.153)		0.049	0.005
76	19.00	0.20	0.036	(0.151)		0.032	0.004
77	19.25	0.30	0.054	(0.148)		0.049	0.005
78	19.50	0.40	0.072	(0.146)		0.065	0.007
79	19.75	0.30	0.054	(0.144)		0.049	0.005
80	20.00	0.20	0.036	(0.142)		0.032	0.004
81	20.25	0.30	0.054	(0.141)		0.049	0.005
82	20.50	0.30	0.054	(0.139)		0.049	0.005
83	20.75	0.30	0.054	(0.137)		0.049	0.005
84	21.00	0.20	0.036	(0.135)		0.032	0.004
85	21.25	0.30	0.054	(0.134)		0.049	0.005
86	21.50	0.20	0.036	(0.132)		0.032	0.004
87	21.75	0.30	0.054	(0.131)		0.049	0.005
88	22.00	0.20	0.036	(0.129)		0.032	0.004
89	22.25	0.30	0.054	(0.128)		0.049	0.005
90	22.50	0.20	0.036	(0.127)		0.032	0.004
91	22.75	0.20	0.036	(0.126)		0.032	0.004
92	23.00	0.20	0.036	(0.125)		0.032	0.004
93	23.25	0.20	0.036	(0.124)		0.032	0.004
94	23.50	0.20	0.036	(0.123)		0.032	0.004
95	23.75	0.20	0.036	(0.123)		0.032	0.004
96	24.00	0.20	0.036	(0.122)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.9

Flood volume = Effective rainfall 1.47(In)
times area 104.5(Ac.)/[(In)/(Ft.)] = 12.8(Ac.Ft)
Total soil loss = 3.03(In)
Total soil loss = 26.384(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 557371.0 Cubic Feet
Total soil loss = 1149288.1 Cubic Feet

Peak flow rate of this hydrograph = 41.254(CFS)

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      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

      ------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-----------------------------------------------------------------------
  0+15       0.0032      0.15  Q         |         |         |         |
  0+30       0.0120      0.42  Q         |         |         |         |
  0+45       0.0233      0.55  Q         |         |         |         |
  1+ 0       0.0366      0.64  Q         |         |         |         |
  1+15       0.0503      0.67  Q         |         |         |         |
  1+30       0.0624      0.58  Q         |         |         |         |
  1+45       0.0742      0.57  Q         |         |         |         |
  2+ 0       0.0875      0.65  Q         |         |         |         |
  2+15       0.1029      0.74  Q         |         |         |         |
  2+30       0.1185      0.76  Q         |         |         |         |
  2+45       0.1357      0.84  Q         |         |         |         |
  3+ 0       0.1550      0.93  Q         |         |         |         |
  3+15       0.1745      0.95  Q         |         |         |         |
  3+30       0.1941      0.95  Q         |         |         |         |
  3+45       0.2137      0.95  Q         |         |         |         |
  4+ 0       0.2349      1.03  Q         |         |         |         |
  4+15       0.2581      1.12  Q         |         |         |         |
  4+30       0.2831      1.21  Q         |         |         |         |
  4+45       0.3102      1.31  VQ        |         |         |         |
  5+ 0       0.3392      1.40  |Q        |         |         |         |
  5+15       0.3670      1.35  |Q        |         |         |         |
  5+30       0.3927      1.24  QV        |         |         |         |
  5+45       0.4215      1.39  |Q        |         |         |         |
  6+ 0       0.4525      1.50  |Q        |         |         |         |
  6+15       0.4854      1.59  |Q        |         |         |         |
  6+30       0.5203      1.69  |Q        |         |         |         |
  6+45       0.5571      1.78  |Q        |         |         |         |
  7+ 0       0.5960      1.88  |Q        |         |         |         |
  7+15       0.6351      1.89  |Q        |         |         |         |
  7+30       0.6759      1.97  |QV       |         |         |         |
  7+45       0.7202      2.15  |QV       |         |         |         |
  8+ 0       0.7685      2.33  |QV       |         |         |         |
  8+15       0.8222      2.60  | Q       |         |         |         |
  8+30       0.8803      2.81  | Q       |         |         |         |
  8+45       0.9405      2.92  | Q       |         |         |         |
  9+ 0       1.0053      3.13  | QV      |         |         |         |
  9+15       1.1087      5.00  |  VQ     |         |         |         |
  9+30       1.2760      8.10  |  V  Q   |         |         |         |
  9+45       1.4931     10.51  |   V   Q |         |         |         |
 10+ 0       1.7582     12.83  |    V    Q         |         |         |
 10+15       1.9538      9.47  |     VQ  |         |         |         |
 10+30       2.0323      3.80  |  Q  V   |         |         |         |
 10+45       2.1696      6.64  |    QV   |         |         |         |
 11+ 0       2.4007     11.19  |      VQ |         |         |         |
 11+15       2.6364     11.41  |       VQ|         |         |         |
 11+30       2.8623     10.93  |       Q |         |         |         |
 11+45       3.0611      9.62  |      Q V|         |         |         |
 12+ 0       3.2433      8.82  |      Q  V         |         |         |
 12+15       3.5590     15.28  |          VQ       |         |         |
 12+30       4.0391     23.24  |          | V     Q |         |         |
 12+45       4.5988     27.09  |          |   V     |Q        |         |
 13+ 0       5.2278     30.44  |          |     V   |   Q     |         |
 13+15       5.9699     35.92  |          |       V |       Q |         |
 13+30       6.8222     41.25  |          |         V         |  Q      |
 13+45       7.5205     33.80  |          |         |  V   Q  |         |
 14+ 0       8.0097     23.68  |          |       Q |    V    |         |
 14+15       8.5384     25.59  |          |         Q     V   |         |
 14+30       9.1319     28.72  |          |         | Q     V |         |
 14+45       9.7235     28.63  |          |         | Q       V         |
 15+ 0      10.3048     28.14  |          |         | Q       | V       |
 15+15      10.8562     26.69  |          |         |Q        |  V      |
```

```
   15+30      11.3753     25.12  |         |         Q         |    V    |
   15+45      11.8136     21.21  |         |     Q   |         |     V   |
   16+ 0      12.1752     17.50  |         |   Q     |         |       V |
   16+15      12.3914     10.46  |       Q |         |         |       V |
   16+30      12.4356      2.14  |Q        |         |         |       V |
   16+45      12.4540      0.89  Q         |         |         |       V |
   17+ 0      12.4660      0.59  Q         |         |         |       V |
   17+15      12.4810      0.73  Q         |         |         |        V|
   17+30      12.5000      0.92  Q         |         |         |        V|
   17+45      12.5195      0.94  Q         |         |         |        V|
   18+ 0      12.5374      0.87  Q         |         |         |        V|
   18+15      12.5535      0.77  Q         |         |         |        V|
   18+30      12.5692      0.76  Q         |         |         |        V|
   18+45      12.5833      0.68  Q         |         |         |        V|
   19+ 0      12.5937      0.51  Q         |         |         |        V|
   19+15      12.6036      0.48  Q         |         |         |        V|
   19+30      12.6166      0.63  Q         |         |         |        V|
   19+45      12.6303      0.66  Q         |         |         |        V|
   20+ 0      12.6408      0.51  Q         |         |         |        V|
   20+15      12.6506      0.48  Q         |         |         |        V|
   20+30      12.6620      0.56  Q         |         |         |        V|
   20+45      12.6737      0.57  Q         |         |         |        V|
   21+ 0      12.6839      0.49  Q         |         |         |        V|
   21+15      12.6937      0.47  Q         |         |         |        V|
   21+30      12.7035      0.48  Q         |         |         |        V|
   21+45      12.7133      0.47  Q         |         |         |        V|
   22+ 0      12.7231      0.48  Q         |         |         |        V|
   22+15      12.7328      0.47  Q         |         |         |        V|
   22+30      12.7427      0.48  Q         |         |         |        V|
   22+45      12.7508      0.39  Q         |         |         |        V|
   23+ 0      12.7587      0.38  Q         |         |         |        V|
   23+15      12.7666      0.38  Q         |         |         |        V|
   23+30      12.7744      0.38  Q         |         |         |        V|
   23+45      12.7822      0.38  Q         |         |         |        V|
   24+ 0      12.7901      0.38  Q         |         |         |        V|
   24+15      12.7947      0.22  Q         |         |         |        V|
   24+30      12.7954      0.03  Q         |         |         |        V|
   24+45      12.7955      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/27/12 File: SubB324100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Stream 2, Subarea B3
Existing Condition
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      92.10(Ac.)  =      0.144 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      92.10(Ac.)  =      0.144 Sq. Mi.
Length along longest watercourse =    3800.00(Ft.)
Length along longest watercourse measured to centroid =    1780.00(Ft.)
Length along longest watercourse =      0.720 Mi.
Length along longest watercourse measured to centroid =      0.337 Mi.
Difference in elevation =     226.00(Ft.)
Slope along watercourse =    314.0211 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.141 Hr.
Lag time =     8.46 Min.
25% of lag time =     2.11 Min.
40% of lag time =     3.38 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           1.80                 165.78

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           4.50                 414.45

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.000           46.00         0.000
    28.000           66.00         0.000
```

3.500	77.00	0.000
41.600	83.00	0.000

Total Area Entered = 92.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.206	0.126
66.0	66.0	0.405	0.000	0.405	0.304	0.123
77.0	77.0	0.279	0.000	0.279	0.038	0.011
83.0	83.0	0.210	0.000	0.210	0.452	0.095
					Sum (F) =	0.355

Area averaged mean soil loss (F) (In/Hr) = 0.355
Minimum soil loss rate ((In/Hr)) = 0.177
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	177.319	37.414	34.727
2	0.500	354.637	52.090	48.350
3	0.750	531.956	8.760	8.131
4	1.000	709.274	1.737	1.612
			Sum = 100.000	Sum= 92.820

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.626)	0.032	0.004
2	0.50	0.30	0.054	(0.619)	0.049	0.005
3	0.75	0.30	0.054	(0.612)	0.049	0.005
4	1.00	0.40	0.072	(0.605)	0.065	0.007
5	1.25	0.30	0.054	(0.597)	0.049	0.005
6	1.50	0.30	0.054	(0.590)	0.049	0.005
7	1.75	0.30	0.054	(0.583)	0.049	0.005
8	2.00	0.40	0.072	(0.576)	0.065	0.007
9	2.25	0.40	0.072	(0.569)	0.065	0.007
10	2.50	0.40	0.072	(0.562)	0.065	0.007
11	2.75	0.50	0.090	(0.556)	0.081	0.009
12	3.00	0.50	0.090	(0.549)	0.081	0.009
13	3.25	0.50	0.090	(0.542)	0.081	0.009
14	3.50	0.50	0.090	(0.535)	0.081	0.009
15	3.75	0.50	0.090	(0.528)	0.081	0.009
16	4.00	0.60	0.108	(0.522)	0.097	0.011
17	4.25	0.60	0.108	(0.515)	0.097	0.011
18	4.50	0.70	0.126	(0.509)	0.113	0.013
19	4.75	0.70	0.126	(0.502)	0.113	0.013
20	5.00	0.80	0.144	(0.496)	0.130	0.014
21	5.25	0.60	0.108	(0.489)	0.097	0.011
22	5.50	0.70	0.126	(0.483)	0.113	0.013
23	5.75	0.80	0.144	(0.477)	0.130	0.014
24	6.00	0.80	0.144	(0.470)	0.130	0.014
25	6.25	0.90	0.162	(0.464)	0.146	0.016
26	6.50	0.90	0.162	(0.458)	0.146	0.016
27	6.75	1.00	0.180	(0.452)	0.162	0.018
28	7.00	1.00	0.180	(0.446)	0.162	0.018
29	7.25	1.00	0.180	(0.440)	0.162	0.018
30	7.50	1.10	0.198	(0.434)	0.178	0.020
31	7.75	1.20	0.216	(0.428)	0.194	0.022
32	8.00	1.30	0.234	(0.422)	0.211	0.023

33	8.25	1.50	0.270	(0.416)		0.243	0.027
34	8.50	1.50	0.270	(0.410)		0.243	0.027
35	8.75	1.60	0.288	(0.404)		0.259	0.029
36	9.00	1.70	0.306	(0.399)		0.275	0.031
37	9.25	1.90	0.342	(0.393)		0.308	0.034
38	9.50	2.00	0.360	(0.387)		0.324	0.036
39	9.75	2.10	0.378	(0.382)		0.340	0.038
40	10.00	2.20	0.396	(0.376)		0.356	0.040
41	10.25	1.50	0.270	(0.371)		0.243	0.027
42	10.50	1.50	0.270	(0.366)		0.243	0.027
43	10.75	2.00	0.360	(0.360)		0.324	0.036
44	11.00	2.00	0.360	(0.355)		0.324	0.036
45	11.25	1.90	0.342	(0.350)		0.308	0.034
46	11.50	1.90	0.342	(0.345)		0.308	0.034
47	11.75	1.70	0.306	(0.339)		0.275	0.031
48	12.00	1.80	0.324	(0.334)		0.292	0.032
49	12.25	2.50	0.450	0.329	(	0.405)	0.121
50	12.50	2.60	0.468	0.324	(	0.421)	0.143
51	12.75	2.80	0.504	0.320	(	0.454)	0.184
52	13.00	2.90	0.522	0.315	(	0.470)	0.207
53	13.25	3.40	0.612	0.310	(	0.551)	0.302
54	13.50	3.40	0.612	0.305	(	0.551)	0.307
55	13.75	2.30	0.414	0.301	(	0.373)	0.113
56	14.00	2.30	0.414	0.296	(	0.373)	0.118
57	14.25	2.70	0.486	0.292	(	0.437)	0.194
58	14.50	2.60	0.468	0.287	(	0.421)	0.181
59	14.75	2.60	0.468	0.283	(	0.421)	0.185
60	15.00	2.50	0.450	0.278	(	0.405)	0.171
61	15.25	2.40	0.432	0.274	(	0.389)	0.158
62	15.50	2.30	0.414	0.270	(	0.373)	0.144
63	15.75	1.90	0.342	0.266	(	0.308)	0.076
64	16.00	1.90	0.342	0.262	(	0.308)	0.080
65	16.25	0.40	0.072	(0.258)		0.065	0.007
66	16.50	0.40	0.072	(0.254)		0.065	0.007
67	16.75	0.30	0.054	(0.250)		0.049	0.005
68	17.00	0.30	0.054	(0.246)		0.049	0.005
69	17.25	0.50	0.090	(0.243)		0.081	0.009
70	17.50	0.50	0.090	(0.239)		0.081	0.009
71	17.75	0.50	0.090	(0.235)		0.081	0.009
72	18.00	0.40	0.072	(0.232)		0.065	0.007
73	18.25	0.40	0.072	(0.228)		0.065	0.007
74	18.50	0.40	0.072	(0.225)		0.065	0.007
75	18.75	0.30	0.054	(0.222)		0.049	0.005
76	19.00	0.20	0.036	(0.219)		0.032	0.004
77	19.25	0.30	0.054	(0.216)		0.049	0.005
78	19.50	0.40	0.072	(0.213)		0.065	0.007
79	19.75	0.30	0.054	(0.210)		0.049	0.005
80	20.00	0.20	0.036	(0.207)		0.032	0.004
81	20.25	0.30	0.054	(0.204)		0.049	0.005
82	20.50	0.30	0.054	(0.202)		0.049	0.005
83	20.75	0.30	0.054	(0.199)		0.049	0.005
84	21.00	0.20	0.036	(0.197)		0.032	0.004
85	21.25	0.30	0.054	(0.194)		0.049	0.005
86	21.50	0.20	0.036	(0.192)		0.032	0.004
87	21.75	0.30	0.054	(0.190)		0.049	0.005
88	22.00	0.20	0.036	(0.188)		0.032	0.004
89	22.25	0.30	0.054	(0.186)		0.049	0.005
90	22.50	0.20	0.036	(0.184)		0.032	0.004
91	22.75	0.20	0.036	(0.183)		0.032	0.004
92	23.00	0.20	0.036	(0.181)		0.032	0.004
93	23.25	0.20	0.036	(0.180)		0.032	0.004
94	23.50	0.20	0.036	(0.179)		0.032	0.004
95	23.75	0.20	0.036	(0.178)		0.032	0.004
96	24.00	0.20	0.036	(0.177)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.7

Flood volume = Effective rainfall 0.94(In)
times area 92.1(Ac.)/[(In)/(Ft.)] = 7.2(Ac.Ft)
Total soil loss = 3.56(In)
Total soil loss = 27.346(Ac.Ft)
Total rainfall = 4.50(In)

```
Flood volume =      312975.8 Cubic Feet
Total soil loss =     1191207.0 Cubic Feet
-----------------------------------------------------------------------
 Peak flow rate of this hydrograph =     27.237(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-----------------------------------------------------------------------
  0+15       0.0026      0.13  Q         |         |         |         |
  0+30       0.0101      0.36  Q         |         |         |         |
  0+45       0.0199      0.48  Q         |         |         |         |
  1+ 0       0.0315      0.56  Q         |         |         |         |
  1+15       0.0437      0.59  Q         |         |         |         |
  1+30       0.0543      0.52  Q         |         |         |         |
  1+45       0.0648      0.50  Q         |         |         |         |
  2+ 0       0.0764      0.56  Q         |         |         |         |
  2+15       0.0899      0.65  Q         |         |         |         |
  2+30       0.1036      0.67  Q         |         |         |         |
  2+45       0.1187      0.73  Q         |         |         |         |
  3+ 0       0.1356      0.82  VQ        |         |         |         |
  3+15       0.1528      0.83  VQ        |         |         |         |
  3+30       0.1701      0.84  VQ        |         |         |         |
  3+45       0.1874      0.84   Q        |         |         |         |
  4+ 0       0.2059      0.90  |Q        |         |         |         |
  4+15       0.2263      0.99  |Q        |         |         |         |
  4+30       0.2482      1.06  |Q        |         |         |         |
  4+45       0.2720      1.15  |Q        |         |         |         |
  5+ 0       0.2974      1.23  |Q        |         |         |         |
  5+15       0.3221      1.19  |Q        |         |         |         |
  5+30       0.3448      1.10  |Q        |         |         |         |
  5+45       0.3700      1.22  |QV       |         |         |         |
  6+ 0       0.3972      1.32  |QV       |         |         |         |
  6+15       0.4261      1.40  |QV       |         |         |         |
  6+30       0.4568      1.49  |QV       |         |         |         |
  6+45       0.4891      1.56  | Q       |         |         |         |
  7+ 0       0.5233      1.65  | Q       |         |         |         |
  7+15       0.5577      1.67  | QV      |         |         |         |
  7+30       0.5936      1.73  | QV      |         |         |         |
  7+45       0.6325      1.88  | QV      |         |         |         |
  8+ 0       0.6748      2.05  | QV      |         |         |         |
  8+15       0.7218      2.28  |  QV     |         |         |         |
  8+30       0.7729      2.47  |  QV     |         |         |         |
  8+45       0.8258      2.56  |  QV     |         |         |         |
  9+ 0       0.8820      2.72  |  QV     |         |         |         |
  9+15       0.9429      2.95  |  Q V    |         |         |         |
  9+30       1.0090      3.20  |   QV    |         |         |         |
  9+45       1.0789      3.38  |   Q V   |         |         |         |
 10+ 0       1.1522      3.55  |   Q V   |         |         |         |
 10+15       1.2187      3.22  |   Q V   |         |         |         |
 10+30       1.2730      2.63  |  Q   V  |         |         |         |
 10+45       1.3317      2.84  |  Q   V  |         |         |         |
 11+ 0       1.3989      3.25  |   Q  V  |         |         |         |
 11+15       1.4664      3.27  |   Q   V |         |         |         |
 11+30       1.5324      3.19  |   Q   V |         |         |         |
 11+45       1.5955      3.05  |   Q   V |         |         |         |
 12+ 0       1.6562      2.94  |  Q     V|         |         |         |
 12+15       1.7814      6.06  |       QV|         |         |         |
 12+30       2.0112     11.13  |          V  Q     |         |         |
 12+45       2.3083     14.38  |         | V      Q|         |         |
 13+ 0       2.6693     17.47  |         |   V     |  Q      |         |
 13+15       3.1288     22.24  |         |      V  |         Q|         |
 13+30       3.6915     27.24  |         |         V         |     Q   |
 13+45       4.1368     21.55  |         |         |  V    Q |         |
 14+ 0       4.3962     12.55  |         |     Q   |   V     |         |
 14+15       4.6827     13.87  |         |       Q |     V   |         |
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   14+30       5.0302     16.82  |         |         | Q     V |         |
   14+45       5.3804     16.95  |         |         | Q      V|         |
   15+ 0       5.7255     16.70  |         |         | Q        V        |
   15+15       6.0473     15.57  |         |         Q         |  V      |
   15+30       6.3433     14.33  |         |        Q|         |    V    |
   15+45       6.5740     11.17  |         |   Q     |         |     V   |
   16+ 0       6.7371      7.89  |         Q         |         |      V  |
   16+15       6.8399      4.98  |     Q   |         |         |       V |
   16+30       6.8683      1.37  |Q        |         |         |       V |
   16+45       6.8832      0.72  Q         |         |         |       V |
   17+ 0       6.8940      0.52  Q         |         |         |       V |
   17+15       6.9070      0.63  Q         |         |         |       V |
   17+30       6.9235      0.80  |Q        |         |         |       V |
   17+45       6.9407      0.83  |Q        |         |         |       V |
   18+ 0       6.9566      0.77  |Q        |         |         |       V |
   18+15       6.9708      0.69  Q         |         |         |       V |
   18+30       6.9847      0.67  Q         |         |         |       V |
   18+45       6.9972      0.61  Q         |         |         |       V |
   19+ 0       7.0066      0.46  Q         |         |         |        V|
   19+15       7.0153      0.42  Q         |         |         |        V|
   19+30       7.0266      0.55  Q         |         |         |        V|
   19+45       7.0387      0.59  Q         |         |         |        V|
   20+ 0       7.0481      0.45  Q         |         |         |        V|
   20+15       7.0567      0.42  Q         |         |         |        V|
   20+30       7.0667      0.49  Q         |         |         |        V|
   20+45       7.0770      0.50  Q         |         |         |        V|
   21+ 0       7.0861      0.44  Q         |         |         |        V|
   21+15       7.0947      0.41  Q         |         |         |        V|
   21+30       7.1034      0.42  Q         |         |         |        V|
   21+45       7.1119      0.41  Q         |         |         |        V|
   22+ 0       7.1207      0.42  Q         |         |         |        V|
   22+15       7.1292      0.41  Q         |         |         |        V|
   22+30       7.1380      0.42  Q         |         |         |        V|
   22+45       7.1452      0.35  Q         |         |         |        V|
   23+ 0       7.1521      0.34  Q         |         |         |        V|
   23+15       7.1591      0.33  Q         |         |         |        V|
   23+30       7.1660      0.33  Q         |         |         |        V|
   23+45       7.1729      0.33  Q         |         |         |        V|
   24+ 0       7.1798      0.33  Q         |         |         |        V|
   24+15       7.1841      0.21  Q         |         |         |        V|
   24+30       7.1848      0.04  Q         |         |         |        V|
   24+45       7.1849      0.01  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/27/12 File: SubB424100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Stream 2, Subarea B4
Existing Condition
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =     765.00(Ac.)  =      1.195 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     765.00(Ac.)  =      1.195 Sq. Mi.
Length along longest watercourse =   11400.00(Ft.)
Length along longest watercourse measured to centroid =    5620.00(Ft.)
Length along longest watercourse =      2.159 Mi.
Length along longest watercourse measured to centroid =      1.064 Mi.
Difference in elevation =     239.00(Ft.)
Slope along watercourse =    110.6947 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.404 Hr.
Lag time =    24.23 Min.
25% of lag time =     6.06 Min.
40% of lag time =     9.69 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      765.00           1.80                1377.00

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      765.00           4.50                3442.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.85 %
Adjusted average point rain =    4.493(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    11.200           76.00         0.000
   751.400           85.00         0.000
```

```
     2.400           92.00         0.000
 Total Area Entered =    765.00(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
76.0  76.0      0.291     0.000        0.291       0.015      0.004
85.0  85.0      0.187     0.000        0.187       0.982      0.184
92.0  92.0      0.104     0.000        0.104       0.003      0.000
                                                  Sum (F) =   0.188
Area averaged mean soil loss (F) (In/Hr) =  0.188
Minimum soil loss rate ((In/Hr)) =  0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
-----------------------------------------------------------------------
               Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.250         61.897          8.651             66.698
    2   0.500        123.794         35.274            271.951
    3   0.750        185.691         25.950            200.068
    4   1.000        247.588          9.993             77.047
    5   1.250        309.485          5.980             46.106
    6   1.500        371.382          4.019             30.983
    7   1.750        433.279          2.828             21.805
    8   2.000        495.176          2.027             15.629
    9   2.250        557.073          1.649             12.716
   10   2.500        618.970          1.201              9.261
   11   2.750        680.867          0.895              6.903
   12   3.000        742.764          0.650              5.012
   13   3.250        804.661          0.882              6.799
                                 Sum = 100.000   Sum=     770.977
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	0.20	0.036	(0.332)	0.032	0.004
2 0.50	0.30	0.054	(0.329)	0.049	0.005
3 0.75	0.30	0.054	(0.325)	0.049	0.005
4 1.00	0.40	0.072	(0.321)	0.065	0.007
5 1.25	0.30	0.054	(0.317)	0.049	0.005
6 1.50	0.30	0.054	(0.313)	0.049	0.005
7 1.75	0.30	0.054	(0.310)	0.049	0.005
8 2.00	0.40	0.072	(0.306)	0.065	0.007
9 2.25	0.40	0.072	(0.302)	0.065	0.007
10 2.50	0.40	0.072	(0.299)	0.065	0.007
11 2.75	0.50	0.090	(0.295)	0.081	0.009
12 3.00	0.50	0.090	(0.291)	0.081	0.009
13 3.25	0.50	0.090	(0.288)	0.081	0.009
14 3.50	0.50	0.090	(0.284)	0.081	0.009
15 3.75	0.50	0.090	(0.281)	0.081	0.009
16 4.00	0.60	0.108	(0.277)	0.097	0.011
17 4.25	0.60	0.108	(0.273)	0.097	0.011
18 4.50	0.70	0.126	(0.270)	0.113	0.013
19 4.75	0.70	0.126	(0.267)	0.113	0.013
20 5.00	0.80	0.144	(0.263)	0.129	0.014
21 5.25	0.60	0.108	(0.260)	0.097	0.011
22 5.50	0.70	0.126	(0.256)	0.113	0.013
23 5.75	0.80	0.144	(0.253)	0.129	0.014
24 6.00	0.80	0.144	(0.250)	0.129	0.014
25 6.25	0.90	0.162	(0.246)	0.146	0.016

26	6.50	0.90	0.162	(	0.243)	0.146	0.016
27	6.75	1.00	0.180	(	0.240)	0.162	0.018
28	7.00	1.00	0.180	(	0.237)	0.162	0.018
29	7.25	1.00	0.180	(	0.233)	0.162	0.018
30	7.50	1.10	0.198	(	0.230)	0.178	0.020
31	7.75	1.20	0.216	(	0.227)	0.194	0.022
32	8.00	1.30	0.234	(	0.224)	0.210	0.023
33	8.25	1.50	0.270		0.221	(0.243)	0.049
34	8.50	1.50	0.270		0.218	(0.243)	0.052
35	8.75	1.60	0.288		0.215	(0.259)	0.073
36	9.00	1.70	0.306		0.212	(0.275)	0.094
37	9.25	1.90	0.341		0.209	(0.307)	0.133
38	9.50	2.00	0.359		0.206	(0.324)	0.154
39	9.75	2.10	0.377		0.203	(0.340)	0.175
40	10.00	2.20	0.395		0.200	(0.356)	0.196
41	10.25	1.50	0.270		0.197	(0.243)	0.073
42	10.50	1.50	0.270		0.194	(0.243)	0.076
43	10.75	2.00	0.359		0.191	(0.324)	0.168
44	11.00	2.00	0.359		0.188	(0.324)	0.171
45	11.25	1.90	0.341		0.186	(0.307)	0.156
46	11.50	1.90	0.341		0.183	(0.307)	0.159
47	11.75	1.70	0.306		0.180	(0.275)	0.125
48	12.00	1.80	0.324		0.178	(0.291)	0.146
49	12.25	2.50	0.449		0.175	(0.404)	0.274
50	12.50	2.60	0.467		0.172	(0.421)	0.295
51	12.75	2.80	0.503		0.170	(0.453)	0.334
52	13.00	2.90	0.521		0.167	(0.469)	0.354
53	13.25	3.40	0.611		0.165	(0.550)	0.447
54	13.50	3.40	0.611		0.162	(0.550)	0.449
55	13.75	2.30	0.413		0.160	(0.372)	0.254
56	14.00	2.30	0.413		0.157	(0.372)	0.256
57	14.25	2.70	0.485		0.155	(0.437)	0.330
58	14.50	2.60	0.467		0.152	(0.421)	0.315
59	14.75	2.60	0.467		0.150	(0.421)	0.317
60	15.00	2.50	0.449		0.148	(0.404)	0.302
61	15.25	2.40	0.431		0.146	(0.388)	0.286
62	15.50	2.30	0.413		0.143	(0.372)	0.270
63	15.75	1.90	0.341		0.141	(0.307)	0.200
64	16.00	1.90	0.341		0.139	(0.307)	0.203
65	16.25	0.40	0.072	(	0.137)	0.065	0.007
66	16.50	0.40	0.072	(	0.135)	0.065	0.007
67	16.75	0.30	0.054	(	0.133)	0.049	0.005
68	17.00	0.30	0.054	(	0.131)	0.049	0.005
69	17.25	0.50	0.090	(	0.129)	0.081	0.009
70	17.50	0.50	0.090	(	0.127)	0.081	0.009
71	17.75	0.50	0.090	(	0.125)	0.081	0.009
72	18.00	0.40	0.072	(	0.123)	0.065	0.007
73	18.25	0.40	0.072	(	0.121)	0.065	0.007
74	18.50	0.40	0.072	(	0.119)	0.065	0.007
75	18.75	0.30	0.054	(	0.118)	0.049	0.005
76	19.00	0.20	0.036	(	0.116)	0.032	0.004
77	19.25	0.30	0.054	(	0.114)	0.049	0.005
78	19.50	0.40	0.072	(	0.113)	0.065	0.007
79	19.75	0.30	0.054	(	0.111)	0.049	0.005
80	20.00	0.20	0.036	(	0.110)	0.032	0.004
81	20.25	0.30	0.054	(	0.108)	0.049	0.005
82	20.50	0.30	0.054	(	0.107)	0.049	0.005
83	20.75	0.30	0.054	(	0.106)	0.049	0.005
84	21.00	0.20	0.036	(	0.104)	0.032	0.004
85	21.25	0.30	0.054	(	0.103)	0.049	0.005
86	21.50	0.20	0.036	(	0.102)	0.032	0.004
87	21.75	0.30	0.054	(	0.101)	0.049	0.005
88	22.00	0.20	0.036	(	0.100)	0.032	0.004
89	22.25	0.30	0.054	(	0.099)	0.049	0.005
90	22.50	0.20	0.036	(	0.098)	0.032	0.004
91	22.75	0.20	0.036	(	0.097)	0.032	0.004
92	23.00	0.20	0.036	(	0.096)	0.032	0.004
93	23.25	0.20	0.036	(	0.096)	0.032	0.004
94	23.50	0.20	0.036	(	0.095)	0.032	0.004
95	23.75	0.20	0.036	(	0.095)	0.032	0.004
96	24.00	0.20	0.036	(	0.094)	0.032	0.004

```
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =     7.4
      Flood volume = Effective rainfall      1.86(In)
       times area     765.0(Ac.)/[(In)/(Ft.)] =     118.3(Ac.Ft)
      Total soil loss =      2.64(In)
      Total soil loss =   168.114(Ac.Ft)
      Total rainfall =      4.49(In)
      Flood volume =     5154570.9 Cubic Feet
      Total soil loss =     7323032.9 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    294.732(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
-------------------------------------------------------------------------
  0+15       0.0050      0.24  Q         |         |         |         |
  0+30       0.0326      1.34  Q         |         |         |         |
  0+45       0.0852      2.55  Q         |         |         |         |
  1+ 0       0.1535      3.30  Q         |         |         |         |
  1+15       0.2356      3.98  Q         |         |         |         |
  1+30       0.3191      4.04  Q         |         |         |         |
  1+45       0.4008      3.95  Q         |         |         |         |
  2+ 0       0.4859      4.11  Q         |         |         |         |
  2+15       0.5819      4.65  Q         |         |         |         |
  2+30       0.6863      5.05  Q         |         |         |         |
  2+45       0.7966      5.34  Q         |         |         |         |
  3+ 0       0.9192      5.94  Q         |         |         |         |
  3+15       1.0510      6.38  Q         |         |         |         |
  3+30       1.1866      6.56  Q         |         |         |         |
  3+45       1.3244      6.67  Q         |         |         |         |
  4+ 0       1.4664      6.87  Q         |         |         |         |
  4+15       1.6195      7.41  Q         |         |         |         |
  4+30       1.7832      7.93  VQ        |         |         |         |
  4+45       1.9606      8.59  VQ        |         |         |         |
  5+ 0       2.1502      9.18  VQ        |         |         |         |
  5+15       2.3493      9.63  VQ        |         |         |         |
  5+30       2.5407      9.27  VQ        |         |         |         |
  5+45       2.7347      9.39  VQ        |         |         |         |
  6+ 0       2.9435     10.11  VQ        |         |         |         |
  6+15       3.1638     10.66  |Q        |         |         |         |
  6+30       3.3979     11.33  |Q        |         |         |         |
  6+45       3.6443     11.93  |Q        |         |         |         |
  7+ 0       3.9055     12.64  |Q        |         |         |         |
  7+15       4.1768     13.13  |Q        |         |         |         |
  7+30       4.4554     13.49  |Q        |         |         |         |
  7+45       4.7497     14.24  |Q        |         |         |         |
  8+ 0       5.0662     15.32  |VQ       |         |         |         |
  8+15       5.4394     18.07  |VQ       |         |         |         |
  8+30       5.9736     25.85  | VQ      |         |         |         |
  8+45       6.6662     33.52  | V Q     |         |         |         |
  9+ 0       7.5635     43.43  | V  Q    |         |         |         |
  9+15       8.7517     57.51  | V    Q  |         |         |         |
  9+30      10.3293     76.36  |  V      Q         |         |         |
  9+45      12.2831     94.56  |   V     | Q       |         |         |
 10+ 0      14.5761    110.98  |   V     |   Q     |         |         |
 10+15      17.0054    117.58  |    V    |    Q    |         |         |
 10+30      18.9348     93.38  |     V   | Q       |         |         |
 10+45      20.6007     80.63  |     V   Q         |         |         |
 11+ 0      22.6758    100.44  |      V  |  Q      |         |         |
 11+15      25.0672    115.74  |       V |    Q    |         |         |
 11+30      27.4948    117.50  |        V|    Q    |         |         |
 11+45      29.8952    116.18  |         V    Q    |         |         |
 12+ 0      32.1675    109.98  |         V   Q     |         |         |
 12+15      34.6122    118.32  |         |V   Q    |         |         |
 12+30      37.8493    156.68  |         | V       Q         |         |
```

```
  12+45      41.7961    191.03  |          |   V     |    Q    |          |
  13+ 0      46.2815    217.09  |          |    V    |       Q |          |
  13+15      51.3161    243.68  |          |      V  |         | Q        |
  13+30      57.1285    281.32  |          |        V|         |      Q   |
  13+45      63.2181    294.73  |          |          V        |        Q|
  14+ 0      68.4641    253.91  |          |         |  V      |  Q       |
  14+15      73.1791    228.20  |          |         |   V     Q          |
  14+30      78.1024    238.29  |          |         |     V   |Q         |
  14+45      83.1459    244.11  |          |         |       V | Q        |
  15+ 0      88.1749    243.40  |          |         |        V| Q        |
  15+15      93.1179    239.24  |          |         |          Q         |
  15+30      97.8886    230.90  |          |         |         Q  V       |
  15+45     102.3811    217.44  |          |         |       Q |   V      |
  16+ 0     106.3742    193.27  |          |         |    Q    |    V     |
  16+15     109.7731    164.51  |          |         |Q        |      V   |
  16+30     111.9310    104.44  |          |  Q      |         |      V   |
  16+45     113.1744     60.18  |        Q |         |         |       V  |
  17+ 0     114.0439     42.08  |    Q     |         |         |       V  |
  17+15     114.6917     31.35  |   Q      |         |         |       V  |
  17+30     115.1988     24.54  |  Q       |         |         |       V  |
  17+45     115.6069     19.75  | Q        |         |         |        V|
  18+ 0     115.9351     15.88  | Q        |         |         |        V|
  18+15     116.1911     12.39  |Q         |         |         |        V|
  18+30     116.3948      9.86  |Q         |         |         |        V|
  18+45     116.5569      7.85  |Q         |         |         |        V|
  19+ 0     116.6856      6.23  Q          |         |         |        V|
  19+15     116.7713      4.15  Q          |         |         |        V|
  19+30     116.8590      4.24  Q          |         |         |        V|
  19+45     116.9569      4.74  Q          |         |         |        V|
  20+ 0     117.0495      4.48  Q          |         |         |        V|
  20+15     117.1298      3.89  Q          |         |         |        V|
  20+30     117.2112      3.94  Q          |         |         |        V|
  20+45     117.2961      4.11  Q          |         |         |        V|
  21+ 0     117.3789      4.01  Q          |         |         |        V|
  21+15     117.4543      3.65  Q          |         |         |        V|
  21+30     117.5299      3.66  Q          |         |         |        V|
  21+45     117.6025      3.51  Q          |         |         |        V|
  22+ 0     117.6763      3.57  Q          |         |         |        V|
  22+15     117.7480      3.47  Q          |         |         |        V|
  22+30     117.8215      3.56  Q          |         |         |        V|
  22+45     117.8900      3.32  Q          |         |         |        V|
  23+ 0     117.9527      3.03  Q          |         |         |        V|
  23+15     118.0137      2.95  Q          |         |         |        V|
  23+30     118.0735      2.89  Q          |         |         |        V|
  23+45     118.1326      2.86  Q          |         |         |        V|
  24+ 0     118.1910      2.83  Q          |         |         |        V|
  24+15     118.2443      2.58  Q          |         |         |        V|
  24+30     118.2770      1.58  Q          |         |         |        V|
  24+45     118.2947      0.86  Q          |         |         |        V|
  25+ 0     118.3064      0.57  Q          |         |         |        V|
  25+15     118.3148      0.40  Q          |         |         |        V|
  25+30     118.3206      0.28  Q          |         |         |        V|
  25+45     118.3248      0.20  Q          |         |         |        V|
  26+ 0     118.3278      0.15  Q          |         |         |        V|
  26+15     118.3299      0.10  Q          |         |         |        V|
  26+30     118.3313      0.07  Q          |         |         |        V|
  26+45     118.3322      0.04  Q          |         |         |        V|
  27+ 0     118.3327      0.02  Q          |         |         |        V|
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 04/27/12

------------------------------------------------------------------


Watershed C, Stream 1
Existing Condition
100-year, 24-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-------------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =   104
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      154.262 (CFS)
               Total volume =      53.876 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       31.000 to Point/Station       32.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1900.00 (Ft.)
Elevation difference =   58.00 (Ft.)
Slope of channel =  0.030526 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1900.00(Ft.)     Elevation difference =  58.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     37.864(CFS)
Depth of flow =     0.598(Ft.)
Average velocity =     5.655(Ft/s)
Total flow rate =    37.864(CFS)
Channel flow top width =   12.392(Ft.)
Depth of flow in channel =   0.60(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.66(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   37.864(CFS)
Total capacity of improved channels =     37.864(CFS)
Critical Depth in Channel =    0.73(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    154.262(CFS)
Depth of flow =     1.346(Ft.)
Average velocity =     9.032(Ft/s)
```

```
Total flow rate =   154.262(CFS)
Channel flow top width =   15.383(Ft.)
Depth of flow in channel =   1.35(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.03(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  154.262(CFS)
Total capacity of improved channels =    154.262(CFS)
Critical Depth in Channel =    1.72(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8416   Travel time =   3.51 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.7225
        dt(routing time-step) =   2.95 (min.),   c* =   0.9990

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       38.6      77.1     115.7     154.3
-----------------------------------------------------------------------
  0+15       0.1116      0.14  O         |         |         |         |
  0+30       0.7791      0.94  O         |         |         |         |
  0+45       1.5049      1.64  O         |         |         |         |
  1+ 0       1.9496      2.02  O         |         |         |         |
  1+15       2.3704      2.46  O         |         |         |         |
  1+30       2.3474      2.32  O         |         |         |         |
  1+45       2.2560      2.24  O         |         |         |         |
  2+ 0       2.2777      2.29  O         |         |         |         |
  2+15       2.5677      2.64  O         |         |         |         |
  2+30       2.7709      2.80  O         |         |         |         |
  2+45       2.9142      2.94  O         |         |         |         |
  3+ 0       3.2587      3.34  O         |         |         |         |
  3+15       3.4830      3.52  O         |         |         |         |
  3+30       3.5786      3.59  O         |         |         |         |
  3+45       3.6234      3.63  O         |         |         |         |
  4+ 0       3.6975      3.71  O         |         |         |         |
  4+15       4.0102      4.08  |O        |         |         |         |
  4+30       4.2801      4.33  |O        |         |         |         |
  4+45       4.6777      4.76  |O        |         |         |         |
  5+ 0       4.9844      5.04  |O        |         |         |         |
  5+15       5.2843      5.34  |O        |         |         |         |
  5+30       4.9854      4.90  |O        |         |         |         |
  5+45       5.0369      5.07  |O        |         |         |         |
  6+ 0       5.4231      5.51  |O        |         |         |         |
  6+15       5.7177      5.77  |O        |         |         |         |
  6+30       6.1301      6.22  |O        |         |         |         |
  6+45       6.4442      6.50  |O        |         |         |         |
  7+ 0       6.8560      6.94  |O        |         |         |         |
  7+15       7.1132      7.15  |O        |         |         |         |
  7+30       7.2802      7.31  |O        |         |         |         |
  7+45       7.6915      7.79  |OI       |         |         |         |
  8+ 0       8.2838      8.41  | O       |         |         |         |
  8+15       9.0094      9.16  | O       |         |         |         |
  8+30       9.9657     10.16  | O       |         |         |         |
  8+45      10.7327     10.87  | O       |         |         |         |
  9+ 0      12.7334     13.19  |  O      |         |         |         |
  9+15      18.4830     19.79  |   OI    |         |         |         |
  9+30      28.7529     30.96  |      OI |         |         |         |
  9+45      38.9272     40.89  |         O         |         |         |
```

```
  10+ 0      48.2755     50.10  |         | O       |         |         |
  10+15      52.8122     53.48  |         |  O      |         |         |
  10+30      36.5915     32.43  |       IO|         |         |         |
  10+45      27.7063     26.54  |     IO  |         |         |         |
  11+ 0      38.8473     41.88  |         O         |         |         |
  11+15      47.6201     49.04  |         | O       |         |         |
  11+30      49.3877     49.48  |         | O       |         |         |
  11+45      49.1467     49.07  |         | O       |         |         |
  12+ 0      44.5492     43.44  |         |O        |         |         |
  12+15      48.3844     49.60  |         | O       |         |         |
  12+30      71.9744     77.48  |         |       O I         |         |
  12+45      92.2479     95.89  |         |         |  OI     |         |
  13+ 0     108.6051    111.74  |         |         |       O |         |
  13+15     123.6432    126.58  |         |         |         | O       |
  13+30     145.5683    150.25  |         |         |         |      OI |
  13+45     153.4643    154.26  |         |         |         |        OI
  14+ 0     126.5914    119.78  |         |         |         |IO       |
  14+15     109.4300    106.87  |         |         |      IO |         |
  14+30     113.4324    115.04  |         |         |        O|         |
  14+45     115.8712    116.08  |         |         |         O         |
  15+ 0     116.3922    116.47  |         |         |         O         |
  15+15     114.0239    113.42  |         |         |        O|         |
  15+30     109.2086    108.17  |         |         |       O |         |
  15+45     101.8669    100.31  |         |         |     O   |         |
  16+ 0      87.3644     84.17  |         |         |IO       |         |
  16+15      73.2574     70.57  |         |       O |         |         |
  16+30      40.6897     33.33  |       I O         |         |         |
  16+45      19.1435     15.64  |   O     |         |         |         |
  17+ 0       9.7157      8.25  | O       |         |         |         |
  17+15       5.4990      4.82  |O        |         |         |         |
  17+30       4.3253      4.20  |O        |         |         |         |
  17+45       4.0101      3.96  |O        |         |         |         |
  18+ 0       3.7130      3.65  O         |         |         |         |
  18+15       3.2748      3.18  O         |         |         |         |
  18+30       3.0598      3.03  O         |         |         |         |
  18+45       2.9253      2.90  O         |         |         |         |
  19+ 0       2.5310      2.44  O         |         |         |         |
  19+15       2.0592      1.97  O         |         |         |         |
  19+30       2.1156      2.15  O         |         |         |         |
  19+45       2.4414      2.51  O         |         |         |         |
  20+ 0       2.3203      2.27  O         |         |         |         |
  20+15       1.9674      1.89  O         |         |         |         |
  20+30       2.0198      2.05  O         |         |         |         |
  20+45       2.1160      2.13  O         |         |         |         |
  21+ 0       2.1011      2.09  O         |         |         |         |
  21+15       1.8750      1.82  O         |         |         |         |
  21+30       1.9231      1.95  O         |         |         |         |
  21+45       1.7940      1.76  O         |         |         |         |
  22+ 0       1.8846      1.92  O         |         |         |         |
  22+15       1.7813      1.75  O         |         |         |         |
  22+30       1.8803      1.91  O         |         |         |         |
  22+45       1.7217      1.67  O         |         |         |         |
  23+ 0       1.5722      1.55  O         |         |         |         |
  23+15       1.5114      1.50  O         |         |         |         |
  23+30       1.4827      1.48  O         |         |         |         |
  23+45       1.4708      1.47  O         |         |         |         |
  24+ 0       1.4666      1.47  O         |         |         |         |
  24+15       1.3527      1.32  O         |         |         |         |
  24+30       0.7391      0.59  O         |         |         |         |
  24+45       0.3189      0.25  O         |         |         |         |
  25+ 0       0.1399      0.11  O         |         |         |         |
  25+15       0.0587      0.05  O         |         |         |         |
  25+30       0.0264      0.02  O         |         |         |         |
  25+45       0.0134      0.01  O         |         |         |         |
  26+ 0       0.0051      0.00  O         |         |         |         |
  26+15       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   105
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      153.464 (CFS)
```

```
                Total volume =      53.876 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


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Process from Point/Station       31.000 to Point/Station       32.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubC224100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       39.5      79.1     118.6     158.1
----------------------------------------------------------------------
  0+15       0.0457      0.16  Q         |         |         |         |
  0+30       0.1061      0.89  Q         |         |         |         |
  0+45       0.1276      1.63  Q         |         |         |         |
  1+ 0       0.1519      2.10  Q         |         |         |         |
  1+15       0.1478      2.52  Q         |         |         |         |
  1+30       0.1304      2.48  Q         |         |         |         |
  1+45       0.1290      2.39  Q         |         |         |         |
  2+ 0       0.1519      2.43  Q         |         |         |         |
  2+15       0.1707      2.74  Q         |         |         |         |
  2+30       0.1721      2.94  Q         |         |         |         |
  2+45       0.1949      3.11  Q         |         |         |         |
  3+ 0       0.2137      3.47  Q         |         |         |         |
  3+15       0.2151      3.70  Q         |         |         |         |
  3+30       0.2151      3.79  Q         |         |         |         |
  3+45       0.2151      3.84  Q         |         |         |         |
  4+ 0       0.2379      3.94  Q         |         |         |         |
  4+15       0.2567      4.27  qQ        |         |         |         |
  4+30       0.2809      4.56  qQ        |         |         |         |
  4+45       0.2997      4.98  qQ        |         |         |         |
  5+ 0       0.3239      5.31  qQ        |         |         |         |
  5+15       0.2970      5.58  qQ        |         |         |         |
  5+30       0.2837      5.27  qQ        |         |         |         |
  5+45       0.3225      5.36  qQ        |         |         |         |
  6+ 0       0.3427      5.77  qQ        |         |         |         |
  6+15       0.3670      6.08  qQ        |         |         |         |
  6+30       0.3857      6.52  qQ        |         |         |         |
  6+45       0.4100      6.85  qQ        |         |         |         |
  7+ 0       0.4287      7.28  qQ        |         |         |         |
  7+15       0.4301      7.54  qQ        |         |         |         |
  7+30       0.4530      7.73  qQ        |         |         |         |
  7+45       0.4946      8.19  q Q       |         |         |         |
  8+ 0       0.5376      8.82  q Q       |         |         |         |
  8+15       0.6035      9.61  q Q       |         |         |         |
  8+30       0.6424     10.61  q Q       |         |         |         |
  8+45       0.6681     11.40  q Q       |         |         |         |
  9+ 0       0.7097     13.44  q  Q      |         |         |         |
  9+15       0.7755     19.26  q   Q     |         |         |         |
  9+30       0.8373     29.59  q      Q  |         |         |         |
  9+45       0.8817     39.81  q         Q         |         |         |
 10+ 0       0.9247     49.20  q         | Q       |         |         |
 10+15       0.7849     53.60  q         |  Q      |         |         |
 10+30       0.6550     37.25  q        Q|         |         |         |
 10+45       0.7594     28.47  q      Q  |         |         |         |
 11+ 0       0.8533     39.70  q         Q         |         |         |
 11+15       0.8374     48.46  q         | Q       |         |         |
```

```
  11+30       0.8187     50.21  q          | Q       |         |         |
  11+45       0.7716     49.92  q          | Q       |         |         |
  12+ 0       0.7569     45.31  q          |Q        |         |         |
  12+15       1.7823     50.17  q          | Q       |         |         |
  12+30       2.9053     74.88  q          |       Q |         |         |
  12+45       3.7282     95.98  q          |         |   Q     |         |
  13+ 0       4.4648    113.07  |q         |         |       Q |         |
  13+15       5.9404    129.58  |q         |         |         | Q       |
  13+30       7.0084    152.58  |q         |         |         |       Q |
  13+45       4.6796    158.14  |q         |         |         |         Q
  14+ 0       2.7289    129.32  q          |         |         | Q       |
  14+15       3.6000    113.03  q          |         |       Q |         |
  14+30       4.2319    117.66  |q         |         |        Q|         |
  14+45       4.2089    120.08  |q         |         |         Q         |
  15+ 0       4.0732    120.47  |q         |         |         Q         |
  15+15       3.7624    117.79  q          |         |        Q|         |
  15+30       3.4360    112.64  q          |         |       Q |         |
  15+45       2.4224    104.29  q          |         |     Q   |         |
  16+ 0       1.7584     89.12  q          |         | Q       |         |
  16+15       0.9096     74.17  q          |       Q |         |         |
  16+30       0.2236     40.91  q         Q         |         |         |
  16+45       0.1492     19.29  q   Q      |         |         |         |
  17+ 0       0.1304      9.85  q Q        |         |         |         |
  17+15       0.1747      5.67  qQ         |         |         |         |
  17+30       0.2123      4.54  qQ         |         |         |         |
  17+45       0.2151      4.23  qQ         |         |         |         |
  18+ 0       0.1922      3.91  Q          |         |         |         |
  18+15       0.1735      3.45  Q          |         |         |         |
  18+30       0.1721      3.23  Q          |         |         |         |
  18+45       0.1492      3.07  Q          |         |         |         |
  19+ 0       0.1076      2.64  Q          |         |         |         |
  19+15       0.1103      2.17  Q          |         |         |         |
  19+30       0.1505      2.27  Q          |         |         |         |
  19+45       0.1478      2.59  Q          |         |         |         |
  20+ 0       0.1076      2.43  Q          |         |         |         |
  20+15       0.1103      2.08  Q          |         |         |         |
  20+30       0.1276      2.15  Q          |         |         |         |
  20+45       0.1290      2.25  Q          |         |         |         |
  21+ 0       0.1062      2.21  Q          |         |         |         |
  21+15       0.1103      1.99  Q          |         |         |         |
  21+30       0.1048      2.03  Q          |         |         |         |
  21+45       0.1103      1.90  Q          |         |         |         |
  22+ 0       0.1048      1.99  Q          |         |         |         |
  22+15       0.1103      1.89  Q          |         |         |         |
  22+30       0.1048      1.99  Q          |         |         |         |
  22+45       0.0874      1.81  Q          |         |         |         |
  23+ 0       0.0860      1.66  Q          |         |         |         |
  23+15       0.0860      1.60  Q          |         |         |         |
  23+30       0.0860      1.57  Q          |         |         |         |
  23+45       0.0860      1.56  Q          |         |         |         |
  24+ 0       0.0860      1.55  Q          |         |         |         |
  24+15       0.0403      1.39  Q          |         |         |         |
  24+30       0.0028      0.74  Q          |         |         |         |
  24+45       0.0000      0.32  Q          |         |         |         |
  25+ 0       0.0000      0.14  Q          |         |         |         |
  25+15       0.0000      0.06  Q          |         |         |         |
  25+30       0.0000      0.03  Q          |         |         |         |
  25+45       0.0000      0.01  Q          |         |         |         |
  26+ 0       0.0000      0.01  Q          |         |         |         |
  26+15       0.0000      0.00  Q          |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   105
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      158.144 (CFS)
                     Total volume =      55.664 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************
```

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------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      321.000 to Point/Station       32.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: C21and22N32.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       57.0     114.0     171.0     228.0
-----------------------------------------------------------------------
  0+15       0.2001      0.36  Q         |         |         |         |
  0+30       0.6519      1.54  Q         |         |         |         |
  0+45       0.9593      2.59  Q         |         |         |         |
  1+ 0       1.1520      3.25  Q         |         |         |         |
  1+15       1.2485      3.77  Q         |         |         |         |
  1+30       1.1430      3.62  Q         |         |         |         |
  1+45       1.0912      3.48  Q         |         |         |         |
  2+ 0       1.1814      3.61  Q         |         |         |         |
  2+15       1.3542      4.09  Q         |         |         |         |
  2+30       1.4195      4.36  Q         |         |         |         |
  2+45       1.5329      4.64  Q         |         |         |         |
  3+ 0       1.7124      5.18  Q         |         |         |         |
  3+15       1.7787      5.48  Q         |         |         |         |
  3+30       1.7922      5.59  Q         |         |         |         |
  3+45       1.7958      5.63  Q         |         |         |         |
  4+ 0       1.8963      5.83  qQ        |         |         |         |
  4+15       2.0722      6.34  qQ        |         |         |         |
  4+30       2.2380      6.80  qQ        |         |         |         |
  4+45       2.4273      7.40  qQ        |         |         |         |
  5+ 0       2.5967      7.91  qQ        |         |         |         |
  5+15       2.5865      8.17  qQ        |         |         |         |
  5+30       2.4041      7.67  qQ        |         |         |         |
  5+45       2.5625      7.92  qQ        |         |         |         |
  6+ 0       2.7809      8.55  qQ        |         |         |         |
  6+15       2.9534      9.04  qQ        |         |         |         |
  6+30       3.1453      9.66  qQ        |         |         |         |
  6+45       3.3152     10.17  qQ        |         |         |         |
  7+ 0       3.5051     10.79  qQ        |         |         |         |
  7+15       3.5745     11.12  qQ        |         |         |         |
  7+30       3.6885     11.42  q Q       |         |         |         |
  7+45       3.9680     12.15  q Q       |         |         |         |
  8+ 0       4.3102     13.13  q Q       |         |         |         |
  8+15       4.7654     14.38  q Q       |         |         |         |
  8+30       5.2000     15.81  q Q       |         |         |         |
  8+45       5.4491     16.85  q Q       |         |         |         |
  9+ 0       6.5855     20.03  |q Q      |         |         |         |
  9+15      10.3191     29.58  |q   Q    |         |         |         |
  9+30      15.6608     45.25  | q    Q  |         |         |         |
  9+45      20.2081     60.02  |  q      Q         |         |         |
 10+ 0      24.2828     73.48  |   q     | Q       |         |         |
 10+15      21.5624     75.16  |  q      |  Q      |         |         |
 10+30      11.5710     48.82  | q     Q |         |         |         |
 10+45      12.0126     40.48  | q    Q  |         |         |         |
 11+ 0      19.9219     59.62  |  q      Q         |         |         |
 11+15      22.7067     71.16  |  q      | Q       |         |         |
 11+30      22.3171     72.52  |  q      | Q       |         |         |
 11+45      20.7768     70.70  |  q      | Q       |         |         |
 12+ 0      18.8298     64.14  |  q      |Q        |         |         |
 12+15      26.1269     76.29  |   q     |  Q      |         |         |
 12+30      40.0070    114.89  |      q  |         Q         |         |
 12+45      49.0755    145.05  |       q |         |    Q    |         |
```

```
 13+ 0      55.8829    168.95  |        q|         |        Q|         |
 13+15      65.0068    194.59  |         |q        |         |   Q     |
 13+30      75.4492    228.03  |         |  q      |         |         Q
 13+45      68.5857    226.73  |         | q       |         |        Q|
 14+ 0      50.5872    179.91  |       q |         |         |Q        |
 14+15      48.1637    161.19  |       q |         |       Q |         |
 14+30      53.3618    171.03  |        q|         |         Q         |
 14+45      54.4448    174.52  |        q|         |         Q         |
 15+ 0      53.8662    174.33  |        q|         |         Q         |
 15+15      51.7058    169.49  |        q|         |        Q|         |
 15+30      48.8543    161.50  |       q |         |       Q |         |
 15+45      42.8687    147.16  |      q  |         |    Q    |         |
 16+ 0      35.5674    124.69  |     q   |         |Q        |         |
 16+15      25.0424     99.21  |   q     |      Q  |         |         |
 16+30       9.2029     50.12  |q      Q |         |         |         |
 16+45       2.9691     22.26  q  Q     |         |         |         |
 17+ 0       1.5394     11.39  qQ       |         |         |         |
 17+15       1.3430      7.02  qQ       |         |         |         |
 17+30       1.6338      6.17  qQ       |         |         |         |
 17+45       1.7617      5.99  qQ       |         |         |         |
 18+ 0       1.6880      5.59  Q        |         |         |         |
 18+15       1.5193      4.97  Q        |         |         |         |
 18+30       1.4546      4.69  Q        |         |         |         |
 18+45       1.3411      4.42  Q        |         |         |         |
 19+ 0       1.0616      3.70  Q        |         |         |         |
 19+15       0.9194      3.09  Q        |         |         |         |
 19+30       1.1161      3.38  Q        |         |         |         |
 19+45       1.2407      3.83  Q        |         |         |         |
 20+ 0       1.0399      3.47  Q        |         |         |         |
 20+15       0.9148      2.99  Q        |         |         |         |
 20+30       1.0156      3.16  Q        |         |         |         |
 20+45       1.0648      3.31  Q        |         |         |         |
 21+ 0       0.9741      3.18  Q        |         |         |         |
 21+15       0.9013      2.89  Q        |         |         |         |
 21+30       0.9120      2.94  Q        |         |         |         |
 21+45       0.8884      2.79  Q        |         |         |         |
 22+ 0       0.9084      2.90  Q        |         |         |         |
 22+15       0.8879      2.78  Q        |         |         |         |
 22+30       0.9084      2.89  Q        |         |         |         |
 22+45       0.7879      2.60  Q        |         |         |         |
 23+ 0       0.7325      2.39  Q        |         |         |         |
 23+15       0.7221      2.32  Q        |         |         |         |
 23+30       0.7190      2.29  Q        |         |         |         |
 23+45       0.7185      2.28  Q        |         |         |         |
 24+ 0       0.7185      2.27  Q        |         |         |         |
 24+15       0.5184      1.91  Q        |         |         |         |
 24+30       0.1666      0.91  Q        |         |         |         |
 24+45       0.0351      0.35  Q        |         |         |         |
 25+ 0       0.0082      0.15  Q        |         |         |         |
 25+15       0.0010      0.06  Q        |         |         |         |
 25+30       0.0000      0.03  Q        |         |         |         |
 25+45       0.0000      0.01  Q        |         |         |         |
 26+ 0       0.0000      0.01  Q        |         |         |         |
 26+15       0.0000      0.00  Q        |         |         |         |
----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                Number of intervals =   105
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      228.026 (CFS)
                Total volume =      80.461 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station       32.000 to Point/Station       33.000
```

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**** STREAM ROUTING SCS CONVEX METHOD ****
____________________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    700.00 (Ft.)
Elevation difference =   22.00 (Ft.)
Slope of channel =  0.031429 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   700.00(Ft.)     Elevation difference =  22.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     56.369(CFS)
Depth of flow =     0.748(Ft.)
Average velocity =     6.552(Ft/s)
Total flow rate =    56.369(CFS)
Channel flow top width =   12.993(Ft.)
Depth of flow in channel =   0.75(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.55(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   56.369(CFS)
Total capacity of improved channels =     56.369(CFS)
Critical Depth in Channel =    0.94(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    228.026(CFS)
Depth of flow =     1.662(Ft.)
Average velocity =    10.299(Ft/s)
Total flow rate =   228.026(CFS)
Channel flow top width =   16.647(Ft.)
Depth of flow in channel =   1.66(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   10.30(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  228.026(CFS)
Total capacity of improved channels =    228.026(CFS)
Critical Depth in Channel =    2.17(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8583   Travel time =   1.13 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  10.6182
       dt(routing time-step) =   0.97 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       57.0     114.0     171.0     228.0
----------------------------------------------------------------------
  0+15       0.3342      0.36  O         |         |         |         |
  0+30       1.4606      1.54  O         |         |         |         |
  0+45       2.5235      2.59  O         |         |         |         |
  1+ 0       3.2106      3.25  O         |         |         |         |
  1+15       3.7335      3.77  O         |         |         |         |
```

```
 1+30       3.6303      3.62  O         |         |         |         |
 1+45       3.4856      3.48  O         |         |         |         |
 2+ 0       3.6023      3.61  O         |         |         |         |
 2+15       4.0613      4.09  O         |         |         |         |
 2+30       4.3449      4.36  O         |         |         |         |
 2+45       4.6239      4.64  O         |         |         |         |
 3+ 0       5.1496      5.18  O         |         |         |         |
 3+15       5.4578      5.48  O         |         |         |         |
 3+30       5.5787      5.59  O         |         |         |         |
 3+45       5.6311      5.63  O         |         |         |         |
 4+ 0       5.8189      5.83  |O        |         |         |         |
 4+15       6.3062      6.34  |O        |         |         |         |
 4+30       6.7692      6.80  |O        |         |         |         |
 4+45       7.3654      7.40  |O        |         |         |         |
 5+ 0       7.8726      7.91  |O        |         |         |         |
 5+15       8.1508      8.17  |O        |         |         |         |
 5+30       7.7053      7.67  |O        |         |         |         |
 5+45       7.9058      7.92  |O        |         |         |         |
 6+ 0       8.5061      8.55  |O        |         |         |         |
 6+15       9.0063      9.04  |O        |         |         |         |
 6+30       9.6208      9.66  |O        |         |         |         |
 6+45      10.1364     10.17  |O        |         |         |         |
 7+ 0      10.7496     10.79  |O        |         |         |         |
 7+15      11.0965     11.12  |O        |         |         |         |
 7+30      11.4020     11.42  | O       |         |         |         |
 7+45      12.1067     12.15  | O       |         |         |         |
 8+ 0      13.0683     13.13  | O       |         |         |         |
 8+15      14.2974     14.38  | O       |         |         |         |
 8+30      15.7154     15.81  | O       |         |         |         |
 8+45      16.7823     16.85  | O       |         |         |         |
 9+ 0      19.8225     20.03  |  O      |         |         |         |
 9+15      28.9586     29.58  |    O    |         |         |         |
 9+30      44.2351     45.25  |      O  |         |         |         |
 9+45      59.0598     60.02  |         O         |         |         |
10+ 0      72.6102     73.48  |         | O       |         |         |
10+15      75.0509     75.16  |         |  O      |         |         |
10+30      50.5250     48.82  |       O |         |         |         |
10+45      41.0190     40.48  |      O  |         |         |         |
11+ 0      58.3816     59.62  |         O         |         |         |
11+15      70.4161     71.16  |         | O       |         |         |
11+30      72.4354     72.52  |         | O       |         |         |
11+45      70.8135     70.70  |         | O       |         |         |
12+ 0      64.5611     64.14  |         |O        |         |         |
12+15      75.5056     76.29  |         |  O      |         |         |
12+30     112.3851    114.89  |         |        OI         |         |
12+45     143.0962    145.05  |         |         |    O    |         |
13+ 0     167.4035    168.95  |         |         |        O|         |
13+15     192.9286    194.59  |         |         |         |  OI     |
13+30     225.8586    228.03  |         |         |         |        OI
13+45     226.8136    226.73  |         |         |         |        O|
14+ 0     182.9425    179.91  |         |         |         |IO       |
14+15     162.4068    161.19  |         |         |       O |         |
14+30     170.3889    171.03  |         |         |        OI         |
14+45     174.2980    174.52  |         |         |         O         |
15+ 0     174.3442    174.33  |         |         |         O         |
15+15     169.8058    169.49  |         |         |        O|         |
15+30     162.0170    161.50  |         |         |       O |         |
15+45     148.0876    147.16  |         |         |    O    |         |
16+ 0     126.1466    124.69  |         |         |IO       |         |
16+15     100.8611     99.21  |         |      O  |         |         |
16+30      53.2984     50.12  |       IO|         |         |         |
16+45      24.0673     22.26  |  IO     |         |         |         |
17+ 0      12.0905     11.39  |IO       |         |         |         |
17+15       7.2999      7.02  |O        |         |         |         |
17+30       6.2262      6.17  |O        |         |         |         |
17+45       5.9988      5.99  |O        |         |         |         |
18+ 0       5.6187      5.59  O         |         |         |         |
18+15       5.0081      4.97  O         |         |         |         |
18+30       4.7046      4.69  O         |         |         |         |
18+45       4.4331      4.42  O         |         |         |         |
19+ 0       3.7465      3.70  O         |         |         |         |
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  19+15       3.1285      3.09  O         |         |         |         |
  19+30       3.3632      3.38  O         |         |         |         |
  19+45       3.8009      3.83  O         |         |         |         |
  20+ 0       3.4913      3.47  O         |         |         |         |
  20+15       3.0232      2.99  O         |         |         |         |
  20+30       3.1520      3.16  O         |         |         |         |
  20+45       3.3003      3.31  O         |         |         |         |
  21+ 0       3.1897      3.18  O         |         |         |         |
  21+15       2.9057      2.89  O         |         |         |         |
  21+30       2.9364      2.94  O         |         |         |         |
  21+45       2.8022      2.79  O         |         |         |         |
  22+ 0       2.8909      2.90  O         |         |         |         |
  22+15       2.7872      2.78  O         |         |         |         |
  22+30       2.8861      2.89  O         |         |         |         |
  22+45       2.6162      2.60  O         |         |         |         |
  23+ 0       2.4041      2.39  O         |         |         |         |
  23+15       2.3241      2.32  O         |         |         |         |
  23+30       2.2899      2.29  O         |         |         |         |
  23+45       2.2761      2.28  O         |         |         |         |
  24+ 0       2.2714      2.27  O         |         |         |         |
  24+15       1.9348      1.91  O         |         |         |         |
  24+30       0.9736      0.91  O         |         |         |         |
  24+45       0.3899      0.35  O         |         |         |         |
  25+ 0       0.1615      0.15  O         |         |         |         |
  25+15       0.0654      0.06  O         |         |         |         |
  25+30       0.0286      0.03  O         |         |         |         |
  25+45       0.0143      0.01  O         |         |         |         |
  26+ 0       0.0056      0.01  O         |         |         |         |
  26+15       0.0003      0.00  O         |         |         |         |
  26+30       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   106
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      226.814 (CFS)
                       Total volume =      80.461 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ---------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       32.000 to Point/Station       33.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        _____________________________________________________________________
        ******************** HYDROGRAPH INFORMATION *********************

                       From study/file name: SubC324100.rte
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f     H y d r o g r a p h
        ---------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       59.9     119.8     179.7     239.6
  -------------------------------------------------------------------------
    0+15       0.1337      0.47  Q         |         |         |         |
    0+30       0.2556      1.72  Q         |         |         |         |
    0+45       0.2831      2.81  Q         |         |         |         |
    1+ 0       0.3499      3.56  Q         |         |         |         |
    1+15       0.3106      4.04  Q         |         |         |         |
    1+30       0.2831      3.91  Q         |         |         |         |
    1+45       0.2831      3.77  Q         |         |         |         |
    2+ 0       0.3499      3.95  Q         |         |         |         |
    2+15       0.3775      4.44  Q         |         |         |         |
    2+30       0.3775      4.72  Q         |         |         |         |
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 2+45       0.4443      5.07  Q         |         |         |         |
 3+ 0       0.4719      5.62  Q         |         |         |         |
 3+15       0.4719      5.93  Q         |         |         |         |
 3+30       0.4719      6.05  qQ        |         |         |         |
 3+45       0.4719      6.10  qQ        |         |         |         |
 4+ 0       0.5387      6.36  qQ        |         |         |         |
 4+15       0.5662      6.87  qQ        |         |         |         |
 4+30       0.6331      7.40  qQ        |         |         |         |
 4+45       0.6606      8.03  qQ        |         |         |         |
 5+ 0       0.7274      8.60  qQ        |         |         |         |
 5+15       0.6213      8.77  qQ        |         |         |         |
 5+30       0.6331      8.34  qQ        |         |         |         |
 5+45       0.7274      8.63  qQ        |         |         |         |
 6+ 0       0.7550      9.26  qQ        |         |         |         |
 6+15       0.8218      9.83  qQ        |         |         |         |
 6+30       0.8493     10.47  qQ        |         |         |         |
 6+45       0.9162     11.05  qQ        |         |         |         |
 7+ 0       0.9437     11.69  qQ        |         |         |         |
 7+15       0.9437     12.04  q Q       |         |         |         |
 7+30       1.0105     12.41  q Q       |         |         |         |
 7+45       1.1049     13.21  q Q       |         |         |         |
 8+ 0       1.1993     14.27  q Q       |         |         |         |
 8+15       1.3605     15.66  q Q       |         |         |         |
 8+30       1.4156     17.13  q Q       |         |         |         |
 8+45       1.4824     18.26  q  Q      |         |         |         |
 9+ 0       1.5768     21.40  q  Q      |         |         |         |
 9+15       1.7380     30.70  q    Q    |         |         |         |
 9+30       1.8599     46.09  q      Q  |         |         |         |
 9+45       1.9542     61.01  q         Q         |         |         |
10+ 0       2.0486     74.66  q         | Q       |         |         |
10+15       1.6083     76.66  q         | Q       |         |         |
10+30       1.4156     51.94  q       Q |         |         |         |
10+45       1.7497     42.77  q      Q  |         |         |         |
11+ 0       1.8874     60.27  q         Q         |         |         |
11+15       1.8206     72.24  q         | Q       |         |         |
11+30       1.7930     74.23  q         | Q       |         |         |
11+45       1.6594     72.47  q         | Q       |         |         |
12+ 0       1.6711     66.23  q         |Q        |         |         |
12+15       3.2288     78.73  q         |  Q      |         |         |
12+30       4.7369    117.12  q         |        Q|         |         |
12+45       6.6420    149.74  |q        |         |    Q    |         |
13+ 0       8.1507    175.55  |q        |         |       Q|         |
13+15      12.0538    204.98  | q       |         |         |   Q     |
13+30      13.7132    239.57  | q       |         |         |       Q
13+45       6.6404    233.45  |q        |         |         |      Q |
14+ 0       3.8865    186.83  q         |         |         |Q        |
14+15       6.8314    169.24  |q        |         |       Q |         |
14+30       7.5324    177.92  |q        |         |        Q|         |
14+45       7.5211    181.82  |q        |         |         Q         |
15+ 0       7.1130    181.46  |q        |         |         Q         |
15+15       6.4256    176.23  |q        |         |        Q|         |
15+30       5.7344    167.75  q         |         |       Q |         |
15+45       3.0342    151.12  q         |         |    Q    |         |
16+ 0       2.1772    128.32  q         |         |Q        |         |
16+15       0.9234    101.78  q         |     Q   |         |         |
16+30       0.3775     53.68  q       Q |         |         |         |
16+45       0.3106     24.38  q   Q     |         |         |         |
17+ 0       0.2831     12.37  q Q       |         |         |         |
17+15       0.4168      7.72  qQ        |         |         |         |
17+30       0.4719      6.70  qQ        |         |         |         |
17+45       0.4719      6.47  qQ        |         |         |         |
18+ 0       0.4050      6.02  qQ        |         |         |         |
18+15       0.3775      5.39  Q         |         |         |         |
18+30       0.3775      5.08  Q         |         |         |         |
18+45       0.3106      4.74  Q         |         |         |         |
19+ 0       0.2163      3.96  Q         |         |         |         |
19+15       0.2556      3.38  Q         |         |         |         |
19+30       0.3499      3.71  Q         |         |         |         |
19+45       0.3106      4.11  Q         |         |         |         |
20+ 0       0.2163      3.71  Q         |         |         |         |
20+15       0.2556      3.28  Q         |         |         |         |
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  20+30       0.2831      3.44  Q         |         |         |         |
  20+45       0.2831      3.58  Q         |         |         |         |
  21+ 0       0.2163      3.41  Q         |         |         |         |
  21+15       0.2556      3.16  Q         |         |         |         |
  21+30       0.2163      3.15  Q         |         |         |         |
  21+45       0.2556      3.06  Q         |         |         |         |
  22+ 0       0.2163      3.11  Q         |         |         |         |
  22+15       0.2556      3.04  Q         |         |         |         |
  22+30       0.2163      3.10  Q         |         |         |         |
  22+45       0.1887      2.80  Q         |         |         |         |
  23+ 0       0.1887      2.59  Q         |         |         |         |
  23+15       0.1887      2.51  Q         |         |         |         |
  23+30       0.1887      2.48  Q         |         |         |         |
  23+45       0.1887      2.46  Q         |         |         |         |
  24+ 0       0.1887      2.46  Q         |         |         |         |
  24+15       0.0551      1.99  Q         |         |         |         |
  24+30       0.0000      0.97  Q         |         |         |         |
  24+45       0.0000      0.39  Q         |         |         |         |
  25+ 0       0.0000      0.16  Q         |         |         |         |
  25+15       0.0000      0.07  Q         |         |         |         |
  25+30       0.0000      0.03  Q         |         |         |         |
  25+45       0.0000      0.01  Q         |         |         |         |
  26+ 0       0.0000      0.01  Q         |         |         |         |
  26+15       0.0000      0.00  Q         |         |         |         |
  26+30       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   106
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      239.572 (CFS)
                       Total volume =      83.791 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       33.000 to Point/Station       34.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1050.00 (Ft.)
        Elevation difference =   20.00 (Ft.)
        Slope of channel =  0.019048 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  1050.00(Ft.)     Elevation difference =  20.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   2.000
        Slope or 'Z' of right channel bank =   2.000
        Manning's 'N'    = 0.030
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =     58.609(CFS)
        Depth of flow =     0.885(Ft.)
        Average velocity =     5.625(Ft/s)
        Total flow rate =    58.609(CFS)
        Channel flow top width =   13.541(Ft.)
        Depth of flow in channel =   0.89(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =    5.63(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =   58.609(CFS)
        Total capacity of improved channels =     58.609(CFS)
        Critical Depth in Channel =    0.95(Ft.)
```

```
Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    239.572(CFS)
Depth of flow =     1.961(Ft.)
Average velocity =     8.776(Ft/s)
Total flow rate =   239.572(CFS)
Channel flow top width =   17.844(Ft.)
Depth of flow in channel =   1.96(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.78(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  239.572(CFS)
Total capacity of improved channels =    239.572(CFS)
Critical Depth in Channel =    2.23(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8377   Travel time =   1.99 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   6.3195
       dt(routing time-step) =   1.67 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       59.9     119.8     179.7     239.6
----------------------------------------------------------------------
  0+15       0.4157      0.47  O         |         |         |         |
  0+30       1.5771      1.72  O         |         |         |         |
  0+45       2.6852      2.81  O         |         |         |         |
  1+ 0       3.4766      3.56  O         |         |         |         |
  1+15       3.9903      4.04  O         |         |         |         |
  1+30       3.9279      3.91  O         |         |         |         |
  1+45       3.7848      3.77  O         |         |         |         |
  2+ 0       3.9318      3.95  O         |         |         |         |
  2+15       4.3846      4.44  O         |         |         |         |
  2+30       4.6908      4.72  O         |         |         |         |
  2+45       5.0297      5.07  O         |         |         |         |
  3+ 0       5.5599      5.62  O         |         |         |         |
  3+15       5.8954      5.93  O         |         |         |         |
  3+30       6.0371      6.05  |O        |         |         |         |
  3+45       6.0971      6.10  |O        |         |         |         |
  4+ 0       6.3292      6.36  |O        |         |         |         |
  4+15       6.8151      6.87  |O        |         |         |         |
  4+30       7.3433      7.40  |O        |         |         |         |
  4+45       7.9566      8.03  |O        |         |         |         |
  5+ 0       8.5361      8.60  |O        |         |         |         |
  5+15       8.7529      8.77  |O        |         |         |         |
  5+30       8.3867      8.34  |O        |         |         |         |
  5+45       8.6004      8.63  |O        |         |         |         |
  6+ 0       9.1912      9.26  |O        |         |         |         |
  6+15       9.7649      9.83  |O        |         |         |         |
  6+30      10.3986     10.47  |O        |         |         |         |
  6+45      10.9877     11.05  |O        |         |         |         |
  7+ 0      11.6220     11.69  |O        |         |         |         |
  7+15      12.0016     12.04  | O       |         |         |         |
  7+30      12.3711     12.41  | O       |         |         |         |
  7+45      13.1226     13.21  | O       |         |         |         |
  8+ 0      14.1499     14.27  | O       |         |         |         |
  8+15      15.5031     15.66  | O       |         |         |         |
  8+30      16.9669     17.13  | O       |         |         |         |
```

8+45	18.1384	18.26		O			
9+ 0	21.0502	21.40		O			
9+15	29.6611	30.70		OI			
9+30	44.3799	46.09		O			
9+45	59.3524	61.01		OI			
10+ 0	73.1390	74.66		O			
10+15	76.4364	76.66		O			
10+30	54.6937	51.94		IO			
10+45	43.7903	42.77		O			
11+ 0	58.3198	60.27		OI			
11+15	70.9037	72.24		OI			
11+30	74.0065	74.23		O			
11+45	72.6684	72.47		O			
12+ 0	66.9273	66.23		O			
12+15	77.3419	78.73		OI			
12+30	112.8465	117.12		OI			
12+45	146.1055	149.74		OI			
13+ 0	172.6789	175.55		OI			
13+15	201.7047	204.98		OI			
13+30	235.7192	239.57		OI			
13+45	234.1353	233.45		IO			
14+ 0	192.0220	186.83		IO			
14+15	171.1975	169.24		O			
14+30	176.9542	177.92		O			
14+45	181.3850	181.82		O			
15+ 0	181.4974	181.46		O			
15+15	176.8135	176.23		O			
15+30	168.6959	167.75		O			
15+45	152.9740	151.12		O			
16+ 0	130.8630	128.32		O			
16+15	104.7403	101.78		IO			
16+30	59.0341	53.68		IO			
16+45	27.6411	24.38		O			
17+ 0	13.7107	12.37		O			
17+15	8.2354	7.72		O			
17+30	6.8115	6.70		O			
17+45	6.4960	6.47		O			
18+ 0	6.0735	6.02		O			
18+15	5.4567	5.39		O			
18+30	5.1159	5.08		O			
18+45	4.7815	4.74		O			
19+ 0	4.0498	3.96		O			
19+15	3.4486	3.38		O			
19+30	3.6765	3.71		O			
19+45	4.0672	4.11		O			
20+ 0	3.7525	3.71		O			
20+15	3.3266	3.28		O			
20+30	3.4177	3.44		O			
20+45	3.5669	3.58		O			
21+ 0	3.4257	3.41		O			
21+15	3.1885	3.16		O			
21+30	3.1536	3.15		O			
21+45	3.0684	3.06		O			
22+ 0	3.1017	3.11		O			
22+15	3.0499	3.04		O			
22+30	3.0957	3.10		O			
22+45	2.8381	2.80		O			
23+ 0	2.6165	2.59		O			
23+15	2.5218	2.51		O			
23+30	2.4824	2.48		O			
23+45	2.4664	2.46		O			
24+ 0	2.4607	2.46		O			
24+15	2.0423	1.99		O			
24+30	1.0868	0.97		O			
24+45	0.4549	0.39		O			
25+ 0	0.1869	0.16		O			
25+15	0.0761	0.07		O			
25+30	0.0327	0.03		O			
25+45	0.0159	0.01		O			
26+ 0	0.0066	0.01		O			
26+15	0.0009	0.00		O			

```
  26+30       0.0000      0.00  O         |         |         |         |
  26+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   107
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      235.719 (CFS)
                      Total volume =      83.791 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       33.000 to Point/Station       34.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: SubC424100.rte
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ----------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       59.7     119.4     179.1     238.8
  ----------------------------------------------------------------------
    0+15       0.0150      0.43  Q         |         |         |         |
    0+30       0.0306      1.61  Q         |         |         |         |
    0+45       0.0355      2.72  Q         |         |         |         |
    1+ 0       0.0434      3.52  Q         |         |         |         |
    1+15       0.0400      4.03  Q         |         |         |         |
    1+30       0.0364      3.96  Q         |         |         |         |
    1+45       0.0359      3.82  Q         |         |         |         |
    2+ 0       0.0434      3.98  Q         |         |         |         |
    2+15       0.0475      4.43  Q         |         |         |         |
    2+30       0.0479      4.74  Q         |         |         |         |
    2+45       0.0554      5.09  Q         |         |         |         |
    3+ 0       0.0595      5.62  Q         |         |         |         |
    3+15       0.0599      5.96  Q         |         |         |         |
    3+30       0.0599      6.10  qQ        |         |         |         |
    3+45       0.0599      6.16  qQ        |         |         |         |
    4+ 0       0.0674      6.40  qQ        |         |         |         |
    4+15       0.0714      6.89  qQ        |         |         |         |
    4+30       0.0794      7.42  qQ        |         |         |         |
    4+45       0.0834      8.04  qQ        |         |         |         |
    5+ 0       0.0914      8.63  qQ        |         |         |         |
    5+15       0.0804      8.83  qQ        |         |         |         |
    5+30       0.0803      8.47  qQ        |         |         |         |
    5+45       0.0909      8.69  qQ        |         |         |         |
    6+ 0       0.0954      9.29  qQ        |         |         |         |
    6+15       0.1033      9.87  qQ        |         |         |         |
    6+30       0.1074     10.51  qQ        |         |         |         |
    6+45       0.1153     11.10  qQ        |         |         |         |
    7+ 0       0.1194     11.74  qQ        |         |         |         |
    7+15       0.1198     12.12  q Q       |         |         |         |
    7+30       0.1273     12.50  q Q       |         |         |         |
    7+45       0.1388     13.26  q Q       |         |         |         |
    8+ 0       0.1618     14.31  q Q       |         |         |         |
    8+15       0.3342     15.84  q Q       |         |         |         |
    8+30       0.4345     17.40  q Q       |         |         |         |
    8+45       0.5372     18.68  q  Q      |         |         |         |
    9+ 0       0.6713     21.72  q  Q      |         |         |         |
    9+15       0.8847     30.55  q    Q    |         |         |         |
    9+30       1.0633     45.44  q      Q  |         |         |         |
```

```
 9+45       1.2058     60.56  q         Q         |         |         |
10+ 0       1.3436     74.48  q         | Q       |         |         |
10+15       0.8812     77.32  q         | Q       |         |         |
10+30       0.6206     55.31  q        Q|         |         |         |
10+45       0.9825     44.77  q      Q  |         |         |         |
11+ 0       1.2018     59.52  q        Q|         |         |         |
11+15       1.1659     72.07  q         | Q       |         |         |
11+30       1.1426     75.15  q         | Q       |         |         |
11+45       1.0050     73.67  q         | Q       |         |         |
12+ 0       1.0158     67.94  q         |Q        |         |         |
12+15       1.5890     78.93  q         |  Q      |         |         |
12+30       1.9674    114.81  q         |        Q|         |         |
12+45       2.2046    148.31  q         |         |   Q     |         |
13+ 0       2.3807    175.06  q         |         |        Q|         |
13+15       2.8206    204.53  q         |         |         |   Q     |
13+30       3.0425    238.76  q         |         |         |        Q
13+45       2.2546    236.39  q         |         |         |       Q|
14+ 0       1.8253    193.85  q         |         |         | Q       |
14+15       2.0920    173.29  q         |         |        Q|         |
14+30       2.1933    179.15  q         |         |         Q         |
14+45       2.1849    183.57  q         |         |         Q         |
15+ 0       2.1198    183.62  q         |         |         Q         |
15+15       2.0185    178.83  q         |         |        Q|         |
15+30       1.9126    170.61  q         |         |       Q |         |
15+45       1.5814    154.56  q         |         |    Q    |         |
16+ 0       1.4288    132.29  q         |         | Q       |         |
16+15       0.5591    105.30  q         |      Q  |         |         |
16+30       0.0980     59.13  q        Q|         |         |         |
16+45       0.0404     27.68  q   Q     |         |         |         |
17+ 0       0.0364     13.75  q Q       |         |         |         |
17+15       0.0509      8.29  qQ        |         |         |         |
17+30       0.0590      6.87  qQ        |         |         |         |
17+45       0.0599      6.56  qQ        |         |         |         |
18+ 0       0.0524      6.13  qQ        |         |         |         |
18+15       0.0484      5.51  Q         |         |         |         |
18+30       0.0479      5.16  Q         |         |         |         |
18+45       0.0404      4.82  Q         |         |         |         |
19+ 0       0.0289      4.08  Q         |         |         |         |
19+15       0.0319      3.48  Q         |         |         |         |
19+30       0.0430      3.72  Q         |         |         |         |
19+45       0.0400      4.11  Q         |         |         |         |
20+ 0       0.0289      3.78  Q         |         |         |         |
20+15       0.0319      3.36  Q         |         |         |         |
20+30       0.0355      3.45  Q         |         |         |         |
20+45       0.0359      3.60  Q         |         |         |         |
21+ 0       0.0284      3.45  Q         |         |         |         |
21+15       0.0319      3.22  Q         |         |         |         |
21+30       0.0280      3.18  Q         |         |         |         |
21+45       0.0319      3.10  Q         |         |         |         |
22+ 0       0.0280      3.13  Q         |         |         |         |
22+15       0.0319      3.08  Q         |         |         |         |
22+30       0.0280      3.12  Q         |         |         |         |
22+45       0.0244      2.86  Q         |         |         |         |
23+ 0       0.0240      2.64  Q         |         |         |         |
23+15       0.0240      2.55  Q         |         |         |         |
23+30       0.0240      2.51  Q         |         |         |         |
23+45       0.0240      2.49  Q         |         |         |         |
24+ 0       0.0240      2.48  Q         |         |         |         |
24+15       0.0090      2.05  Q         |         |         |         |
24+30       0.0009      1.09  Q         |         |         |         |
24+45       0.0000      0.45  Q         |         |         |         |
25+ 0       0.0000      0.19  Q         |         |         |         |
25+15       0.0000      0.08  Q         |         |         |         |
25+30       0.0000      0.03  Q         |         |         |         |
25+45       0.0000      0.02  Q         |         |         |         |
26+ 0       0.0000      0.01  Q         |         |         |         |
26+15       0.0000      0.00  Q         |         |         |         |
26+30       0.0000      0.00  Q         |         |         |         |
26+45       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
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```
                Number of intervals =   107
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      238.762 (CFS)
                Total volume =      84.870 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
****************************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      341.000 to Point/Station       34.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: C41and42N34.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       67.8     135.6     203.3     271.1
--------------------------------------------------------------------
  0+15       0.1725      0.60  Q         |         |         |         |
  0+30       0.3904      2.00  Q         |         |         |         |
  0+45       0.4762      3.20  Q         |         |         |         |
  1+ 0       0.5735      4.09  Q         |         |         |         |
  1+15       0.5537      4.58  Q         |         |         |         |
  1+30       0.4978      4.46  Q         |         |         |         |
  1+45       0.4883      4.31  Q         |         |         |         |
  2+ 0       0.5741      4.55  Q         |         |         |         |
  2+15       0.6399      5.07  Q         |         |         |         |
  2+30       0.6499      5.39  Q         |         |         |         |
  2+45       0.7367      5.82  Q         |         |         |         |
  3+ 0       0.8025      6.42  Q         |         |         |         |
  3+15       0.8125      6.77  Q         |         |         |         |
  3+30       0.8130      6.91  qQ        |         |         |         |
  3+45       0.8130      6.97  qQ        |         |         |         |
  4+ 0       0.8993      7.30  qQ        |         |         |         |
  4+15       0.9651      7.85  qQ        |         |         |         |
  4+30       1.0614      8.48  qQ        |         |         |         |
  4+45       1.1277      9.17  qQ        |         |         |         |
  5+ 0       1.2240      9.85  qQ        |         |         |         |
  5+15       1.1179      9.95  qQ        |         |         |         |
  5+30       1.0824      9.55  qQ        |         |         |         |
  5+45       1.2150      9.91  qQ        |         |         |         |
  6+ 0       1.2898     10.58  qQ        |         |         |         |
  6+15       1.3866     11.25  qQ        |         |         |         |
  6+30       1.4529     11.96  qQ        |         |         |         |
  6+45       1.5492     12.65  qQ        |         |         |         |
  7+ 0       1.6155     13.36  qQ        |         |         |         |
  7+15       1.6256     13.75  q Q       |         |         |         |
  7+30       1.7123     14.21  q Q       |         |         |         |
  7+45       1.8644     15.13  q Q       |         |         |         |
  8+ 0       2.0265     16.34  q Q       |         |         |         |
  8+15       2.2753     18.11  q Q       |         |         |         |
  8+30       2.4175     19.82  q Q       |         |         |         |
  8+45       2.5243     21.20  q  Q      |         |         |         |
  9+ 0       2.6774     24.40  q  Q      |         |         |         |
  9+15       3.8390     34.38  q    Q    |         |         |         |
  9+30       5.5419     50.99  q      Q  |         |         |         |
  9+45       7.0252     67.58  |q       Q|         |         |         |
 10+ 0       8.4383     82.92  |q        | Q       |         |         |
 10+15       5.9762     83.29  q         | Q       |         |         |
 10+30       3.0483     58.36  q       Q |         |         |         |
```

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  10+45       4.9196     49.69  q      Q  |         |         |         |
  11+ 0       7.3265     66.85  |q       Q|         |         |         |
  11+15       7.4373     79.51  |q        |Q        |         |         |
  11+30       7.1660     82.32  |q        | Q       |         |         |
  11+45       6.2025     79.88  q         |Q        |         |         |
  12+ 0       5.9226     73.87  q         Q         |         |         |
  12+15      11.5167     90.45  |q        |  Q      |         |         |
  12+30      16.9681    131.78  | q       |        Q|         |         |
  12+45      20.4141    168.72  |  q      |         |   Q     |         |
  13+ 0      23.0828    198.14  |  q      |         |        Q|         |
  13+15      28.6070    233.13  |   q     |         |         |   Q     |
  13+30      32.3538    271.12  |   q     |         |         |        Q
  13+45      23.7135    260.10  |  q      |         |         |       Q |
  14+ 0      16.8326    210.68  | q       |         |         |Q        |
  14+15      19.5120    192.80  | q       |         |       Q |         |
  14+30      21.5522    200.70  |  q      |         |        Q|         |
  14+45      21.6159    205.19  |  q      |         |         Q         |
  15+ 0      20.9917    204.61  |  q      |         |         Q         |
  15+15      19.7783    198.61  | q       |         |        Q|         |
  15+30      18.4653    189.07  | q       |         |      Q  |         |
  15+45      14.5552    169.11  | q       |         |   Q     |         |
  16+ 0      12.1144    144.41  |q        |         |Q        |         |
  16+15       6.3218    111.62  q         |     Q   |         |         |
  16+30       1.5349     60.67  q       Q |         |         |         |
  16+45       0.6082     28.29  q   Q     |         |         |         |
  17+ 0       0.4984     14.25  q Q       |         |         |         |
  17+15       0.6608      8.95  qQ        |         |         |         |
  17+30       0.7920      7.66  qQ        |         |         |         |
  17+45       0.8120      7.37  qQ        |         |         |         |
  18+ 0       0.7268      6.85  qQ        |         |         |         |
  18+15       0.6610      6.17  Q         |         |         |         |
  18+30       0.6510      5.81  Q         |         |         |         |
  18+45       0.5642      5.39  Q         |         |         |         |
  19+ 0       0.4121      4.49  Q         |         |         |         |
  19+15       0.4225      3.90  Q         |         |         |         |
  19+30       0.5640      4.28  Q         |         |         |         |
  19+45       0.5531      4.66  Q         |         |         |         |
  20+ 0       0.4116      4.19  Q         |         |         |         |
  20+15       0.4225      3.78  Q         |         |         |         |
  20+30       0.4778      3.93  Q         |         |         |         |
  20+45       0.4873      4.09  Q         |         |         |         |
  21+ 0       0.4016      3.86  Q         |         |         |         |
  21+15       0.4220      3.64  Q         |         |         |         |
  21+30       0.3916      3.57  Q         |         |         |         |
  21+45       0.4215      3.52  Q         |         |         |         |
  22+ 0       0.3916      3.52  Q         |         |         |         |
  22+15       0.4215      3.50  Q         |         |         |         |
  22+30       0.3916      3.52  Q         |         |         |         |
  22+45       0.3352      3.20  Q         |         |         |         |
  23+ 0       0.3257      2.97  Q         |         |         |         |
  23+15       0.3252      2.87  Q         |         |         |         |
  23+30       0.3252      2.83  Q         |         |         |         |
  23+45       0.3252      2.82  Q         |         |         |         |
  24+ 0       0.3252      2.81  Q         |         |         |         |
  24+15       0.1527      2.20  Q         |         |         |         |
  24+30       0.0211      1.11  Q         |         |         |         |
  24+45       0.0010      0.46  Q         |         |         |         |
  25+ 0       0.0000      0.19  Q         |         |         |         |
  25+15       0.0000      0.08  Q         |         |         |         |
  25+30       0.0000      0.03  Q         |         |         |         |
  25+45       0.0000      0.02  Q         |         |         |         |
  26+ 0       0.0000      0.01  Q         |         |         |         |
  26+15       0.0000      0.00  Q         |         |         |         |
  26+30       0.0000      0.00  Q         |         |         |         |
  26+45       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   107
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      271.115 (CFS)
                     Total volume =      94.365 (Ac.Ft)
```

```
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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Process from Point/Station       34.000 to Point/Station       35.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    790.00 (Ft.)
Elevation difference =   12.00 (Ft.)
Slope of channel =  0.015190 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   790.00(Ft.)     Elevation difference =  12.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     66.003(CFS)
Depth of flow =     1.012(Ft.)
Average velocity =     5.425(Ft/s)
Total flow rate =    66.003(CFS)
Channel flow top width =   14.048(Ft.)
Depth of flow in channel =   1.01(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.42(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   66.003(CFS)
Total capacity of improved channels =     66.003(CFS)
Critical Depth in Channel =    1.03(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    271.115(CFS)
Depth of flow =     2.231(Ft.)
Average velocity =     8.403(Ft/s)
Total flow rate =   271.115(CFS)
Channel flow top width =   18.924(Ft.)
Depth of flow in channel =   2.23(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.40(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  271.115(CFS)
Total capacity of improved channels =    271.115(CFS)
Critical Depth in Channel =    2.41(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8317   Travel time =   1.57 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   8.0068
        dt(routing time-step) =   1.30 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
```

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Out = O(CFS)	In = I	0	67.8	135.6	203.3	271.1
0+15	0.5508	0.60	O				
0+30	1.8769	2.00	O				
0+45	3.0928	3.20	O				
1+ 0	4.0157	4.09	O				
1+15	4.5413	4.58	O				
1+30	4.4727	4.46	O				
1+45	4.3224	4.31	O				
2+ 0	4.5284	4.55	O				
2+15	5.0266	5.07	O				
2+30	5.3611	5.39	O				
2+45	5.7842	5.82	O				
3+ 0	6.3697	6.42	O				
3+15	6.7377	6.77	O				
3+30	6.8977	6.91	O				
3+45	6.9648	6.97	O				
4+ 0	7.2676	7.30	O				
4+15	7.8033	7.85	O				
4+30	8.4291	8.48	O				
4+45	9.1083	9.17	O				
5+ 0	9.7920	9.85	O				
5+15	9.9425	9.95	O				
5+30	9.5843	9.55	O				
5+45	9.8753	9.91	O				
6+ 0	10.5182	10.58	O				
6+15	11.1959	11.25	O				
6+30	11.8978	11.96	O				
6+45	12.5920	12.65	O				
7+ 0	13.2956	13.36	O				
7+15	13.7130	13.75	O				
7+30	14.1704	14.21	O				
7+45	15.0463	15.13	O				
8+ 0	16.2329	16.34	O				
8+15	17.9584	18.11	O				
8+30	19.6707	19.82	O				
8+45	21.0799	21.20	O				
9+ 0	24.1210	24.40	O				
9+15	33.5172	34.38	OI				
9+30	49.5429	50.99	O				
9+45	66.1413	67.58	O				
10+ 0	81.5884	82.92		O			
10+15	83.2614	83.29		O			
10+30	60.5285	58.36	O				
10+45	50.4456	49.69	O				
11+ 0	65.3576	66.85	O				
11+15	78.4071	79.51	O				
11+30	82.0711	82.32		O			
11+45	80.0879	79.88	O				
12+ 0	74.3879	73.87	O				
12+15	89.0070	90.45		O			
12+30	128.1909	131.78			OI		
12+45	165.5147	168.72				O	
13+ 0	195.5866	198.14				OI	
13+15	230.0924	233.13					OI
13+30	267.8155	271.12					OI
13+45	261.0602	260.10					O
14+ 0	214.9738	210.68				O	
14+15	194.3548	192.80				O	
14+30	200.0135	200.70				O	
14+45	204.7961	205.19				O	
15+ 0	204.6591	204.61				O	
15+15	199.1314	198.61				O	
15+30	189.9023	189.07				IO	
15+45	170.8450	169.11				IO	
16+ 0	146.5525	144.41			O		
16+15	114.4696	111.62		O			

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  16+30      65.0939     60.67  |       IO|         |         |         |
  16+45      31.1027     28.29  |   O     |         |         |         |
  17+ 0      15.4656     14.25  | O       |         |         |         |
  17+15       9.4075      8.95  |O        |         |         |         |
  17+30       7.7741      7.66  |O        |         |         |         |
  17+45       7.3934      7.37  |O        |         |         |         |
  18+ 0       6.8975      6.85  |O        |         |         |         |
  18+15       6.2257      6.17  O         |         |         |         |
  18+30       5.8453      5.81  O         |         |         |         |
  18+45       5.4233      5.39  O         |         |         |         |
  19+ 0       4.5686      4.49  O         |         |         |         |
  19+15       3.9540      3.90  O         |         |         |         |
  19+30       4.2505      4.28  O         |         |         |         |
  19+45       4.6276      4.66  O         |         |         |         |
  20+ 0       4.2336      4.19  O         |         |         |         |
  20+15       3.8168      3.78  O         |         |         |         |
  20+30       3.9180      3.93  O         |         |         |         |
  20+45       4.0763      4.09  O         |         |         |         |
  21+ 0       3.8761      3.86  O         |         |         |         |
  21+15       3.6609      3.64  O         |         |         |         |
  21+30       3.5792      3.57  O         |         |         |         |
  21+45       3.5262      3.52  O         |         |         |         |
  22+ 0       3.5213      3.52  O         |         |         |         |
  22+15       3.5048      3.50  O         |         |         |         |
  22+30       3.5142      3.52  O         |         |         |         |
  22+45       3.2253      3.20  O         |         |         |         |
  23+ 0       2.9863      2.97  O         |         |         |         |
  23+15       2.8792      2.87  O         |         |         |         |
  23+30       2.8350      2.83  O         |         |         |         |
  23+45       2.8170      2.82  O         |         |         |         |
  24+ 0       2.8104      2.81  O         |         |         |         |
  24+15       2.2566      2.20  O         |         |         |         |
  24+30       1.2039      1.11  O         |         |         |         |
  24+45       0.5127      0.46  O         |         |         |         |
  25+ 0       0.2103      0.19  O         |         |         |         |
  25+15       0.0858      0.08  O         |         |         |         |
  25+30       0.0365      0.03  O         |         |         |         |
  25+45       0.0173      0.02  O         |         |         |         |
  26+ 0       0.0074      0.01  O         |         |         |         |
  26+15       0.0014      0.00  O         |         |         |         |
  26+30       0.0001      0.00  O         |         |         |         |
  26+45       0.0000      0.00  O         |         |         |         |
  27+ 0       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   108
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      267.815 (CFS)
                      Total volume =      94.365 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       -------------------------------------------------------------------

       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       34.000 to Point/Station       35.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ___________________________________________________________________
       ******************** HYDROGRAPH INFORMATION *********************

                      From study/file name: SubC524100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)
```

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      ---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       69.8     139.6     209.4     279.2
-----------------------------------------------------------------------
  0+15       0.0547      0.61  Q         |         |         |         |
  0+30       0.1139      1.99  Q         |         |         |         |
  0+45       0.1340      3.23  Q         |         |         |         |
  1+ 0       0.1635      4.18  Q         |         |         |         |
  1+15       0.1520      4.69  Q         |         |         |         |
  1+30       0.1382      4.61  Q         |         |         |         |
  1+45       0.1361      4.46  Q         |         |         |         |
  2+ 0       0.1635      4.69  Q         |         |         |         |
  2+15       0.1794      5.21  Q         |         |         |         |
  2+30       0.1815      5.54  Q         |         |         |         |
  2+45       0.2089      5.99  Q         |         |         |         |
  3+ 0       0.2248      6.59  Q         |         |         |         |
  3+15       0.2269      6.96  Q         |         |         |         |
  3+30       0.2269      7.12  qQ        |         |         |         |
  3+45       0.2269      7.19  qQ        |         |         |         |
  4+ 0       0.2542      7.52  qQ        |         |         |         |
  4+15       0.2702      8.07  qQ        |         |         |         |
  4+30       0.2996      8.73  qQ        |         |         |         |
  4+45       0.3155      9.42  qQ        |         |         |         |
  5+ 0       0.3450     10.14  qQ        |         |         |         |
  5+15       0.3062     10.25  qQ        |         |         |         |
  5+30       0.3038      9.89  qQ        |         |         |         |
  5+45       0.3429     10.22  qQ        |         |         |         |
  6+ 0       0.3609     10.88  qQ        |         |         |         |
  6+15       0.3903     11.59  qQ        |         |         |         |
  6+30       0.4063     12.30  qQ        |         |         |         |
  6+45       0.4357     13.03  qQ        |         |         |         |
  7+ 0       0.4516     13.75  qQ        |         |         |         |
  7+15       0.4537     14.17  q Q       |         |         |         |
  7+30       0.4811     14.65  q Q       |         |         |         |
  7+45       0.5244     15.57  q Q       |         |         |         |
  8+ 0       0.5698     16.80  q Q       |         |         |         |
  8+15       1.1212     19.08  q Q       |         |         |         |
  8+30       1.4786     21.15  q  Q      |         |         |         |
  8+45       1.8633     22.94  q  Q      |         |         |         |
  9+ 0       2.3695     26.49  q  Q      |         |         |         |
  9+15       3.1695     36.69  q    Q    |         |         |         |
  9+30       3.8545     53.40  q      Q  |         |         |         |
  9+45       4.4003     70.54  q         Q         |         |         |
 10+ 0       4.9247     86.51  q         | Q       |         |         |
 10+15       3.2594     86.52  q         | Q       |         |         |
 10+30       2.2343     62.76  q       Q |         |         |         |
 10+45       3.5255     53.97  q      Q  |         |         |         |
 11+ 0       4.3899     69.75  q        Q|         |         |         |
 11+15       4.2874     82.69  q         |Q        |         |         |
 11+30       4.1946     86.27  q         | Q       |         |         |
 11+45       3.6923     83.78  q         | Q       |         |         |
 12+ 0       3.7124     78.10  q         |Q        |         |         |
 12+15       5.8098     94.82  q         |  Q      |         |         |
 12+30       7.2829    135.47  |q        |        Q|         |         |
 12+45       8.1979    173.71  |q        |         |   Q     |         |
 13+ 0       8.8730    204.46  |q        |         |       Q|         |
 13+15      10.5034    240.60  |q        |         |         |   Q     |
 13+30      11.3813    279.20  |q        |         |         |        Q
 13+45       8.5352    269.60  |q        |         |         |       Q |
 14+ 0       6.8419    221.82  q         |         |        |Q        |
 14+15       7.7659    202.12  |q        |         |       Q |         |
 14+30       8.1869    208.20  |q        |         |        Q|         |
 14+45       8.1674    212.96  |q        |         |         Q         |
 15+ 0       7.9288    212.59  |q        |         |         Q         |
 15+15       7.5509    206.68  |q        |         |        Q|         |
 15+30       7.1513    197.05  |q        |         |       Q |         |
 15+45       5.9300    176.77  q         |         |    Q    |         |
 16+ 0       5.3245    151.88  q         |         |Q        |         |
 16+15       2.1967    116.67  q         |     Q   |         |         |
 16+30       0.4145     65.51  q        Q|         |         |         |
 16+45       0.1541     31.26  q   Q     |         |         |         |
 17+ 0       0.1382     15.60  q Q       |         |         |         |
```

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  17+15       0.1908      9.60  qQ        |         |         |         |
  17+30       0.2227      8.00  qQ        |         |         |         |
  17+45       0.2269      7.62  qQ        |         |         |         |
  18+ 0       0.1995      7.10  qQ        |         |         |         |
  18+15       0.1836      6.41  Q         |         |         |         |
  18+30       0.1815      6.03  Q         |         |         |         |
  18+45       0.1541      5.58  Q         |         |         |         |
  19+ 0       0.1108      4.68  Q         |         |         |         |
  19+15       0.1202      4.07  Q         |         |         |         |
  19+30       0.1614      4.41  Q         |         |         |         |
  19+45       0.1520      4.78  Q         |         |         |         |
  20+ 0       0.1108      4.34  Q         |         |         |         |
  20+15       0.1202      3.94  Q         |         |         |         |
  20+30       0.1340      4.05  Q         |         |         |         |
  20+45       0.1361      4.21  Q         |         |         |         |
  21+ 0       0.1088      3.98  Q         |         |         |         |
  21+15       0.1202      3.78  Q         |         |         |         |
  21+30       0.1067      3.69  Q         |         |         |         |
  21+45       0.1202      3.65  Q         |         |         |         |
  22+ 0       0.1067      3.63  Q         |         |         |         |
  22+15       0.1202      3.63  Q         |         |         |         |
  22+30       0.1067      3.62  Q         |         |         |         |
  22+45       0.0928      3.32  Q         |         |         |         |
  23+ 0       0.0907      3.08  Q         |         |         |         |
  23+15       0.0907      2.97  Q         |         |         |         |
  23+30       0.0907      2.93  Q         |         |         |         |
  23+45       0.0907      2.91  Q         |         |         |         |
  24+ 0       0.0907      2.90  Q         |         |         |         |
  24+15       0.0360      2.29  Q         |         |         |         |
  24+30       0.0042      1.21  Q         |         |         |         |
  24+45       0.0000      0.51  Q         |         |         |         |
  25+ 0       0.0000      0.21  Q         |         |         |         |
  25+15       0.0000      0.09  Q         |         |         |         |
  25+30       0.0000      0.04  Q         |         |         |         |
  25+45       0.0000      0.02  Q         |         |         |         |
  26+ 0       0.0000      0.01  Q         |         |         |         |
  26+15       0.0000      0.00  Q         |         |         |         |
  26+30       0.0000      0.00  Q         |         |         |         |
  26+45       0.0000      0.00  Q         |         |         |         |
  27+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   108
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      279.197 (CFS)
                      Total volume =      98.366 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station      351.000 to Point/Station       35.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: C51and52N35.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ----------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       71.8     143.7     215.5     287.4
  ----------------------------------------------------------------------
```

```
 0+15       0.0416      0.65  Q         |         |         |         |
 0+30       0.0894      2.08  Q         |         |         |         |
 0+45       0.1067      3.33  Q         |         |         |         |
 1+ 0       0.1296      4.31  Q         |         |         |         |
 1+15       0.1224      4.82  Q         |         |         |         |
 1+30       0.1108      4.72  Q         |         |         |         |
 1+45       0.1090      4.57  Q         |         |         |         |
 2+ 0       0.1297      4.82  Q         |         |         |         |
 2+15       0.1432      5.35  Q         |         |         |         |
 2+30       0.1451      5.69  Q         |         |         |         |
 2+45       0.1660      6.16  Q         |         |         |         |
 3+ 0       0.1795      6.77  Q         |         |         |         |
 3+15       0.1814      7.15  Q         |         |         |         |
 3+30       0.1815      7.31  qQ        |         |         |         |
 3+45       0.1815      7.37  qQ        |         |         |         |
 4+ 0       0.2023      7.72  qQ        |         |         |         |
 4+15       0.2158      8.29  qQ        |         |         |         |
 4+30       0.2385      8.97  qQ        |         |         |         |
 4+45       0.2521      9.68  qQ        |         |         |         |
 5+ 0       0.2748     10.41  qQ        |         |         |         |
 5+15       0.2468     10.50  qQ        |         |         |         |
 5+30       0.2425     10.13  qQ        |         |         |         |
 5+45       0.2731     10.49  qQ        |         |         |         |
 6+ 0       0.2883     11.17  qQ        |         |         |         |
 6+15       0.3111     11.90  qQ        |         |         |         |
 6+30       0.3247     12.63  qQ        |         |         |         |
 6+45       0.3474     13.38  qQ        |         |         |         |
 7+ 0       0.3610     14.11  qQ        |         |         |         |
 7+15       0.3629     14.53  q Q       |         |         |         |
 7+30       0.3838     15.04  q Q       |         |         |         |
 7+45       0.4181     15.99  q Q       |         |         |         |
 8+ 0       0.5119     17.31  q Q       |         |         |         |
 8+15       0.7685     19.85  q Q       |         |         |         |
 8+30       0.9005     22.05  q  Q      |         |         |         |
 8+45       1.0230     23.97  q  Q      |         |         |         |
 9+ 0       1.1966     27.69  q  Q      |         |         |         |
 9+15       1.5185     38.21  q    Q    |         |         |         |
 9+30       1.9221     55.32  q      Q  |         |         |         |
 9+45       2.3455     72.89  q         Q         |         |         |
10+ 0       2.7809     89.29  q         | Q       |         |         |
10+15       1.8276     88.35  q         | Q       |         |         |
10+30       1.1478     63.91  q       Q |         |         |         |
10+45       1.9028     55.87  q      Q  |         |         |         |
11+ 0       2.4579     72.21  q         Q         |         |         |
11+15       2.3747     85.07  q         |Q        |         |         |
11+30       2.3115     88.58  q         | Q       |         |         |
11+45       1.9450     85.73  q         |Q        |         |         |
12+ 0       1.9491     80.05  q         |Q        |         |         |
12+15       3.5691     98.39  q         |  Q      |         |         |
12+30       4.8051    140.28  q         |       Q|         |         |
12+45       5.5539    179.27  q         |         |   Q     |         |
13+ 0       6.1225    210.58  q         |         |       Q|         |
13+15       7.4002    248.00  |q        |         |         |   Q     |
13+30       8.1592    287.36  |q        |         |         |       Q
13+45       6.0284    275.62  q         |         |         |      Q |
14+ 0       4.6092    226.42  q         |         |         |Q       |
14+15       5.2947    207.42  q         |         |      Q |         |
14+30       5.6749    213.88  q         |         |       Q|         |
14+45       5.6732    218.64  q         |         |        Q        |
15+ 0       5.5083    218.10  q         |         |        Q        |
15+15       5.2214    211.90  q         |         |       Q|         |
15+30       4.9155    201.97  q         |         |      Q |         |
15+45       3.9838    180.76  q         |         |    Q   |         |
16+ 0       3.4780    155.35  q         |        |Q       |         |
16+15       1.5011    118.17  q         |     Q  |         |         |
16+30       0.2942     65.80  q        Q|        |         |         |
16+45       0.1327     31.39  q   Q     |         |         |         |
17+ 0       0.1113     15.72  q Q       |         |         |         |
17+15       0.1506      9.75  qQ        |         |         |         |
17+30       0.1775      8.17  qQ        |         |         |         |
17+45       0.1813      7.80  qQ        |         |         |         |
```

```
   18+ 0       0.1607      7.26  qQ        |         |         |         |
   18+15       0.1472      6.56  Q         |         |         |         |
   18+30       0.1453      6.17  Q         |         |         |         |
   18+45       0.1244      5.70  Q         |         |         |         |
   19+ 0       0.0901      4.77  Q         |         |         |         |
   19+15       0.0955      4.17  Q         |         |         |         |
   19+30       0.1278      4.54  Q         |         |         |         |
   19+45       0.1223      4.90  Q         |         |         |         |
   20+ 0       0.0900      4.43  Q         |         |         |         |
   20+15       0.0955      4.03  Q         |         |         |         |
   20+30       0.1070      4.16  Q         |         |         |         |
   20+45       0.1088      4.32  Q         |         |         |         |
   21+ 0       0.0881      4.07  Q         |         |         |         |
   21+15       0.0954      3.88  Q         |         |         |         |
   21+30       0.0862      3.77  Q         |         |         |         |
   21+45       0.0953      3.74  Q         |         |         |         |
   22+ 0       0.0862      3.71  Q         |         |         |         |
   22+15       0.0953      3.72  Q         |         |         |         |
   22+30       0.0862      3.71  Q         |         |         |         |
   22+45       0.0745      3.39  Q         |         |         |         |
   23+ 0       0.0727      3.15  Q         |         |         |         |
   23+15       0.0726      3.04  Q         |         |         |         |
   23+30       0.0726      3.00  Q         |         |         |         |
   23+45       0.0726      2.98  Q         |         |         |         |
   24+ 0       0.0726      2.97  Q         |         |         |         |
   24+15       0.0310      2.32  Q         |         |         |         |
   24+30       0.0040      1.21  Q         |         |         |         |
   24+45       0.0000      0.51  Q         |         |         |         |
   25+ 0       0.0000      0.21  Q         |         |         |         |
   25+15       0.0000      0.09  Q         |         |         |         |
   25+30       0.0000      0.04  Q         |         |         |         |
   25+45       0.0000      0.02  Q         |         |         |         |
   26+ 0       0.0000      0.01  Q         |         |         |         |
   26+15       0.0000      0.00  Q         |         |         |         |
   26+30       0.0000      0.00  Q         |         |         |         |
   26+45       0.0000      0.00  Q         |         |         |         |
   27+ 0       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   108
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      287.356 (CFS)
                       Total volume =     100.984 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ---------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       35.000 to Point/Station       36.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   3400.00 (Ft.)
        Elevation difference =   68.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  3400.00(Ft.)     Elevation difference =  68.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   2.000
        Slope or 'Z' of right channel bank =   2.000
        Manning's 'N'    = 0.030
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =     70.629(CFS)
```

```
Depth of flow =     0.972(Ft.)
Average velocity =     6.083(Ft/s)
Total flow rate =    70.629(CFS)
Channel flow top width =   13.888(Ft.)
Depth of flow in channel =   0.97(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.08(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   70.629(CFS)
Total capacity of improved channels =     70.629(CFS)
Critical Depth in Channel =    1.08(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    287.356(CFS)
Depth of flow =     2.137(Ft.)
Average velocity =     9.421(Ft/s)
Total flow rate =   287.356(CFS)
Channel flow top width =   18.548(Ft.)
Depth of flow in channel =   2.14(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.42(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  287.356(CFS)
Total capacity of improved channels =    287.356(CFS)
Critical Depth in Channel =    2.47(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8471   Travel time =   6.01 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   2.2959
       dt(routing time-step) =   5.10 (min.),   c* =   0.9866

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       71.8     143.7     215.5     287.4
----------------------------------------------------------------------
  0+15       0.4216      0.65  O         |         |         |         |
  0+30       1.5777      2.08  O         |         |         |         |
  0+45       2.8899      3.33  O         |         |         |         |
  1+ 0       3.9629      4.31  O         |         |         |         |
  1+15       4.6344      4.82  O         |         |         |         |
  1+30       4.7521      4.72  O         |         |         |         |
  1+45       4.6217      4.57  O         |         |         |         |
  2+ 0       4.7338      4.82  O         |         |         |         |
  2+15       5.1641      5.35  O         |         |         |         |
  2+30       5.5672      5.69  O         |         |         |         |
  2+45       5.9931      6.16  O         |         |         |         |
  3+ 0       6.5574      6.77  O         |         |         |         |
  3+15       7.0134      7.15  O         |         |         |         |
  3+30       7.2485      7.31  |O        |         |         |         |
  3+45       7.3490      7.37  |O        |         |         |         |
  4+ 0       7.6015      7.72  |O        |         |         |         |
  4+15       8.0907      8.29  |O        |         |         |         |
  4+30       8.7282      8.97  |O        |         |         |         |
  4+45       9.4257      9.68  |O        |         |         |         |
  5+ 0      10.1520     10.41  |O        |         |         |         |
  5+15      10.4628     10.50  |O        |         |         |         |
  5+30      10.2573     10.13  |O        |         |         |         |
```

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 5+45      10.3672     10.49  |O        |         |         |         |
 6+ 0      10.9301     11.17  |O        |         |         |         |
 6+15      11.6397     11.90  |O        |         |         |         |
 6+30      12.3703     12.63  |O        |         |         |         |
 6+45      13.1115     13.38  |O        |         |         |         |
 7+ 0      13.8492     14.11  |O        |         |         |         |
 7+15      14.3793     14.53  | O       |         |         |         |
 7+30      14.8570     15.04  | O       |         |         |         |
 7+45      15.6540     15.99  | O       |         |         |         |
 8+ 0      16.8479     17.31  | O       |         |         |         |
 8+15      18.9588     19.85  | O       |         |         |         |
 8+30      21.2705     22.05  | OI      |         |         |         |
 8+45      23.2878     23.97  |  O      |         |         |         |
 9+ 0      26.3811     27.69  |  O      |         |         |         |
 9+15      34.5216     38.21  |   OI    |         |         |         |
 9+30      49.3050     55.32  |     OI  |         |         |         |
 9+45      66.6834     72.89  |        OI         |         |         |
10+ 0      83.4923     89.29  |         |OI       |         |         |
10+15      88.6003     88.35  |         | O       |         |         |
10+30      72.4317     63.91  |       I O         |         |         |
10+45      58.7893     55.87  |      IO |         |         |         |
11+ 0      66.5522     72.21  |        OI         |         |         |
11+15      80.5098     85.07  |         |O        |         |         |
11+30      87.2934     88.58  |         | O       |         |         |
11+45      86.7020     85.73  |         |IO       |         |         |
12+ 0      82.0408     80.05  |         |O        |         |         |
12+15      92.0214     98.39  |         | OI      |         |         |
12+30     125.5919    140.28  |         |      O I|         |         |
12+45     165.4806    179.27  |         |         |  OI     |         |
13+ 0     199.4824    210.58  |         |         |      O I|         |
13+15     234.8067    248.00  |         |         |         | O I     |
13+30     273.4604    287.36  |         |         |         |       O I
13+45     279.5267    275.62  |         |         |         |       O |
14+ 0     243.6253    226.42  |         |         |         |I O      |
14+15     214.2716    207.42  |         |         |       IO|         |
14+30     211.7156    213.88  |         |         |        O|         |
14+45     216.9482    218.64  |         |         |         O         |
15+ 0     218.2619    218.10  |         |         |         O         |
15+15     214.0643    211.90  |         |         |        O|         |
15+30     205.4607    201.97  |         |         |       O |         |
15+45     188.1984    180.76  |         |         |    IO   |         |
16+ 0     164.3091    155.35  |         |         |IO       |         |
16+15     131.2491    118.17  |         |     I O |         |         |
16+30      84.2296     65.80  |        I|O        |         |         |
16+45      43.6311     31.39  |   I O   |         |         |         |
17+ 0      21.3425     15.72  | O       |         |         |         |
17+15      11.9039      9.75  |O        |         |         |         |
17+30       8.7521      8.17  |O        |         |         |         |
17+45       7.9392      7.80  |O        |         |         |         |
18+ 0       7.4491      7.26  |O        |         |         |         |
18+15       6.8034      6.56  O         |         |         |         |
18+30       6.3094      6.17  O         |         |         |         |
18+45       5.8676      5.70  O         |         |         |         |
19+ 0       5.0967      4.77  O         |         |         |         |
19+15       4.3832      4.17  O         |         |         |         |
19+30       4.4136      4.54  O         |         |         |         |
19+45       4.7740      4.90  O         |         |         |         |
20+ 0       4.5957      4.43  O         |         |         |         |
20+15       4.1747      4.03  O         |         |         |         |
20+30       4.1168      4.16  O         |         |         |         |
20+45       4.2642      4.32  O         |         |         |         |
21+ 0       4.1588      4.07  O         |         |         |         |
21+15       3.9462      3.88  O         |         |         |         |
21+30       3.8094      3.77  O         |         |         |         |
21+45       3.7528      3.74  O         |         |         |         |
22+ 0       3.7239      3.71  O         |         |         |         |
22+15       3.7183      3.72  O         |         |         |         |
22+30       3.7117      3.71  O         |         |         |         |
22+45       3.5023      3.39  O         |         |         |         |
23+ 0       3.2359      3.15  O         |         |         |         |
23+15       3.0811      3.04  O         |         |         |         |
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  23+30       3.0143      3.00  O         |         |         |         |
  23+45       2.9868      2.98  O         |         |         |         |
  24+ 0       2.9761      2.97  O         |         |         |         |
  24+15       2.5502      2.32  O         |         |         |         |
  24+30       1.6025      1.21  O         |         |         |         |
  24+45       0.7617      0.51  O         |         |         |         |
  25+ 0       0.3190      0.21  O         |         |         |         |
  25+15       0.1306      0.09  O         |         |         |         |
  25+30       0.0542      0.04  O         |         |         |         |
  25+45       0.0242      0.02  O         |         |         |         |
  26+ 0       0.0110      0.01  O         |         |         |         |
  26+15       0.0036      0.00  O         |         |         |         |
  26+30       0.0006      0.00  O         |         |         |         |
  26+45       0.0000      0.00  O         |         |         |         |
  27+ 0       0.0000      0.00  O         |         |         |         |
  27+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   109
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      279.527 (CFS)
                      Total volume =     100.984 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       35.000 to Point/Station       36.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       _____________________________________________________________________
       ******************** HYDROGRAPH INFORMATION *********************

                      From study/file name: SubC624100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       76.0     152.1     228.1     304.1
  ----------------------------------------------------------------------
    0+15       0.0715      0.49  Q         |         |         |         |
    0+30       0.2254      1.80  Q         |         |         |         |
    0+45       0.3145      3.20  Q         |         |         |         |
    1+ 0       0.3786      4.34  Q         |         |         |         |
    1+15       0.4158      5.05  Q         |         |         |         |
    1+30       0.3808      5.13  Q         |         |         |         |
    1+45       0.3752      5.00  Q         |         |         |         |
    2+ 0       0.4080      5.14  Q         |         |         |         |
    2+15       0.4661      5.63  Q         |         |         |         |
    2+30       0.4784      6.05  Q         |         |         |         |
    2+45       0.5208      6.51  Q         |         |         |         |
    3+ 0       0.5835      7.14  Q         |         |         |         |
    3+15       0.6013      7.61  qQ        |         |         |         |
    3+30       0.6079      7.86  qQ        |         |         |         |
    3+45       0.6116      7.96  qQ        |         |         |         |
    4+ 0       0.6501      8.25  qQ        |         |         |         |
    4+15       0.7091      8.80  qQ        |         |         |         |
    4+30       0.7599      9.49  qQ        |         |         |         |
    4+45       0.8256     10.25  qQ        |         |         |         |
    5+ 0       0.8800     11.03  qQ        |         |         |         |
    5+15       0.8769     11.34  qQ        |         |         |         |
    5+30       0.8132     11.07  qQ        |         |         |         |
    5+45       0.8874     11.25  qQ        |         |         |         |
    6+ 0       0.9518     11.88  qQ        |         |         |         |
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 6+15       1.0047     12.64  qQ        |         |         |         |
 6+30       1.0686     13.44  qQ        |         |         |         |
 6+45       1.1257     14.24  qQ        |         |         |         |
 7+ 0       1.1942     15.04  qQ        |         |         |         |
 7+15       1.2128     15.59  q Q       |         |         |         |
 7+30       1.2580     16.11  q Q       |         |         |         |
 7+45       1.3564     17.01  q Q       |         |         |         |
 8+ 0       1.4690     18.32  q Q       |         |         |         |
 8+15       1.6213     20.58  q Q       |         |         |         |
 8+30       1.7647     23.04  q  Q      |         |         |         |
 8+45       2.1899     25.48  q  Q      |         |         |         |
 9+ 0       3.2661     29.65  q  Q      |         |         |         |
 9+15       4.9210     39.44  q    Q    |         |         |         |
 9+30       6.8921     56.20  q      Q  |         |         |         |
 9+45       8.4621     75.15  |q       Q|         |         |         |
10+ 0       9.9803     93.47  |q        | Q       |         |         |
10+15       8.6085     97.21  |q        | Q       |         |         |
10+30       5.0039     77.44  q         Q        |         |         |
10+45       6.0918     64.88  q       Q |        |         |         |
11+ 0       8.8598     75.41  |q       Q|         |         |         |
11+15       9.2407     89.75  |q        |Q        |         |         |
11+30       9.0050     96.30  |q        | Q       |         |         |
11+45       8.5322     95.23  |q        | Q       |         |         |
12+ 0       7.9874     90.03  |q        |Q        |         |         |
12+15      10.9512    102.97  |q        |  Q      |         |         |
12+30      15.6365    141.23  | q       |       Q |         |         |
12+45      18.1883    183.67  | q       |         |   Q     |         |
13+ 0      20.5245    220.01  | q       |         |       Q |         |
13+15      23.7485    258.56  |  q      |         |         |   Q     |
13+30      27.4071    300.87  |  q      |         |         |        Q|
13+45      24.5822    304.11  |  q      |         |         |         Q
14+ 0      18.6992    262.32  | q       |         |         |   Q     |
14+15      18.8754    233.15  | q       |         |        Q        |
14+30      20.4686    232.18  | q       |         |        Q        |
14+45      20.2605    237.21  | q       |         |        |Q       |
15+ 0      19.8979    238.16  | q       |         |        |Q       |
15+15      19.2052    233.27  | q       |         |        Q        |
15+30      18.3542    223.81  | q       |         |       Q|        |
15+45      16.2606    204.46  | q       |         |     Q   |        |
16+ 0      13.8140    178.12  |q        |         |  Q      |        |
16+15       9.6606    140.91  |q        |       Q |         |        |
16+30       3.5198     87.75  q        |Q        |         |        |
16+45       1.8433     45.47  q    Q   |         |         |        |
17+ 0       1.0236     22.37  q Q       |         |         |        |
17+15       0.7240     12.63  qQ        |         |         |        |
17+30       0.5646      9.32  qQ        |         |         |        |
17+45       0.5910      8.53  qQ        |         |         |        |
18+ 0       0.5658      8.01  qQ        |         |         |        |
18+15       0.5140      7.32  Q         |         |         |        |
18+30       0.5045      6.81  Q         |         |         |        |
18+45       0.4620      6.33  Q         |         |         |        |
19+ 0       0.3636      5.46  Q         |         |         |        |
19+15       0.3225      4.71  Q         |         |         |        |
19+30       0.3957      4.81  Q         |         |         |        |
19+45       0.4237      5.20  Q         |         |         |        |
20+ 0       0.3442      4.94  Q         |         |         |        |
20+15       0.3134      4.49  Q         |         |         |        |
20+30       0.3572      4.47  Q         |         |         |        |
20+45       0.3646      4.63  Q         |         |         |        |
21+ 0       0.3292      4.49  Q         |         |         |        |
21+15       0.3068      4.25  Q         |         |         |        |
21+30       0.3178      4.13  Q         |         |         |        |
21+45       0.3029      4.06  Q         |         |         |        |
22+ 0       0.3142      4.04  Q         |         |         |        |
22+15       0.3001      4.02  Q         |         |         |        |
22+30       0.3142      4.03  Q         |         |         |        |
22+45       0.2644      3.77  Q         |         |         |        |
23+ 0       0.2551      3.49  Q         |         |         |        |
23+15       0.2494      3.33  Q         |         |         |        |
23+30       0.2485      3.26  Q         |         |         |        |
23+45       0.2457      3.23  Q         |         |         |        |
```

```
  24+ 0       0.2457      3.22  Q         |         |         |         |
  24+15       0.1742      2.72  Q         |         |         |         |
  24+30       0.0561      1.66  Q         |         |         |         |
  24+45       0.0261      0.79  Q         |         |         |         |
  25+ 0       0.0127      0.33  Q         |         |         |         |
  25+15       0.0055      0.14  Q         |         |         |         |
  25+30       0.0000      0.05  Q         |         |         |         |
  25+45       0.0000      0.02  Q         |         |         |         |
  26+ 0       0.0000      0.01  Q         |         |         |         |
  26+15       0.0000      0.00  Q         |         |         |         |
  26+30       0.0000      0.00  Q         |         |         |         |
  26+45       0.0000      0.00  Q         |         |         |         |
  27+ 0       0.0000      0.00  Q         |         |         |         |
  27+15       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   109
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      304.109 (CFS)
                      Total volume =     110.480 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       -------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       36.000 to Point/Station       37.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ______________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   3100.00 (Ft.)
       Elevation difference =   54.00 (Ft.)
       Slope of channel =  0.017419 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  3100.00(Ft.)     Elevation difference =  54.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Channel base width  =   10.000(Ft.)
       Slope or 'Z' of left channel bank =   2.000
       Slope or 'Z' of right channel bank =   2.000
       Manning's 'N'    = 0.030
       Maximum depth of channel  =    5.000(Ft.)
       Flow(q) thru subarea =     76.532(CFS)
       Depth of flow =     1.059(Ft.)
       Average velocity =     5.962(Ft/s)
       Total flow rate =    76.532(CFS)
       Channel flow top width =   14.237(Ft.)
       Depth of flow in channel =   1.06(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =    5.96(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =   76.532(CFS)
       Total capacity of improved channels =     76.532(CFS)
       Critical Depth in Channel =    1.13(Ft.)


       Channel evaluation using maximum flow rate of hydrograph
       Flow(q) thru subarea =    304.109(CFS)
       Depth of flow =     2.287(Ft.)
       Average velocity =     9.121(Ft/s)
       Total flow rate =   304.109(CFS)
       Channel flow top width =   19.150(Ft.)
       Depth of flow in channel =   2.29(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =    9.12(Ft/s)
       Travel time  =    0.00 min.
```

```
Individual channel flow =  304.109(CFS)
Total capacity of improved channels =    304.109(CFS)
Critical Depth in Channel =    2.56(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8429   Travel time =   5.66 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   2.4278
        dt(routing time-step) =   4.77 (min.),   c* =   0.9888

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       76.0     152.1     228.1     304.1
-----------------------------------------------------------------------
  0+15       0.3324      0.49  O         |         |         |         |
  0+30       1.3744      1.80  O         |         |         |         |
  0+45       2.7429      3.20  O         |         |         |         |
  1+ 0       3.9657      4.34  O         |         |         |         |
  1+15       4.8150      5.05  O         |         |         |         |
  1+30       5.1033      5.13  O         |         |         |         |
  1+45       5.0409      5.00  O         |         |         |         |
  2+ 0       5.0950      5.14  O         |         |         |         |
  2+15       5.4705      5.63  O         |         |         |         |
  2+30       5.9085      6.05  O         |         |         |         |
  2+45       6.3598      6.51  O         |         |         |         |
  3+ 0       6.9349      7.14  O         |         |         |         |
  3+15       7.4580      7.61  OI        |         |         |         |
  3+30       7.7759      7.86  |O        |         |         |         |
  3+45       7.9257      7.96  |O        |         |         |         |
  4+ 0       8.1563      8.25  |O        |         |         |         |
  4+15       8.6200      8.80  |O        |         |         |         |
  4+30       9.2618      9.49  |O        |         |         |         |
  4+45      10.0000     10.25  |O        |         |         |         |
  5+ 0      10.7747     11.03  |O        |         |         |         |
  5+15      11.2366     11.34  |O        |         |         |         |
  5+30      11.1571     11.07  |O        |         |         |         |
  5+45      11.1956     11.25  |O        |         |         |         |
  6+ 0      11.6768     11.88  |O        |         |         |         |
  6+15      12.3936     12.64  |O        |         |         |         |
  6+30      13.1772     13.44  |O        |         |         |         |
  6+45      13.9741     14.24  |O        |         |         |         |
  7+ 0      14.7777     15.04  |O        |         |         |         |
  7+15      15.4103     15.59  | O       |         |         |         |
  7+30      15.9425     16.11  | O       |         |         |         |
  7+45      16.7167     17.01  | O       |         |         |         |
  8+ 0      17.8878     18.32  | O       |         |         |         |
  8+15      19.8376     20.58  | O       |         |         |         |
  8+30      22.2267     23.04  | OI      |         |         |         |
  8+45      24.6726     25.48  |  O      |         |         |         |
  9+ 0      28.2792     29.65  |  O      |         |         |         |
  9+15      36.2348     39.44  |   OI    |         |         |         |
  9+30      50.7007     56.20  |     OI  |         |         |         |
  9+45      68.9084     75.15  |        O|         |         |         |
 10+ 0      87.4297     93.47  |         |OI       |         |         |
 10+15      95.9235     97.21  |         | O       |         |         |
 10+30      83.8657     77.44  |         IO        |         |         |
 10+45      69.0448     64.88  |       IO|         |         |         |
 11+ 0      72.0263     75.41  |        O|         |         |         |
 11+15      85.0394     89.75  |         |O        |         |         |
```

```
11+30      94.1116     96.30  |         | O       |         |         |
11+45      95.5566     95.23  |         | O       |         |         |
12+ 0      91.7285     90.03  |         |IO       |         |         |
12+15      98.7728    102.97  |         | OI      |         |         |
12+30     128.7131    141.23  |         |     O I |         |         |
12+45     169.6967    183.67  |         |         | O I     |         |
13+ 0     208.0073    220.01  |         |         |      OI |         |
13+15     245.8573    258.56  |         |         |         | O I     |
13+30     286.9351    300.87  |         |         |         |      O I|
13+45     302.8967    304.11  |         |         |         |        OI
14+ 0     275.9294    262.32  |         |         |         |   I O   |
14+15     242.8087    233.15  |         |         |         IO        |
14+30     232.6060    232.18  |         |         |         O         |
14+45     235.5758    237.21  |         |         |         OI        |
15+ 0     237.8316    238.16  |         |         |         |O        |
15+15     234.8597    233.27  |         |         |         O         |
15+30     226.9142    223.81  |         |         |        O|         |
15+45     210.8021    204.46  |         |         |     IO  |         |
16+ 0     186.7774    178.12  |         |         |  IO     |         |
16+15     153.1351    140.91  |         |       I O         |         |
16+30     105.2121     87.75  |         |I O      |         |         |
16+45      59.4479     45.47  |    I O  |         |         |         |
17+ 0      30.0538     22.37  | IO      |         |         |         |
17+15      15.8877     12.63  |IO       |         |         |         |
17+30      10.4323      9.32  |O        |         |         |         |
17+45       8.7990      8.53  |O        |         |         |         |
18+ 0       8.1859      8.01  |O        |         |         |         |
18+15       7.5466      7.32  O         |         |         |         |
18+30       6.9805      6.81  O         |         |         |         |
18+45       6.4893      6.33  O         |         |         |         |
19+ 0       5.7454      5.46  O         |         |         |         |
19+15       4.9548      4.71  O         |         |         |         |
19+30       4.7783      4.81  O         |         |         |         |
19+45       5.0708      5.20  O         |         |         |         |
20+ 0       5.0225      4.94  O         |         |         |         |
20+15       4.6363      4.49  O         |         |         |         |
20+30       4.4803      4.47  O         |         |         |         |
20+45       4.5784      4.63  O         |         |         |         |
21+ 0       4.5333      4.49  O         |         |         |         |
21+15       4.3300      4.25  O         |         |         |         |
21+30       4.1691      4.13  O         |         |         |         |
21+45       4.0794      4.06  O         |         |         |         |
22+ 0       4.0441      4.04  O         |         |         |         |
22+15       4.0249      4.02  O         |         |         |         |
22+30       4.0235      4.03  O         |         |         |         |
22+45       3.8511      3.77  O         |         |         |         |
23+ 0       3.5818      3.49  O         |         |         |         |
23+15       3.3838      3.33  O         |         |         |         |
23+30       3.2854      3.26  O         |         |         |         |
23+45       3.2426      3.23  O         |         |         |         |
24+ 0       3.2254      3.22  O         |         |         |         |
24+15       2.8866      2.72  O         |         |         |         |
24+30       2.0078      1.66  O         |         |         |         |
24+45       1.0755      0.79  O         |         |         |         |
25+ 0       0.4836      0.33  O         |         |         |         |
25+15       0.2016      0.14  O         |         |         |         |
25+30       0.0816      0.05  O         |         |         |         |
25+45       0.0343      0.02  O         |         |         |         |
26+ 0       0.0154      0.01  O         |         |         |         |
26+15       0.0060      0.00  O         |         |         |         |
26+30       0.0016      0.00  O         |         |         |         |
26+45       0.0002      0.00  O         |         |         |         |
27+ 0       0.0000      0.00  O         |         |         |         |
27+15       0.0000      0.00  O         |         |         |         |
27+30       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =   110
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      302.897 (CFS)
                        Total volume =     110.480 (Ac.Ft)
```

```
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       36.000 to Point/Station       37.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubC724100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       81.7     163.4     245.1     326.9
-------------------------------------------------------------------
  0+15       0.0677      0.40  Q         |         |         |         |
  0+30       0.2262      1.60  Q         |         |         |         |
  0+45       0.3217      3.06  Q         |         |         |         |
  1+ 0       0.3872      4.35  Q         |         |         |         |
  1+15       0.4315      5.25  Q         |         |         |         |
  1+30       0.3946      5.50  Q         |         |         |         |
  1+45       0.3909      5.43  Q         |         |         |         |
  2+ 0       0.4229      5.52  Q         |         |         |         |
  2+15       0.4834      5.95  Q         |         |         |         |
  2+30       0.4992      6.41  Q         |         |         |         |
  2+45       0.5390      6.90  Q         |         |         |         |
  3+ 0       0.6055      7.54  Q         |         |         |         |
  3+15       0.6245      8.08  Q         |         |         |         |
  3+30       0.6335      8.41  qQ        |         |         |         |
  3+45       0.6377      8.56  qQ        |         |         |         |
  4+ 0       0.6738      8.83  qQ        |         |         |         |
  4+15       0.7377      9.36  qQ        |         |         |         |
  4+30       0.7881     10.05  qQ        |         |         |         |
  4+45       0.8580     10.86  qQ        |         |         |         |
  5+ 0       0.9126     11.69  qQ        |         |         |         |
  5+15       0.9170     12.15  qQ        |         |         |         |
  5+30       0.8486     12.01  qQ        |         |         |         |
  5+45       0.9213     12.12  qQ        |         |         |         |
  6+ 0       0.9910     12.67  qQ        |         |         |         |
  6+15       1.0429     13.44  qQ        |         |         |         |
  6+30       1.1138     14.29  qQ        |         |         |         |
  6+45       1.1677     15.14  qQ        |         |         |         |
  7+ 0       1.2413     16.02  qQ        |         |         |         |
  7+15       1.2637     16.67  q Q       |         |         |         |
  7+30       1.3073     17.25  q Q       |         |         |         |
  7+45       1.4092     18.13  q Q       |         |         |         |
  8+ 0       1.5243     19.41  q Q       |         |         |         |
  8+15       1.6799     21.52  q Q       |         |         |         |
  8+30       1.8329     24.06  q Q       |         |         |         |
  8+45       1.9140     26.59  q  Q      |         |         |         |
  9+ 0       2.0661     30.35  q  Q      |         |         |         |
  9+15       2.9677     39.20  q   Q     |         |         |         |
  9+30       4.8052     55.51  q     Q   |         |         |         |
  9+45       6.3616     75.27  q        Q|         |         |         |
 10+ 0       7.9039     95.33  q         |Q        |         |         |
 10+15       6.9683    102.89  q         | Q       |         |         |
 10+30       3.5350     87.40  q         Q         |         |         |
 10+45       4.3275     73.37  q       Q |         |         |         |
 11+ 0       6.9998     79.03  q        Q|         |         |         |
 11+15       7.4359     92.48  q         |Q        |         |         |
 11+30       7.2688    101.38  q         | Q       |         |         |
```

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   11+45       6.7675    102.32  q          | Q       |         |         |
   12+ 0       6.1379     97.87  q          |Q        |         |         |
   12+15       9.0727    107.85  |q         |  Q      |         |         |
   12+30      14.0114    142.72  |q         |      Q  |         |         |
   12+45      16.6936    186.39  | q        |         | Q       |         |
   13+ 0      19.2034    227.21  | q        |         |      Q  |         |
   13+15      22.4474    268.30  | q        |         |         | Q       |
   13+30      26.3326    313.27  |  q       |         |         |       Q |
   13+45      23.9604    326.86  | q        |         |         |         Q
   14+ 0      17.8111    293.74  | q        |         |         |    Q    |
   14+15      17.8226    260.63  | q        |         |         |Q        |
   14+30      19.5060    252.11  | q        |         |         Q         |
   14+45      19.3836    254.96  | q        |         |         |Q        |
   15+ 0      19.1381    256.97  | q        |         |         |Q        |
   15+15      18.3132    253.17  | q        |         |         Q         |
   15+30      17.4457    244.36  | q        |         |        Q|         |
   15+45      15.4714    226.27  |q         |         |      Q  |         |
   16+ 0      12.8832    199.66  |q         |         |   Q     |         |
   16+15       9.3104    162.45  |q         |        Q|         |         |
   16+30       3.6121    108.82  q          |  Q      |         |         |
   16+45       1.9644     61.41  q      Q   |         |         |         |
   17+ 0       1.1611     31.21  q  Q       |         |         |         |
   17+15       0.7975     16.69  q Q        |         |         |         |
   17+30       0.7166     11.15  qQ         |         |         |         |
   17+45       0.6143      9.41  qQ         |         |         |         |
   18+ 0       0.5931      8.78  qQ         |         |         |         |
   18+15       0.5377      8.08  Q          |         |         |         |
   18+30       0.5257      7.51  Q          |         |         |         |
   18+45       0.4874      6.98  Q          |         |         |         |
   19+ 0       0.3871      6.13  Q          |         |         |         |
   19+15       0.3396      5.29  Q          |         |         |         |
   19+30       0.4101      5.19  Q          |         |         |         |
   19+45       0.4436      5.51  Q          |         |         |         |
   20+ 0       0.3650      5.39  Q          |         |         |         |
   20+15       0.3278      4.96  Q          |         |         |         |
   20+30       0.3709      4.85  Q          |         |         |         |
   20+45       0.3797      4.96  Q          |         |         |         |
   21+ 0       0.3484      4.88  Q          |         |         |         |
   21+15       0.3203      4.65  Q          |         |         |         |
   21+30       0.3329      4.50  Q          |         |         |         |
   21+45       0.3151      4.39  Q          |         |         |         |
   22+ 0       0.3303      4.37  Q          |         |         |         |
   22+15       0.3128      4.34  Q          |         |         |         |
   22+30       0.3287      4.35  Q          |         |         |         |
   22+45       0.2789      4.13  Q          |         |         |         |
   23+ 0       0.2664      3.85  Q          |         |         |         |
   23+15       0.2623      3.65  Q          |         |         |         |
   23+30       0.2589      3.54  Q          |         |         |         |
   23+45       0.2581      3.50  Q          |         |         |         |
   24+ 0       0.2566      3.48  Q          |         |         |         |
   24+15       0.1889      3.08  Q          |         |         |         |
   24+30       0.0643      2.07  Q          |         |         |         |
   24+45       0.0310      1.11  Q          |         |         |         |
   25+ 0       0.0161      0.50  Q          |         |         |         |
   25+15       0.0077      0.21  Q          |         |         |         |
   25+30       0.0030      0.08  Q          |         |         |         |
   25+45       0.0000      0.03  Q          |         |         |         |
   26+ 0       0.0000      0.02  Q          |         |         |         |
   26+15       0.0000      0.01  Q          |         |         |         |
   26+30       0.0000      0.00  Q          |         |         |         |
   26+45       0.0000      0.00  Q          |         |         |         |
   27+ 0       0.0000      0.00  Q          |         |         |         |
   27+15       0.0000      0.00  Q          |         |         |         |
   27+30       0.0000      0.00  Q          |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   110
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      326.857 (CFS)
                     Total volume =     119.166 (Ac.Ft)
               Status of hydrographs being held in storage
```

```
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       37.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSC24hrSt1.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/27/12

------------------------------------------------------------------


Watershed C, Stream 1, Node 320 to 32
Existing Condition
100-year, 24-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC2124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =   100
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       72.297 (CFS)
               Total volume =      23.515 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      321.000 to Point/Station       32.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1550.00 (Ft.)
Elevation difference =   51.00 (Ft.)
Slope of channel =  0.032903 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1550.00(Ft.)     Elevation difference =  51.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     16.800(CFS)
Depth of flow =     0.362(Ft.)
Average velocity =     4.327(Ft/s)
Total flow rate =    16.800(CFS)
Channel flow top width =   11.448(Ft.)
Depth of flow in channel =   0.36(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    4.33(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   16.800(CFS)
Total capacity of improved channels =     16.800(CFS)
Critical Depth in Channel =    0.43(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     72.297(CFS)
Depth of flow =     0.853(Ft.)
Average velocity =     7.238(Ft/s)
```

```
Total flow rate =    72.297(CFS)
Channel flow top width =   13.413(Ft.)
Depth of flow in channel =   0.85(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.24(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   72.297(CFS)
Total capacity of improved channels =     72.297(CFS)
Critical Depth in Channel =    1.09(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8098   Travel time =   3.57 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.7931
        dt(routing time-step) =   2.89 (min.),   c* =   0.9982

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       18.1      36.1      54.2      72.3
----------------------------------------------------------------------
  0+15       0.1639      0.20  O         |         |         |         |
  0+30       0.5705      0.66  O         |         |         |         |
  0+45       0.8627      0.91  O         |         |         |         |
  1+ 0       1.0364      1.07  O         |         |         |         |
  1+15       1.1375      1.15  O         |         |         |         |
  1+30       1.0447      1.02  O         |         |         |         |
  1+45       0.9937      0.99  O         |         |         |         |
  2+ 0       1.0658      1.08  O         |         |         |         |
  2+15       1.2251      1.26  O         |         |         |         |
  2+30       1.2895      1.30  O         |         |         |         |
  2+45       1.3849      1.41  O         |         |         |         |
  3+ 0       1.5508      1.59  O         |         |         |         |
  3+15       1.6163      1.62  O         |         |         |         |
  3+30       1.6297      1.63  O         |         |         |         |
  3+45       1.6333      1.63  O         |         |         |         |
  4+ 0       1.7158      1.74  O         |         |         |         |
  4+15       1.8781      1.91  |O        |         |         |         |
  4+30       2.0250      2.05  |O        |         |         |         |
  4+45       2.2008      2.24  |O        |         |         |         |
  5+ 0       2.3512      2.38  |O        |         |         |         |
  5+15       2.3637      2.36  |O        |         |         |         |
  5+30       2.1894      2.15  |O        |         |         |         |
  5+45       2.3178      2.36  |O        |         |         |         |
  6+ 0       2.5218      2.56  |O        |         |         |         |
  6+15       2.6754      2.70  |O        |         |         |         |
  6+30       2.8538      2.89  |O        |         |         |         |
  6+45       3.0048      3.03  |O        |         |         |         |
  7+ 0       3.1811      3.22  |O        |         |         |         |
  7+15       3.2496      3.26  |O        |         |         |         |
  7+30       3.3455      3.37  |O        |         |         |         |
  7+45       3.5933      3.65  |OI       |         |         |         |
  8+ 0       3.9031      3.96  | O       |         |         |         |
  8+15       4.3077      4.39  | O       |         |         |         |
  8+30       4.7143      4.79  | O       |         |         |         |
  8+45       4.9437      4.98  | O       |         |         |         |
  9+ 0       6.0485      6.31  |  O      |         |         |         |
  9+15       9.7314     10.56  |    O    |         |         |         |
  9+30      15.0271     16.11  |       O |         |         |         |
  9+45      19.5411     20.37  |         OI        |         |         |
```

```
   10+ 0      23.5833     24.36  |         |  O      |         |         |
   10+15      20.9753     20.16  |         |O        |         |         |
   10+30      11.0779      8.89  |   I O   |         |         |         |
   10+45      11.4348     12.04  |     O   |         |         |         |
   11+ 0      19.2762     21.02  |         OI        |         |         |
   11+15      22.0750     22.33  |         | O       |         |         |
   11+30      21.6991     21.55  |         |IO       |         |         |
   11+45      20.1957     19.87  |         IO        |         |         |
   12+ 0      18.2578     17.87  |        IO         |         |         |
   12+15      24.8732     26.56  |         |  OI     |         |         |
   12+30      38.0171     40.78  |         |         |OI       |         |
   12+45      46.4655     47.84  |         |         |    OI   |         |
   13+ 0      52.7193     53.90  |         |         |        O|         |
   13+15      60.6938     62.33  |         |         |         |  OI     |
   13+30      70.3592     72.30  |         |         |         |       OI|
   13+45      65.3564     63.69  |         |         |         |    IO   |
   14+ 0      48.7605     45.16  |         |         |   I O   |         |
   14+15      45.6161     45.72  |         |         |    O    |         |
   14+30      50.3669     51.49  |         |         |      OI |         |
   14+45      51.4674     51.47  |         |         |       O |         |
   15+ 0      50.9944     50.88  |         |         |       O |         |
   15+15      49.0681     48.63  |         |         |     IO  |         |
   15+30      46.4602     45.94  |         |         |    O    |         |
   15+45      41.2626     40.14  |         |         | O       |         |
   16+ 0      34.4331     33.06  |         |       IO|         |         |
   16+15      24.4683     22.40  |         | IO      |         |         |
   16+30       9.0474      5.83  |  I O    |         |         |         |
   16+45       2.8572      2.13  |O        |         |         |         |
   17+ 0       1.4411      1.27  O         |         |         |         |
   17+15       1.2093      1.19  O         |         |         |         |
   17+30       1.4730      1.54  O         |         |         |         |
   17+45       1.5992      1.61  O         |         |         |         |
   18+ 0       1.5437      1.53  O         |         |         |         |
   18+15       1.3885      1.36  O         |         |         |         |
   18+30       1.3246      1.32  O         |         |         |         |
   18+45       1.2293      1.21  O         |         |         |         |
   19+ 0       0.9814      0.93  O         |         |         |         |
   19+15       0.8355      0.81  O         |         |         |         |
   19+30       1.0014      1.05  O         |         |         |         |
   19+45       1.1297      1.15  O         |         |         |         |
   20+ 0       0.9597      0.91  O         |         |         |         |
   20+15       0.8309      0.81  O         |         |         |         |
   20+30       0.9190      0.94  O         |         |         |         |
   20+45       0.9674      0.97  O         |         |         |         |
   21+ 0       0.8948      0.88  O         |         |         |         |
   21+15       0.8174      0.80  O         |         |         |         |
   21+30       0.8334      0.84  O         |         |         |         |
   21+45       0.8045      0.80  O         |         |         |         |
   22+ 0       0.8298      0.84  O         |         |         |         |
   22+15       0.8040      0.80  O         |         |         |         |
   22+30       0.8298      0.84  O         |         |         |         |
   22+45       0.7221      0.69  O         |         |         |         |
   23+ 0       0.6675      0.66  O         |         |         |         |
   23+15       0.6571      0.66  O         |         |         |         |
   23+30       0.6540      0.65  O         |         |         |         |
   23+45       0.6535      0.65  O         |         |         |         |
   24+ 0       0.6535      0.65  O         |         |         |         |
   24+15       0.4897      0.45  O         |         |         |         |
   24+30       0.1650      0.10  O         |         |         |         |
   24+45       0.0351      0.02  O         |         |         |         |
   25+ 0       0.0082      0.01  O         |         |         |         |
   25+15       0.0010      0.00  O         |         |         |         |
   25+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   102
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       70.359 (CFS)
                     Total volume =      23.515 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
```

```
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      321.000 to Point/Station       32.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubC2224100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       18.9      37.7      56.6      75.4
----------------------------------------------------------------------
  0+15       0.0362      0.20  Q         |         |         |         |
  0+30       0.0814      0.65  Q         |         |         |         |
  0+45       0.0966      0.96  Q         |         |         |         |
  1+ 0       0.1156      1.15  Q         |         |         |         |
  1+15       0.1110      1.25  Q         |         |         |         |
  1+30       0.0983      1.14  Q         |         |         |         |
  1+45       0.0975      1.09  Q         |         |         |         |
  2+ 0       0.1156      1.18  Q         |         |         |         |
  2+15       0.1291      1.35  Q         |         |         |         |
  2+30       0.1299      1.42  Q         |         |         |         |
  2+45       0.1481      1.53  Q         |         |         |         |
  3+ 0       0.1616      1.71  Q         |         |         |         |
  3+15       0.1624      1.78  Q         |         |         |         |
  3+30       0.1624      1.79  Q         |         |         |         |
  3+45       0.1624      1.80  Q         |         |         |         |
  4+ 0       0.1805      1.90  qQ        |         |         |         |
  4+15       0.1941      2.07  qQ        |         |         |         |
  4+30       0.2130      2.24  qQ        |         |         |         |
  4+45       0.2266      2.43  qQ        |         |         |         |
  5+ 0       0.2455      2.60  qQ        |         |         |         |
  5+15       0.2229      2.59  qQ        |         |         |         |
  5+30       0.2147      2.40  qQ        |         |         |         |
  5+45       0.2447      2.56  qQ        |         |         |         |
  6+ 0       0.2591      2.78  qQ        |         |         |         |
  6+15       0.2780      2.95  qQ        |         |         |         |
  6+30       0.2916      3.15  qQ        |         |         |         |
  6+45       0.3105      3.32  qQ        |         |         |         |
  7+ 0       0.3240      3.51  qQ        |         |         |         |
  7+15       0.3249      3.57  qQ        |         |         |         |
  7+30       0.3430      3.69  qQ        |         |         |         |
  7+45       0.3746      3.97  q Q       |         |         |         |
  8+ 0       0.4071      4.31  q Q       |         |         |         |
  8+15       0.4577      4.77  q Q       |         |         |         |
  8+30       0.4857      5.20  q Q       |         |         |         |
  8+45       0.5054      5.45  q Q       |         |         |         |
  9+ 0       0.5371      6.59  q  Q      |         |         |         |
  9+15       0.5877     10.32  q    Q    |         |         |         |
  9+30       0.6337     15.66  q       Q |         |         |         |
  9+45       0.6670     20.21  q         Q         |         |         |
 10+ 0       0.6995     24.28  q         | Q       |         |         |
 10+15       0.5872     21.56  q         |Q        |         |         |
 10+30       0.4931     11.57  q     Q   |         |         |         |
 10+45       0.5778     12.01  q     Q   |         |         |         |
 11+ 0       0.6456     19.92  q         Q         |         |         |
 11+15       0.6316     22.71  q         | Q       |         |         |
 11+30       0.6181     22.32  q         |Q        |         |         |
 11+45       0.5810     20.78  q         |Q        |         |         |
 12+ 0       0.5720     18.83  q        Q|         |         |         |
```

```
  12+15       1.2537     26.13  q          |  Q      |         |         |
  12+30       1.9899     40.01  |q         |         |Q        |         |
  12+45       2.6100     49.08  |q         |         |     Q   |         |
  13+ 0       3.1636     55.88  |q         |         |        Q|         |
  13+15       4.3130     65.01  | q        |         |         |   Q     |
  13+30       5.0900     75.45  | q        |         |         |         Q
  13+45       3.2293     68.59  |q         |         |         |     Q   |
  14+ 0       1.8267     50.59  q          |         |     Q   |         |
  14+15       2.5476     48.16  |q         |         |    Q    |         |
  14+30       2.9949     53.36  |q         |         |       Q |         |
  14+45       2.9774     54.44  |q         |         |       Q |         |
  15+ 0       2.8718     53.87  |q         |         |       Q |         |
  15+15       2.6377     51.71  |q         |         |      Q  |         |
  15+30       2.3941     48.85  |q         |         |    Q    |         |
  15+45       1.6061     42.87  q          |         | Q       |         |
  16+ 0       1.1343     35.57  q          |       Q |         |         |
  16+15       0.5742     25.04  q          |  Q      |         |         |
  16+30       0.1555      9.20  q   Q      |         |         |         |
  16+45       0.1118      2.97  qQ         |         |         |         |
  17+ 0       0.0983      1.54  Q          |         |         |         |
  17+15       0.1337      1.34  Q          |         |         |         |
  17+30       0.1608      1.63  Q          |         |         |         |
  17+45       0.1624      1.76  Q          |         |         |         |
  18+ 0       0.1443      1.69  Q          |         |         |         |
  18+15       0.1308      1.52  Q          |         |         |         |
  18+30       0.1299      1.45  Q          |         |         |         |
  18+45       0.1118      1.34  Q          |         |         |         |
  19+ 0       0.0802      1.06  Q          |         |         |         |
  19+15       0.0839      0.92  Q          |         |         |         |
  19+30       0.1147      1.12  Q          |         |         |         |
  19+45       0.1110      1.24  Q          |         |         |         |
  20+ 0       0.0802      1.04  Q          |         |         |         |
  20+15       0.0839      0.91  Q          |         |         |         |
  20+30       0.0966      1.02  Q          |         |         |         |
  20+45       0.0975      1.06  Q          |         |         |         |
  21+ 0       0.0794      0.97  Q          |         |         |         |
  21+15       0.0839      0.90  Q          |         |         |         |
  21+30       0.0785      0.91  Q          |         |         |         |
  21+45       0.0839      0.89  Q          |         |         |         |
  22+ 0       0.0785      0.91  Q          |         |         |         |
  22+15       0.0839      0.89  Q          |         |         |         |
  22+30       0.0785      0.91  Q          |         |         |         |
  22+45       0.0658      0.79  Q          |         |         |         |
  23+ 0       0.0650      0.73  Q          |         |         |         |
  23+15       0.0650      0.72  Q          |         |         |         |
  23+30       0.0650      0.72  Q          |         |         |         |
  23+45       0.0650      0.72  Q          |         |         |         |
  24+ 0       0.0650      0.72  Q          |         |         |         |
  24+15       0.0288      0.52  Q          |         |         |         |
  24+30       0.0016      0.17  Q          |         |         |         |
  24+45       0.0000      0.04  Q          |         |         |         |
  25+ 0       0.0000      0.01  Q          |         |         |         |
  25+15       0.0000      0.00  Q          |         |         |         |
  25+30       0.0000      0.00  Q          |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   102
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =       75.449 (CFS)
                       Total volume =      24.796 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      321.000 to Point/Station       32.000
```

```
**** STORE OR DELETE CURRENT HYDROGRAPH ****
_____________________________________________________________________
Current stream hydrograph saved in file C21and22N32.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/27/12

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Watershed C, Stream 1, Node 340 to 34
Existing Condition
100-year, 24-hour

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Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC4124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    98
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       24.423 (CFS)
               Total volume =       7.411 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      341.000 to Point/Station       34.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    920.00 (Ft.)
Elevation difference =   49.00 (Ft.)
Slope of channel =  0.053261 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   920.00(Ft.)     Elevation difference =  49.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      5.237(CFS)
Depth of flow =     0.157(Ft.)
Average velocity =     3.241(Ft/s)
Total flow rate =     5.237(CFS)
Channel flow top width =   10.627(Ft.)
Depth of flow in channel =   0.16(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    3.24(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    5.237(CFS)
Total capacity of improved channels =      5.237(CFS)
Critical Depth in Channel =    0.20(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     24.423(CFS)
Depth of flow =     0.392(Ft.)
Average velocity =     5.780(Ft/s)
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```
Total flow rate =    24.423(CFS)
Channel flow top width =   11.567(Ft.)
Depth of flow in channel =   0.39(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.78(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   24.423(CFS)
Total capacity of improved channels =     24.423(CFS)
Critical Depth in Channel =    0.55(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.7727   Travel time =   2.65 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   5.2116
        dt(routing time-step) =   2.05 (min.),   c* =   0.9996

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        6.1      12.2      18.3      24.4
----------------------------------------------------------------------
  0+15       0.1016      0.12  O         |         |         |         |
  0+30       0.2533      0.27  O         |         |         |         |
  0+45       0.3238      0.33  O         |         |         |         |
  1+ 0       0.3857      0.39  O         |         |         |         |
  1+15       0.3858      0.38  O         |         |         |         |
  1+30       0.3454      0.34  O         |         |         |         |
  1+45       0.3359      0.34  O         |         |         |         |
  2+ 0       0.3862      0.39  O         |         |         |         |
  2+15       0.4366      0.44  O         |         |         |         |
  2+30       0.4466      0.45  O         |         |         |         |
  2+45       0.4980      0.51  O         |         |         |         |
  3+ 0       0.5484      0.56  O         |         |         |         |
  3+15       0.5584      0.56  O         |         |         |         |
  3+30       0.5590      0.56  O         |         |         |         |
  3+45       0.5590      0.56  O         |         |         |         |
  4+ 0       0.6098      0.62  OI        |         |         |         |
  4+15       0.6602      0.67  |O        |         |         |         |
  4+30       0.7210      0.73  |O        |         |         |         |
  4+45       0.7720      0.78  |O        |         |         |         |
  5+ 0       0.8328      0.84  |O        |         |         |         |
  5+15       0.7822      0.77  |O        |         |         |         |
  5+30       0.7421      0.74  |O        |         |         |         |
  5+45       0.8239      0.84  |O        |         |         |         |
  6+ 0       0.8833      0.89  |O        |         |         |         |
  6+15       0.9446      0.95  |O        |         |         |         |
  6+30       0.9956      1.00  |O        |         |         |         |
  6+45       1.0564      1.07  |O        |         |         |         |
  7+ 0       1.1074      1.11  |O        |         |         |         |
  7+15       1.1174      1.12  |O        |         |         |         |
  7+30       1.1687      1.18  |O        |         |         |         |
  7+45       1.2700      1.28  | O       |         |         |         |
  8+ 0       1.3812      1.40  | O       |         |         |         |
  8+15       1.5439      1.57  | O       |         |         |         |
  8+30       1.6553      1.67  | O       |         |         |         |
  8+45       1.7266      1.74  | O       |         |         |         |
  9+ 0       1.8289      1.84  | OI      |         |         |         |
  9+15       2.9042      3.07  |   OI    |         |         |         |
  9+30       4.5410      4.77  |      O  |         |         |         |
  9+45       5.9734      6.16  |        OI         |         |         |
```

```
  10+ 0       7.3357      7.52  |          | O       |         |         |
  10+15       5.1062      4.72  |       IO |         |         |         |
  10+30       2.2860      1.90  |  O       |         |         |         |
  10+45       3.9803      4.31  |     OI   |         |         |         |
  11+ 0       6.3101      6.63  |         O         |         |         |
  11+15       6.4563      6.43  |         O         |         |         |
  11+30       6.2005      6.16  |         O         |         |         |
  11+45       5.3079      5.17  |       O  |         |         |         |
  12+ 0       5.0233      5.00  |       O  |         |         |         |
  12+15       9.1035      9.76  |          |   OI    |         |         |
  12+30      13.4487     14.04  |          |         | O       |         |
  12+45      15.8891     16.18  |          |         |     O   |         |
  13+ 0      17.7542     18.00  |          |         |        O|         |
  13+15      21.2136     21.72  |          |         |         |   OI    |
  13+30      24.0526     24.42  |          |         |         |        OI
  13+45      19.1721     18.34  |          |         |         IO        |
  14+ 0      13.8505     13.14  |          |         |IO       |         |
  14+15      14.9805     15.27  |          |         |   OI    |         |
  14+30      16.6281     16.84  |          |         |      O  |         |
  14+45      16.7168     16.70  |          |         |      O  |         |
  15+ 0      16.3196     16.26  |          |         |     O   |         |
  15+15      15.4891     15.37  |          |         |    O    |         |
  15+30      14.5609     14.43  |          |         |  O      |         |
  15+45      12.1002     11.73  |          |        O|         |         |
  16+ 0      10.1558      9.91  |          |     O   |         |         |
  16+15       5.5758      4.89  |       IO|         |         |         |
  16+30       1.3316      0.77  |IO        |         |         |         |
  16+45       0.4404      0.39  O          |         |         |         |
  17+ 0       0.3459      0.34  O          |         |         |         |
  17+15       0.4375      0.45  O          |         |         |         |
  17+30       0.5379      0.55  O          |         |         |         |
  17+45       0.5579      0.56  O          |         |         |         |
  18+ 0       0.5081      0.50  O          |         |         |         |
  18+15       0.4577      0.45  O          |         |         |         |
  18+30       0.4477      0.45  O          |         |         |         |
  18+45       0.3963      0.39  O          |         |         |         |
  19+ 0       0.2951      0.28  O          |         |         |         |
  19+15       0.2855      0.29  O          |         |         |         |
  19+30       0.3762      0.39  O          |         |         |         |
  19+45       0.3853      0.38  O          |         |         |         |
  20+ 0       0.2946      0.28  O          |         |         |         |
  20+15       0.2855      0.29  O          |         |         |         |
  20+30       0.3254      0.33  O          |         |         |         |
  20+45       0.3348      0.34  O          |         |         |         |
  21+ 0       0.2846      0.28  O          |         |         |         |
  21+15       0.2849      0.29  O          |         |         |         |
  21+30       0.2745      0.27  O          |         |         |         |
  21+45       0.2844      0.29  O          |         |         |         |
  22+ 0       0.2745      0.27  O          |         |         |         |
  22+15       0.2844      0.29  O          |         |         |         |
  22+30       0.2745      0.27  O          |         |         |         |
  22+45       0.2336      0.23  O          |         |         |         |
  23+ 0       0.2241      0.22  O          |         |         |         |
  23+15       0.2236      0.22  O          |         |         |         |
  23+30       0.2236      0.22  O          |         |         |         |
  23+45       0.2236      0.22  O          |         |         |         |
  24+ 0       0.2236      0.22  O          |         |         |         |
  24+15       0.1220      0.11  O          |         |         |         |
  24+30       0.0211      0.01  O          |         |         |         |
  24+45       0.0010      0.00  O          |         |         |         |
  25+ 0       0.0000      0.00  O          |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                 Number of intervals =   100
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =       24.053 (CFS)
                 Total volume =       7.411 (Ac.Ft)
           Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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**********************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      341.000 to Point/Station       34.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubC4224100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0        8.1      16.2      24.3      32.4
----------------------------------------------------------------------
  0+15       0.0708      0.17  Q         |         |         |         |
  0+30       0.1371      0.39  Q         |         |         |         |
  0+45       0.1525      0.48  Q         |         |         |         |
  1+ 0       0.1879      0.57  Q         |         |         |         |
  1+15       0.1678      0.55  Q         |         |         |         |
  1+30       0.1525      0.50  Q         |         |         |         |
  1+45       0.1525      0.49  Q         |         |         |         |
  2+ 0       0.1879      0.57  Q         |         |         |         |
  2+15       0.2033      0.64  Q         |         |         |         |
  2+30       0.2033      0.65  Q         |         |         |         |
  2+45       0.2387      0.74  Q         |         |         |         |
  3+ 0       0.2541      0.80  Q         |         |         |         |
  3+15       0.2541      0.81  qQ        |         |         |         |
  3+30       0.2541      0.81  qQ        |         |         |         |
  3+45       0.2541      0.81  qQ        |         |         |         |
  4+ 0       0.2895      0.90  qQ        |         |         |         |
  4+15       0.3049      0.97  qQ        |         |         |         |
  4+30       0.3403      1.06  qQ        |         |         |         |
  4+45       0.3557      1.13  qQ        |         |         |         |
  5+ 0       0.3911      1.22  qQ        |         |         |         |
  5+15       0.3357      1.12  qQ        |         |         |         |
  5+30       0.3403      1.08  qQ        |         |         |         |
  5+45       0.3911      1.22  qQ        |         |         |         |
  6+ 0       0.4065      1.29  qQ        |         |         |         |
  6+15       0.4420      1.39  qQ        |         |         |         |
  6+30       0.4574      1.45  qQ        |         |         |         |
  6+45       0.4928      1.55  qQ        |         |         |         |
  7+ 0       0.5082      1.62  qQ        |         |         |         |
  7+15       0.5082      1.63  q Q       |         |         |         |
  7+30       0.5436      1.71  q Q       |         |         |         |
  7+45       0.5944      1.86  q Q       |         |         |         |
  8+ 0       0.6452      2.03  q Q       |         |         |         |
  8+15       0.7315      2.28  q Q       |         |         |         |
  8+30       0.7623      2.42  q Q       |         |         |         |
  8+45       0.7977      2.52  q  Q      |         |         |         |
  9+ 0       0.8485      2.68  |q Q      |         |         |         |
  9+15       0.9347      3.84  |q  Q     |         |         |         |
  9+30       1.0009      5.54  |q    Q   |         |         |         |
  9+45       1.0518      7.03  |q      Q |         |         |         |
 10+ 0       1.1026      8.44  |q        Q         |         |         |
 10+15       0.8700      5.98  |q     Q  |         |         |         |
 10+30       0.7623      3.05  q  Q      |         |         |         |
 10+45       0.9394      4.92  |q    Q   |         |         |         |
 11+ 0       1.0163      7.33  |q       Q|         |         |         |
 11+15       0.9809      7.44  |q       Q|         |         |         |
 11+30       0.9655      7.17  |q      Q |         |         |         |
 11+45       0.8947      6.20  |q     Q  |         |         |         |
 12+ 0       0.8993      5.92  |q     Q  |         |         |         |
 12+15       2.4132     11.52  | q       |   Q     |         |         |
 12+30       3.5194     16.97  |   q     |         Q         |         |
```

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  12+45       4.5250     20.41  |    q    |         |    Q    |         |
  13+ 0       5.3286     23.08  |     q   |         |       Q |         |
  13+15       7.3933     28.61  |        q|         |         |    Q    |
  13+30       8.3012     32.35  |         q         |         |       Q
  13+45       4.5414     23.71  |    q    |         |        Q|         |
  14+ 0       2.9821     16.83  |  q      |         Q         |         |
  14+15       4.5315     19.51  |    q    |         |   Q     |         |
  14+30       4.9241     21.55  |     q   |         |     Q   |         |
  14+45       4.8991     21.62  |     q   |         |     Q   |         |
  15+ 0       4.6721     20.99  |    q    |         |    Q    |         |
  15+15       4.2892     19.78  |    q    |         |   Q     |         |
  15+30       3.9043     18.47  |   q     |         | Q       |         |
  15+45       2.4550     14.56  |  q      |      Q  |         |         |
  16+ 0       1.9585     12.11  | q       |   Q     |         |         |
  16+15       0.7461      6.32  q      Q  |         |         |         |
  16+30       0.2033      1.53  qQ        |         |         |         |
  16+45       0.1678      0.61  Q         |         |         |         |
  17+ 0       0.1525      0.50  Q         |         |         |         |
  17+15       0.2233      0.66  Q         |         |         |         |
  17+30       0.2541      0.79  Q         |         |         |         |
  17+45       0.2541      0.81  qQ        |         |         |         |
  18+ 0       0.2187      0.73  Q         |         |         |         |
  18+15       0.2033      0.66  Q         |         |         |         |
  18+30       0.2033      0.65  Q         |         |         |         |
  18+45       0.1678      0.56  Q         |         |         |         |
  19+ 0       0.1170      0.41  Q         |         |         |         |
  19+15       0.1371      0.42  Q         |         |         |         |
  19+30       0.1879      0.56  Q         |         |         |         |
  19+45       0.1678      0.55  Q         |         |         |         |
  20+ 0       0.1170      0.41  Q         |         |         |         |
  20+15       0.1371      0.42  Q         |         |         |         |
  20+30       0.1525      0.48  Q         |         |         |         |
  20+45       0.1525      0.49  Q         |         |         |         |
  21+ 0       0.1170      0.40  Q         |         |         |         |
  21+15       0.1371      0.42  Q         |         |         |         |
  21+30       0.1170      0.39  Q         |         |         |         |
  21+45       0.1371      0.42  Q         |         |         |         |
  22+ 0       0.1170      0.39  Q         |         |         |         |
  22+15       0.1371      0.42  Q         |         |         |         |
  22+30       0.1170      0.39  Q         |         |         |         |
  22+45       0.1016      0.34  Q         |         |         |         |
  23+ 0       0.1016      0.33  Q         |         |         |         |
  23+15       0.1016      0.33  Q         |         |         |         |
  23+30       0.1016      0.33  Q         |         |         |         |
  23+45       0.1016      0.33  Q         |         |         |         |
  24+ 0       0.1016      0.33  Q         |         |         |         |
  24+15       0.0308      0.15  Q         |         |         |         |
  24+30       0.0000      0.02  Q         |         |         |         |
  24+45       0.0000      0.00  Q         |         |         |         |
  25+ 0       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =   100
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       32.354 (CFS)
                    Total volume =       9.495 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ---------------------------------------------------------------------


      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station      341.000 to Point/Station       34.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      _____________________________________________________________________
      Current stream hydrograph saved in file C41and42N34.rte
      ****************************HYDROGRAPH DATA***************************
```

```
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/27/12

------------------------------------------------------------------


Watershed C, Stream 1, Node 350 to 35
Existing Condition
100-year, 24-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubC5124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    97
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =        4.833 (CFS)
               Total volume =       1.387 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      351.000 to Point/Station       35.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    950.00 (Ft.)
Elevation difference =   29.00 (Ft.)
Slope of channel =  0.030526 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   950.00(Ft.)     Elevation difference =  29.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      0.971(CFS)
Depth of flow =     0.067(Ft.)
Average velocity =     1.419(Ft/s)
Total flow rate =     0.971(CFS)
Channel flow top width =   10.270(Ft.)
Depth of flow in channel =   0.07(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    1.42(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    0.971(CFS)
Total capacity of improved channels =      0.971(CFS)
Critical Depth in Channel =    0.07(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =      4.833(CFS)
Depth of flow =     0.176(Ft.)
Average velocity =     2.648(Ft/s)
```

```
Total flow rate =     4.833(CFS)
Channel flow top width =   10.705(Ft.)
Depth of flow in channel =   0.18(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    2.65(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    4.833(CFS)
Total capacity of improved channels =      4.833(CFS)
Critical Depth in Channel =    0.19(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.6090   Travel time =   5.98 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.0792
        dt(routing time-step) =   3.64 (min.),   c* =   0.9445

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        1.2       2.4       3.6       4.8
-----------------------------------------------------------------------
  0+15       0.0243      0.03  O         |         |         |         |
  0+30       0.0543      0.06  O         |         |         |         |
  0+45       0.0669      0.07  O         |         |         |         |
  1+ 0       0.0812      0.09  O         |         |         |         |
  1+15       0.0780      0.08  O         |         |         |         |
  1+30       0.0710      0.07  O         |         |         |         |
  1+45       0.0693      0.07  O         |         |         |         |
  2+ 0       0.0813      0.09  O         |         |         |         |
  2+15       0.0902      0.09  O         |         |         |         |
  2+30       0.0921      0.09  O         |         |         |         |
  2+45       0.1043      0.11  O         |         |         |         |
  3+ 0       0.1133      0.12  O         |         |         |         |
  3+15       0.1151      0.12  O         |         |         |         |
  3+30       0.1152      0.12  O         |         |         |         |
  3+45       0.1152      0.12  O         |         |         |         |
  4+ 0       0.1274      0.13  |O        |         |         |         |
  4+15       0.1363      0.14  |O        |         |         |         |
  4+30       0.1503      0.16  |O        |         |         |         |
  4+45       0.1594      0.16  |O        |         |         |         |
  5+ 0       0.1734      0.18  |O        |         |         |         |
  5+15       0.1581      0.15  |O        |         |         |         |
  5+30       0.1543      0.16  |O        |         |         |         |
  5+45       0.1717      0.18  |O        |         |         |         |
  6+ 0       0.1823      0.18  |O        |         |         |         |
  6+15       0.1964      0.20  |O        |         |         |         |
  6+30       0.2054      0.21  |O        |         |         |         |
  6+45       0.2195      0.22  |O        |         |         |         |
  7+ 0       0.2285      0.23  |O        |         |         |         |
  7+15       0.2304      0.23  |O        |         |         |         |
  7+30       0.2426      0.25  | O       |         |         |         |
  7+45       0.2637      0.27  | O       |         |         |         |
  8+ 0       0.2866      0.29  | O       |         |         |         |
  8+15       0.3218      0.33  | O       |         |         |         |
  8+30       0.3416      0.35  | O       |         |         |         |
  8+45       0.3577      0.36  | OI      |         |         |         |
  9+ 0       0.3789      0.39  |  O      |         |         |         |
  9+15       0.4623      0.49  |  OI     |         |         |         |
  9+30       0.6679      0.74  |    OI   |         |         |         |
  9+45       0.9396      1.02  |      OI |         |         |         |
```

```
  10+ 0       1.2234      1.31  |         O         |         |         |
  10+15       0.8104      0.62  |    IO   |         |         |         |
  10+30       0.4341      0.35  | IO      |         |         |         |
  10+45       0.7383      0.89  |     OI  |         |         |         |
  11+ 0       1.0449      1.12  |       OI|         |         |         |
  11+15       1.0300      1.00  |       O |         |         |         |
  11+30       0.9949      0.99  |       O |         |         |         |
  11+45       0.7835      0.70  |    IO   |         |         |         |
  12+ 0       0.7757      0.80  |     O   |         |         |         |
  12+15       1.7270      2.10  |         |   O  I  |         |         |
  12+30       2.5371      2.74  |         |         O I       |         |
  12+45       3.0501      3.19  |         |         |    OI   |         |
  13+ 0       3.4234      3.53  |         |         |       OI|         |
  13+15       4.2061      4.48  |         |         |         |   O  I  |
  13+30       4.7186      4.83  |         |         |         |        OI
  13+45       3.5227      3.01  |         |         |   I    O|         |
  14+ 0       2.5939      2.39  |         |        I|O        |         |
  14+15       2.9179      3.11  |         |         |   OI    |         |
  14+30       3.1849      3.23  |         |         |     O   |         |
  14+45       3.2139      3.21  |         |         |     O   |         |
  15+ 0       3.1204      3.08  |         |         |    O    |         |
  15+15       2.9511      2.90  |         |         |  IO     |         |
  15+30       2.7632      2.71  |         |         | O       |         |
  15+45       2.2089      2.01  |         |     I O |         |         |
  16+ 0       1.8731      1.80  |         |   IO    |         |         |
  16+15       0.9072      0.54  |   I  O  |         |         |         |
  16+30       0.2412      0.09  IO        |         |         |         |
  16+45       0.0883      0.08  O         |         |         |         |
  17+ 0       0.0716      0.07  O         |         |         |         |
  17+15       0.0936      0.10  O         |         |         |         |
  17+30       0.1113      0.12  O         |         |         |         |
  17+45       0.1150      0.12  O         |         |         |         |
  18+ 0       0.1031      0.10  O         |         |         |         |
  18+15       0.0942      0.09  O         |         |         |         |
  18+30       0.0923      0.09  O         |         |         |         |
  18+45       0.0801      0.08  O         |         |         |         |
  19+ 0       0.0590      0.05  O         |         |         |         |
  19+15       0.0604      0.06  O         |         |         |         |
  19+30       0.0794      0.09  O         |         |         |         |
  19+45       0.0779      0.08  O         |         |         |         |
  20+ 0       0.0589      0.05  O         |         |         |         |
  20+15       0.0604      0.06  O         |         |         |         |
  20+30       0.0673      0.07  O         |         |         |         |
  20+45       0.0690      0.07  O         |         |         |         |
  21+ 0       0.0570      0.05  O         |         |         |         |
  21+15       0.0602      0.06  O         |         |         |         |
  21+30       0.0551      0.05  O         |         |         |         |
  21+45       0.0601      0.06  O         |         |         |         |
  22+ 0       0.0551      0.05  O         |         |         |         |
  22+15       0.0601      0.06  O         |         |         |         |
  22+30       0.0551      0.05  O         |         |         |         |
  22+45       0.0480      0.05  O         |         |         |         |
  23+ 0       0.0462      0.05  O         |         |         |         |
  23+15       0.0461      0.05  O         |         |         |         |
  23+30       0.0461      0.05  O         |         |         |         |
  23+45       0.0461      0.05  O         |         |         |         |
  24+ 0       0.0461      0.05  O         |         |         |         |
  24+15       0.0218      0.01  O         |         |         |         |
  24+30       0.0040      0.00  O         |         |         |         |
  24+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    99
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =        4.719 (CFS)
                Total volume =       1.387 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************
```

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---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      351.000 to Point/Station       35.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubC5224100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0        2.0       4.1       6.1       8.2
----------------------------------------------------------------------
  0+15       0.0173      0.04  Q         |         |         |         |
  0+30       0.0351      0.09  Q         |         |         |         |
  0+45       0.0397      0.11  Q         |         |         |         |
  1+ 0       0.0484      0.13  Q         |         |         |         |
  1+15       0.0444      0.12  Q         |         |         |         |
  1+30       0.0397      0.11  Q         |         |         |         |
  1+45       0.0397      0.11  Q         |         |         |         |
  2+ 0       0.0484      0.13  Q         |         |         |         |
  2+15       0.0530      0.14  Q         |         |         |         |
  2+30       0.0530      0.15  Q         |         |         |         |
  2+45       0.0616      0.17  Q         |         |         |         |
  3+ 0       0.0662      0.18  Q         |         |         |         |
  3+15       0.0662      0.18  Q         |         |         |         |
  3+30       0.0662      0.18  Q         |         |         |         |
  3+45       0.0662      0.18  Q         |         |         |         |
  4+ 0       0.0749      0.20  Q         |         |         |         |
  4+15       0.0795      0.22  qQ        |         |         |         |
  4+30       0.0881      0.24  qQ        |         |         |         |
  4+45       0.0927      0.25  qQ        |         |         |         |
  5+ 0       0.1014      0.27  qQ        |         |         |         |
  5+15       0.0887      0.25  qQ        |         |         |         |
  5+30       0.0881      0.24  qQ        |         |         |         |
  5+45       0.1014      0.27  qQ        |         |         |         |
  6+ 0       0.1060      0.29  qQ        |         |         |         |
  6+15       0.1146      0.31  qQ        |         |         |         |
  6+30       0.1192      0.32  qQ        |         |         |         |
  6+45       0.1279      0.35  qQ        |         |         |         |
  7+ 0       0.1325      0.36  qQ        |         |         |         |
  7+15       0.1325      0.36  qQ        |         |         |         |
  7+30       0.1411      0.38  qQ        |         |         |         |
  7+45       0.1544      0.42  q Q       |         |         |         |
  8+ 0       0.2252      0.51  |qQ       |         |         |         |
  8+15       0.4466      0.77  | qQ      |         |         |         |
  8+30       0.5589      0.90  | q Q     |         |         |         |
  8+45       0.6653      1.02  |  q Q    |         |         |         |
  9+ 0       0.8176      1.20  |   qQ    |         |         |         |
  9+15       1.0562      1.52  |    q Q  |         |         |         |
  9+30       1.2542      1.92  |     q  Q|         |         |         |
  9+45       1.4059      2.35  |     q   |Q        |         |         |
 10+ 0       1.5575      2.78  |      q  |  Q      |         |         |
 10+15       1.0172      1.83  |   q   Q |         |         |         |
 10+30       0.7137      1.15  |  q Q    |         |         |         |
 10+45       1.1645      1.90  |    q   Q|         |         |         |
 11+ 0       1.4130      2.46  |     q   | Q       |         |         |
 11+15       1.3447      2.37  |     q   |Q        |         |         |
 11+30       1.3166      2.31  |     q   |Q        |         |         |
 11+45       1.1615      1.94  |    q   Q|         |         |         |
 12+ 0       1.1734      1.95  |    q   Q|         |         |         |
 12+15       1.8421      3.57  |        q|      Q  |         |         |
 12+30       2.2679      4.81  |         |q        |  Q      |         |
 12+45       2.5039      5.55  |         | q       |      Q  |         |
```

```
   13+ 0       2.6992      6.12  |          |  q       |          Q          |
   13+15       3.1940      7.40  |          |    q     |          |      Q   |
   13+30       3.4406      8.16  |          |     q    |          |          Q
   13+45       2.5057      6.03  |          | q        |         Q|          |
   14+ 0       2.0152      4.61  |         q|          | Q        |          |
   14+15       2.3768      5.29  |          |q         |    Q     |          |
   14+30       2.4900      5.67  |          | q        |      Q   |          |
   14+45       2.4593      5.67  |          | q        |      Q   |          |
   15+ 0       2.3879      5.51  |          |q         |      Q   |          |
   15+15       2.2702      5.22  |          |q         |    Q     |          |
   15+30       2.1524      4.92  |          q          |   Q      |          |
   15+45       1.7749      3.98  |        q |         Q|          |          |
   16+ 0       1.6049      3.48  |       q  |       Q  |          |          |
   16+15       0.5939      1.50  | q    Q   |          |          |          |
   16+30       0.0530      0.29  qQ         |          |          |          |
   16+45       0.0444      0.13  Q          |          |          |          |
   17+ 0       0.0397      0.11  Q          |          |          |          |
   17+15       0.0570      0.15  Q          |          |          |          |
   17+30       0.0662      0.18  Q          |          |          |          |
   17+45       0.0662      0.18  Q          |          |          |          |
   18+ 0       0.0576      0.16  Q          |          |          |          |
   18+15       0.0530      0.15  Q          |          |          |          |
   18+30       0.0530      0.15  Q          |          |          |          |
   18+45       0.0444      0.12  Q          |          |          |          |
   19+ 0       0.0311      0.09  Q          |          |          |          |
   19+15       0.0351      0.10  Q          |          |          |          |
   19+30       0.0484      0.13  Q          |          |          |          |
   19+45       0.0444      0.12  Q          |          |          |          |
   20+ 0       0.0311      0.09  Q          |          |          |          |
   20+15       0.0351      0.10  Q          |          |          |          |
   20+30       0.0397      0.11  Q          |          |          |          |
   20+45       0.0397      0.11  Q          |          |          |          |
   21+ 0       0.0311      0.09  Q          |          |          |          |
   21+15       0.0351      0.10  Q          |          |          |          |
   21+30       0.0311      0.09  Q          |          |          |          |
   21+45       0.0351      0.10  Q          |          |          |          |
   22+ 0       0.0311      0.09  Q          |          |          |          |
   22+15       0.0351      0.10  Q          |          |          |          |
   22+30       0.0311      0.09  Q          |          |          |          |
   22+45       0.0265      0.07  Q          |          |          |          |
   23+ 0       0.0265      0.07  Q          |          |          |          |
   23+15       0.0265      0.07  Q          |          |          |          |
   23+30       0.0265      0.07  Q          |          |          |          |
   23+45       0.0265      0.07  Q          |          |          |          |
   24+ 0       0.0265      0.07  Q          |          |          |          |
   24+15       0.0092      0.03  Q          |          |          |          |
   24+30       0.0000      0.00  Q          |          |          |          |
   24+45       0.0000      0.00  Q          |          |          |          |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                       Number of intervals =    99
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =        8.159 (CFS)
                       Total volume =       2.618 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      351.000 to Point/Station       35.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file C51and52N35.rte
        ****************************HYDROGRAPH DATA****************************
                       Number of intervals =     0
                       Time interval =    0.0 (Min.)
```

```
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/25/12 File: SubC124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C1
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =     403.10(Ac.)  =      0.630 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     403.10(Ac.)  =      0.630 Sq. Mi.
Length along longest watercourse =    9900.00(Ft.)
Length along longest watercourse measured to centroid =    5600.00(Ft.)
Length along longest watercourse =      1.875 Mi.
Length along longest watercourse measured to centroid =      1.061 Mi.
Difference in elevation =     700.00(Ft.)
Slope along watercourse =    373.3333 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.303 Hr.
Lag time =    18.21 Min.
25% of lag time =     4.55 Min.
40% of lag time =     7.28 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10           1.80                725.58

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10           4.50               1813.95

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    4.496(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.500           46.00         0.000
     5.400           66.00         0.000
```

13.200	77.00	0.000
376.000	83.00	0.000

Total Area Entered = 403.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.021	0.013
66.0	66.0	0.405	0.000	0.405	0.013	0.005
77.0	77.0	0.279	0.000	0.279	0.033	0.009
83.0	83.0	0.210	0.000	0.210	0.933	0.196
					Sum (F) =	0.223

Area averaged mean soil loss (F) (In/Hr) = 0.223
Minimum soil loss rate ((In/Hr)) = 0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	82.386	9.509	38.632
2	0.500	164.773	49.802	202.320
3	0.750	247.159	23.542	95.638
4	1.000	329.545	9.452	38.397
5	1.250	411.931	4.591	18.651
6	1.500	494.318	1.618	6.571
7	1.750	576.704	0.707	2.873
8	2.000	659.090	0.536	2.179
9	2.250	741.476	0.243	0.986
			Sum = 100.000	Sum= 406.249

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.394)	0.032	0.004
2	0.50	0.30	0.054	(0.390)	0.049	0.005
3	0.75	0.30	0.054	(0.385)	0.049	0.005
4	1.00	0.40	0.072	(0.380)	0.065	0.007
5	1.25	0.30	0.054	(0.376)	0.049	0.005
6	1.50	0.30	0.054	(0.371)	0.049	0.005
7	1.75	0.30	0.054	(0.367)	0.049	0.005
8	2.00	0.40	0.072	(0.363)	0.065	0.007
9	2.25	0.40	0.072	(0.358)	0.065	0.007
10	2.50	0.40	0.072	(0.354)	0.065	0.007
11	2.75	0.50	0.090	(0.350)	0.081	0.009
12	3.00	0.50	0.090	(0.345)	0.081	0.009
13	3.25	0.50	0.090	(0.341)	0.081	0.009
14	3.50	0.50	0.090	(0.337)	0.081	0.009
15	3.75	0.50	0.090	(0.333)	0.081	0.009
16	4.00	0.60	0.108	(0.328)	0.097	0.011
17	4.25	0.60	0.108	(0.324)	0.097	0.011
18	4.50	0.70	0.126	(0.320)	0.113	0.013
19	4.75	0.70	0.126	(0.316)	0.113	0.013
20	5.00	0.80	0.144	(0.312)	0.129	0.014
21	5.25	0.60	0.108	(0.308)	0.097	0.011
22	5.50	0.70	0.126	(0.304)	0.113	0.013
23	5.75	0.80	0.144	(0.300)	0.129	0.014
24	6.00	0.80	0.144	(0.296)	0.129	0.014
25	6.25	0.90	0.162	(0.292)	0.146	0.016
26	6.50	0.90	0.162	(0.288)	0.146	0.016
27	6.75	1.00	0.180	(0.284)	0.162	0.018

28	7.00	1.00	0.180	(	0.280)	0.162	0.018
29	7.25	1.00	0.180	(	0.277)	0.162	0.018
30	7.50	1.10	0.198	(	0.273)	0.178	0.020
31	7.75	1.20	0.216	(	0.269)	0.194	0.022
32	8.00	1.30	0.234	(	0.265)	0.210	0.023
33	8.25	1.50	0.270	(	0.262)	0.243	0.027
34	8.50	1.50	0.270	(	0.258)	0.243	0.027
35	8.75	1.60	0.288		0.254	(0.259)	0.033
36	9.00	1.70	0.306		0.251	(0.275)	0.055
37	9.25	1.90	0.342		0.247	(0.308)	0.094
38	9.50	2.00	0.360		0.244	(0.324)	0.116
39	9.75	2.10	0.378		0.240	(0.340)	0.137
40	10.00	2.20	0.396		0.237	(0.356)	0.159
41	10.25	1.50	0.270		0.233	(0.243)	0.036
42	10.50	1.50	0.270		0.230	(0.243)	0.040
43	10.75	2.00	0.360		0.227	(0.324)	0.133
44	11.00	2.00	0.360		0.223	(0.324)	0.136
45	11.25	1.90	0.342		0.220	(0.308)	0.122
46	11.50	1.90	0.342		0.217	(0.308)	0.125
47	11.75	1.70	0.306		0.214	(0.275)	0.092
48	12.00	1.80	0.324		0.210	(0.291)	0.113
49	12.25	2.50	0.450		0.207	(0.405)	0.242
50	12.50	2.60	0.468		0.204	(0.421)	0.263
51	12.75	2.80	0.504		0.201	(0.453)	0.303
52	13.00	2.90	0.522		0.198	(0.469)	0.324
53	13.25	3.40	0.612		0.195	(0.550)	0.416
54	13.50	3.40	0.612		0.192	(0.550)	0.419
55	13.75	2.30	0.414		0.189	(0.372)	0.224
56	14.00	2.30	0.414		0.186	(0.372)	0.227
57	14.25	2.70	0.486		0.183	(0.437)	0.302
58	14.50	2.60	0.468		0.181	(0.421)	0.287
59	14.75	2.60	0.468		0.178	(0.421)	0.290
60	15.00	2.50	0.450		0.175	(0.405)	0.274
61	15.25	2.40	0.432		0.173	(0.388)	0.259
62	15.50	2.30	0.414		0.170	(0.372)	0.244
63	15.75	1.90	0.342		0.167	(0.308)	0.174
64	16.00	1.90	0.342		0.165	(0.308)	0.177
65	16.25	0.40	0.072	(	0.162)	0.065	0.007
66	16.50	0.40	0.072	(	0.160)	0.065	0.007
67	16.75	0.30	0.054	(	0.157)	0.049	0.005
68	17.00	0.30	0.054	(	0.155)	0.049	0.005
69	17.25	0.50	0.090	(	0.153)	0.081	0.009
70	17.50	0.50	0.090	(	0.150)	0.081	0.009
71	17.75	0.50	0.090	(	0.148)	0.081	0.009
72	18.00	0.40	0.072	(	0.146)	0.065	0.007
73	18.25	0.40	0.072	(	0.144)	0.065	0.007
74	18.50	0.40	0.072	(	0.142)	0.065	0.007
75	18.75	0.30	0.054	(	0.140)	0.049	0.005
76	19.00	0.20	0.036	(	0.138)	0.032	0.004
77	19.25	0.30	0.054	(	0.136)	0.049	0.005
78	19.50	0.40	0.072	(	0.134)	0.065	0.007
79	19.75	0.30	0.054	(	0.132)	0.049	0.005
80	20.00	0.20	0.036	(	0.130)	0.032	0.004
81	20.25	0.30	0.054	(	0.128)	0.049	0.005
82	20.50	0.30	0.054	(	0.127)	0.049	0.005
83	20.75	0.30	0.054	(	0.125)	0.049	0.005
84	21.00	0.20	0.036	(	0.124)	0.032	0.004
85	21.25	0.30	0.054	(	0.122)	0.049	0.005
86	21.50	0.20	0.036	(	0.121)	0.032	0.004
87	21.75	0.30	0.054	(	0.119)	0.049	0.005
88	22.00	0.20	0.036	(	0.118)	0.032	0.004
89	22.25	0.30	0.054	(	0.117)	0.049	0.005
90	22.50	0.20	0.036	(	0.116)	0.032	0.004
91	22.75	0.20	0.036	(	0.115)	0.032	0.004
92	23.00	0.20	0.036	(	0.114)	0.032	0.004
93	23.25	0.20	0.036	(	0.113)	0.032	0.004
94	23.50	0.20	0.036	(	0.113)	0.032	0.004
95	23.75	0.20	0.036	(	0.112)	0.032	0.004
96	24.00	0.20	0.036	(	0.112)	0.032	0.004
		(Loss Rate Not Used)					
Sum =		100.0				Sum =	6.4

```
Flood volume = Effective rainfall      1.60(In)
 times area     403.1(Ac.)/[(In)/(Ft.)] =      53.9(Ac.Ft)
Total soil loss =      2.89(In)
Total soil loss =    97.167(Ac.Ft)
Total rainfall =      4.50(In)
Flood volume =     2346842.5 Cubic Feet
Total soil loss =     4232611.9 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    154.262(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------
  0+15       0.0029      0.14  Q         |         |         |         |
  0+30       0.0222      0.94  Q         |         |         |         |
  0+45       0.0562      1.64  Q         |         |         |         |
  1+ 0       0.0980      2.02  Q         |         |         |         |
  1+15       0.1488      2.46  Q         |         |         |         |
  1+30       0.1967      2.32  Q         |         |         |         |
  1+45       0.2430      2.24  Q         |         |         |         |
  2+ 0       0.2903      2.29  Q         |         |         |         |
  2+15       0.3447      2.64  Q         |         |         |         |
  2+30       0.4027      2.80  Q         |         |         |         |
  2+45       0.4635      2.94  Q         |         |         |         |
  3+ 0       0.5324      3.34  Q         |         |         |         |
  3+15       0.6051      3.52  Q         |         |         |         |
  3+30       0.6793      3.59  Q         |         |         |         |
  3+45       0.7544      3.63  Q         |         |         |         |
  4+ 0       0.8311      3.71  Q         |         |         |         |
  4+15       0.9155      4.08  Q         |         |         |         |
  4+30       1.0049      4.33  Q         |         |         |         |
  4+45       1.1033      4.76  Q         |         |         |         |
  5+ 0       1.2074      5.04  VQ        |         |         |         |
  5+15       1.3179      5.34  VQ        |         |         |         |
  5+30       1.4190      4.90  QV        |         |         |         |
  5+45       1.5238      5.07  |Q        |         |         |         |
  6+ 0       1.6376      5.51  |Q        |         |         |         |
  6+15       1.7568      5.77  |Q        |         |         |         |
  6+30       1.8853      6.22  |Q        |         |         |         |
  6+45       2.0196      6.50  |Q        |         |         |         |
  7+ 0       2.1631      6.94  |Q        |         |         |         |
  7+15       2.3109      7.15  |Q        |         |         |         |
  7+30       2.4620      7.31  |Q        |         |         |         |
  7+45       2.6228      7.79  |Q        |         |         |         |
  8+ 0       2.7965      8.41  |QV       |         |         |         |
  8+15       2.9857      9.16  |QV       |         |         |         |
  8+30       3.1958     10.16  | Q       |         |         |         |
  8+45       3.4204     10.87  | Q       |         |         |         |
  9+ 0       3.6930     13.19  | Q       |         |         |         |
  9+15       4.1018     19.79  |  Q      |         |         |         |
  9+30       4.7415     30.96  |  V  Q   |         |         |         |
  9+45       5.5863     40.89  |   V   Q |         |         |         |
 10+ 0       6.6214     50.10  |   V     Q         |         |         |
 10+15       7.7264     53.48  |    V    Q         |         |         |
 10+30       8.3965     32.43  |     Q   |         |         |         |
 10+45       8.9448     26.54  |    QV   |         |         |         |
 11+ 0       9.8100     41.88  |      VQ |         |         |         |
 11+15      10.8232     49.04  |       VQ|         |         |         |
 11+30      11.8454     49.48  |       VQ|         |         |         |
 11+45      12.8592     49.07  |        Q|         |         |         |
 12+ 0      13.7566     43.44  |       Q V         |         |         |
 12+15      14.7815     49.60  |        QV         |         |         |
 12+30      16.3824     77.48  |         | V  Q    |         |         |
 12+45      18.3636     95.89  |         |  V     Q|         |         |
 13+ 0      20.6722    111.74  |         |    V    | Q       |         |
```

```
  13+15      23.2875    126.58  |         |      V  |    Q    |         |
  13+30      26.3918    150.25  |         |        V|         Q         |
  13+45      29.5790    154.26  |         |         V        Q         |
  14+ 0      32.0538    119.78  |         |         |  Q      |         |
  14+15      34.2619    106.87  |         |         |Q   V    |         |
  14+30      36.6389    115.04  |         |         |  Q   V  |         |
  14+45      39.0371    116.08  |         |         |  Q    V |         |
  15+ 0      41.4435    116.47  |         |         |  Q      V         |
  15+15      43.7870    113.42  |         |         | Q       | V       |
  15+30      46.0219    108.17  |         |         |Q        |   V     |
  15+45      48.0945    100.31  |         |         Q         |    V    |
  16+ 0      49.8336     84.17  |         |     Q   |         |     V   |
  16+15      51.2916     70.57  |         |   Q     |         |       V |
  16+30      51.9803     33.33  |     Q   |         |         |       V |
  16+45      52.3034     15.64  |  Q      |         |         |       V |
  17+ 0      52.4739      8.25  |Q        |         |         |       V |
  17+15      52.5735      4.82  Q         |         |         |        V|
  17+30      52.6603      4.20  Q         |         |         |        V|
  17+45      52.7422      3.96  Q         |         |         |        V|
  18+ 0      52.8177      3.65  Q         |         |         |        V|
  18+15      52.8834      3.18  Q         |         |         |        V|
  18+30      52.9460      3.03  Q         |         |         |        V|
  18+45      53.0059      2.90  Q         |         |         |        V|
  19+ 0      53.0563      2.44  Q         |         |         |        V|
  19+15      53.0969      1.97  Q         |         |         |        V|
  19+30      53.1414      2.15  Q         |         |         |        V|
  19+45      53.1933      2.51  Q         |         |         |        V|
  20+ 0      53.2403      2.27  Q         |         |         |        V|
  20+15      53.2794      1.89  Q         |         |         |        V|
  20+30      53.3217      2.05  Q         |         |         |        V|
  20+45      53.3658      2.13  Q         |         |         |        V|
  21+ 0      53.4091      2.09  Q         |         |         |        V|
  21+15      53.4467      1.82  Q         |         |         |        V|
  21+30      53.4869      1.95  Q         |         |         |        V|
  21+45      53.5232      1.76  Q         |         |         |        V|
  22+ 0      53.5628      1.92  Q         |         |         |        V|
  22+15      53.5989      1.75  Q         |         |         |        V|
  22+30      53.6384      1.91  Q         |         |         |        V|
  22+45      53.6730      1.67  Q         |         |         |        V|
  23+ 0      53.7050      1.55  Q         |         |         |        V|
  23+15      53.7361      1.50  Q         |         |         |        V|
  23+30      53.7666      1.48  Q         |         |         |        V|
  23+45      53.7969      1.47  Q         |         |         |        V|
  24+ 0      53.8272      1.47  Q         |         |         |        V|
  24+15      53.8546      1.32  Q         |         |         |        V|
  24+30      53.8669      0.59  Q         |         |         |        V|
  24+45      53.8721      0.25  Q         |         |         |        V|
  25+ 0      53.8744      0.11  Q         |         |         |        V|
  25+15      53.8753      0.05  Q         |         |         |        V|
  25+30      53.8758      0.02  Q         |         |         |        V|
  25+45      53.8760      0.01  Q         |         |         |        V|
  26+ 0      53.8761      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/25/12 File: SubC224100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Sream 1, Existing Condition
Subarea C2
100-year, 24 hour

--------------------------------------------------------------------
Drainage Area =      23.70(Ac.)  =      0.037 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      23.70(Ac.)  =      0.037 Sq. Mi.
Length along longest watercourse =    1900.00(Ft.)
Length along longest watercourse measured to centroid =     890.00(Ft.)
Length along longest watercourse =      0.360 Mi.
Length along longest watercourse measured to centroid =      0.169 Mi.
Difference in elevation =      58.00(Ft.)
Slope along watercourse =    161.1789 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.095 Hr.
Lag time =     5.67 Min.
25% of lag time =     1.42 Min.
40% of lag time =     2.27 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       23.70           1.80                 42.66

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       23.70           4.50                106.65

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    18.700           66.00         0.000
     5.000           83.00         0.000
```

Total Area Entered = 23.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.789	0.320
83.0	83.0	0.210	0.000	0.210	0.211	0.044
					Sum (F) =	0.364

Area averaged mean soil loss (F) (In/Hr) = 0.364
Minimum soil loss rate ((In/Hr)) = 0.182
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	264.547	53.121	12.688
2 0.500	529.095	43.617	10.418
3 0.750	793.642	3.262	0.779
		Sum = 100.000	Sum= 23.885

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.643)	0.032	0.004
2	0.50	0.30	0.054	(0.635)	0.049	0.005
3	0.75	0.30	0.054	(0.628)	0.049	0.005
4	1.00	0.40	0.072	(0.620)	0.065	0.007
5	1.25	0.30	0.054	(0.613)	0.049	0.005
6	1.50	0.30	0.054	(0.606)	0.049	0.005
7	1.75	0.30	0.054	(0.599)	0.049	0.005
8	2.00	0.40	0.072	(0.591)	0.065	0.007
9	2.25	0.40	0.072	(0.584)	0.065	0.007
10	2.50	0.40	0.072	(0.577)	0.065	0.007
11	2.75	0.50	0.090	(0.570)	0.081	0.009
12	3.00	0.50	0.090	(0.563)	0.081	0.009
13	3.25	0.50	0.090	(0.556)	0.081	0.009
14	3.50	0.50	0.090	(0.549)	0.081	0.009
15	3.75	0.50	0.090	(0.542)	0.081	0.009
16	4.00	0.60	0.108	(0.536)	0.097	0.011
17	4.25	0.60	0.108	(0.529)	0.097	0.011
18	4.50	0.70	0.126	(0.522)	0.113	0.013
19	4.75	0.70	0.126	(0.515)	0.113	0.013
20	5.00	0.80	0.144	(0.509)	0.130	0.014
21	5.25	0.60	0.108	(0.502)	0.097	0.011
22	5.50	0.70	0.126	(0.496)	0.113	0.013
23	5.75	0.80	0.144	(0.489)	0.130	0.014
24	6.00	0.80	0.144	(0.483)	0.130	0.014
25	6.25	0.90	0.162	(0.476)	0.146	0.016
26	6.50	0.90	0.162	(0.470)	0.146	0.016
27	6.75	1.00	0.180	(0.464)	0.162	0.018
28	7.00	1.00	0.180	(0.457)	0.162	0.018
29	7.25	1.00	0.180	(0.451)	0.162	0.018
30	7.50	1.10	0.198	(0.445)	0.178	0.020
31	7.75	1.20	0.216	(0.439)	0.194	0.022
32	8.00	1.30	0.234	(0.433)	0.211	0.023
33	8.25	1.50	0.270	(0.427)	0.243	0.027
34	8.50	1.50	0.270	(0.421)	0.243	0.027
35	8.75	1.60	0.288	(0.415)	0.259	0.029
36	9.00	1.70	0.306	(0.409)	0.275	0.031
37	9.25	1.90	0.342	(0.403)	0.308	0.034

38	9.50	2.00	0.360	(	0.398)	0.324	0.036
39	9.75	2.10	0.378	(	0.392)	0.340	0.038
40	10.00	2.20	0.396	(	0.386)	0.356	0.040
41	10.25	1.50	0.270	(	0.381)	0.243	0.027
42	10.50	1.50	0.270	(	0.375)	0.243	0.027
43	10.75	2.00	0.360	(	0.370)	0.324	0.036
44	11.00	2.00	0.360	(	0.364)	0.324	0.036
45	11.25	1.90	0.342	(	0.359)	0.308	0.034
46	11.50	1.90	0.342	(	0.354)	0.308	0.034
47	11.75	1.70	0.306	(	0.348)	0.275	0.031
48	12.00	1.80	0.324	(	0.343)	0.292	0.032
49	12.25	2.50	0.450		0.338	(0.405)	0.112
50	12.50	2.60	0.468		0.333	(0.421)	0.135
51	12.75	2.80	0.504		0.328	(0.454)	0.176
52	13.00	2.90	0.522		0.323	(0.470)	0.199
53	13.25	3.40	0.612		0.318	(0.551)	0.294
54	13.50	3.40	0.612		0.313	(0.551)	0.299
55	13.75	2.30	0.414		0.309	(0.373)	0.105
56	14.00	2.30	0.414		0.304	(0.373)	0.110
57	14.25	2.70	0.486		0.299	(0.437)	0.187
58	14.50	2.60	0.468		0.295	(0.421)	0.173
59	14.75	2.60	0.468		0.290	(0.421)	0.178
60	15.00	2.50	0.450		0.286	(0.405)	0.164
61	15.25	2.40	0.432		0.281	(0.389)	0.151
62	15.50	2.30	0.414		0.277	(0.373)	0.137
63	15.75	1.90	0.342		0.273	(0.308)	0.069
64	16.00	1.90	0.342		0.269	(0.308)	0.073
65	16.25	0.40	0.072	(	0.265)	0.065	0.007
66	16.50	0.40	0.072	(	0.261)	0.065	0.007
67	16.75	0.30	0.054	(	0.257)	0.049	0.005
68	17.00	0.30	0.054	(	0.253)	0.049	0.005
69	17.25	0.50	0.090	(	0.249)	0.081	0.009
70	17.50	0.50	0.090	(	0.245)	0.081	0.009
71	17.75	0.50	0.090	(	0.241)	0.081	0.009
72	18.00	0.40	0.072	(	0.238)	0.065	0.007
73	18.25	0.40	0.072	(	0.234)	0.065	0.007
74	18.50	0.40	0.072	(	0.231)	0.065	0.007
75	18.75	0.30	0.054	(	0.228)	0.049	0.005
76	19.00	0.20	0.036	(	0.224)	0.032	0.004
77	19.25	0.30	0.054	(	0.221)	0.049	0.005
78	19.50	0.40	0.072	(	0.218)	0.065	0.007
79	19.75	0.30	0.054	(	0.215)	0.049	0.005
80	20.00	0.20	0.036	(	0.212)	0.032	0.004
81	20.25	0.30	0.054	(	0.209)	0.049	0.005
82	20.50	0.30	0.054	(	0.207)	0.049	0.005
83	20.75	0.30	0.054	(	0.204)	0.049	0.005
84	21.00	0.20	0.036	(	0.202)	0.032	0.004
85	21.25	0.30	0.054	(	0.199)	0.049	0.005
86	21.50	0.20	0.036	(	0.197)	0.032	0.004
87	21.75	0.30	0.054	(	0.195)	0.049	0.005
88	22.00	0.20	0.036	(	0.193)	0.032	0.004
89	22.25	0.30	0.054	(	0.191)	0.049	0.005
90	22.50	0.20	0.036	(	0.189)	0.032	0.004
91	22.75	0.20	0.036	(	0.188)	0.032	0.004
92	23.00	0.20	0.036	(	0.186)	0.032	0.004
93	23.25	0.20	0.036	(	0.185)	0.032	0.004
94	23.50	0.20	0.036	(	0.184)	0.032	0.004
95	23.75	0.20	0.036	(	0.183)	0.032	0.004
96	24.00	0.20	0.036	(	0.182)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.6

Flood volume = Effective rainfall 0.91(In)
times area 23.7(Ac.)/[(In)/(Ft.)] = 1.8(Ac.Ft)
Total soil loss = 3.59(In)
Total soil loss = 7.099(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 77899.2 Cubic Feet
Total soil loss = 309222.4 Cubic Feet

Peak flow rate of this hydrograph = 7.008(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0009	0.05	Q	|	|	|	|
0+30	0.0031	0.11	Q	|	|	|	|
0+45	0.0058	0.13	Q	|	|	|	|
1+ 0	0.0089	0.15	Q	|	|	|	|
1+15	0.0120	0.15	Q	|	|	|	|
1+30	0.0147	0.13	Q	|	|	|	|
1+45	0.0173	0.13	Q	|	|	|	|
2+ 0	0.0205	0.15	Q	|	|	|	|
2+15	0.0240	0.17	Q	|	|	|	|
2+30	0.0275	0.17	Q	|	|	|	|
2+45	0.0316	0.19	Q	|	|	|	|
3+ 0	0.0360	0.21	Q	|	|	|	|
3+15	0.0404	0.22	Q	|	|	|	|
3+30	0.0449	0.22	QV	|	|	|	|
3+45	0.0493	0.22	QV	|	|	|	|
4+ 0	0.0542	0.24	QV	|	|	|	|
4+15	0.0595	0.26	|Q	|	|	|	|
4+30	0.0653	0.28	|Q	|	|	|	|
4+45	0.0715	0.30	|Q	|	|	|	|
5+ 0	0.0782	0.32	|Q	|	|	|	|
5+15	0.0844	0.30	|Q	|	|	|	|
5+30	0.0902	0.28	|QV	|	|	|	|
5+45	0.0969	0.32	|QV	|	|	|	|
6+ 0	0.1040	0.34	|QV	|	|	|	|
6+15	0.1116	0.37	|QV	|	|	|	|
6+30	0.1195	0.39	|QV	|	|	|	|
6+45	0.1280	0.41	|QV	|	|	|	|
7+ 0	0.1368	0.43	|Q V	|	|	|	|
7+15	0.1457	0.43	|Q V	|	|	|	|
7+30	0.1551	0.45	|Q V	|	|	|	|
7+45	0.1653	0.49	|Q V	|	|	|	|
8+ 0	0.1764	0.54	| QV	|	|	|	|
8+15	0.1889	0.60	| Q V	|	|	|	|
8+30	0.2022	0.64	| Q V	|	|	|	|
8+45	0.2160	0.67	| Q V	|	|	|	|
9+ 0	0.2306	0.71	| Q V	|	|	|	|
9+15	0.2467	0.78	| Q V	|	|	|	|
9+30	0.2640	0.84	| Q V	|	|	|	|
9+45	0.2822	0.88	| Q V	|	|	|	|
10+ 0	0.3013	0.92	| Q V	|	|	|	|
10+15	0.3175	0.78	| Q V	|	|	|	|
10+30	0.3310	0.66	| Q V	|	|	|	|
10+45	0.3467	0.76	| Q V	|	|	|	|
11+ 0	0.3643	0.85	| Q V |	|	|	|	|
11+15	0.3816	0.84	| Q V |	|	|	|	|
11+30	0.3986	0.82	| Q V |	|	|	|	|
11+45	0.4145	0.77	| Q V|	|	|	|	|
12+ 0	0.4301	0.76	| Q V|	|	|	|	|
12+15	0.4670	1.78	| Q V	|	|	|	|
12+30	0.5270	2.91	| Q	|	|	|	|
12+45	0.6040	3.73	| | VQ	|	|	|	|
13+ 0	0.6963	4.46	| | V Q	|	|	|	|
13+15	0.8190	5.94	| | V | Q	|	|	|	|
13+30	0.9638	7.01	| | V Q |	|	|	|	|
13+45	1.0605	4.68	| | Q | V	|	|	|	|
14+ 0	1.1169	2.73	| Q | V	|	|	|	|
14+15	1.1913	3.60	| | Q | V	|	|	|	|
14+30	1.2787	4.23	| | Q | V |	|	|	|	|
14+45	1.3657	4.21	| | Q | V	|	|	|	|
15+ 0	1.4498	4.07	| | Q | V	|	|	|	|
15+15	1.5275	3.76	| | Q | V	|	|	|	|
15+30	1.5985	3.44	| | Q | V	|	|	|	|

```
   15+45       1.6486      2.42  |        Q|         |         |     V   |
   16+ 0       1.6849      1.76  |       Q |         |         |      V  |
   16+15       1.7037      0.91  |  Q      |         |         |       V |
   16+30       1.7083      0.22  Q         |         |         |       V |
   16+45       1.7114      0.15  Q         |         |         |       V |
   17+ 0       1.7141      0.13  Q         |         |         |       V |
   17+15       1.7177      0.17  Q         |         |         |       V |
   17+30       1.7221      0.21  Q         |         |         |       V |
   17+45       1.7265      0.22  Q         |         |         |       V |
   18+ 0       1.7305      0.19  Q         |         |         |       V |
   18+15       1.7341      0.17  Q         |         |         |       V |
   18+30       1.7377      0.17  Q         |         |         |       V |
   18+45       1.7407      0.15  Q         |         |         |       V |
   19+ 0       1.7430      0.11  Q         |         |         |       V |
   19+15       1.7452      0.11  Q         |         |         |        V|
   19+30       1.7484      0.15  Q         |         |         |        V|
   19+45       1.7514      0.15  Q         |         |         |        V|
   20+ 0       1.7536      0.11  Q         |         |         |        V|
   20+15       1.7559      0.11  Q         |         |         |        V|
   20+30       1.7585      0.13  Q         |         |         |        V|
   20+45       1.7612      0.13  Q         |         |         |        V|
   21+ 0       1.7634      0.11  Q         |         |         |        V|
   21+15       1.7657      0.11  Q         |         |         |        V|
   21+30       1.7678      0.10  Q         |         |         |        V|
   21+45       1.7701      0.11  Q         |         |         |        V|
   22+ 0       1.7723      0.10  Q         |         |         |        V|
   22+15       1.7746      0.11  Q         |         |         |        V|
   22+30       1.7767      0.10  Q         |         |         |        V|
   22+45       1.7785      0.09  Q         |         |         |        V|
   23+ 0       1.7803      0.09  Q         |         |         |        V|
   23+15       1.7821      0.09  Q         |         |         |        V|
   23+30       1.7839      0.09  Q         |         |         |        V|
   23+45       1.7857      0.09  Q         |         |         |        V|
   24+ 0       1.7874      0.09  Q         |         |         |        V|
   24+15       1.7883      0.04  Q         |         |         |        V|
   24+30       1.7883      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/25/12 File: SubC2124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C21
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =     180.10(Ac.)  =      0.281 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     180.10(Ac.)  =      0.281 Sq. Mi.
Length along longest watercourse =    5800.00(Ft.)
Length along longest watercourse measured to centroid =    2200.00(Ft.)
Length along longest watercourse =      1.098 Mi.
Length along longest watercourse measured to centroid =      0.417 Mi.
Difference in elevation =     547.00(Ft.)
Slope along watercourse =    497.9586 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.164 Hr.
Lag time =     9.86 Min.
25% of lag time =     2.47 Min.
40% of lag time =     3.95 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      180.10           1.80                 324.18

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      180.10           4.50                 810.45

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    4.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    17.000           66.00         0.000
     1.300           77.00         0.000
```

```
   161.800          83.00         0.000
 Total Area Entered =    180.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       0.094      0.038
77.0  77.0      0.279     0.000        0.279       0.007      0.002
83.0  83.0      0.210     0.000        0.210       0.898      0.188
                                                  Sum (F) =   0.229
Area averaged mean soil loss (F) (In/Hr) =  0.229
Minimum soil loss rate ((In/Hr)) =  0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
-----------------------------------------------------------------------
               Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.250        152.073         31.114             56.474
    2   0.500        304.146         54.171             98.324
    3   0.750        456.220         11.618             21.087
    4   1.000        608.293          2.287              4.152
    5   1.250        760.366          0.810              1.471
                                Sum = 100.000   Sum=     181.507
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.404)	0.032	0.004
2	0.50	0.30	0.054	(0.399)	0.049	0.005
3	0.75	0.30	0.054	(0.395)	0.049	0.005
4	1.00	0.40	0.072	(0.390)	0.065	0.007
5	1.25	0.30	0.054	(0.385)	0.049	0.005
6	1.50	0.30	0.054	(0.381)	0.049	0.005
7	1.75	0.30	0.054	(0.376)	0.049	0.005
8	2.00	0.40	0.072	(0.372)	0.065	0.007
9	2.25	0.40	0.072	(0.367)	0.065	0.007
10	2.50	0.40	0.072	(0.363)	0.065	0.007
11	2.75	0.50	0.090	(0.358)	0.081	0.009
12	3.00	0.50	0.090	(0.354)	0.081	0.009
13	3.25	0.50	0.090	(0.350)	0.081	0.009
14	3.50	0.50	0.090	(0.345)	0.081	0.009
15	3.75	0.50	0.090	(0.341)	0.081	0.009
16	4.00	0.60	0.108	(0.337)	0.097	0.011
17	4.25	0.60	0.108	(0.332)	0.097	0.011
18	4.50	0.70	0.126	(0.328)	0.113	0.013
19	4.75	0.70	0.126	(0.324)	0.113	0.013
20	5.00	0.80	0.144	(0.320)	0.130	0.014
21	5.25	0.60	0.108	(0.316)	0.097	0.011
22	5.50	0.70	0.126	(0.311)	0.113	0.013
23	5.75	0.80	0.144	(0.307)	0.130	0.014
24	6.00	0.80	0.144	(0.303)	0.130	0.014
25	6.25	0.90	0.162	(0.299)	0.146	0.016
26	6.50	0.90	0.162	(0.295)	0.146	0.016
27	6.75	1.00	0.180	(0.291)	0.162	0.018
28	7.00	1.00	0.180	(0.287)	0.162	0.018
29	7.25	1.00	0.180	(0.283)	0.162	0.018
30	7.50	1.10	0.198	(0.280)	0.178	0.020
31	7.75	1.20	0.216	(0.276)	0.194	0.022
32	8.00	1.30	0.234	(0.272)	0.211	0.023
33	8.25	1.50	0.270	(0.268)	0.243	0.027

34	8.50	1.50	0.270	(	0.264)		0.243	0.027
35	8.75	1.60	0.288	(	0.261)		0.259	0.029
36	9.00	1.70	0.306		0.257	(	0.275)	0.049
37	9.25	1.90	0.342		0.253	(	0.308)	0.088
38	9.50	2.00	0.360		0.250	(	0.324)	0.110
39	9.75	2.10	0.378		0.246	(	0.340)	0.132
40	10.00	2.20	0.396		0.243	(	0.356)	0.153
41	10.25	1.50	0.270		0.239	(	0.243)	0.031
42	10.50	1.50	0.270		0.236	(	0.243)	0.034
43	10.75	2.00	0.360		0.232	(	0.324)	0.128
44	11.00	2.00	0.360		0.229	(	0.324)	0.131
45	11.25	1.90	0.342		0.226	(	0.308)	0.116
46	11.50	1.90	0.342		0.222	(	0.308)	0.120
47	11.75	1.70	0.306		0.219	(	0.275)	0.087
48	12.00	1.80	0.324		0.216	(	0.291)	0.108
49	12.25	2.50	0.450		0.212	(	0.405)	0.237
50	12.50	2.60	0.468		0.209	(	0.421)	0.259
51	12.75	2.80	0.504		0.206	(	0.453)	0.298
52	13.00	2.90	0.522		0.203	(	0.470)	0.319
53	13.25	3.40	0.612		0.200	(	0.551)	0.412
54	13.50	3.40	0.612		0.197	(	0.551)	0.415
55	13.75	2.30	0.414		0.194	(	0.372)	0.220
56	14.00	2.30	0.414		0.191	(	0.372)	0.223
57	14.25	2.70	0.486		0.188	(	0.437)	0.298
58	14.50	2.60	0.468		0.185	(	0.421)	0.283
59	14.75	2.60	0.468		0.182	(	0.421)	0.285
60	15.00	2.50	0.450		0.180	(	0.405)	0.270
61	15.25	2.40	0.432		0.177	(	0.389)	0.255
62	15.50	2.30	0.414		0.174	(	0.372)	0.240
63	15.75	1.90	0.342		0.171	(	0.308)	0.170
64	16.00	1.90	0.342		0.169	(	0.308)	0.173
65	16.25	0.40	0.072	(	0.166)		0.065	0.007
66	16.50	0.40	0.072	(	0.164)		0.065	0.007
67	16.75	0.30	0.054	(	0.161)		0.049	0.005
68	17.00	0.30	0.054	(	0.159)		0.049	0.005
69	17.25	0.50	0.090	(	0.156)		0.081	0.009
70	17.50	0.50	0.090	(	0.154)		0.081	0.009
71	17.75	0.50	0.090	(	0.152)		0.081	0.009
72	18.00	0.40	0.072	(	0.150)		0.065	0.007
73	18.25	0.40	0.072	(	0.147)		0.065	0.007
74	18.50	0.40	0.072	(	0.145)		0.065	0.007
75	18.75	0.30	0.054	(	0.143)		0.049	0.005
76	19.00	0.20	0.036	(	0.141)		0.032	0.004
77	19.25	0.30	0.054	(	0.139)		0.049	0.005
78	19.50	0.40	0.072	(	0.137)		0.065	0.007
79	19.75	0.30	0.054	(	0.135)		0.049	0.005
80	20.00	0.20	0.036	(	0.133)		0.032	0.004
81	20.25	0.30	0.054	(	0.132)		0.049	0.005
82	20.50	0.30	0.054	(	0.130)		0.049	0.005
83	20.75	0.30	0.054	(	0.128)		0.049	0.005
84	21.00	0.20	0.036	(	0.127)		0.032	0.004
85	21.25	0.30	0.054	(	0.125)		0.049	0.005
86	21.50	0.20	0.036	(	0.124)		0.032	0.004
87	21.75	0.30	0.054	(	0.122)		0.049	0.005
88	22.00	0.20	0.036	(	0.121)		0.032	0.004
89	22.25	0.30	0.054	(	0.120)		0.049	0.005
90	22.50	0.20	0.036	(	0.119)		0.032	0.004
91	22.75	0.20	0.036	(	0.118)		0.032	0.004
92	23.00	0.20	0.036	(	0.117)		0.032	0.004
93	23.25	0.20	0.036	(	0.116)		0.032	0.004
94	23.50	0.20	0.036	(	0.115)		0.032	0.004
95	23.75	0.20	0.036	(	0.115)		0.032	0.004
96	24.00	0.20	0.036	(	0.114)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.3

Flood volume = Effective rainfall 1.57(In)
times area 180.1(Ac.)/[(In)/(Ft.)] = 23.5(Ac.Ft)
Total soil loss = 2.93(In)
Total soil loss = 43.999(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1024294.3 Cubic Feet

```
Total soil loss =     1916604.3 Cubic Feet
-----------------------------------------------------------------------
 Peak flow rate of this hydrograph =     72.297(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       20.0      40.0      60.0      80.0
-----------------------------------------------------------------------
  0+15       0.0042      0.20  Q         |         |         |         |
  0+30       0.0178      0.66  Q         |         |         |         |
  0+45       0.0367      0.91  Q         |         |         |         |
  1+ 0       0.0587      1.07  Q         |         |         |         |
  1+15       0.0826      1.15  Q         |         |         |         |
  1+30       0.1036      1.02  Q         |         |         |         |
  1+45       0.1240      0.99  Q         |         |         |         |
  2+ 0       0.1464      1.08  Q         |         |         |         |
  2+15       0.1724      1.26  Q         |         |         |         |
  2+30       0.1992      1.30  Q         |         |         |         |
  2+45       0.2283      1.41  Q         |         |         |         |
  3+ 0       0.2610      1.59  Q         |         |         |         |
  3+15       0.2946      1.62  Q         |         |         |         |
  3+30       0.3283      1.63  Q         |         |         |         |
  3+45       0.3620      1.63  Q         |         |         |         |
  4+ 0       0.3979      1.74  Q         |         |         |         |
  4+15       0.4374      1.91  Q         |         |         |         |
  4+30       0.4798      2.05  VQ        |         |         |         |
  4+45       0.5260      2.24  VQ        |         |         |         |
  5+ 0       0.5752      2.38  VQ        |         |         |         |
  5+15       0.6239      2.36  |Q        |         |         |         |
  5+30       0.6683      2.15  |Q        |         |         |         |
  5+45       0.7171      2.36  |Q        |         |         |         |
  6+ 0       0.7700      2.56  |Q        |         |         |         |
  6+15       0.8258      2.70  |Q        |         |         |         |
  6+30       0.8855      2.89  |Q        |         |         |         |
  6+45       0.9482      3.03  |Q        |         |         |         |
  7+ 0       1.0147      3.22  |Q        |         |         |         |
  7+15       1.0820      3.26  |Q        |         |         |         |
  7+30       1.1515      3.37  |Q        |         |         |         |
  7+45       1.2269      3.65  |QV       |         |         |         |
  8+ 0       1.3088      3.96  |QV       |         |         |         |
  8+15       1.3995      4.39  | Q       |         |         |         |
  8+30       1.4985      4.79  | Q       |         |         |         |
  8+45       1.6014      4.98  | Q       |         |         |         |
  9+ 0       1.7317      6.31  | VQ      |         |         |         |
  9+15       1.9499     10.56  |  V Q    |         |         |         |
  9+30       2.2826     16.11  |  V    Q |         |         |         |
  9+45       2.7035     20.37  |   V     Q         |         |         |
 10+ 0       3.2068     24.36  |    V    | Q       |         |         |
 10+15       3.6234     20.16  |     V   Q         |         |         |
 10+30       3.8070      8.89  |   Q V   |         |         |         |
 10+45       4.0558     12.04  |     Q   |         |         |         |
 11+ 0       4.4901     21.02  |      V  Q         |         |         |
 11+15       4.9516     22.33  |       V |Q        |         |         |
 11+30       5.3967     21.55  |        VQ         |         |         |
 11+45       5.8073     19.87  |        Q|         |         |         |
 12+ 0       6.1765     17.87  |       Q V         |         |         |
 12+15       6.7252     26.56  |          V Q      |         |         |
 12+30       7.5678     40.78  |          | V       Q         |         |
 12+45       8.5563     47.84  |          |   V     |  Q      |         |
 13+ 0       9.6699     53.90  |          |     V   |     Q   |         |
 13+15      10.9578     62.33  |          |       V |         |Q        |
 13+30      12.4515     72.30  |          |         V         |     Q   |
 13+45      13.7674     63.69  |          |         |  V      |Q        |
 14+ 0      14.7004     45.16  |          |         | Q  V    |         |
 14+15      15.6450     45.72  |          |         | Q   V   |         |
 14+30      16.7088     51.49  |          |         |    Q  V |         |
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  14+45      17.7721     51.47  |         |         |    Q    V         |
  15+ 0      18.8234     50.88  |         |         |    Q      V       |
  15+15      19.8282     48.63  |         |         |   Q     |  V      |
  15+30      20.7773     45.94  |         |         | Q       |    V    |
  15+45      21.6065     40.14  |         |         Q         |     V   |
  16+ 0      22.2895     33.06  |         |     Q   |         |      V  |
  16+15      22.7522     22.40  |         |Q        |         |       V |
  16+30      22.8726      5.83  | Q       |         |         |       V |
  16+45      22.9167      2.13  |Q        |         |         |       V |
  17+ 0      22.9430      1.27  Q         |         |         |        V|
  17+15      22.9676      1.19  Q         |         |         |        V|
  17+30      22.9995      1.54  Q         |         |         |        V|
  17+45      23.0328      1.61  Q         |         |         |        V|
  18+ 0      23.0643      1.53  Q         |         |         |        V|
  18+15      23.0923      1.36  Q         |         |         |        V|
  18+30      23.1195      1.32  Q         |         |         |        V|
  18+45      23.1445      1.21  Q         |         |         |        V|
  19+ 0      23.1637      0.93  Q         |         |         |        V|
  19+15      23.1805      0.81  Q         |         |         |        V|
  19+30      23.2021      1.05  Q         |         |         |        V|
  19+45      23.2258      1.15  Q         |         |         |        V|
  20+ 0      23.2447      0.91  Q         |         |         |        V|
  20+15      23.2615      0.81  Q         |         |         |        V|
  20+30      23.2810      0.94  Q         |         |         |        V|
  20+45      23.3011      0.97  Q         |         |         |        V|
  21+ 0      23.3192      0.88  Q         |         |         |        V|
  21+15      23.3358      0.80  Q         |         |         |        V|
  21+30      23.3532      0.84  Q         |         |         |        V|
  21+45      23.3696      0.80  Q         |         |         |        V|
  22+ 0      23.3869      0.84  Q         |         |         |        V|
  22+15      23.4034      0.80  Q         |         |         |        V|
  22+30      23.4207      0.84  Q         |         |         |        V|
  22+45      23.4350      0.69  Q         |         |         |        V|
  23+ 0      23.4487      0.66  Q         |         |         |        V|
  23+15      23.4622      0.66  Q         |         |         |        V|
  23+30      23.4757      0.65  Q         |         |         |        V|
  23+45      23.4892      0.65  Q         |         |         |        V|
  24+ 0      23.5027      0.65  Q         |         |         |        V|
  24+15      23.5120      0.45  Q         |         |         |        V|
  24+30      23.5140      0.10  Q         |         |         |        V|
  24+45      23.5145      0.02  Q         |         |         |        V|
  25+ 0      23.5146      0.01  Q         |         |         |        V|
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/25/12 File: SubC2224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C22
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      17.90(Ac.)  =      0.028 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      17.90(Ac.)  =      0.028 Sq. Mi.
Length along longest watercourse =    1550.00(Ft.)
Length along longest watercourse measured to centroid =     940.00(Ft.)
Length along longest watercourse =      0.294 Mi.
Length along longest watercourse measured to centroid =      0.178 Mi.
Difference in elevation =      51.00(Ft.)
Slope along watercourse =    173.7290 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.088 Hr.
Lag time =     5.28 Min.
25% of lag time =     1.32 Min.
40% of lag time =     2.11 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.90           1.80                 32.22

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.90           4.50                 80.55

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    15.400           66.00         0.000
     2.500           83.00         0.000
```

Total Area Entered = 17.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.860	0.349
83.0	83.0	0.210	0.000	0.210	0.140	0.029
					Sum (F) =	0.378

Area averaged mean soil loss (F) (In/Hr) = 0.378
Minimum soil loss rate ((In/Hr)) = 0.189
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	283.969	55.732	10.054
2	0.500	567.937	41.728	7.528
3	0.750	851.906	2.539	0.458
		Sum =	100.000	Sum= 18.040

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.667)	0.032	0.004
2	0.50	0.30	0.054	(0.660)	0.049	0.005
3	0.75	0.30	0.054	(0.652)	0.049	0.005
4	1.00	0.40	0.072	(0.644)	0.065	0.007
5	1.25	0.30	0.054	(0.637)	0.049	0.005
6	1.50	0.30	0.054	(0.629)	0.049	0.005
7	1.75	0.30	0.054	(0.622)	0.049	0.005
8	2.00	0.40	0.072	(0.614)	0.065	0.007
9	2.25	0.40	0.072	(0.607)	0.065	0.007
10	2.50	0.40	0.072	(0.599)	0.065	0.007
11	2.75	0.50	0.090	(0.592)	0.081	0.009
12	3.00	0.50	0.090	(0.585)	0.081	0.009
13	3.25	0.50	0.090	(0.577)	0.081	0.009
14	3.50	0.50	0.090	(0.570)	0.081	0.009
15	3.75	0.50	0.090	(0.563)	0.081	0.009
16	4.00	0.60	0.108	(0.556)	0.097	0.011
17	4.25	0.60	0.108	(0.549)	0.097	0.011
18	4.50	0.70	0.126	(0.542)	0.113	0.013
19	4.75	0.70	0.126	(0.535)	0.113	0.013
20	5.00	0.80	0.144	(0.528)	0.130	0.014
21	5.25	0.60	0.108	(0.521)	0.097	0.011
22	5.50	0.70	0.126	(0.515)	0.113	0.013
23	5.75	0.80	0.144	(0.508)	0.130	0.014
24	6.00	0.80	0.144	(0.501)	0.130	0.014
25	6.25	0.90	0.162	(0.494)	0.146	0.016
26	6.50	0.90	0.162	(0.488)	0.146	0.016
27	6.75	1.00	0.180	(0.481)	0.162	0.018
28	7.00	1.00	0.180	(0.475)	0.162	0.018
29	7.25	1.00	0.180	(0.468)	0.162	0.018
30	7.50	1.10	0.198	(0.462)	0.178	0.020
31	7.75	1.20	0.216	(0.456)	0.194	0.022
32	8.00	1.30	0.234	(0.449)	0.211	0.023
33	8.25	1.50	0.270	(0.443)	0.243	0.027
34	8.50	1.50	0.270	(0.437)	0.243	0.027
35	8.75	1.60	0.288	(0.431)	0.259	0.029
36	9.00	1.70	0.306	(0.425)	0.275	0.031
37	9.25	1.90	0.342	(0.419)	0.308	0.034

38	9.50	2.00	0.360	(	0.413)	0.324	0.036
39	9.75	2.10	0.378	(	0.407)	0.340	0.038
40	10.00	2.20	0.396	(	0.401)	0.356	0.040
41	10.25	1.50	0.270	(	0.395)	0.243	0.027
42	10.50	1.50	0.270	(	0.389)	0.243	0.027
43	10.75	2.00	0.360	(	0.384)	0.324	0.036
44	11.00	2.00	0.360	(	0.378)	0.324	0.036
45	11.25	1.90	0.342	(	0.373)	0.308	0.034
46	11.50	1.90	0.342	(	0.367)	0.308	0.034
47	11.75	1.70	0.306	(	0.362)	0.275	0.031
48	12.00	1.80	0.324	(	0.356)	0.292	0.032
49	12.25	2.50	0.450		0.351	(0.405)	0.099
50	12.50	2.60	0.468		0.346	(0.421)	0.122
51	12.75	2.80	0.504		0.341	(0.454)	0.163
52	13.00	2.90	0.522		0.335	(0.470)	0.187
53	13.25	3.40	0.612		0.330	(0.551)	0.282
54	13.50	3.40	0.612		0.325	(0.551)	0.287
55	13.75	2.30	0.414		0.320	(0.373)	0.094
56	14.00	2.30	0.414		0.316	(0.373)	0.098
57	14.25	2.70	0.486		0.311	(0.437)	0.175
58	14.50	2.60	0.468		0.306	(0.421)	0.162
59	14.75	2.60	0.468		0.301	(0.421)	0.167
60	15.00	2.50	0.450		0.297	(0.405)	0.153
61	15.25	2.40	0.432		0.292	(0.389)	0.140
62	15.50	2.30	0.414		0.288	(0.373)	0.126
63	15.75	1.90	0.342		0.283	(0.308)	0.059
64	16.00	1.90	0.342		0.279	(0.308)	0.063
65	16.25	0.40	0.072	(	0.275)	0.065	0.007
66	16.50	0.40	0.072	(	0.271)	0.065	0.007
67	16.75	0.30	0.054	(	0.266)	0.049	0.005
68	17.00	0.30	0.054	(	0.262)	0.049	0.005
69	17.25	0.50	0.090	(	0.258)	0.081	0.009
70	17.50	0.50	0.090	(	0.255)	0.081	0.009
71	17.75	0.50	0.090	(	0.251)	0.081	0.009
72	18.00	0.40	0.072	(	0.247)	0.065	0.007
73	18.25	0.40	0.072	(	0.243)	0.065	0.007
74	18.50	0.40	0.072	(	0.240)	0.065	0.007
75	18.75	0.30	0.054	(	0.236)	0.049	0.005
76	19.00	0.20	0.036	(	0.233)	0.032	0.004
77	19.25	0.30	0.054	(	0.230)	0.049	0.005
78	19.50	0.40	0.072	(	0.227)	0.065	0.007
79	19.75	0.30	0.054	(	0.223)	0.049	0.005
80	20.00	0.20	0.036	(	0.220)	0.032	0.004
81	20.25	0.30	0.054	(	0.218)	0.049	0.005
82	20.50	0.30	0.054	(	0.215)	0.049	0.005
83	20.75	0.30	0.054	(	0.212)	0.049	0.005
84	21.00	0.20	0.036	(	0.209)	0.032	0.004
85	21.25	0.30	0.054	(	0.207)	0.049	0.005
86	21.50	0.20	0.036	(	0.205)	0.032	0.004
87	21.75	0.30	0.054	(	0.202)	0.049	0.005
88	22.00	0.20	0.036	(	0.200)	0.032	0.004
89	22.25	0.30	0.054	(	0.198)	0.049	0.005
90	22.50	0.20	0.036	(	0.196)	0.032	0.004
91	22.75	0.20	0.036	(	0.195)	0.032	0.004
92	23.00	0.20	0.036	(	0.193)	0.032	0.004
93	23.25	0.20	0.036	(	0.192)	0.032	0.004
94	23.50	0.20	0.036	(	0.191)	0.032	0.004
95	23.75	0.20	0.036	(	0.190)	0.032	0.004
96	24.00	0.20	0.036	(	0.189)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.4

Flood volume = Effective rainfall 0.86(In)
times area 17.9(Ac.)/[(In)/(Ft.)] = 1.3(Ac.Ft)
Total soil loss = 3.64(In)
Total soil loss = 5.431(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 55829.7 Cubic Feet
Total soil loss = 236556.6 Cubic Feet

Peak flow rate of this hydrograph = 5.090(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0007	0.04	Q	|	|	|	|
0+30	0.0024	0.08	Q	|	|	|	|
0+45	0.0044	0.10	Q	|	|	|	|
1+ 0	0.0068	0.12	Q	|	|	|	|
1+15	0.0091	0.11	Q	|	|	|	|
1+30	0.0111	0.10	Q	|	|	|	|
1+45	0.0132	0.10	Q	|	|	|	|
2+ 0	0.0155	0.12	Q	|	|	|	|
2+15	0.0182	0.13	Q	|	|	|	|
2+30	0.0209	0.13	Q	|	|	|	|
2+45	0.0240	0.15	Q	|	|	|	|
3+ 0	0.0273	0.16	Q	|	|	|	|
3+15	0.0306	0.16	Q	|	|	|	|
3+30	0.0340	0.16	QV	|	|	|	|
3+45	0.0374	0.16	QV	|	|	|	|
4+ 0	0.0411	0.18	QV	|	|	|	|
4+15	0.0451	0.19	QV	|	|	|	|
4+30	0.0495	0.21	QV	|	|	|	|
4+45	0.0542	0.23	QV	|	|	|	|
5+ 0	0.0593	0.25	QV	|	|	|	|
5+15	0.0639	0.22	QV	|	|	|	|
5+30	0.0683	0.21	Q V	|	|	|	|
5+45	0.0734	0.24	Q V	|	|	|	|
6+ 0	0.0787	0.26	|QV	|	|	|	|
6+15	0.0844	0.28	|QV	|	|	|	|
6+30	0.0905	0.29	|QV	|	|	|	|
6+45	0.0969	0.31	|Q V	|	|	|	|
7+ 0	0.1036	0.32	|Q V	|	|	|	|
7+15	0.1103	0.32	|Q V	|	|	|	|
7+30	0.1174	0.34	|Q V	|	|	|	|
7+45	0.1251	0.37	|Q V	|	|	|	|
8+ 0	0.1335	0.41	|Q V	|	|	|	|
8+15	0.1430	0.46	|Q V	|	|	|	|
8+30	0.1530	0.49	|Q V	|	|	|	|
8+45	0.1635	0.51	| Q V	|	|	|	|
9+ 0	0.1746	0.54	| Q V	|	|	|	|
9+15	0.1867	0.59	| Q V	|	|	|	|
9+30	0.1998	0.63	| Q V	|	|	|	|
9+45	0.2136	0.67	| Q V	|	|	|	|
10+ 0	0.2280	0.70	| Q V	|	|	|	|
10+15	0.2402	0.59	| Q V	|	|	|	|
10+30	0.2504	0.49	|Q V	|	|	|	|
10+45	0.2623	0.58	| Q V	|	|	|	|
11+ 0	0.2756	0.65	| Q V	|	|	|	|
11+15	0.2887	0.63	| Q V|	|	|	|	|
11+30	0.3015	0.62	| Q V|	|	|	|	|
11+45	0.3135	0.58	| Q V|	|	|	|	|
12+ 0	0.3253	0.57	| Q V	|	|	|	|
12+15	0.3512	1.25	| Q V	|	|	|	|
12+30	0.3923	1.99	| Q | V	|	|	|	|
12+45	0.4462	2.61	| Q V	|	|	|	|
13+ 0	0.5116	3.16	| | Q V	|	|	|	|
13+15	0.6007	4.31	| | QV |	|	|	|	|
13+30	0.7059	5.09	| | Q V	|	|	|	|
13+45	0.7726	3.23	| | Q	| V	|	|	|
14+ 0	0.8103	1.83	| Q |	| V	|	|	|
14+15	0.8630	2.55	| Q	| V	|	|	|
14+30	0.9248	2.99	| |Q	| V |	|	|	|
14+45	0.9864	2.98	| |Q	| V	|	|	|
15+ 0	1.0457	2.87	| |Q	| V	|	|	|
15+15	1.1002	2.64	| Q	| V	|	|	|
15+30	1.1497	2.39	| Q|	| V	|	|	|

```
  15+45       1.1828      1.61  |     Q   |         |         |     V   |
  16+ 0       1.2063      1.13  |   Q     |         |         |      V  |
  16+15       1.2181      0.57  | Q       |         |         |       V |
  16+30       1.2213      0.16  Q         |         |         |       V |
  16+45       1.2237      0.11  Q         |         |         |       V |
  17+ 0       1.2257      0.10  Q         |         |         |       V |
  17+15       1.2285      0.13  Q         |         |         |       V |
  17+30       1.2318      0.16  Q         |         |         |       V |
  17+45       1.2351      0.16  Q         |         |         |       V |
  18+ 0       1.2381      0.14  Q         |         |         |       V |
  18+15       1.2408      0.13  Q         |         |         |       V |
  18+30       1.2435      0.13  Q         |         |         |       V |
  18+45       1.2458      0.11  Q         |         |         |       V |
  19+ 0       1.2475      0.08  Q         |         |         |       V |
  19+15       1.2492      0.08  Q         |         |         |       V |
  19+30       1.2516      0.11  Q         |         |         |        V|
  19+45       1.2539      0.11  Q         |         |         |        V|
  20+ 0       1.2555      0.08  Q         |         |         |        V|
  20+15       1.2573      0.08  Q         |         |         |        V|
  20+30       1.2593      0.10  Q         |         |         |        V|
  20+45       1.2613      0.10  Q         |         |         |        V|
  21+ 0       1.2629      0.08  Q         |         |         |        V|
  21+15       1.2646      0.08  Q         |         |         |        V|
  21+30       1.2663      0.08  Q         |         |         |        V|
  21+45       1.2680      0.08  Q         |         |         |        V|
  22+ 0       1.2696      0.08  Q         |         |         |        V|
  22+15       1.2714      0.08  Q         |         |         |        V|
  22+30       1.2730      0.08  Q         |         |         |        V|
  22+45       1.2743      0.07  Q         |         |         |        V|
  23+ 0       1.2757      0.06  Q         |         |         |        V|
  23+15       1.2770      0.06  Q         |         |         |        V|
  23+30       1.2784      0.06  Q         |         |         |        V|
  23+45       1.2797      0.06  Q         |         |         |        V|
  24+ 0       1.2810      0.06  Q         |         |         |        V|
  24+15       1.2816      0.03  Q         |         |         |        V|
  24+30       1.2817      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/25/12 File: SubC324100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Conditoin
Subarea C3
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      52.00(Ac.)  =      0.081 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      52.00(Ac.)  =      0.081 Sq. Mi.
Length along longest watercourse =     700.00(Ft.)
Length along longest watercourse measured to centroid =     600.00(Ft.)
Length along longest watercourse =      0.133 Mi.
Length along longest watercourse measured to centroid =      0.114 Mi.
Difference in elevation =      22.00(Ft.)
Slope along watercourse =    165.9429 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.055 Hr.
Lag time =     3.32 Min.
25% of lag time =     0.83 Min.
40% of lag time =     1.33 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       52.00           1.80                 93.60

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       52.00           4.50                234.00

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    52.000           66.00         0.000
 Total Area Entered =     52.00(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	1.000	0.405
					Sum (F) =	0.405

Area averaged mean soil loss (F) (In/Hr) = 0.405
Minimum soil loss rate ((In/Hr)) = 0.203
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	451.613	70.820	37.114
2	0.500	903.227	29.180	15.292
		Sum = 100.000	Sum=	52.406

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.716)	0.032	0.004
2	0.50	0.30	0.054	(0.707)	0.049	0.005
3	0.75	0.30	0.054	(0.699)	0.049	0.005
4	1.00	0.40	0.072	(0.691)	0.065	0.007
5	1.25	0.30	0.054	(0.683)	0.049	0.005
6	1.50	0.30	0.054	(0.675)	0.049	0.005
7	1.75	0.30	0.054	(0.666)	0.049	0.005
8	2.00	0.40	0.072	(0.658)	0.065	0.007
9	2.25	0.40	0.072	(0.650)	0.065	0.007
10	2.50	0.40	0.072	(0.643)	0.065	0.007
11	2.75	0.50	0.090	(0.635)	0.081	0.009
12	3.00	0.50	0.090	(0.627)	0.081	0.009
13	3.25	0.50	0.090	(0.619)	0.081	0.009
14	3.50	0.50	0.090	(0.611)	0.081	0.009
15	3.75	0.50	0.090	(0.604)	0.081	0.009
16	4.00	0.60	0.108	(0.596)	0.097	0.011
17	4.25	0.60	0.108	(0.589)	0.097	0.011
18	4.50	0.70	0.126	(0.581)	0.113	0.013
19	4.75	0.70	0.126	(0.574)	0.113	0.013
20	5.00	0.80	0.144	(0.566)	0.130	0.014
21	5.25	0.60	0.108	(0.559)	0.097	0.011
22	5.50	0.70	0.126	(0.552)	0.113	0.013
23	5.75	0.80	0.144	(0.544)	0.130	0.014
24	6.00	0.80	0.144	(0.537)	0.130	0.014
25	6.25	0.90	0.162	(0.530)	0.146	0.016
26	6.50	0.90	0.162	(0.523)	0.146	0.016
27	6.75	1.00	0.180	(0.516)	0.162	0.018
28	7.00	1.00	0.180	(0.509)	0.162	0.018
29	7.25	1.00	0.180	(0.502)	0.162	0.018
30	7.50	1.10	0.198	(0.495)	0.178	0.020
31	7.75	1.20	0.216	(0.489)	0.194	0.022
32	8.00	1.30	0.234	(0.482)	0.211	0.023
33	8.25	1.50	0.270	(0.475)	0.243	0.027
34	8.50	1.50	0.270	(0.468)	0.243	0.027
35	8.75	1.60	0.288	(0.462)	0.259	0.029
36	9.00	1.70	0.306	(0.455)	0.275	0.031
37	9.25	1.90	0.342	(0.449)	0.308	0.034
38	9.50	2.00	0.360	(0.443)	0.324	0.036
39	9.75	2.10	0.378	(0.436)	0.340	0.038
40	10.00	2.20	0.396	(0.430)	0.356	0.040

41	10.25	1.50	0.270	(	0.424)	0.243	0.027
42	10.50	1.50	0.270	(	0.418)	0.243	0.027
43	10.75	2.00	0.360	(	0.412)	0.324	0.036
44	11.00	2.00	0.360	(	0.406)	0.324	0.036
45	11.25	1.90	0.342	(	0.400)	0.308	0.034
46	11.50	1.90	0.342	(	0.394)	0.308	0.034
47	11.75	1.70	0.306	(	0.388)	0.275	0.031
48	12.00	1.80	0.324	(	0.382)	0.292	0.032
49	12.25	2.50	0.450		0.376	(0.405)	0.074
50	12.50	2.60	0.468		0.371	(0.421)	0.097
51	12.75	2.80	0.504		0.365	(0.454)	0.139
52	13.00	2.90	0.522		0.360	(0.470)	0.162
53	13.25	3.40	0.612		0.354	(0.551)	0.258
54	13.50	3.40	0.612		0.349	(0.551)	0.263
55	13.75	2.30	0.414		0.344	(0.373)	0.070
56	14.00	2.30	0.414		0.338	(0.373)	0.076
57	14.25	2.70	0.486		0.333	(0.437)	0.153
58	14.50	2.60	0.468		0.328	(0.421)	0.140
59	14.75	2.60	0.468		0.323	(0.421)	0.145
60	15.00	2.50	0.450		0.318	(0.405)	0.132
61	15.25	2.40	0.432		0.313	(0.389)	0.119
62	15.50	2.30	0.414		0.308	(0.373)	0.106
63	15.75	1.90	0.342		0.304	(0.308)	0.038
64	16.00	1.90	0.342		0.299	(0.308)	0.043
65	16.25	0.40	0.072	(	0.295)	0.065	0.007
66	16.50	0.40	0.072	(	0.290)	0.065	0.007
67	16.75	0.30	0.054	(	0.286)	0.049	0.005
68	17.00	0.30	0.054	(	0.281)	0.049	0.005
69	17.25	0.50	0.090	(	0.277)	0.081	0.009
70	17.50	0.50	0.090	(	0.273)	0.081	0.009
71	17.75	0.50	0.090	(	0.269)	0.081	0.009
72	18.00	0.40	0.072	(	0.265)	0.065	0.007
73	18.25	0.40	0.072	(	0.261)	0.065	0.007
74	18.50	0.40	0.072	(	0.257)	0.065	0.007
75	18.75	0.30	0.054	(	0.253)	0.049	0.005
76	19.00	0.20	0.036	(	0.250)	0.032	0.004
77	19.25	0.30	0.054	(	0.246)	0.049	0.005
78	19.50	0.40	0.072	(	0.243)	0.065	0.007
79	19.75	0.30	0.054	(	0.240)	0.049	0.005
80	20.00	0.20	0.036	(	0.236)	0.032	0.004
81	20.25	0.30	0.054	(	0.233)	0.049	0.005
82	20.50	0.30	0.054	(	0.230)	0.049	0.005
83	20.75	0.30	0.054	(	0.227)	0.049	0.005
84	21.00	0.20	0.036	(	0.225)	0.032	0.004
85	21.25	0.30	0.054	(	0.222)	0.049	0.005
86	21.50	0.20	0.036	(	0.219)	0.032	0.004
87	21.75	0.30	0.054	(	0.217)	0.049	0.005
88	22.00	0.20	0.036	(	0.215)	0.032	0.004
89	22.25	0.30	0.054	(	0.213)	0.049	0.005
90	22.50	0.20	0.036	(	0.211)	0.032	0.004
91	22.75	0.20	0.036	(	0.209)	0.032	0.004
92	23.00	0.20	0.036	(	0.207)	0.032	0.004
93	23.25	0.20	0.036	(	0.206)	0.032	0.004
94	23.50	0.20	0.036	(	0.204)	0.032	0.004
95	23.75	0.20	0.036	(	0.203)	0.032	0.004
96	24.00	0.20	0.036	(	0.203)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.1

Flood volume = Effective rainfall 0.77(In)
times area 52.0(Ac.)/[(In)/(Ft.)] = 3.3(Ac.Ft)
Total soil loss = 3.73(In)
Total soil loss = 16.168(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 145049.6 Cubic Feet
Total soil loss = 704284.1 Cubic Feet

Peak flow rate of this hydrograph = 13.713(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+15	0.0028	0.13	Q
0+30	0.0080	0.26	Q
0+45	0.0139	0.28	Q
1+ 0	0.0211	0.35	Q
1+15	0.0275	0.31	Q
1+30	0.0334	0.28	Q
1+45	0.0392	0.28	Q
2+ 0	0.0465	0.35	Q
2+15	0.0543	0.38	Q
2+30	0.0621	0.38	Q
2+45	0.0712	0.44	Q
3+ 0	0.0810	0.47	Q
3+15	0.0907	0.47	QV
3+30	0.1005	0.47	QV
3+45	0.1102	0.47	QV
4+ 0	0.1214	0.54	|Q
4+15	0.1331	0.57	|Q
4+30	0.1462	0.63	|Q
4+45	0.1598	0.66	|Q
5+ 0	0.1748	0.73	|QV
5+15	0.1877	0.62	|QV
5+30	0.2007	0.63	|QV
5+45	0.2158	0.73	|QV
6+ 0	0.2314	0.75	|QV
6+15	0.2484	0.82	|QV
6+30	0.2659	0.85	|Q V
6+45	0.2848	0.92	|Q V
7+ 0	0.3043	0.94	|Q V
7+15	0.3238	0.94	|Q V
7+30	0.3447	1.01	| Q V
7+45	0.3675	1.10	| Q V
8+ 0	0.3923	1.20	| Q V
8+15	0.4204	1.36	| Q V
8+30	0.4497	1.42	| Q V
8+45	0.4803	1.48	| Q V
9+ 0	0.5129	1.58	| Q V
9+15	0.5488	1.74	| Q V
9+30	0.5872	1.86	| Q V
9+45	0.6276	1.95	| Q V
10+ 0	0.6699	2.05	| Q V
10+15	0.7031	1.61	| Q V
10+30	0.7324	1.42	| Q V
10+45	0.7685	1.75	| Q V|
11+ 0	0.8075	1.89	| Q V|
11+15	0.8452	1.82	| Q V
11+30	0.8822	1.79	| Q V
11+45	0.9165	1.66	| Q V
12+ 0	0.9510	1.67	| Q |V
12+15	1.0177	3.23	| Q | V
12+30	1.1156	4.74	| Q| V
12+45	1.2528	6.64	| | Q V
13+ 0	1.4212	8.15	| | QV
13+15	1.6703	12.05	| | V Q
13+30	1.9536	13.71	| | V Q
13+45	2.0908	6.64	| | Q | V
14+ 0	2.1711	3.89	| Q | V
14+15	2.3122	6.83	| | Q | V
14+30	2.4679	7.53	| | Q | V|
14+45	2.6233	7.52	| | Q | V
15+ 0	2.7702	7.11	| | Q | V
15+15	2.9030	6.43	| | Q | V
15+30	3.0215	5.73	| |Q | V
15+45	3.0842	3.03	| Q | | V
16+ 0	3.1291	2.18	| Q | | V
16+15	3.1482	0.92	|Q | | V

```
   16+30       3.1560      0.38  Q         |         |         |      V  |
   16+45       3.1624      0.31  Q         |         |         |      V  |
   17+ 0       3.1683      0.28  Q         |         |         |       V |
   17+15       3.1769      0.42  Q         |         |         |       V |
   17+30       3.1866      0.47  Q         |         |         |       V |
   17+45       3.1964      0.47  Q         |         |         |       V |
   18+ 0       3.2048      0.41  Q         |         |         |       V |
   18+15       3.2126      0.38  Q         |         |         |       V |
   18+30       3.2204      0.38  Q         |         |         |       V |
   18+45       3.2268      0.31  Q         |         |         |       V |
   19+ 0       3.2313      0.22  Q         |         |         |       V |
   19+15       3.2365      0.26  Q         |         |         |       V |
   19+30       3.2438      0.35  Q         |         |         |       V |
   19+45       3.2502      0.31  Q         |         |         |        V|
   20+ 0       3.2547      0.22  Q         |         |         |        V|
   20+15       3.2599      0.26  Q         |         |         |        V|
   20+30       3.2658      0.28  Q         |         |         |        V|
   20+45       3.2716      0.28  Q         |         |         |        V|
   21+ 0       3.2761      0.22  Q         |         |         |        V|
   21+15       3.2814      0.26  Q         |         |         |        V|
   21+30       3.2858      0.22  Q         |         |         |        V|
   21+45       3.2911      0.26  Q         |         |         |        V|
   22+ 0       3.2956      0.22  Q         |         |         |        V|
   22+15       3.3009      0.26  Q         |         |         |        V|
   22+30       3.3053      0.22  Q         |         |         |        V|
   22+45       3.3092      0.19  Q         |         |         |        V|
   23+ 0       3.3131      0.19  Q         |         |         |        V|
   23+15       3.3170      0.19  Q         |         |         |        V|
   23+30       3.3209      0.19  Q         |         |         |        V|
   23+45       3.3248      0.19  Q         |         |         |        V|
   24+ 0       3.3287      0.19  Q         |         |         |        V|
   24+15       3.3299      0.06  Q         |         |         |         V
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/25/12 File: SubC424100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C4
100-year, 24 hour

--------------------------------------------------------------------
Drainage Area =       6.60(Ac.)  =      0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       6.60(Ac.)  =      0.010 Sq. Mi.
Length along longest watercourse =    1050.00(Ft.)
Length along longest watercourse measured to centroid =     540.00(Ft.)
Length along longest watercourse =      0.199 Mi.
Length along longest watercourse measured to centroid =      0.102 Mi.
Difference in elevation =      20.00(Ft.)
Slope along watercourse =    100.5714 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.068 Hr.
Lag time =     4.09 Min.
25% of lag time =     1.02 Min.
40% of lag time =     1.64 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        6.60           1.80                 11.88

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        6.60           4.50                 29.70

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     5.200           85.00         0.000
     1.400           90.00         0.000
```

Total Area Entered = 6.60(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	0.788	0.147
90.0	90.0	0.130	0.000	0.130	0.212	0.028
					Sum (F) =	0.175

Area averaged mean soil loss (F) (In/Hr) = 0.175
Minimum soil loss rate ((In/Hr)) = 0.087
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	366.368	62.618	4.165
2 0.500	732.737	33.724	2.243
3 0.750	1099.105	3.658	0.243
		Sum = 100.000	Sum= 6.652

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.309)	0.032	0.004
2	0.50	0.30	0.054	(0.305)	0.049	0.005
3	0.75	0.30	0.054	(0.302)	0.049	0.005
4	1.00	0.40	0.072	(0.298)	0.065	0.007
5	1.25	0.30	0.054	(0.295)	0.049	0.005
6	1.50	0.30	0.054	(0.291)	0.049	0.005
7	1.75	0.30	0.054	(0.288)	0.049	0.005
8	2.00	0.40	0.072	(0.284)	0.065	0.007
9	2.25	0.40	0.072	(0.281)	0.065	0.007
10	2.50	0.40	0.072	(0.277)	0.065	0.007
11	2.75	0.50	0.090	(0.274)	0.081	0.009
12	3.00	0.50	0.090	(0.271)	0.081	0.009
13	3.25	0.50	0.090	(0.267)	0.081	0.009
14	3.50	0.50	0.090	(0.264)	0.081	0.009
15	3.75	0.50	0.090	(0.261)	0.081	0.009
16	4.00	0.60	0.108	(0.257)	0.097	0.011
17	4.25	0.60	0.108	(0.254)	0.097	0.011
18	4.50	0.70	0.126	(0.251)	0.113	0.013
19	4.75	0.70	0.126	(0.248)	0.113	0.013
20	5.00	0.80	0.144	(0.244)	0.130	0.014
21	5.25	0.60	0.108	(0.241)	0.097	0.011
22	5.50	0.70	0.126	(0.238)	0.113	0.013
23	5.75	0.80	0.144	(0.235)	0.130	0.014
24	6.00	0.80	0.144	(0.232)	0.130	0.014
25	6.25	0.90	0.162	(0.229)	0.146	0.016
26	6.50	0.90	0.162	(0.226)	0.146	0.016
27	6.75	1.00	0.180	(0.223)	0.162	0.018
28	7.00	1.00	0.180	(0.220)	0.162	0.018
29	7.25	1.00	0.180	(0.217)	0.162	0.018
30	7.50	1.10	0.198	(0.214)	0.178	0.020
31	7.75	1.20	0.216	(0.211)	0.194	0.022
32	8.00	1.30	0.234	0.208	(0.211)	0.026
33	8.25	1.50	0.270	0.205	(0.243)	0.065
34	8.50	1.50	0.270	0.202	(0.243)	0.068
35	8.75	1.60	0.288	0.199	(0.259)	0.089
36	9.00	1.70	0.306	0.197	(0.275)	0.109
37	9.25	1.90	0.342	0.194	(0.308)	0.148

38	9.50	2.00	0.360	0.191	(	0.324)	0.169
39	9.75	2.10	0.378	0.188	(	0.340)	0.190
40	10.00	2.20	0.396	0.186	(	0.356)	0.210
41	10.25	1.50	0.270	0.183	(	0.243)	0.087
42	10.50	1.50	0.270	0.180	(	0.243)	0.090
43	10.75	2.00	0.360	0.178	(	0.324)	0.182
44	11.00	2.00	0.360	0.175	(	0.324)	0.185
45	11.25	1.90	0.342	0.172	(	0.308)	0.170
46	11.50	1.90	0.342	0.170	(	0.308)	0.172
47	11.75	1.70	0.306	0.167	(	0.275)	0.139
48	12.00	1.80	0.324	0.165	(	0.292)	0.159
49	12.25	2.50	0.450	0.162	(	0.405)	0.288
50	12.50	2.60	0.468	0.160	(	0.421)	0.308
51	12.75	2.80	0.504	0.158	(	0.454)	0.346
52	13.00	2.90	0.522	0.155	(	0.470)	0.367
53	13.25	3.40	0.612	0.153	(	0.551)	0.459
54	13.50	3.40	0.612	0.151	(	0.551)	0.461
55	13.75	2.30	0.414	0.148	(	0.373)	0.266
56	14.00	2.30	0.414	0.146	(	0.373)	0.268
57	14.25	2.70	0.486	0.144	(	0.437)	0.342
58	14.50	2.60	0.468	0.142	(	0.421)	0.326
59	14.75	2.60	0.468	0.139	(	0.421)	0.329
60	15.00	2.50	0.450	0.137	(	0.405)	0.313
61	15.25	2.40	0.432	0.135	(	0.389)	0.297
62	15.50	2.30	0.414	0.133	(	0.373)	0.281
63	15.75	1.90	0.342	0.131	(	0.308)	0.211
64	16.00	1.90	0.342	0.129	(	0.308)	0.213
65	16.25	0.40	0.072	(0.127)		0.065	0.007
66	16.50	0.40	0.072	(0.125)		0.065	0.007
67	16.75	0.30	0.054	(0.123)		0.049	0.005
68	17.00	0.30	0.054	(0.121)		0.049	0.005
69	17.25	0.50	0.090	(0.120)		0.081	0.009
70	17.50	0.50	0.090	(0.118)		0.081	0.009
71	17.75	0.50	0.090	(0.116)		0.081	0.009
72	18.00	0.40	0.072	(0.114)		0.065	0.007
73	18.25	0.40	0.072	(0.113)		0.065	0.007
74	18.50	0.40	0.072	(0.111)		0.065	0.007
75	18.75	0.30	0.054	(0.109)		0.049	0.005
76	19.00	0.20	0.036	(0.108)		0.032	0.004
77	19.25	0.30	0.054	(0.106)		0.049	0.005
78	19.50	0.40	0.072	(0.105)		0.065	0.007
79	19.75	0.30	0.054	(0.103)		0.049	0.005
80	20.00	0.20	0.036	(0.102)		0.032	0.004
81	20.25	0.30	0.054	(0.101)		0.049	0.005
82	20.50	0.30	0.054	(0.099)		0.049	0.005
83	20.75	0.30	0.054	(0.098)		0.049	0.005
84	21.00	0.20	0.036	(0.097)		0.032	0.004
85	21.25	0.30	0.054	(0.096)		0.049	0.005
86	21.50	0.20	0.036	(0.095)		0.032	0.004
87	21.75	0.30	0.054	(0.094)		0.049	0.005
88	22.00	0.20	0.036	(0.093)		0.032	0.004
89	22.25	0.30	0.054	(0.092)		0.049	0.005
90	22.50	0.20	0.036	(0.091)		0.032	0.004
91	22.75	0.20	0.036	(0.090)		0.032	0.004
92	23.00	0.20	0.036	(0.089)		0.032	0.004
93	23.25	0.20	0.036	(0.089)		0.032	0.004
94	23.50	0.20	0.036	(0.088)		0.032	0.004
95	23.75	0.20	0.036	(0.088)		0.032	0.004
96	24.00	0.20	0.036	(0.088)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.8

Flood volume = Effective rainfall 1.96(In)
times area 6.6(Ac.)/[(In)/(Ft.)] = 1.1(Ac.Ft)
Total soil loss = 2.54(In)
Total soil loss = 1.396(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 47016.3 Cubic Feet
Total soil loss = 60793.3 Cubic Feet

Peak flow rate of this hydrograph = 3.042(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0003	0.02	Q				
0+30	0.0009	0.03	Q				
0+45	0.0017	0.04	Q				
1+ 0	0.0026	0.04	Q				
1+15	0.0034	0.04	Q				
1+30	0.0042	0.04	Q				
1+45	0.0049	0.04	Q				
2+ 0	0.0058	0.04	Q				
2+15	0.0068	0.05	Q				
2+30	0.0078	0.05	Q				
2+45	0.0089	0.06	Q				
3+ 0	0.0101	0.06	Q				
3+15	0.0114	0.06	Q				
3+30	0.0126	0.06	Q				
3+45	0.0138	0.06	Q				
4+ 0	0.0152	0.07	Q				
4+15	0.0167	0.07	Q				
4+30	0.0184	0.08	Q				
4+45	0.0201	0.08	Q				
5+ 0	0.0220	0.09	Q				
5+15	0.0236	0.08	Q				
5+30	0.0253	0.08	Q				
5+45	0.0272	0.09	QV				
6+ 0	0.0291	0.10	QV				
6+15	0.0313	0.10	QV				
6+30	0.0335	0.11	QV				
6+45	0.0359	0.12	QV				
7+ 0	0.0383	0.12	QV				
7+15	0.0408	0.12	QV				
7+30	0.0434	0.13	QV				
7+45	0.0463	0.14	QV				
8+ 0	0.0497	0.16	QV				
8+15	0.0566	0.33	|QV				
8+30	0.0655	0.43	|QV				
8+45	0.0766	0.54	| Q				
9+ 0	0.0905	0.67	| QV				
9+15	0.1088	0.88	| QV				
9+30	0.1308	1.06	| Q				
9+45	0.1557	1.21	| QV				
10+ 0	0.1834	1.34	| QV				
10+15	0.2016	0.88	| Q V				
10+30	0.2145	0.62	| Q V				
10+45	0.2348	0.98	| Q V				
11+ 0	0.2596	1.20	| Q V|				
11+15	0.2837	1.17	| Q V				
11+30	0.3073	1.14	| Q V				
11+45	0.3280	1.00	| Q | V				
12+ 0	0.3490	1.02	| Q | V				
12+15	0.3819	1.59	| Q | V				
12+30	0.4225	1.97	| Q | V				
12+45	0.4681	2.20	| Q | V				
13+ 0	0.5173	2.38	| Q| V|				
13+15	0.5755	2.82	| |Q V				
13+30	0.6384	3.04	| | Q | V				
13+45	0.6850	2.25	| Q| | V				
14+ 0	0.7227	1.83	| Q | | V |				
14+15	0.7659	2.09	| Q | | V |				
14+30	0.8112	2.19	| Q | | V				
14+45	0.8564	2.18	| Q | | V				
15+ 0	0.9002	2.12	| Q | | | V				
15+15	0.9419	2.02	| Q | | | V				
15+30	0.9814	1.91	| Q | | | V |				

```
   15+45       1.0141      1.58  |     Q   |         |         |      V  |
   16+ 0       1.0436      1.43  |    Q    |         |         |       V |
   16+15       1.0551      0.56  | Q       |         |         |        V|
   16+30       1.0572      0.10  Q         |         |         |        V|
   16+45       1.0580      0.04  Q         |         |         |        V|
   17+ 0       1.0587      0.04  Q         |         |         |        V|
   17+15       1.0598      0.05  Q         |         |         |        V|
   17+30       1.0610      0.06  Q         |         |         |        V|
   17+45       1.0623      0.06  Q         |         |         |        V|
   18+ 0       1.0633      0.05  Q         |         |         |        V|
   18+15       1.0643      0.05  Q         |         |         |        V|
   18+30       1.0653      0.05  Q         |         |         |        V|
   18+45       1.0662      0.04  Q         |         |         |        V|
   19+ 0       1.0668      0.03  Q         |         |         |        V|
   19+15       1.0674      0.03  Q         |         |         |        V|
   19+30       1.0683      0.04  Q         |         |         |        V|
   19+45       1.0691      0.04  Q         |         |         |        V|
   20+ 0       1.0697      0.03  Q         |         |         |        V|
   20+15       1.0704      0.03  Q         |         |         |        V|
   20+30       1.0711      0.04  Q         |         |         |        V|
   20+45       1.0719      0.04  Q         |         |         |        V|
   21+ 0       1.0725      0.03  Q         |         |         |        V|
   21+15       1.0731      0.03  Q         |         |         |        V|
   21+30       1.0737      0.03  Q         |         |         |        V|
   21+45       1.0743      0.03  Q         |         |         |        V|
   22+ 0       1.0749      0.03  Q         |         |         |        V|
   22+15       1.0756      0.03  Q         |         |         |        V|
   22+30       1.0762      0.03  Q         |         |         |        V|
   22+45       1.0767      0.02  Q         |         |         |        V|
   23+ 0       1.0772      0.02  Q         |         |         |        V|
   23+15       1.0777      0.02  Q         |         |         |        V|
   23+30       1.0782      0.02  Q         |         |         |        V|
   23+45       1.0786      0.02  Q         |         |         |        V|
   24+ 0       1.0791      0.02  Q         |         |         |        V|
   24+15       1.0793      0.01  Q         |         |         |        V|
   24+30       1.0793      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/25/12 File: SubC4124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C41
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      61.60(Ac.)  =      0.096 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      61.60(Ac.)  =      0.096 Sq. Mi.
Length along longest watercourse =    2300.00(Ft.)
Length along longest watercourse measured to centroid =    1340.00(Ft.)
Length along longest watercourse =      0.436 Mi.
Length along longest watercourse measured to centroid =      0.254 Mi.
Difference in elevation =     219.00(Ft.)
Slope along watercourse =    502.7478 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.096 Hr.
Lag time =     5.74 Min.
25% of lag time =     1.43 Min.
40% of lag time =     2.30 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       61.60           1.80                110.88

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       61.60           4.50                277.20

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.200           66.00         0.000
    11.300           77.00         0.000
```

```
    42.100          83.00         0.000
 Total Area Entered =     61.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       0.133      0.054
77.0  77.0      0.279     0.000        0.279       0.183      0.051
83.0  83.0      0.210     0.000        0.210       0.683      0.143
                                                  Sum (F) =   0.249
Area averaged mean soil loss (F) (In/Hr) =  0.249
Minimum soil loss rate ((In/Hr)) =  0.124
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        261.402         52.675             32.701
    2   0.500        522.805         43.927             27.270
    3   0.750        784.207          3.398              2.110
                                Sum = 100.000   Sum=      62.081
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.439)	0.032	0.004
2	0.50	0.30	0.054	(0.434)	0.049	0.005
3	0.75	0.30	0.054	(0.429)	0.049	0.005
4	1.00	0.40	0.072	(0.424)	0.065	0.007
5	1.25	0.30	0.054	(0.419)	0.049	0.005
6	1.50	0.30	0.054	(0.414)	0.049	0.005
7	1.75	0.30	0.054	(0.409)	0.049	0.005
8	2.00	0.40	0.072	(0.404)	0.065	0.007
9	2.25	0.40	0.072	(0.399)	0.065	0.007
10	2.50	0.40	0.072	(0.394)	0.065	0.007
11	2.75	0.50	0.090	(0.389)	0.081	0.009
12	3.00	0.50	0.090	(0.385)	0.081	0.009
13	3.25	0.50	0.090	(0.380)	0.081	0.009
14	3.50	0.50	0.090	(0.375)	0.081	0.009
15	3.75	0.50	0.090	(0.370)	0.081	0.009
16	4.00	0.60	0.108	(0.366)	0.097	0.011
17	4.25	0.60	0.108	(0.361)	0.097	0.011
18	4.50	0.70	0.126	(0.357)	0.113	0.013
19	4.75	0.70	0.126	(0.352)	0.113	0.013
20	5.00	0.80	0.144	(0.347)	0.130	0.014
21	5.25	0.60	0.108	(0.343)	0.097	0.011
22	5.50	0.70	0.126	(0.338)	0.113	0.013
23	5.75	0.80	0.144	(0.334)	0.130	0.014
24	6.00	0.80	0.144	(0.330)	0.130	0.014
25	6.25	0.90	0.162	(0.325)	0.146	0.016
26	6.50	0.90	0.162	(0.321)	0.146	0.016
27	6.75	1.00	0.180	(0.317)	0.162	0.018
28	7.00	1.00	0.180	(0.312)	0.162	0.018
29	7.25	1.00	0.180	(0.308)	0.162	0.018
30	7.50	1.10	0.198	(0.304)	0.178	0.020
31	7.75	1.20	0.216	(0.300)	0.194	0.022
32	8.00	1.30	0.234	(0.296)	0.211	0.023
33	8.25	1.50	0.270	(0.291)	0.243	0.027
34	8.50	1.50	0.270	(0.287)	0.243	0.027
35	8.75	1.60	0.288	(0.283)	0.259	0.029

36	9.00	1.70	0.306	(	0.279)	0.275	0.031
37	9.25	1.90	0.342		0.275	(0.308)	0.067
38	9.50	2.00	0.360		0.271	(0.324)	0.088
39	9.75	2.10	0.378		0.268	(0.340)	0.110
40	10.00	2.20	0.396		0.264	(0.356)	0.132
41	10.25	1.50	0.270	(	0.260)	0.243	0.027
42	10.50	1.50	0.270	(	0.256)	0.243	0.027
43	10.75	2.00	0.360		0.252	(0.324)	0.107
44	11.00	2.00	0.360		0.249	(0.324)	0.111
45	11.25	1.90	0.342		0.245	(0.308)	0.097
46	11.50	1.90	0.342		0.241	(0.308)	0.100
47	11.75	1.70	0.306		0.238	(0.275)	0.068
48	12.00	1.80	0.324		0.234	(0.292)	0.090
49	12.25	2.50	0.450		0.231	(0.405)	0.219
50	12.50	2.60	0.468		0.227	(0.421)	0.241
51	12.75	2.80	0.504		0.224	(0.454)	0.280
52	13.00	2.90	0.522		0.221	(0.470)	0.301
53	13.25	3.40	0.612		0.217	(0.551)	0.395
54	13.50	3.40	0.612		0.214	(0.551)	0.398
55	13.75	2.30	0.414		0.211	(0.373)	0.203
56	14.00	2.30	0.414		0.208	(0.373)	0.206
57	14.25	2.70	0.486		0.204	(0.437)	0.282
58	14.50	2.60	0.468		0.201	(0.421)	0.267
59	14.75	2.60	0.468		0.198	(0.421)	0.270
60	15.00	2.50	0.450		0.195	(0.405)	0.255
61	15.25	2.40	0.432		0.192	(0.389)	0.240
62	15.50	2.30	0.414		0.189	(0.373)	0.225
63	15.75	1.90	0.342		0.186	(0.308)	0.156
64	16.00	1.90	0.342		0.183	(0.308)	0.158
65	16.25	0.40	0.072	(	0.181)	0.065	0.007
66	16.50	0.40	0.072	(	0.178)	0.065	0.007
67	16.75	0.30	0.054	(	0.175)	0.049	0.005
68	17.00	0.30	0.054	(	0.173)	0.049	0.005
69	17.25	0.50	0.090	(	0.170)	0.081	0.009
70	17.50	0.50	0.090	(	0.167)	0.081	0.009
71	17.75	0.50	0.090	(	0.165)	0.081	0.009
72	18.00	0.40	0.072	(	0.162)	0.065	0.007
73	18.25	0.40	0.072	(	0.160)	0.065	0.007
74	18.50	0.40	0.072	(	0.158)	0.065	0.007
75	18.75	0.30	0.054	(	0.155)	0.049	0.005
76	19.00	0.20	0.036	(	0.153)	0.032	0.004
77	19.25	0.30	0.054	(	0.151)	0.049	0.005
78	19.50	0.40	0.072	(	0.149)	0.065	0.007
79	19.75	0.30	0.054	(	0.147)	0.049	0.005
80	20.00	0.20	0.036	(	0.145)	0.032	0.004
81	20.25	0.30	0.054	(	0.143)	0.049	0.005
82	20.50	0.30	0.054	(	0.141)	0.049	0.005
83	20.75	0.30	0.054	(	0.139)	0.049	0.005
84	21.00	0.20	0.036	(	0.138)	0.032	0.004
85	21.25	0.30	0.054	(	0.136)	0.049	0.005
86	21.50	0.20	0.036	(	0.135)	0.032	0.004
87	21.75	0.30	0.054	(	0.133)	0.049	0.005
88	22.00	0.20	0.036	(	0.132)	0.032	0.004
89	22.25	0.30	0.054	(	0.130)	0.049	0.005
90	22.50	0.20	0.036	(	0.129)	0.032	0.004
91	22.75	0.20	0.036	(	0.128)	0.032	0.004
92	23.00	0.20	0.036	(	0.127)	0.032	0.004
93	23.25	0.20	0.036	(	0.126)	0.032	0.004
94	23.50	0.20	0.036	(	0.125)	0.032	0.004
95	23.75	0.20	0.036	(	0.125)	0.032	0.004
96	24.00	0.20	0.036	(	0.124)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.8

Flood volume = Effective rainfall 1.44(In)
times area 61.6(Ac.)/[(In)/(Ft.)] = 7.4(Ac.Ft)
Total soil loss = 3.06(In)
Total soil loss = 15.686(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 322815.8 Cubic Feet
Total soil loss = 683299.1 Cubic Feet

Peak flow rate of this hydrograph = 24.423(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 7.5 15.0 22.5 30.0
0+15	0.0024	0.12	Q | | | |
0+30	0.0081	0.27	Q | | | |
0+45	0.0150	0.33	Q | | | |
1+ 0	0.0231	0.39	Q | | | |
1+15	0.0311	0.38	Q | | | |
1+30	0.0381	0.34	Q | | | |
1+45	0.0450	0.34	Q | | | |
2+ 0	0.0531	0.39	Q | | | |
2+15	0.0623	0.44	Q | | | |
2+30	0.0715	0.45	Q | | | |
2+45	0.0820	0.51	Q | | | |
3+ 0	0.0935	0.56	Q | | | |
3+15	0.1050	0.56	Q | | | |
3+30	0.1166	0.56	Q | | | |
3+45	0.1281	0.56	Q | | | |
4+ 0	0.1409	0.62	Q | | | |
4+15	0.1547	0.67	Q | | | |
4+30	0.1697	0.73	Q | | | |
4+45	0.1858	0.78	Q | | | |
5+ 0	0.2032	0.84	|Q | | | |
5+15	0.2192	0.77	|Q | | | |
5+30	0.2344	0.74	QV | | | |
5+45	0.2517	0.84	|Q | | | |
6+ 0	0.2701	0.89	|Q | | | |
6+15	0.2898	0.95	|Q | | | |
6+30	0.3105	1.00	|Q | | | |
6+45	0.3325	1.07	|Q | | | |
7+ 0	0.3555	1.11	|Q | | | |
7+15	0.3786	1.12	|QV | | | |
7+30	0.4029	1.18	|QV | | | |
7+45	0.4295	1.28	|QV | | | |
8+ 0	0.4583	1.40	|QV | | | |
8+15	0.4907	1.57	| Q | | | |
8+30	0.5252	1.67	| Q | | | |
8+45	0.5611	1.74	| QV | | | |
9+ 0	0.5992	1.84	| QV | | | |
9+15	0.6627	3.07	| VQ | | | |
9+30	0.7613	4.77	| V Q | | | |
9+45	0.8886	6.16	| V Q | | | |
10+ 0	1.0441	7.52	| V Q | | |
10+15	1.1416	4.72	| Q | | | |
10+30	1.1809	1.90	| Q V | | | |
10+45	1.2699	4.31	| QV | | | |
11+ 0	1.4069	6.63	| VQ | | | |
11+15	1.5397	6.43	| Q | | | |
11+30	1.6671	6.16	| Q | | | |
11+45	1.7739	5.17	| Q V| | | |
12+ 0	1.8772	5.00	| Q V | | |
12+15	2.0788	9.76	| V Q | | |
12+30	2.3688	14.04	| | V Q | | |
12+45	2.7031	16.18	| V |Q | |
13+ 0	3.0751	18.00	| V | Q | |
13+15	3.5239	21.72	| V| Q | |
13+30	4.0285	24.42	| V | Q |
13+45	4.4074	18.34	| | VQ | |
14+ 0	4.6789	13.14	| Q | V | |
14+15	4.9944	15.27	| Q V | |
14+30	5.3424	16.84	| | Q V | |
14+45	5.6874	16.70	| | Q V |
15+ 0	6.0234	16.26	| | |Q | V |

```
   15+15       6.3409     15.37  |         |         Q         |   V     |
   15+30       6.6391     14.43  |         |        Q|         |    V    |
   15+45       6.8814     11.73  |         |    Q    |         |      V  |
   16+ 0       7.0861      9.91  |         |  Q      |         |       V |
   16+15       7.1871      4.89  |     Q   |         |         |       V |
   16+30       7.2029      0.77  |Q        |         |         |       V |
   16+45       7.2109      0.39  Q         |         |         |       V |
   17+ 0       7.2179      0.34  Q         |         |         |       V |
   17+15       7.2273      0.45  Q         |         |         |        V|
   17+30       7.2387      0.55  Q         |         |         |        V|
   17+45       7.2502      0.56  Q         |         |         |        V|
   18+ 0       7.2606      0.50  Q         |         |         |        V|
   18+15       7.2699      0.45  Q         |         |         |        V|
   18+30       7.2791      0.45  Q         |         |         |        V|
   18+45       7.2871      0.39  Q         |         |         |        V|
   19+ 0       7.2929      0.28  Q         |         |         |        V|
   19+15       7.2988      0.29  Q         |         |         |        V|
   19+30       7.3069      0.39  Q         |         |         |        V|
   19+45       7.3148      0.38  Q         |         |         |        V|
   20+ 0       7.3206      0.28  Q         |         |         |        V|
   20+15       7.3266      0.29  Q         |         |         |        V|
   20+30       7.3334      0.33  Q         |         |         |        V|
   20+45       7.3403      0.34  Q         |         |         |        V|
   21+ 0       7.3460      0.28  Q         |         |         |        V|
   21+15       7.3520      0.29  Q         |         |         |        V|
   21+30       7.3576      0.27  Q         |         |         |        V|
   21+45       7.3635      0.29  Q         |         |         |        V|
   22+ 0       7.3691      0.27  Q         |         |         |        V|
   22+15       7.3751      0.29  Q         |         |         |        V|
   22+30       7.3807      0.27  Q         |         |         |        V|
   22+45       7.3854      0.23  Q         |         |         |        V|
   23+ 0       7.3900      0.22  Q         |         |         |        V|
   23+15       7.3946      0.22  Q         |         |         |        V|
   23+30       7.3992      0.22  Q         |         |         |        V|
   23+45       7.4039      0.22  Q         |         |         |        V|
   24+ 0       7.4085      0.22  Q         |         |         |        V|
   24+15       7.4107      0.11  Q         |         |         |        V|
   24+30       7.4108      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/25/12 File: SubC4224100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C42
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      28.00(Ac.)  =      0.044 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      28.00(Ac.)  =      0.044 Sq. Mi.
Length along longest watercourse =     920.00(Ft.)
Length along longest watercourse measured to centroid =     660.00(Ft.)
Length along longest watercourse =      0.174 Mi.
Length along longest watercourse measured to centroid =      0.125 Mi.
Difference in elevation =      49.00(Ft.)
Slope along watercourse =    281.2174 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.058 Hr.
Lag time =     3.46 Min.
25% of lag time =     0.86 Min.
40% of lag time =     1.38 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       28.00           1.80                 50.40

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       28.00           4.50                126.00

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    21.900           66.00         0.000
     2.000           77.00         0.000
```

```
     4.100          83.00         0.000
 Total Area Entered =     28.00(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       0.782      0.317
77.0  77.0      0.279     0.000        0.279       0.071      0.020
83.0  83.0      0.210     0.000        0.210       0.146      0.031
                                                  Sum (F) =   0.368
Area averaged mean soil loss (F) (In/Hr) =  0.368
Minimum soil loss rate ((In/Hr)) =  0.184
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        433.972         69.699             19.668
    2   0.500        867.943         30.301              8.551
                                Sum = 100.000   Sum=      28.219
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.649)	0.032	0.004
2	0.50	0.30	0.054	(0.642)	0.049	0.005
3	0.75	0.30	0.054	(0.634)	0.049	0.005
4	1.00	0.40	0.072	(0.627)	0.065	0.007
5	1.25	0.30	0.054	(0.619)	0.049	0.005
6	1.50	0.30	0.054	(0.612)	0.049	0.005
7	1.75	0.30	0.054	(0.605)	0.049	0.005
8	2.00	0.40	0.072	(0.597)	0.065	0.007
9	2.25	0.40	0.072	(0.590)	0.065	0.007
10	2.50	0.40	0.072	(0.583)	0.065	0.007
11	2.75	0.50	0.090	(0.576)	0.081	0.009
12	3.00	0.50	0.090	(0.569)	0.081	0.009
13	3.25	0.50	0.090	(0.562)	0.081	0.009
14	3.50	0.50	0.090	(0.555)	0.081	0.009
15	3.75	0.50	0.090	(0.548)	0.081	0.009
16	4.00	0.60	0.108	(0.541)	0.097	0.011
17	4.25	0.60	0.108	(0.534)	0.097	0.011
18	4.50	0.70	0.126	(0.527)	0.113	0.013
19	4.75	0.70	0.126	(0.520)	0.113	0.013
20	5.00	0.80	0.144	(0.514)	0.130	0.014
21	5.25	0.60	0.108	(0.507)	0.097	0.011
22	5.50	0.70	0.126	(0.500)	0.113	0.013
23	5.75	0.80	0.144	(0.494)	0.130	0.014
24	6.00	0.80	0.144	(0.487)	0.130	0.014
25	6.25	0.90	0.162	(0.481)	0.146	0.016
26	6.50	0.90	0.162	(0.475)	0.146	0.016
27	6.75	1.00	0.180	(0.468)	0.162	0.018
28	7.00	1.00	0.180	(0.462)	0.162	0.018
29	7.25	1.00	0.180	(0.456)	0.162	0.018
30	7.50	1.10	0.198	(0.449)	0.178	0.020
31	7.75	1.20	0.216	(0.443)	0.194	0.022
32	8.00	1.30	0.234	(0.437)	0.211	0.023
33	8.25	1.50	0.270	(0.431)	0.243	0.027
34	8.50	1.50	0.270	(0.425)	0.243	0.027
35	8.75	1.60	0.288	(0.419)	0.259	0.029
36	9.00	1.70	0.306	(0.413)	0.275	0.031

37	9.25	1.90	0.342	(	0.407)	0.308	0.034
38	9.50	2.00	0.360	(	0.401)	0.324	0.036
39	9.75	2.10	0.378	(	0.396)	0.340	0.038
40	10.00	2.20	0.396	(	0.390)	0.356	0.040
41	10.25	1.50	0.270	(	0.384)	0.243	0.027
42	10.50	1.50	0.270	(	0.379)	0.243	0.027
43	10.75	2.00	0.360	(	0.373)	0.324	0.036
44	11.00	2.00	0.360	(	0.368)	0.324	0.036
45	11.25	1.90	0.342	(	0.362)	0.308	0.034
46	11.50	1.90	0.342	(	0.357)	0.308	0.034
47	11.75	1.70	0.306	(	0.352)	0.275	0.031
48	12.00	1.80	0.324	(	0.347)	0.292	0.032
49	12.25	2.50	0.450		0.341	(0.405)	0.109
50	12.50	2.60	0.468		0.336	(0.421)	0.132
51	12.75	2.80	0.504		0.331	(0.454)	0.173
52	13.00	2.90	0.522		0.326	(0.470)	0.196
53	13.25	3.40	0.612		0.321	(0.551)	0.291
54	13.50	3.40	0.612		0.316	(0.551)	0.295
55	13.75	2.30	0.414		0.312	(0.373)	0.102
56	14.00	2.30	0.414		0.307	(0.373)	0.107
57	14.25	2.70	0.486		0.302	(0.437)	0.184
58	14.50	2.60	0.468		0.298	(0.421)	0.170
59	14.75	2.60	0.468		0.293	(0.421)	0.175
60	15.00	2.50	0.450		0.289	(0.405)	0.161
61	15.25	2.40	0.432		0.284	(0.389)	0.148
62	15.50	2.30	0.414		0.280	(0.373)	0.134
63	15.75	1.90	0.342		0.276	(0.308)	0.066
64	16.00	1.90	0.342		0.271	(0.308)	0.071
65	16.25	0.40	0.072	(	0.267)	0.065	0.007
66	16.50	0.40	0.072	(	0.263)	0.065	0.007
67	16.75	0.30	0.054	(	0.259)	0.049	0.005
68	17.00	0.30	0.054	(	0.255)	0.049	0.005
69	17.25	0.50	0.090	(	0.251)	0.081	0.009
70	17.50	0.50	0.090	(	0.248)	0.081	0.009
71	17.75	0.50	0.090	(	0.244)	0.081	0.009
72	18.00	0.40	0.072	(	0.240)	0.065	0.007
73	18.25	0.40	0.072	(	0.237)	0.065	0.007
74	18.50	0.40	0.072	(	0.233)	0.065	0.007
75	18.75	0.30	0.054	(	0.230)	0.049	0.005
76	19.00	0.20	0.036	(	0.227)	0.032	0.004
77	19.25	0.30	0.054	(	0.223)	0.049	0.005
78	19.50	0.40	0.072	(	0.220)	0.065	0.007
79	19.75	0.30	0.054	(	0.217)	0.049	0.005
80	20.00	0.20	0.036	(	0.214)	0.032	0.004
81	20.25	0.30	0.054	(	0.212)	0.049	0.005
82	20.50	0.30	0.054	(	0.209)	0.049	0.005
83	20.75	0.30	0.054	(	0.206)	0.049	0.005
84	21.00	0.20	0.036	(	0.204)	0.032	0.004
85	21.25	0.30	0.054	(	0.201)	0.049	0.005
86	21.50	0.20	0.036	(	0.199)	0.032	0.004
87	21.75	0.30	0.054	(	0.197)	0.049	0.005
88	22.00	0.20	0.036	(	0.195)	0.032	0.004
89	22.25	0.30	0.054	(	0.193)	0.049	0.005
90	22.50	0.20	0.036	(	0.191)	0.032	0.004
91	22.75	0.20	0.036	(	0.189)	0.032	0.004
92	23.00	0.20	0.036	(	0.188)	0.032	0.004
93	23.25	0.20	0.036	(	0.187)	0.032	0.004
94	23.50	0.20	0.036	(	0.185)	0.032	0.004
95	23.75	0.20	0.036	(	0.185)	0.032	0.004
96	24.00	0.20	0.036	(	0.184)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.6

Flood volume = Effective rainfall 0.89(In)
times area 28.0(Ac.)/[(In)/(Ft.)] = 2.1(Ac.Ft)
Total soil loss = 3.61(In)
Total soil loss = 8.415(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 90806.9 Cubic Feet
Total soil loss = 366548.1 Cubic Feet

Peak flow rate of this hydrograph = 8.301(CFS)

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      ----------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

      ----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+15       0.0015      0.07  Q         |         |         |         |
  0+30       0.0043      0.14  Q         |         |         |         |
  0+45       0.0074      0.15  Q         |         |         |         |
  1+ 0       0.0113      0.19  Q         |         |         |         |
  1+15       0.0148      0.17  Q         |         |         |         |
  1+30       0.0179      0.15  Q         |         |         |         |
  1+45       0.0211      0.15  Q         |         |         |         |
  2+ 0       0.0250      0.19  Q         |         |         |         |
  2+15       0.0292      0.20  Q         |         |         |         |
  2+30       0.0334      0.20  Q         |         |         |         |
  2+45       0.0383      0.24  Q         |         |         |         |
  3+ 0       0.0436      0.25  VQ        |         |         |         |
  3+15       0.0488      0.25  VQ        |         |         |         |
  3+30       0.0541      0.25   Q        |         |         |         |
  3+45       0.0593      0.25  |Q        |         |         |         |
  4+ 0       0.0653      0.29  |Q        |         |         |         |
  4+15       0.0716      0.30  |Q        |         |         |         |
  4+30       0.0786      0.34  |Q        |         |         |         |
  4+45       0.0860      0.36  |Q        |         |         |         |
  5+ 0       0.0940      0.39  |Q        |         |         |         |
  5+15       0.1010      0.34  |Q        |         |         |         |
  5+30       0.1080      0.34  |QV       |         |         |         |
  5+45       0.1161      0.39  |QV       |         |         |         |
  6+ 0       0.1245      0.41  |QV       |         |         |         |
  6+15       0.1336      0.44  |QV       |         |         |         |
  6+30       0.1431      0.46  |QV       |         |         |         |
  6+45       0.1533      0.49  |QV       |         |         |         |
  7+ 0       0.1638      0.51  | QV      |         |         |         |
  7+15       0.1743      0.51  | QV      |         |         |         |
  7+30       0.1855      0.54  | QV      |         |         |         |
  7+45       0.1978      0.59  | QV      |         |         |         |
  8+ 0       0.2111      0.65  | Q V     |         |         |         |
  8+15       0.2262      0.73  | Q V     |         |         |         |
  8+30       0.2420      0.76  |  QV     |         |         |         |
  8+45       0.2584      0.80  |  QV     |         |         |         |
  9+ 0       0.2760      0.85  |  Q V    |         |         |         |
  9+15       0.2953      0.93  |  Q V    |         |         |         |
  9+30       0.3160      1.00  |   Q V   |         |         |         |
  9+45       0.3377      1.05  |   Q V   |         |         |         |
 10+ 0       0.3605      1.10  |   Q V   |         |         |         |
 10+15       0.3785      0.87  |  Q   V  |         |         |         |
 10+30       0.3942      0.76  |  Q   V  |         |         |         |
 10+45       0.4136      0.94  |  Q   V  |         |         |         |
 11+ 0       0.4346      1.02  |   Q   V |         |         |         |
 11+15       0.4549      0.98  |  Q    V |         |         |         |
 11+30       0.4748      0.97  |  Q     V|         |         |         |
 11+45       0.4933      0.89  |  Q     V|         |         |         |
 12+ 0       0.5119      0.90  |  Q     V|         |         |         |
 12+15       0.5618      2.41  |        QV         |         |         |
 12+30       0.6345      3.52  |         | V Q     |         |         |
 12+45       0.7280      4.52  |         |  V    Q |         |         |
 13+ 0       0.8381      5.33  |         |     V   |Q        |         |
 13+15       0.9908      7.39  |         |        V|        Q|         |
 13+30       1.1623      8.30  |         |           V       |  Q      |
 13+45       1.2562      4.54  |         |       Q |   V     |         |
 14+ 0       1.3178      2.98  |         |Q        |    V    |         |
 14+15       1.4114      4.53  |         |       Q |      V  |         |
 14+30       1.5131      4.92  |         |        Q|        V|         |
 14+45       1.6144      4.90  |         |        Q|         V         |
 15+ 0       1.7109      4.67  |         |       Q |         | V       |
 15+15       1.7995      4.29  |         |      Q  |         |   V     |
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   15+30       1.8802      3.90  |          |    Q    |         |     V   |
   15+45       1.9309      2.46  |        Q|          |         |      V  |
   16+ 0       1.9714      1.96  |      Q  |          |         |      V  |
   16+15       1.9868      0.75  | Q       |          |         |       V |
   16+30       1.9910      0.20  Q         |          |         |       V |
   16+45       1.9944      0.17  Q         |          |         |       V |
   17+ 0       1.9976      0.15  Q         |          |         |       V |
   17+15       2.0022      0.22  Q         |          |         |       V |
   17+30       2.0075      0.25  |Q        |          |         |       V |
   17+45       2.0127      0.25  |Q        |          |         |       V |
   18+ 0       2.0172      0.22  Q         |          |         |       V |
   18+15       2.0214      0.20  Q         |          |         |       V |
   18+30       2.0256      0.20  Q         |          |         |       V |
   18+45       2.0291      0.17  Q         |          |         |       V |
   19+ 0       2.0315      0.12  Q         |          |         |       V |
   19+15       2.0343      0.14  Q         |          |         |        V|
   19+30       2.0382      0.19  Q         |          |         |        V|
   19+45       2.0417      0.17  Q         |          |         |        V|
   20+ 0       2.0441      0.12  Q         |          |         |        V|
   20+15       2.0469      0.14  Q         |          |         |        V|
   20+30       2.0501      0.15  Q         |          |         |        V|
   20+45       2.0532      0.15  Q         |          |         |        V|
   21+ 0       2.0557      0.12  Q         |          |         |        V|
   21+15       2.0585      0.14  Q         |          |         |        V|
   21+30       2.0609      0.12  Q         |          |         |        V|
   21+45       2.0637      0.14  Q         |          |         |        V|
   22+ 0       2.0662      0.12  Q         |          |         |        V|
   22+15       2.0690      0.14  Q         |          |         |        V|
   22+30       2.0714      0.12  Q         |          |         |        V|
   22+45       2.0735      0.10  Q         |          |         |        V|
   23+ 0       2.0756      0.10  Q         |          |         |        V|
   23+15       2.0777      0.10  Q         |          |         |        V|
   23+30       2.0798      0.10  Q         |          |         |        V|
   23+45       2.0819      0.10  Q         |          |         |        V|
   24+ 0       2.0840      0.10  Q         |          |         |        V|
   24+15       2.0846      0.03  Q         |          |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/25/12 File: SubC524100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C5
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =      25.00(Ac.)  =      0.039 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      25.00(Ac.)  =      0.039 Sq. Mi.
Length along longest watercourse =     790.00(Ft.)
Length along longest watercourse measured to centroid =     789.99(Ft.)
Length along longest watercourse =      0.150 Mi.
Length along longest watercourse measured to centroid =      0.150 Mi.
Difference in elevation =      12.00(Ft.)
Slope along watercourse =     80.2025 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.074 Hr.
Lag time =     4.43 Min.
25% of lag time =     1.11 Min.
40% of lag time =     1.77 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       25.00           1.80                 45.00

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       25.00           4.50                112.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    22.100           85.00         0.000
     2.900           90.00         0.000
```

Total Area Entered = 25.00(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	0.884	0.165
90.0	90.0	0.130	0.000	0.130	0.116	0.015
					Sum (F) =	0.180

Area averaged mean soil loss (F) (In/Hr) = 0.180
Minimum soil loss rate ((In/Hr)) = 0.090
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	338.385	60.307	15.194
2	0.500	676.769	35.110	8.846
3	0.750	1015.154	4.583	1.155
			Sum = 100.000	Sum= 25.195

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.319)	0.032	0.004
2	0.50	0.30	0.054	(0.315)	0.049	0.005
3	0.75	0.30	0.054	(0.311)	0.049	0.005
4	1.00	0.40	0.072	(0.308)	0.065	0.007
5	1.25	0.30	0.054	(0.304)	0.049	0.005
6	1.50	0.30	0.054	(0.300)	0.049	0.005
7	1.75	0.30	0.054	(0.297)	0.049	0.005
8	2.00	0.40	0.072	(0.293)	0.065	0.007
9	2.25	0.40	0.072	(0.290)	0.065	0.007
10	2.50	0.40	0.072	(0.286)	0.065	0.007
11	2.75	0.50	0.090	(0.283)	0.081	0.009
12	3.00	0.50	0.090	(0.279)	0.081	0.009
13	3.25	0.50	0.090	(0.276)	0.081	0.009
14	3.50	0.50	0.090	(0.272)	0.081	0.009
15	3.75	0.50	0.090	(0.269)	0.081	0.009
16	4.00	0.60	0.108	(0.265)	0.097	0.011
17	4.25	0.60	0.108	(0.262)	0.097	0.011
18	4.50	0.70	0.126	(0.259)	0.113	0.013
19	4.75	0.70	0.126	(0.255)	0.113	0.013
20	5.00	0.80	0.144	(0.252)	0.130	0.014
21	5.25	0.60	0.108	(0.249)	0.097	0.011
22	5.50	0.70	0.126	(0.246)	0.113	0.013
23	5.75	0.80	0.144	(0.242)	0.130	0.014
24	6.00	0.80	0.144	(0.239)	0.130	0.014
25	6.25	0.90	0.162	(0.236)	0.146	0.016
26	6.50	0.90	0.162	(0.233)	0.146	0.016
27	6.75	1.00	0.180	(0.230)	0.162	0.018
28	7.00	1.00	0.180	(0.227)	0.162	0.018
29	7.25	1.00	0.180	(0.224)	0.162	0.018
30	7.50	1.10	0.198	(0.221)	0.178	0.020
31	7.75	1.20	0.216	(0.217)	0.194	0.022
32	8.00	1.30	0.234	(0.214)	0.211	0.023
33	8.25	1.50	0.270	0.212	(0.243)	0.058
34	8.50	1.50	0.270	0.209	(0.243)	0.061
35	8.75	1.60	0.288	0.206	(0.259)	0.082
36	9.00	1.70	0.306	0.203	(0.275)	0.103
37	9.25	1.90	0.342	0.200	(0.308)	0.142

38	9.50	2.00	0.360	0.197	(	0.324)	0.163
39	9.75	2.10	0.378	0.194	(	0.340)	0.184
40	10.00	2.20	0.396	0.191	(	0.356)	0.205
41	10.25	1.50	0.270	0.189	(	0.243)	0.081
42	10.50	1.50	0.270	0.186	(	0.243)	0.084
43	10.75	2.00	0.360	0.183	(	0.324)	0.177
44	11.00	2.00	0.360	0.181	(	0.324)	0.179
45	11.25	1.90	0.342	0.178	(	0.308)	0.164
46	11.50	1.90	0.342	0.175	(	0.308)	0.167
47	11.75	1.70	0.306	0.173	(	0.275)	0.133
48	12.00	1.80	0.324	0.170	(	0.292)	0.154
49	12.25	2.50	0.450	0.168	(	0.405)	0.282
50	12.50	2.60	0.468	0.165	(	0.421)	0.303
51	12.75	2.80	0.504	0.163	(	0.454)	0.341
52	13.00	2.90	0.522	0.160	(	0.470)	0.362
53	13.25	3.40	0.612	0.158	(	0.551)	0.454
54	13.50	3.40	0.612	0.155	(	0.551)	0.457
55	13.75	2.30	0.414	0.153	(	0.373)	0.261
56	14.00	2.30	0.414	0.151	(	0.373)	0.263
57	14.25	2.70	0.486	0.148	(	0.437)	0.338
58	14.50	2.60	0.468	0.146	(	0.421)	0.322
59	14.75	2.60	0.468	0.144	(	0.421)	0.324
60	15.00	2.50	0.450	0.142	(	0.405)	0.308
61	15.25	2.40	0.432	0.139	(	0.389)	0.293
62	15.50	2.30	0.414	0.137	(	0.373)	0.277
63	15.75	1.90	0.342	0.135	(	0.308)	0.207
64	16.00	1.90	0.342	0.133	(	0.308)	0.209
65	16.25	0.40	0.072	(0.131)		0.065	0.007
66	16.50	0.40	0.072	(0.129)		0.065	0.007
67	16.75	0.30	0.054	(0.127)		0.049	0.005
68	17.00	0.30	0.054	(0.125)		0.049	0.005
69	17.25	0.50	0.090	(0.123)		0.081	0.009
70	17.50	0.50	0.090	(0.121)		0.081	0.009
71	17.75	0.50	0.090	(0.120)		0.081	0.009
72	18.00	0.40	0.072	(0.118)		0.065	0.007
73	18.25	0.40	0.072	(0.116)		0.065	0.007
74	18.50	0.40	0.072	(0.114)		0.065	0.007
75	18.75	0.30	0.054	(0.113)		0.049	0.005
76	19.00	0.20	0.036	(0.111)		0.032	0.004
77	19.25	0.30	0.054	(0.110)		0.049	0.005
78	19.50	0.40	0.072	(0.108)		0.065	0.007
79	19.75	0.30	0.054	(0.107)		0.049	0.005
80	20.00	0.20	0.036	(0.105)		0.032	0.004
81	20.25	0.30	0.054	(0.104)		0.049	0.005
82	20.50	0.30	0.054	(0.102)		0.049	0.005
83	20.75	0.30	0.054	(0.101)		0.049	0.005
84	21.00	0.20	0.036	(0.100)		0.032	0.004
85	21.25	0.30	0.054	(0.099)		0.049	0.005
86	21.50	0.20	0.036	(0.098)		0.032	0.004
87	21.75	0.30	0.054	(0.097)		0.049	0.005
88	22.00	0.20	0.036	(0.096)		0.032	0.004
89	22.25	0.30	0.054	(0.095)		0.049	0.005
90	22.50	0.20	0.036	(0.094)		0.032	0.004
91	22.75	0.20	0.036	(0.093)		0.032	0.004
92	23.00	0.20	0.036	(0.092)		0.032	0.004
93	23.25	0.20	0.036	(0.092)		0.032	0.004
94	23.50	0.20	0.036	(0.091)		0.032	0.004
95	23.75	0.20	0.036	(0.091)		0.032	0.004
96	24.00	0.20	0.036	(0.090)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.7

Flood volume = Effective rainfall 1.92(In)
times area 25.0(Ac.)/[(In)/(Ft.)] = 4.0(Ac.Ft)
Total soil loss = 2.58(In)
Total soil loss = 5.374(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 174271.6 Cubic Feet
Total soil loss = 234083.5 Cubic Feet

Peak flow rate of this hydrograph = 11.381(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+15	0.0011	0.05	Q
0+30	0.0035	0.11	Q
0+45	0.0063	0.13	Q
1+ 0	0.0096	0.16	Q
1+15	0.0128	0.15	Q
1+30	0.0156	0.14	Q
1+45	0.0184	0.14	Q
2+ 0	0.0218	0.16	Q
2+15	0.0255	0.18	Q
2+30	0.0293	0.18	Q
2+45	0.0336	0.21	Q
3+ 0	0.0382	0.22	Q
3+15	0.0429	0.23	Q
3+30	0.0476	0.23	Q
3+45	0.0523	0.23	Q
4+ 0	0.0575	0.25	Q
4+15	0.0631	0.27	Q
4+30	0.0693	0.30	Q
4+45	0.0758	0.32	Q
5+ 0	0.0830	0.34	Q
5+15	0.0893	0.31	Q
5+30	0.0956	0.30	Q
5+45	0.1027	0.34	QV
6+ 0	0.1101	0.36	QV
6+15	0.1182	0.39	QV
6+30	0.1266	0.41	QV
6+45	0.1356	0.44	QV
7+ 0	0.1449	0.45	QV
7+15	0.1543	0.45	QV
7+30	0.1642	0.48	QV
7+45	0.1751	0.52	Q
8+ 0	0.1868	0.57	Q
8+15	0.2100	1.12	Q
8+30	0.2405	1.48	Q
8+45	0.2790	1.86	VQ
9+ 0	0.3280	2.37	VQ
9+15	0.3935	3.17	V Q
9+30	0.4731	3.85	V Q
9+45	0.5640	4.40	V Q
10+ 0	0.6658	4.92	V Q
10+15	0.7331	3.26	QV
10+30	0.7793	2.23	Q V
10+45	0.8521	3.53	QV
11+ 0	0.9428	4.39	QV
11+15	1.0314	4.29	Q V
11+30	1.1181	4.19	Q V
11+45	1.1944	3.69	Q V
12+ 0	1.2711	3.71	Q V
12+15	1.3911	5.81	Q V
12+30	1.5416	7.28	QV
12+45	1.7110	8.20	QV
13+ 0	1.8943	8.87	QV
13+15	2.1113	10.50	Q
13+30	2.3464	11.38	QV
13+45	2.5228	8.54	Q V
14+ 0	2.6642	6.84	Q V
14+15	2.8246	7.77	Q V
14+30	2.9938	8.19	Q V
14+45	3.1625	8.17	Q V
15+ 0	3.3263	7.93	Q V
15+15	3.4823	7.55	Q V
15+30	3.6301	7.15	Q V

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  15+45       3.7526      5.93  |         |Q        |         |      V  |
  16+ 0       3.8626      5.32  |         Q         |         |       V |
  16+15       3.9080      2.20  |   Q     |         |         |        V|
  16+30       3.9166      0.41  Q         |         |         |        V|
  16+45       3.9198      0.15  Q         |         |         |        V|
  17+ 0       3.9226      0.14  Q         |         |         |        V|
  17+15       3.9266      0.19  Q         |         |         |        V|
  17+30       3.9312      0.22  Q         |         |         |        V|
  17+45       3.9358      0.23  Q         |         |         |        V|
  18+ 0       3.9400      0.20  Q         |         |         |        V|
  18+15       3.9438      0.18  Q         |         |         |        V|
  18+30       3.9475      0.18  Q         |         |         |        V|
  18+45       3.9507      0.15  Q         |         |         |        V|
  19+ 0       3.9530      0.11  Q         |         |         |        V|
  19+15       3.9555      0.12  Q         |         |         |        V|
  19+30       3.9588      0.16  Q         |         |         |        V|
  19+45       3.9619      0.15  Q         |         |         |        V|
  20+ 0       3.9642      0.11  Q         |         |         |        V|
  20+15       3.9667      0.12  Q         |         |         |        V|
  20+30       3.9695      0.13  Q         |         |         |        V|
  20+45       3.9723      0.14  Q         |         |         |        V|
  21+ 0       3.9745      0.11  Q         |         |         |        V|
  21+15       3.9770      0.12  Q         |         |         |        V|
  21+30       3.9792      0.11  Q         |         |         |        V|
  21+45       3.9817      0.12  Q         |         |         |        V|
  22+ 0       3.9839      0.11  Q         |         |         |        V|
  22+15       3.9864      0.12  Q         |         |         |        V|
  22+30       3.9886      0.11  Q         |         |         |        V|
  22+45       3.9905      0.09  Q         |         |         |        V|
  23+ 0       3.9924      0.09  Q         |         |         |        V|
  23+15       3.9943      0.09  Q         |         |         |        V|
  23+30       3.9961      0.09  Q         |         |         |        V|
  23+45       3.9980      0.09  Q         |         |         |        V|
  24+ 0       3.9999      0.09  Q         |         |         |        V|
  24+15       4.0006      0.04  Q         |         |         |        V|
  24+30       4.0007      0.00  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/25/12 File: SubC5124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C51
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      12.70(Ac.)  =      0.020 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      12.70(Ac.)  =      0.020 Sq. Mi.
Length along longest watercourse =    1160.00(Ft.)
Length along longest watercourse measured to centroid =     510.00(Ft.)
Length along longest watercourse =      0.220 Mi.
Length along longest watercourse measured to centroid =      0.097 Mi.
Difference in elevation =     129.00(Ft.)
Slope along watercourse =    587.1724 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.050 Hr.
Lag time =     2.98 Min.
25% of lag time =     0.74 Min.
40% of lag time =     1.19 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       12.70           1.80                 22.86

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       12.70           4.50                 57.15

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     4.000           66.00         0.000
     8.700           83.00         0.000
```

Total Area Entered = 12.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.315	0.128
83.0	83.0	0.210	0.000	0.210	0.685	0.144
					Sum (F) =	0.271

Area averaged mean soil loss (F) (In/Hr) = 0.271
Minimum soil loss rate ((In/Hr)) = 0.136
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	504.085	73.731	9.437
2	0.500	1008.171	26.269	3.362
			Sum = 100.000	Sum= 12.799

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.479)	0.032	0.004
2	0.50	0.30	0.054	(0.474)	0.049	0.005
3	0.75	0.30	0.054	(0.468)	0.049	0.005
4	1.00	0.40	0.072	(0.463)	0.065	0.007
5	1.25	0.30	0.054	(0.457)	0.049	0.005
6	1.50	0.30	0.054	(0.452)	0.049	0.005
7	1.75	0.30	0.054	(0.446)	0.049	0.005
8	2.00	0.40	0.072	(0.441)	0.065	0.007
9	2.25	0.40	0.072	(0.436)	0.065	0.007
10	2.50	0.40	0.072	(0.430)	0.065	0.007
11	2.75	0.50	0.090	(0.425)	0.081	0.009
12	3.00	0.50	0.090	(0.420)	0.081	0.009
13	3.25	0.50	0.090	(0.415)	0.081	0.009
14	3.50	0.50	0.090	(0.409)	0.081	0.009
15	3.75	0.50	0.090	(0.404)	0.081	0.009
16	4.00	0.60	0.108	(0.399)	0.097	0.011
17	4.25	0.60	0.108	(0.394)	0.097	0.011
18	4.50	0.70	0.126	(0.389)	0.113	0.013
19	4.75	0.70	0.126	(0.384)	0.113	0.013
20	5.00	0.80	0.144	(0.379)	0.130	0.014
21	5.25	0.60	0.108	(0.374)	0.097	0.011
22	5.50	0.70	0.126	(0.369)	0.113	0.013
23	5.75	0.80	0.144	(0.365)	0.130	0.014
24	6.00	0.80	0.144	(0.360)	0.130	0.014
25	6.25	0.90	0.162	(0.355)	0.146	0.016
26	6.50	0.90	0.162	(0.350)	0.146	0.016
27	6.75	1.00	0.180	(0.346)	0.162	0.018
28	7.00	1.00	0.180	(0.341)	0.162	0.018
29	7.25	1.00	0.180	(0.336)	0.162	0.018
30	7.50	1.10	0.198	(0.332)	0.178	0.020
31	7.75	1.20	0.216	(0.327)	0.194	0.022
32	8.00	1.30	0.234	(0.323)	0.211	0.023
33	8.25	1.50	0.270	(0.318)	0.243	0.027
34	8.50	1.50	0.270	(0.314)	0.243	0.027
35	8.75	1.60	0.288	(0.309)	0.259	0.029
36	9.00	1.70	0.306	(0.305)	0.275	0.031
37	9.25	1.90	0.342	0.301	(0.308)	0.041
38	9.50	2.00	0.360	0.296	(0.324)	0.064

39	9.75	2.10	0.378	0.292	(	0.340)	0.086
40	10.00	2.20	0.396	0.288	(	0.356)	0.108
41	10.25	1.50	0.270	(0.284)		0.243	0.027
42	10.50	1.50	0.270	(0.280)		0.243	0.027
43	10.75	2.00	0.360	0.276	(	0.324)	0.084
44	11.00	2.00	0.360	0.272	(	0.324)	0.088
45	11.25	1.90	0.342	0.268	(	0.308)	0.074
46	11.50	1.90	0.342	0.264	(	0.308)	0.078
47	11.75	1.70	0.306	0.260	(	0.275)	0.046
48	12.00	1.80	0.324	0.256	(	0.292)	0.068
49	12.25	2.50	0.450	0.252	(	0.405)	0.198
50	12.50	2.60	0.468	0.248	(	0.421)	0.220
51	12.75	2.80	0.504	0.245	(	0.454)	0.259
52	13.00	2.90	0.522	0.241	(	0.470)	0.281
53	13.25	3.40	0.612	0.237	(	0.551)	0.375
54	13.50	3.40	0.612	0.234	(	0.551)	0.378
55	13.75	2.30	0.414	0.230	(	0.373)	0.184
56	14.00	2.30	0.414	0.227	(	0.373)	0.187
57	14.25	2.70	0.486	0.223	(	0.437)	0.263
58	14.50	2.60	0.468	0.220	(	0.421)	0.248
59	14.75	2.60	0.468	0.216	(	0.421)	0.252
60	15.00	2.50	0.450	0.213	(	0.405)	0.237
61	15.25	2.40	0.432	0.210	(	0.389)	0.222
62	15.50	2.30	0.414	0.207	(	0.373)	0.207
63	15.75	1.90	0.342	0.203	(	0.308)	0.139
64	16.00	1.90	0.342	0.200	(	0.308)	0.142
65	16.25	0.40	0.072	(0.197)		0.065	0.007
66	16.50	0.40	0.072	(0.194)		0.065	0.007
67	16.75	0.30	0.054	(0.191)		0.049	0.005
68	17.00	0.30	0.054	(0.188)		0.049	0.005
69	17.25	0.50	0.090	(0.186)		0.081	0.009
70	17.50	0.50	0.090	(0.183)		0.081	0.009
71	17.75	0.50	0.090	(0.180)		0.081	0.009
72	18.00	0.40	0.072	(0.177)		0.065	0.007
73	18.25	0.40	0.072	(0.175)		0.065	0.007
74	18.50	0.40	0.072	(0.172)		0.065	0.007
75	18.75	0.30	0.054	(0.170)		0.049	0.005
76	19.00	0.20	0.036	(0.167)		0.032	0.004
77	19.25	0.30	0.054	(0.165)		0.049	0.005
78	19.50	0.40	0.072	(0.163)		0.065	0.007
79	19.75	0.30	0.054	(0.160)		0.049	0.005
80	20.00	0.20	0.036	(0.158)		0.032	0.004
81	20.25	0.30	0.054	(0.156)		0.049	0.005
82	20.50	0.30	0.054	(0.154)		0.049	0.005
83	20.75	0.30	0.054	(0.152)		0.049	0.005
84	21.00	0.20	0.036	(0.150)		0.032	0.004
85	21.25	0.30	0.054	(0.149)		0.049	0.005
86	21.50	0.20	0.036	(0.147)		0.032	0.004
87	21.75	0.30	0.054	(0.145)		0.049	0.005
88	22.00	0.20	0.036	(0.144)		0.032	0.004
89	22.25	0.30	0.054	(0.142)		0.049	0.005
90	22.50	0.20	0.036	(0.141)		0.032	0.004
91	22.75	0.20	0.036	(0.140)		0.032	0.004
92	23.00	0.20	0.036	(0.139)		0.032	0.004
93	23.25	0.20	0.036	(0.138)		0.032	0.004
94	23.50	0.20	0.036	(0.137)		0.032	0.004
95	23.75	0.20	0.036	(0.136)		0.032	0.004
96	24.00	0.20	0.036	(0.136)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.2

Flood volume = Effective rainfall 1.31(In)
times area 12.7(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 3.19(In)
Total soil loss = 3.376(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 60402.2 Cubic Feet
Total soil loss = 147047.2 Cubic Feet

Peak flow rate of this hydrograph = 4.833(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+15	0.0007	0.03	Q
0+30	0.0020	0.06	Q
0+45	0.0034	0.07	Q
1+ 0	0.0052	0.09	Q
1+15	0.0068	0.08	Q
1+30	0.0082	0.07	Q
1+45	0.0096	0.07	Q
2+ 0	0.0114	0.09	Q
2+15	0.0133	0.09	Q
2+30	0.0152	0.09	Q
2+45	0.0175	0.11	Q
3+ 0	0.0199	0.12	Q
3+15	0.0222	0.12	Q
3+30	0.0246	0.12	Q
3+45	0.0270	0.12	Q
4+ 0	0.0297	0.13	Q
4+15	0.0326	0.14	Q
4+30	0.0358	0.16	QV
4+45	0.0391	0.16	QV
5+ 0	0.0428	0.18	QV
5+15	0.0459	0.15	QV
5+30	0.0491	0.16	QV
5+45	0.0528	0.18	QV
6+ 0	0.0566	0.18	QV
6+15	0.0608	0.20	QV
6+30	0.0651	0.21	QV
6+45	0.0697	0.22	Q V
7+ 0	0.0745	0.23	Q V
7+15	0.0792	0.23	Q V
7+30	0.0843	0.25	Q V
7+45	0.0899	0.27	QV
8+ 0	0.0960	0.29	QV
8+15	0.1029	0.33	QV
8+30	0.1100	0.35	Q V
8+45	0.1175	0.36	Q V
9+ 0	0.1255	0.39	Q V
9+15	0.1357	0.49	Q V
9+30	0.1510	0.74	Q V
9+45	0.1722	1.02	Q
10+ 0	0.1992	1.31	Q
10+15	0.2120	0.62	Q V
10+30	0.2191	0.35	Q V
10+45	0.2375	0.89	Q V
11+ 0	0.2606	1.12	Q V
11+15	0.2813	1.00	Q V
11+30	0.3017	0.99	Q V
11+45	0.3162	0.70	Q V
12+ 0	0.3327	0.80	Q V
12+15	0.3761	2.10	Q V
12+30	0.4327	2.74	Q V
12+45	0.4986	3.19	Q V
13+ 0	0.5715	3.53	Q V
13+15	0.6641	4.48	Q V
13+30	0.7640	4.83	Q V
13+45	0.8262	3.01	Q V
14+ 0	0.8755	2.39	Q V
14+15	0.9398	3.11	Q V
14+30	1.0065	3.23	Q V
14+45	1.0729	3.21	Q V
15+ 0	1.1366	3.08	Q V
15+15	1.1964	2.90	Q V
15+30	1.2523	2.71	Q V
15+45	1.2938	2.01	Q V

```
   16+ 0       1.3311      1.80  |      Q  |         |         |       V |
   16+15       1.3423      0.54  | Q       |         |         |       V |
   16+30       1.3442      0.09  Q         |         |         |       V |
   16+45       1.3458      0.08  Q         |         |         |       V |
   17+ 0       1.3472      0.07  Q         |         |         |       V |
   17+15       1.3493      0.10  Q         |         |         |       V |
   17+30       1.3517      0.12  Q         |         |         |       V |
   17+45       1.3541      0.12  Q         |         |         |        V|
   18+ 0       1.3561      0.10  Q         |         |         |        V|
   18+15       1.3580      0.09  Q         |         |         |        V|
   18+30       1.3599      0.09  Q         |         |         |        V|
   18+45       1.3615      0.08  Q         |         |         |        V|
   19+ 0       1.3626      0.05  Q         |         |         |        V|
   19+15       1.3639      0.06  Q         |         |         |        V|
   19+30       1.3657      0.09  Q         |         |         |        V|
   19+45       1.3672      0.08  Q         |         |         |        V|
   20+ 0       1.3683      0.05  Q         |         |         |        V|
   20+15       1.3696      0.06  Q         |         |         |        V|
   20+30       1.3710      0.07  Q         |         |         |        V|
   20+45       1.3725      0.07  Q         |         |         |        V|
   21+ 0       1.3735      0.05  Q         |         |         |        V|
   21+15       1.3748      0.06  Q         |         |         |        V|
   21+30       1.3759      0.05  Q         |         |         |        V|
   21+45       1.3772      0.06  Q         |         |         |        V|
   22+ 0       1.3783      0.05  Q         |         |         |        V|
   22+15       1.3796      0.06  Q         |         |         |        V|
   22+30       1.3807      0.05  Q         |         |         |        V|
   22+45       1.3816      0.05  Q         |         |         |        V|
   23+ 0       1.3826      0.05  Q         |         |         |        V|
   23+15       1.3835      0.05  Q         |         |         |        V|
   23+30       1.3845      0.05  Q         |         |         |        V|
   23+45       1.3854      0.05  Q         |         |         |        V|
   24+ 0       1.3864      0.05  Q         |         |         |        V|
   24+15       1.3866      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/25/12 File: SubC5224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

----------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



----------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C52
100-year, 24-hour

---------------------------------------------------------------------
Drainage Area =       7.30(Ac.)  =      0.011 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =       7.30(Ac.)  =      0.011 Sq. Mi.
Length along longest watercourse =     950.00(Ft.)
Length along longest watercourse measured to centroid =     590.00(Ft.)
Length along longest watercourse =      0.180 Mi.
Length along longest watercourse measured to centroid =      0.112 Mi.
Difference in elevation =      29.00(Ft.)
Slope along watercourse =    161.1789 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.062 Hr.
Lag time =     3.73 Min.
25% of lag time =     0.93 Min.
40% of lag time =     1.49 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        7.30           1.80                 13.14

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
        7.30           4.50                 32.85

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     5.200           85.00         0.000
     1.100           90.00         0.000
```

```
     1.000          92.00         0.000
 Total Area Entered =      7.30(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.000        0.187       0.712      0.133
90.0  90.0      0.130     0.000        0.130       0.151      0.020
92.0  92.0      0.104     0.000        0.104       0.137      0.014
                                                  Sum (F) =   0.167
Area averaged mean soil loss (F) (In/Hr) =  0.167
Minimum soil loss rate ((In/Hr)) =  0.084
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

                U n i t  H y d r o g r a p h
                       VALLEY S-Curve
--------------------------------------------------------------------
                Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        402.475         65.255              4.801
    2   0.500        804.950         34.745              2.556
                                Sum = 100.000   Sum=       7.357
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.295)	0.032	0.004
2	0.50	0.30	0.054	(0.292)	0.049	0.005
3	0.75	0.30	0.054	(0.288)	0.049	0.005
4	1.00	0.40	0.072	(0.285)	0.065	0.007
5	1.25	0.30	0.054	(0.281)	0.049	0.005
6	1.50	0.30	0.054	(0.278)	0.049	0.005
7	1.75	0.30	0.054	(0.275)	0.049	0.005
8	2.00	0.40	0.072	(0.271)	0.065	0.007
9	2.25	0.40	0.072	(0.268)	0.065	0.007
10	2.50	0.40	0.072	(0.265)	0.065	0.007
11	2.75	0.50	0.090	(0.262)	0.081	0.009
12	3.00	0.50	0.090	(0.258)	0.081	0.009
13	3.25	0.50	0.090	(0.255)	0.081	0.009
14	3.50	0.50	0.090	(0.252)	0.081	0.009
15	3.75	0.50	0.090	(0.249)	0.081	0.009
16	4.00	0.60	0.108	(0.246)	0.097	0.011
17	4.25	0.60	0.108	(0.243)	0.097	0.011
18	4.50	0.70	0.126	(0.240)	0.113	0.013
19	4.75	0.70	0.126	(0.236)	0.113	0.013
20	5.00	0.80	0.144	(0.233)	0.130	0.014
21	5.25	0.60	0.108	(0.230)	0.097	0.011
22	5.50	0.70	0.126	(0.227)	0.113	0.013
23	5.75	0.80	0.144	(0.224)	0.130	0.014
24	6.00	0.80	0.144	(0.221)	0.130	0.014
25	6.25	0.90	0.162	(0.219)	0.146	0.016
26	6.50	0.90	0.162	(0.216)	0.146	0.016
27	6.75	1.00	0.180	(0.213)	0.162	0.018
28	7.00	1.00	0.180	(0.210)	0.162	0.018
29	7.25	1.00	0.180	(0.207)	0.162	0.018
30	7.50	1.10	0.198	(0.204)	0.178	0.020
31	7.75	1.20	0.216	(0.201)	0.194	0.022
32	8.00	1.30	0.234	0.199	(0.211)	0.035
33	8.25	1.50	0.270	0.196	(0.243)	0.074
34	8.50	1.50	0.270	0.193	(0.243)	0.077
35	8.75	1.60	0.288	0.190	(0.259)	0.098
36	9.00	1.70	0.306	0.188	(0.275)	0.118

37	9.25	1.90	0.342	0.185	(	0.308)	0.157
38	9.50	2.00	0.360	0.182	(	0.324)	0.178
39	9.75	2.10	0.378	0.180	(	0.340)	0.198
40	10.00	2.20	0.396	0.177	(	0.356)	0.219
41	10.25	1.50	0.270	0.175	(	0.243)	0.095
42	10.50	1.50	0.270	0.172	(	0.243)	0.098
43	10.75	2.00	0.360	0.170	(	0.324)	0.190
44	11.00	2.00	0.360	0.167	(	0.324)	0.193
45	11.25	1.90	0.342	0.165	(	0.308)	0.177
46	11.50	1.90	0.342	0.162	(	0.308)	0.180
47	11.75	1.70	0.306	0.160	(	0.275)	0.146
48	12.00	1.80	0.324	0.157	(	0.292)	0.166
49	12.25	2.50	0.450	0.155	(	0.405)	0.295
50	12.50	2.60	0.468	0.153	(	0.421)	0.315
51	12.75	2.80	0.504	0.151	(	0.454)	0.353
52	13.00	2.90	0.522	0.148	(	0.470)	0.374
53	13.25	3.40	0.612	0.146	(	0.551)	0.466
54	13.50	3.40	0.612	0.144	(	0.551)	0.468
55	13.75	2.30	0.414	0.142	(	0.373)	0.272
56	14.00	2.30	0.414	0.139	(	0.373)	0.275
57	14.25	2.70	0.486	0.137	(	0.437)	0.349
58	14.50	2.60	0.468	0.135	(	0.421)	0.333
59	14.75	2.60	0.468	0.133	(	0.421)	0.335
60	15.00	2.50	0.450	0.131	(	0.405)	0.319
61	15.25	2.40	0.432	0.129	(	0.389)	0.303
62	15.50	2.30	0.414	0.127	(	0.373)	0.287
63	15.75	1.90	0.342	0.125	(	0.308)	0.217
64	16.00	1.90	0.342	0.123	(	0.308)	0.219
65	16.25	0.40	0.072	(0.121)		0.065	0.007
66	16.50	0.40	0.072	(0.120)		0.065	0.007
67	16.75	0.30	0.054	(0.118)		0.049	0.005
68	17.00	0.30	0.054	(0.116)		0.049	0.005
69	17.25	0.50	0.090	(0.114)		0.081	0.009
70	17.50	0.50	0.090	(0.113)		0.081	0.009
71	17.75	0.50	0.090	(0.111)		0.081	0.009
72	18.00	0.40	0.072	(0.109)		0.065	0.007
73	18.25	0.40	0.072	(0.108)		0.065	0.007
74	18.50	0.40	0.072	(0.106)		0.065	0.007
75	18.75	0.30	0.054	(0.104)		0.049	0.005
76	19.00	0.20	0.036	(0.103)		0.032	0.004
77	19.25	0.30	0.054	(0.102)		0.049	0.005
78	19.50	0.40	0.072	(0.100)		0.065	0.007
79	19.75	0.30	0.054	(0.099)		0.049	0.005
80	20.00	0.20	0.036	(0.097)		0.032	0.004
81	20.25	0.30	0.054	(0.096)		0.049	0.005
82	20.50	0.30	0.054	(0.095)		0.049	0.005
83	20.75	0.30	0.054	(0.094)		0.049	0.005
84	21.00	0.20	0.036	(0.093)		0.032	0.004
85	21.25	0.30	0.054	(0.091)		0.049	0.005
86	21.50	0.20	0.036	(0.090)		0.032	0.004
87	21.75	0.30	0.054	(0.089)		0.049	0.005
88	22.00	0.20	0.036	(0.088)		0.032	0.004
89	22.25	0.30	0.054	(0.088)		0.049	0.005
90	22.50	0.20	0.036	(0.087)		0.032	0.004
91	22.75	0.20	0.036	(0.086)		0.032	0.004
92	23.00	0.20	0.036	(0.085)		0.032	0.004
93	23.25	0.20	0.036	(0.085)		0.032	0.004
94	23.50	0.20	0.036	(0.084)		0.032	0.004
95	23.75	0.20	0.036	(0.084)		0.032	0.004
96	24.00	0.20	0.036	(0.084)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 8.1

Flood volume = Effective rainfall 2.02(In)
times area 7.3(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)
Total soil loss = 2.48(In)
Total soil loss = 1.506(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 53637.1 Cubic Feet
Total soil loss = 65606.7 Cubic Feet

Peak flow rate of this hydrograph = 3.441(CFS)

```
     ------------------------------------------------------------------
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
     ------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

     ------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+15       0.0004      0.02  Q         |         |         |         |
  0+30       0.0011      0.04  Q         |         |         |         |
  0+45       0.0019      0.04  Q         |         |         |         |
  1+ 0       0.0029      0.05  Q         |         |         |         |
  1+15       0.0038      0.04  Q         |         |         |         |
  1+30       0.0046      0.04  Q         |         |         |         |
  1+45       0.0055      0.04  Q         |         |         |         |
  2+ 0       0.0065      0.05  Q         |         |         |         |
  2+15       0.0076      0.05  Q         |         |         |         |
  2+30       0.0087      0.05  Q         |         |         |         |
  2+45       0.0099      0.06  Q         |         |         |         |
  3+ 0       0.0113      0.07  Q         |         |         |         |
  3+15       0.0127      0.07  Q         |         |         |         |
  3+30       0.0140      0.07  Q         |         |         |         |
  3+45       0.0154      0.07  Q         |         |         |         |
  4+ 0       0.0169      0.07  Q         |         |         |         |
  4+15       0.0186      0.08  Q         |         |         |         |
  4+30       0.0204      0.09  Q         |         |         |         |
  4+45       0.0223      0.09  Q         |         |         |         |
  5+ 0       0.0244      0.10  Q         |         |         |         |
  5+15       0.0263      0.09  Q         |         |         |         |
  5+30       0.0281      0.09  Q         |         |         |         |
  5+45       0.0302      0.10  Q         |         |         |         |
  6+ 0       0.0324      0.11  QV        |         |         |         |
  6+15       0.0347      0.11  QV        |         |         |         |
  6+30       0.0372      0.12  QV        |         |         |         |
  6+45       0.0398      0.13  QV        |         |         |         |
  7+ 0       0.0426      0.13  QV        |         |         |         |
  7+15       0.0453      0.13  QV        |         |         |         |
  7+30       0.0482      0.14  QV        |         |         |         |
  7+45       0.0514      0.15  QV        |         |         |         |
  8+ 0       0.0561      0.23  QV        |         |         |         |
  8+15       0.0653      0.45  |QV       |         |         |         |
  8+30       0.0768      0.56  | Q       |         |         |         |
  8+45       0.0906      0.67  | Q       |         |         |         |
  9+ 0       0.1075      0.82  |  Q      |         |         |         |
  9+15       0.1293      1.06  |   Q     |         |         |         |
  9+30       0.1552      1.25  |    Q    |         |         |         |
  9+45       0.1843      1.41  |    Q    |         |         |         |
 10+ 0       0.2164      1.56  |     QV  |         |         |         |
 10+15       0.2375      1.02  |   Q  V  |         |         |         |
 10+30       0.2522      0.71  | Q     V |         |         |         |
 10+45       0.2763      1.16  |   Q   V |         |         |         |
 11+ 0       0.3055      1.41  |    Q   V|         |         |         |
 11+15       0.3332      1.34  |    Q    V         |         |         |
 11+30       0.3604      1.32  |    Q    |V        |         |         |
 11+45       0.3844      1.16  |   Q     | V       |         |         |
 12+ 0       0.4087      1.17  |   Q     |  V      |         |         |
 12+15       0.4468      1.84  |      Q  |   V     |         |         |
 12+30       0.4936      2.27  |         Q|     V  |         |         |
 12+45       0.5453      2.50  |         Q      V  |         |         |
 13+ 0       0.6011      2.70  |         Q        V|         |         |
 13+15       0.6671      3.19  |         | Q        V        |         |
 13+30       0.7382      3.44  |         |  Q      |  V      |         |
 13+45       0.7900      2.51  |         Q         |    V    |         |
 14+ 0       0.8316      2.02  |       Q |         |      V  |         |
 14+15       0.8807      2.38  |         Q|        |       V |         |
 14+30       0.9321      2.49  |         Q|        |         V         |
 14+45       0.9830      2.46  |         Q|        |          V        |
 15+ 0       1.0323      2.39  |         Q|        |         |  V      |
 15+15       1.0792      2.27  |         Q|        |         |    V    |
```

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   15+30       1.1237      2.15  |       Q |         |         |     V   |
   15+45       1.1603      1.77  |      Q  |         |         |      V  |
   16+ 0       1.1935      1.60  |     Q   |         |         |       V |
   16+15       1.2058      0.59  | Q       |         |         |        V|
   16+30       1.2069      0.05  Q         |         |         |        V|
   16+45       1.2078      0.04  Q         |         |         |        V|
   17+ 0       1.2086      0.04  Q         |         |         |        V|
   17+15       1.2098      0.06  Q         |         |         |        V|
   17+30       1.2112      0.07  Q         |         |         |        V|
   17+45       1.2125      0.07  Q         |         |         |        V|
   18+ 0       1.2137      0.06  Q         |         |         |        V|
   18+15       1.2148      0.05  Q         |         |         |        V|
   18+30       1.2159      0.05  Q         |         |         |        V|
   18+45       1.2168      0.04  Q         |         |         |        V|
   19+ 0       1.2175      0.03  Q         |         |         |        V|
   19+15       1.2182      0.04  Q         |         |         |        V|
   19+30       1.2192      0.05  Q         |         |         |        V|
   19+45       1.2201      0.04  Q         |         |         |        V|
   20+ 0       1.2207      0.03  Q         |         |         |        V|
   20+15       1.2215      0.04  Q         |         |         |        V|
   20+30       1.2223      0.04  Q         |         |         |        V|
   20+45       1.2231      0.04  Q         |         |         |        V|
   21+ 0       1.2238      0.03  Q         |         |         |        V|
   21+15       1.2245      0.04  Q         |         |         |        V|
   21+30       1.2251      0.03  Q         |         |         |        V|
   21+45       1.2259      0.04  Q         |         |         |        V|
   22+ 0       1.2265      0.03  Q         |         |         |        V|
   22+15       1.2272      0.04  Q         |         |         |        V|
   22+30       1.2279      0.03  Q         |         |         |        V|
   22+45       1.2284      0.03  Q         |         |         |        V|
   23+ 0       1.2290      0.03  Q         |         |         |        V|
   23+15       1.2295      0.03  Q         |         |         |        V|
   23+30       1.2301      0.03  Q         |         |         |        V|
   23+45       1.2306      0.03  Q         |         |         |        V|
   24+ 0       1.2311      0.03  Q         |         |         |        V|
   24+15       1.2313      0.01  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/25/12 File: SubC624100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C6
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      67.70(Ac.)  =      0.106 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      67.70(Ac.)  =      0.106 Sq. Mi.
Length along longest watercourse =    3400.00(Ft.)
Length along longest watercourse measured to centroid =    2410.00(Ft.)
Length along longest watercourse =      0.644 Mi.
Length along longest watercourse measured to centroid =      0.456 Mi.
Difference in elevation =      68.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.187 Hr.
Lag time =    11.19 Min.
25% of lag time =     2.80 Min.
40% of lag time =     4.48 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       67.70           1.80                121.86

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       67.70           4.50                304.65

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    17.100           76.00         0.000
    49.100           85.00         0.000
```

```
     1.500           90.00         0.000
 Total Area Entered =     67.70(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
76.0  76.0      0.291     0.000        0.291       0.253      0.074
85.0  85.0      0.187     0.000        0.187       0.725      0.136
90.0  90.0      0.130     0.000        0.130       0.022      0.003
                                                  Sum (F) =   0.212
Area averaged mean soil loss (F) (In/Hr) =  0.212
Minimum soil loss rate ((In/Hr)) =  0.106
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

                U n i t  H y d r o g r a p h
                        VALLEY S-Curve
-----------------------------------------------------------------------
                Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.250        134.022         29.108             19.860
    2   0.500        268.045         48.072             32.799
    3   0.750        402.067         12.212              8.332
    4   1.000        536.089          5.424              3.700
    5   1.250        670.111          2.957              2.018
    6   1.500        804.134          2.226              1.519
                                Sum = 100.000   Sum=      68.229
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.374)	0.032	0.004
2	0.50	0.30	0.054	(0.370)	0.049	0.005
3	0.75	0.30	0.054	(0.366)	0.049	0.005
4	1.00	0.40	0.072	(0.362)	0.065	0.007
5	1.25	0.30	0.054	(0.357)	0.049	0.005
6	1.50	0.30	0.054	(0.353)	0.049	0.005
7	1.75	0.30	0.054	(0.349)	0.049	0.005
8	2.00	0.40	0.072	(0.345)	0.065	0.007
9	2.25	0.40	0.072	(0.340)	0.065	0.007
10	2.50	0.40	0.072	(0.336)	0.065	0.007
11	2.75	0.50	0.090	(0.332)	0.081	0.009
12	3.00	0.50	0.090	(0.328)	0.081	0.009
13	3.25	0.50	0.090	(0.324)	0.081	0.009
14	3.50	0.50	0.090	(0.320)	0.081	0.009
15	3.75	0.50	0.090	(0.316)	0.081	0.009
16	4.00	0.60	0.108	(0.312)	0.097	0.011
17	4.25	0.60	0.108	(0.308)	0.097	0.011
18	4.50	0.70	0.126	(0.304)	0.113	0.013
19	4.75	0.70	0.126	(0.300)	0.113	0.013
20	5.00	0.80	0.144	(0.296)	0.130	0.014
21	5.25	0.60	0.108	(0.293)	0.097	0.011
22	5.50	0.70	0.126	(0.289)	0.113	0.013
23	5.75	0.80	0.144	(0.285)	0.130	0.014
24	6.00	0.80	0.144	(0.281)	0.130	0.014
25	6.25	0.90	0.162	(0.277)	0.146	0.016
26	6.50	0.90	0.162	(0.274)	0.146	0.016
27	6.75	1.00	0.180	(0.270)	0.162	0.018
28	7.00	1.00	0.180	(0.266)	0.162	0.018
29	7.25	1.00	0.180	(0.263)	0.162	0.018
30	7.50	1.10	0.198	(0.259)	0.178	0.020
31	7.75	1.20	0.216	(0.256)	0.194	0.022
32	8.00	1.30	0.234	(0.252)	0.211	0.023

33	8.25	1.50	0.270	(	0.249)		0.243	0.027
34	8.50	1.50	0.270	(	0.245)		0.243	0.027
35	8.75	1.60	0.288		0.242	(	0.259)	0.046
36	9.00	1.70	0.306		0.238	(	0.275)	0.068
37	9.25	1.90	0.342		0.235	(	0.308)	0.107
38	9.50	2.00	0.360		0.232	(	0.324)	0.128
39	9.75	2.10	0.378		0.228	(	0.340)	0.150
40	10.00	2.20	0.396		0.225	(	0.356)	0.171
41	10.25	1.50	0.270		0.222	(	0.243)	0.048
42	10.50	1.50	0.270		0.219	(	0.243)	0.051
43	10.75	2.00	0.360		0.215	(	0.324)	0.145
44	11.00	2.00	0.360		0.212	(	0.324)	0.148
45	11.25	1.90	0.342		0.209	(	0.308)	0.133
46	11.50	1.90	0.342		0.206	(	0.308)	0.136
47	11.75	1.70	0.306		0.203	(	0.275)	0.103
48	12.00	1.80	0.324		0.200	(	0.292)	0.124
49	12.25	2.50	0.450		0.197	(	0.405)	0.253
50	12.50	2.60	0.468		0.194	(	0.421)	0.274
51	12.75	2.80	0.504		0.191	(	0.454)	0.313
52	13.00	2.90	0.522		0.188	(	0.470)	0.334
53	13.25	3.40	0.612		0.185	(	0.551)	0.427
54	13.50	3.40	0.612		0.183	(	0.551)	0.429
55	13.75	2.30	0.414		0.180	(	0.373)	0.234
56	14.00	2.30	0.414		0.177	(	0.373)	0.237
57	14.25	2.70	0.486		0.174	(	0.437)	0.312
58	14.50	2.60	0.468		0.172	(	0.421)	0.296
59	14.75	2.60	0.468		0.169	(	0.421)	0.299
60	15.00	2.50	0.450		0.166	(	0.405)	0.283
61	15.25	2.40	0.432		0.164	(	0.389)	0.268
62	15.50	2.30	0.414		0.161	(	0.373)	0.253
63	15.75	1.90	0.342		0.159	(	0.308)	0.183
64	16.00	1.90	0.342		0.157	(	0.308)	0.185
65	16.25	0.40	0.072	(	0.154)		0.065	0.007
66	16.50	0.40	0.072	(	0.152)		0.065	0.007
67	16.75	0.30	0.054	(	0.149)		0.049	0.005
68	17.00	0.30	0.054	(	0.147)		0.049	0.005
69	17.25	0.50	0.090	(	0.145)		0.081	0.009
70	17.50	0.50	0.090	(	0.143)		0.081	0.009
71	17.75	0.50	0.090	(	0.141)		0.081	0.009
72	18.00	0.40	0.072	(	0.139)		0.065	0.007
73	18.25	0.40	0.072	(	0.137)		0.065	0.007
74	18.50	0.40	0.072	(	0.135)		0.065	0.007
75	18.75	0.30	0.054	(	0.133)		0.049	0.005
76	19.00	0.20	0.036	(	0.131)		0.032	0.004
77	19.25	0.30	0.054	(	0.129)		0.049	0.005
78	19.50	0.40	0.072	(	0.127)		0.065	0.007
79	19.75	0.30	0.054	(	0.125)		0.049	0.005
80	20.00	0.20	0.036	(	0.124)		0.032	0.004
81	20.25	0.30	0.054	(	0.122)		0.049	0.005
82	20.50	0.30	0.054	(	0.120)		0.049	0.005
83	20.75	0.30	0.054	(	0.119)		0.049	0.005
84	21.00	0.20	0.036	(	0.118)		0.032	0.004
85	21.25	0.30	0.054	(	0.116)		0.049	0.005
86	21.50	0.20	0.036	(	0.115)		0.032	0.004
87	21.75	0.30	0.054	(	0.114)		0.049	0.005
88	22.00	0.20	0.036	(	0.112)		0.032	0.004
89	22.25	0.30	0.054	(	0.111)		0.049	0.005
90	22.50	0.20	0.036	(	0.110)		0.032	0.004
91	22.75	0.20	0.036	(	0.109)		0.032	0.004
92	23.00	0.20	0.036	(	0.108)		0.032	0.004
93	23.25	0.20	0.036	(	0.108)		0.032	0.004
94	23.50	0.20	0.036	(	0.107)		0.032	0.004
95	23.75	0.20	0.036	(	0.106)		0.032	0.004
96	24.00	0.20	0.036	(	0.106)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.7

Flood volume = Effective rainfall 1.68(In)

times area 67.7(Ac.)/[(In)/(Ft.)] = 9.5(Ac.Ft)

Total soil loss = 2.82(In)

Total soil loss = 15.888(Ac.Ft)

Total rainfall = 4.50(In)

```
Flood volume =      413649.4 Cubic Feet
Total soil loss =      692083.9 Cubic Feet
-----------------------------------------------------------------------
 Peak flow rate of this hydrograph =     27.407(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f     H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-----------------------------------------------------------------------
  0+15       0.0015      0.07  Q         |         |         |         |
  0+30       0.0061      0.23  Q         |         |         |         |
  0+45       0.0126      0.31  Q         |         |         |         |
  1+ 0       0.0205      0.38  Q         |         |         |         |
  1+15       0.0290      0.42  Q         |         |         |         |
  1+30       0.0369      0.38  Q         |         |         |         |
  1+45       0.0447      0.38  Q         |         |         |         |
  2+ 0       0.0531      0.41  Q         |         |         |         |
  2+15       0.0627      0.47  Q         |         |         |         |
  2+30       0.0726      0.48  Q         |         |         |         |
  2+45       0.0834      0.52  Q         |         |         |         |
  3+ 0       0.0954      0.58  Q         |         |         |         |
  3+15       0.1079      0.60  Q         |         |         |         |
  3+30       0.1204      0.61  Q         |         |         |         |
  3+45       0.1330      0.61  Q         |         |         |         |
  4+ 0       0.1465      0.65  Q         |         |         |         |
  4+15       0.1611      0.71  Q         |         |         |         |
  4+30       0.1768      0.76  VQ        |         |         |         |
  4+45       0.1939      0.83  VQ        |         |         |         |
  5+ 0       0.2121      0.88  VQ        |         |         |         |
  5+15       0.2302      0.88  VQ        |         |         |         |
  5+30       0.2470      0.81   Q        |         |         |         |
  5+45       0.2653      0.89  |Q        |         |         |         |
  6+ 0       0.2850      0.95  |Q        |         |         |         |
  6+15       0.3057      1.00  |Q        |         |         |         |
  6+30       0.3278      1.07  |Q        |         |         |         |
  6+45       0.3511      1.13  |Q        |         |         |         |
  7+ 0       0.3758      1.19  |Q        |         |         |         |
  7+15       0.4008      1.21  |Q        |         |         |         |
  7+30       0.4268      1.26  |Q        |         |         |         |
  7+45       0.4548      1.36  |Q        |         |         |         |
  8+ 0       0.4852      1.47  |QV       |         |         |         |
  8+15       0.5187      1.62  | Q       |         |         |         |
  8+30       0.5551      1.76  | Q       |         |         |         |
  8+45       0.6004      2.19  | Q       |         |         |         |
  9+ 0       0.6679      3.27  | V Q     |         |         |         |
  9+15       0.7695      4.92  |  V  Q   |         |         |         |
  9+30       0.9119      6.89  |  V     Q|         |         |         |
  9+45       1.0868      8.46  |   V     |Q        |         |         |
 10+ 0       1.2930      9.98  |    V    |  Q      |         |         |
 10+15       1.4708      8.61  |     V   |Q        |         |         |
 10+30       1.5742      5.00  |     Q   |         |         |         |
 10+45       1.7001      6.09  |      VQ |         |         |         |
 11+ 0       1.8832      8.86  |      V  |Q        |         |         |
 11+15       2.0741      9.24  |       V | Q       |         |         |
 11+30       2.2601      9.00  |        V| Q       |         |         |
 11+45       2.4364      8.53  |         VQ        |         |         |
 12+ 0       2.6014      7.99  |         Q         |         |         |
 12+15       2.8277     10.95  |         |V  Q     |         |         |
 12+30       3.1508     15.64  |         |  V      Q         |         |
 12+45       3.5266     18.19  |         |   V     |   Q     |         |
 13+ 0       3.9506     20.52  |         |     V   |       Q |         |
 13+15       4.4413     23.75  |         |       V |         |Q        |
 13+30       5.0076     27.41  |         |          V        |     Q   |
 13+45       5.5155     24.58  |         |          |  V     | Q       |
 14+ 0       5.9018     18.70  |         |          |   Q    |         |
 14+15       6.2918     18.88  |         |          |    QV  |         |
```

```
   14+30       6.7147     20.47  |         |         |      QV |         |
   14+45       7.1333     20.26  |         |         |      Q  V         |
   15+ 0       7.5444     19.90  |         |         |     Q    V        |
   15+15       7.9412     19.21  |         |         |    Q     |  V      |
   15+30       8.3204     18.35  |         |         |   Q      |    V    |
   15+45       8.6564     16.26  |         |         |Q         |     V   |
   16+ 0       8.9418     13.81  |         |       Q |          |      V  |
   16+15       9.1414      9.66  |         | Q       |          |       V |
   16+30       9.2141      3.52  |   Q     |         |          |       V |
   16+45       9.2522      1.84  | Q       |         |          |       V |
   17+ 0       9.2734      1.02  |Q        |         |          |        V|
   17+15       9.2883      0.72  Q         |         |          |        V|
   17+30       9.3000      0.56  Q         |         |          |        V|
   17+45       9.3122      0.59  Q         |         |          |        V|
   18+ 0       9.3239      0.57  Q         |         |          |        V|
   18+15       9.3345      0.51  Q         |         |          |        V|
   18+30       9.3449      0.50  Q         |         |          |        V|
   18+45       9.3545      0.46  Q         |         |          |        V|
   19+ 0       9.3620      0.36  Q         |         |          |        V|
   19+15       9.3687      0.32  Q         |         |          |        V|
   19+30       9.3768      0.40  Q         |         |          |        V|
   19+45       9.3856      0.42  Q         |         |          |        V|
   20+ 0       9.3927      0.34  Q         |         |          |        V|
   20+15       9.3992      0.31  Q         |         |          |        V|
   20+30       9.4066      0.36  Q         |         |          |        V|
   20+45       9.4141      0.36  Q         |         |          |        V|
   21+ 0       9.4209      0.33  Q         |         |          |        V|
   21+15       9.4272      0.31  Q         |         |          |        V|
   21+30       9.4338      0.32  Q         |         |          |        V|
   21+45       9.4401      0.30  Q         |         |          |        V|
   22+ 0       9.4465      0.31  Q         |         |          |        V|
   22+15       9.4527      0.30  Q         |         |          |        V|
   22+30       9.4592      0.31  Q         |         |          |        V|
   22+45       9.4647      0.26  Q         |         |          |        V|
   23+ 0       9.4700      0.26  Q         |         |          |        V|
   23+15       9.4751      0.25  Q         |         |          |        V|
   23+30       9.4803      0.25  Q         |         |          |        V|
   23+45       9.4853      0.25  Q         |         |          |        V|
   24+ 0       9.4904      0.25  Q         |         |          |        V|
   24+15       9.4940      0.17  Q         |         |          |        V|
   24+30       9.4952      0.06  Q         |         |          |        V|
   24+45       9.4957      0.03  Q         |         |          |        V|
   25+ 0       9.4960      0.01  Q         |         |          |        V|
   25+15       9.4961      0.01  Q         |         |          |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/25/12 File: SubC724100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C6
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =      70.70(Ac.)  =      0.110 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      70.70(Ac.)  =      0.110 Sq. Mi.
Length along longest watercourse =    3100.00(Ft.)
Length along longest watercourse measured to centroid =    3020.00(Ft.)
Length along longest watercourse =      0.587 Mi.
Length along longest watercourse measured to centroid =      0.572 Mi.
Difference in elevation =      54.00(Ft.)
Slope along watercourse =     91.9742 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.201 Hr.
Lag time =    12.09 Min.
25% of lag time =     3.02 Min.
40% of lag time =     4.83 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       70.70           1.80                127.26

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       70.70           4.50                318.15

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    38.300           76.00         0.000
    32.400           85.00         0.000
```

Total Area Entered = 70.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.542	0.158
85.0	85.0	0.187	0.000	0.187	0.458	0.086
					Sum (F) =	0.243

Area averaged mean soil loss (F) (In/Hr) = 0.243
Minimum soil loss rate ((In/Hr)) = 0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	124.104	26.376	18.793
2	0.500	248.208	48.571	34.608
3	0.750	372.312	12.961	9.235
4	1.000	496.416	5.838	4.160
5	1.250	620.520	3.254	2.318
6	1.500	744.624	1.813	1.292
7	1.750	868.728	1.188	0.847
		Sum = 100.000	Sum=	71.252

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.430)	0.032	0.004
2	0.50	0.30	0.054	(0.425)	0.049	0.005
3	0.75	0.30	0.054	(0.420)	0.049	0.005
4	1.00	0.40	0.072	(0.415)	0.065	0.007
5	1.25	0.30	0.054	(0.410)	0.049	0.005
6	1.50	0.30	0.054	(0.405)	0.049	0.005
7	1.75	0.30	0.054	(0.400)	0.049	0.005
8	2.00	0.40	0.072	(0.396)	0.065	0.007
9	2.25	0.40	0.072	(0.391)	0.065	0.007
10	2.50	0.40	0.072	(0.386)	0.065	0.007
11	2.75	0.50	0.090	(0.381)	0.081	0.009
12	3.00	0.50	0.090	(0.377)	0.081	0.009
13	3.25	0.50	0.090	(0.372)	0.081	0.009
14	3.50	0.50	0.090	(0.367)	0.081	0.009
15	3.75	0.50	0.090	(0.363)	0.081	0.009
16	4.00	0.60	0.108	(0.358)	0.097	0.011
17	4.25	0.60	0.108	(0.354)	0.097	0.011
18	4.50	0.70	0.126	(0.349)	0.113	0.013
19	4.75	0.70	0.126	(0.345)	0.113	0.013
20	5.00	0.80	0.144	(0.340)	0.130	0.014
21	5.25	0.60	0.108	(0.336)	0.097	0.011
22	5.50	0.70	0.126	(0.331)	0.113	0.013
23	5.75	0.80	0.144	(0.327)	0.130	0.014
24	6.00	0.80	0.144	(0.323)	0.130	0.014
25	6.25	0.90	0.162	(0.318)	0.146	0.016
26	6.50	0.90	0.162	(0.314)	0.146	0.016
27	6.75	1.00	0.180	(0.310)	0.162	0.018
28	7.00	1.00	0.180	(0.306)	0.162	0.018
29	7.25	1.00	0.180	(0.302)	0.162	0.018
30	7.50	1.10	0.198	(0.298)	0.178	0.020
31	7.75	1.20	0.216	(0.294)	0.194	0.022
32	8.00	1.30	0.234	(0.289)	0.211	0.023
33	8.25	1.50	0.270	(0.285)	0.243	0.027

34	8.50	1.50	0.270	(	0.281)		0.243	0.027
35	8.75	1.60	0.288	(	0.278)		0.259	0.029
36	9.00	1.70	0.306		0.274	(	0.275)	0.032
37	9.25	1.90	0.342		0.270	(	0.308)	0.072
38	9.50	2.00	0.360		0.266	(	0.324)	0.094
39	9.75	2.10	0.378		0.262	(	0.340)	0.116
40	10.00	2.20	0.396		0.258	(	0.356)	0.138
41	10.25	1.50	0.270	(	0.255)		0.243	0.027
42	10.50	1.50	0.270	(	0.251)		0.243	0.027
43	10.75	2.00	0.360		0.247	(	0.324)	0.113
44	11.00	2.00	0.360		0.244	(	0.324)	0.116
45	11.25	1.90	0.342		0.240	(	0.308)	0.102
46	11.50	1.90	0.342		0.237	(	0.308)	0.105
47	11.75	1.70	0.306		0.233	(	0.275)	0.073
48	12.00	1.80	0.324		0.230	(	0.292)	0.094
49	12.25	2.50	0.450		0.226	(	0.405)	0.224
50	12.50	2.60	0.468		0.223	(	0.421)	0.245
51	12.75	2.80	0.504		0.219	(	0.454)	0.285
52	13.00	2.90	0.522		0.216	(	0.470)	0.306
53	13.25	3.40	0.612		0.213	(	0.551)	0.399
54	13.50	3.40	0.612		0.210	(	0.551)	0.402
55	13.75	2.30	0.414		0.206	(	0.373)	0.208
56	14.00	2.30	0.414		0.203	(	0.373)	0.211
57	14.25	2.70	0.486		0.200	(	0.437)	0.286
58	14.50	2.60	0.468		0.197	(	0.421)	0.271
59	14.75	2.60	0.468		0.194	(	0.421)	0.274
60	15.00	2.50	0.450		0.191	(	0.405)	0.259
61	15.25	2.40	0.432		0.188	(	0.389)	0.244
62	15.50	2.30	0.414		0.185	(	0.373)	0.229
63	15.75	1.90	0.342		0.182	(	0.308)	0.159
64	16.00	1.90	0.342		0.180	(	0.308)	0.162
65	16.25	0.40	0.072	(	0.177)		0.065	0.007
66	16.50	0.40	0.072	(	0.174)		0.065	0.007
67	16.75	0.30	0.054	(	0.172)		0.049	0.005
68	17.00	0.30	0.054	(	0.169)		0.049	0.005
69	17.25	0.50	0.090	(	0.166)		0.081	0.009
70	17.50	0.50	0.090	(	0.164)		0.081	0.009
71	17.75	0.50	0.090	(	0.162)		0.081	0.009
72	18.00	0.40	0.072	(	0.159)		0.065	0.007
73	18.25	0.40	0.072	(	0.157)		0.065	0.007
74	18.50	0.40	0.072	(	0.155)		0.065	0.007
75	18.75	0.30	0.054	(	0.152)		0.049	0.005
76	19.00	0.20	0.036	(	0.150)		0.032	0.004
77	19.25	0.30	0.054	(	0.148)		0.049	0.005
78	19.50	0.40	0.072	(	0.146)		0.065	0.007
79	19.75	0.30	0.054	(	0.144)		0.049	0.005
80	20.00	0.20	0.036	(	0.142)		0.032	0.004
81	20.25	0.30	0.054	(	0.140)		0.049	0.005
82	20.50	0.30	0.054	(	0.138)		0.049	0.005
83	20.75	0.30	0.054	(	0.137)		0.049	0.005
84	21.00	0.20	0.036	(	0.135)		0.032	0.004
85	21.25	0.30	0.054	(	0.133)		0.049	0.005
86	21.50	0.20	0.036	(	0.132)		0.032	0.004
87	21.75	0.30	0.054	(	0.130)		0.049	0.005
88	22.00	0.20	0.036	(	0.129)		0.032	0.004
89	22.25	0.30	0.054	(	0.128)		0.049	0.005
90	22.50	0.20	0.036	(	0.127)		0.032	0.004
91	22.75	0.20	0.036	(	0.125)		0.032	0.004
92	23.00	0.20	0.036	(	0.124)		0.032	0.004
93	23.25	0.20	0.036	(	0.124)		0.032	0.004
94	23.50	0.20	0.036	(	0.123)		0.032	0.004
95	23.75	0.20	0.036	(	0.122)		0.032	0.004
96	24.00	0.20	0.036	(	0.122)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.9

Flood volume = Effective rainfall 1.47(In)
times area 70.7(Ac.)/[(In)/(Ft.)] = 8.7(Ac.Ft)
Total soil loss = 3.03(In)
Total soil loss = 17.823(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 378339.2 Cubic Feet

```
Total soil loss =      776385.8 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =     26.333(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-----------------------------------------------------------------------
  0+15       0.0014      0.07  Q         |         |         |         |
  0+30       0.0061      0.23  Q         |         |         |         |
  0+45       0.0127      0.32  Q         |         |         |         |
  1+ 0       0.0207      0.39  Q         |         |         |         |
  1+15       0.0296      0.43  Q         |         |         |         |
  1+30       0.0378      0.39  Q         |         |         |         |
  1+45       0.0459      0.39  Q         |         |         |         |
  2+ 0       0.0546      0.42  Q         |         |         |         |
  2+15       0.0646      0.48  Q         |         |         |         |
  2+30       0.0749      0.50  Q         |         |         |         |
  2+45       0.0860      0.54  Q         |         |         |         |
  3+ 0       0.0986      0.61  Q         |         |         |         |
  3+15       0.1115      0.62  Q         |         |         |         |
  3+30       0.1245      0.63  Q         |         |         |         |
  3+45       0.1377      0.64  Q         |         |         |         |
  4+ 0       0.1516      0.67  Q         |         |         |         |
  4+15       0.1669      0.74  Q         |         |         |         |
  4+30       0.1832      0.79  VQ        |         |         |         |
  4+45       0.2009      0.86  VQ        |         |         |         |
  5+ 0       0.2197      0.91   Q        |         |         |         |
  5+15       0.2387      0.92  |Q        |         |         |         |
  5+30       0.2562      0.85  |Q        |         |         |         |
  5+45       0.2753      0.92  |Q        |         |         |         |
  6+ 0       0.2957      0.99  |Q        |         |         |         |
  6+15       0.3173      1.04  |Q        |         |         |         |
  6+30       0.3403      1.11  |Q        |         |         |         |
  6+45       0.3644      1.17  |Q        |         |         |         |
  7+ 0       0.3901      1.24  |Q        |         |         |         |
  7+15       0.4162      1.26  |Q        |         |         |         |
  7+30       0.4432      1.31  |QV       |         |         |         |
  7+45       0.4723      1.41  |QV       |         |         |         |
  8+ 0       0.5038      1.52  | Q       |         |         |         |
  8+15       0.5385      1.68  | Q       |         |         |         |
  8+30       0.5764      1.83  | Q       |         |         |         |
  8+45       0.6159      1.91  | Q       |         |         |         |
  9+ 0       0.6586      2.07  | QV      |         |         |         |
  9+15       0.7199      2.97  |  Q      |         |         |         |
  9+30       0.8192      4.81  |  V  Q   |         |         |         |
  9+45       0.9506      6.36  |   V   Q |         |         |         |
 10+ 0       1.1139      7.90  |    V    Q         |         |         |
 10+15       1.2579      6.97  |    V   Q|         |         |         |
 10+30       1.3310      3.53  |   Q V   |         |         |         |
 10+45       1.4204      4.33  |    QV   |         |         |         |
 11+ 0       1.5650      7.00  |      V Q|         |         |         |
 11+15       1.7186      7.44  |      V Q|         |         |         |
 11+30       1.8688      7.27  |       VQ|         |         |         |
 11+45       2.0086      6.77  |        Q|         |         |         |
 12+ 0       2.1354      6.14  |       QV|         |         |         |
 12+15       2.3229      9.07  |         V Q       |         |         |
 12+30       2.6124     14.01  |          | V     Q |         |         |
 12+45       2.9573     16.69  |          |  V      | Q       |         |
 13+ 0       3.3541     19.20  |          |    V    |    Q    |         |
 13+15       3.8179     22.45  |          |      V  |         Q|         |
 13+30       4.3619     26.33  |          |         V         |    Q    |
 13+45       4.8570     23.96  |          |           V       |Q        |
 14+ 0       5.2250     17.81  |          |          |  QV    |         |
 14+15       5.5932     17.82  |          |          |  Q V   |         |
 14+30       5.9962     19.51  |          |          |     QV |         |
```

```
   14+45       6.3967     19.38  |         |         |    Q   V|         |
   15+ 0       6.7921     19.14  |         |         |    Q     V        |
   15+15       7.1705     18.31  |         |         |   Q     |  V      |
   15+30       7.5309     17.45  |         |         |  Q      |   V     |
   15+45       7.8506     15.47  |         |        Q        |     V   |
   16+ 0       8.1168     12.88  |         |      Q  |         |      V  |
   16+15       8.3091      9.31  |         | Q       |         |       V |
   16+30       8.3838      3.61  |   Q     |         |         |       V |
   16+45       8.4244      1.96  | Q       |         |         |       V |
   17+ 0       8.4483      1.16  |Q        |         |         |       V |
   17+15       8.4648      0.80  |Q        |         |         |       V |
   17+30       8.4796      0.72  Q         |         |         |        V|
   17+45       8.4923      0.61  Q         |         |         |        V|
   18+ 0       8.5046      0.59  Q         |         |         |        V|
   18+15       8.5157      0.54  Q         |         |         |        V|
   18+30       8.5265      0.53  Q         |         |         |        V|
   18+45       8.5366      0.49  Q         |         |         |        V|
   19+ 0       8.5446      0.39  Q         |         |         |        V|
   19+15       8.5516      0.34  Q         |         |         |        V|
   19+30       8.5601      0.41  Q         |         |         |        V|
   19+45       8.5693      0.44  Q         |         |         |        V|
   20+ 0       8.5768      0.37  Q         |         |         |        V|
   20+15       8.5836      0.33  Q         |         |         |        V|
   20+30       8.5912      0.37  Q         |         |         |        V|
   20+45       8.5991      0.38  Q         |         |         |        V|
   21+ 0       8.6063      0.35  Q         |         |         |        V|
   21+15       8.6129      0.32  Q         |         |         |        V|
   21+30       8.6198      0.33  Q         |         |         |        V|
   21+45       8.6263      0.32  Q         |         |         |        V|
   22+ 0       8.6331      0.33  Q         |         |         |        V|
   22+15       8.6396      0.31  Q         |         |         |        V|
   22+30       8.6464      0.33  Q         |         |         |        V|
   22+45       8.6521      0.28  Q         |         |         |        V|
   23+ 0       8.6576      0.27  Q         |         |         |        V|
   23+15       8.6631      0.26  Q         |         |         |        V|
   23+30       8.6684      0.26  Q         |         |         |        V|
   23+45       8.6737      0.26  Q         |         |         |        V|
   24+ 0       8.6790      0.26  Q         |         |         |        V|
   24+15       8.6830      0.19  Q         |         |         |        V|
   24+30       8.6843      0.06  Q         |         |         |        V|
   24+45       8.6849      0.03  Q         |         |         |        V|
   25+ 0       8.6853      0.02  Q         |         |         |        V|
   25+15       8.6854      0.01  Q         |         |         |        V|
   25+30       8.6855      0.00  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/07/12 File: SUBC824100.out


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----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 2, Existing Condition
Subarea C8
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     116.90(Ac.)  =      0.183 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     116.90(Ac.)  =      0.183 Sq. Mi.
Length along longest watercourse =    5100.00(Ft.)
Length along longest watercourse measured to centroid =    2050.00(Ft.)
Length along longest watercourse =      0.966 Mi.
Length along longest watercourse measured to centroid =      0.388 Mi.
Difference in elevation =     122.00(Ft.)
Slope along watercourse =    126.3059 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.198 Hr.
Lag time =    11.87 Min.
25% of lag time =     2.97 Min.
40% of lag time =     4.75 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      116.90           1.80                 210.42

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      116.90           4.80                 561.12

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.800(In)

Point rain (area averaged) =    4.800(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.799(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    33.300           76.00         0.000
    83.600           85.00         0.000
```

Total Area Entered = 116.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.285	0.083
85.0	85.0	0.187	0.000	0.187	0.715	0.134
					Sum (F) =	0.217

Area averaged mean soil loss (F) (In/Hr) = 0.217
Minimum soil loss rate ((In/Hr)) = 0.108
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	126.397	27.023	31.837
2	0.500	252.794	48.469	57.102
3	0.750	379.191	12.777	15.053
4	1.000	505.588	5.742	6.765
5	1.250	631.985	3.180	3.747
6	1.500	758.382	1.756	2.069
7	1.750	884.779	1.053	1.241
			Sum = 100.000	Sum= 117.813

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.038	(0.383)	0.035	0.004
2	0.50	0.30	0.058	(0.378)	0.052	0.006
3	0.75	0.30	0.058	(0.374)	0.052	0.006
4	1.00	0.40	0.077	(0.369)	0.069	0.008
5	1.25	0.30	0.058	(0.365)	0.052	0.006
6	1.50	0.30	0.058	(0.361)	0.052	0.006
7	1.75	0.30	0.058	(0.356)	0.052	0.006
8	2.00	0.40	0.077	(0.352)	0.069	0.008
9	2.25	0.40	0.077	(0.348)	0.069	0.008
10	2.50	0.40	0.077	(0.344)	0.069	0.008
11	2.75	0.50	0.096	(0.339)	0.086	0.010
12	3.00	0.50	0.096	(0.335)	0.086	0.010
13	3.25	0.50	0.096	(0.331)	0.086	0.010
14	3.50	0.50	0.096	(0.327)	0.086	0.010
15	3.75	0.50	0.096	(0.323)	0.086	0.010
16	4.00	0.60	0.115	(0.319)	0.104	0.012
17	4.25	0.60	0.115	(0.315)	0.104	0.012
18	4.50	0.70	0.134	(0.311)	0.121	0.013
19	4.75	0.70	0.134	(0.307)	0.121	0.013
20	5.00	0.80	0.154	(0.303)	0.138	0.015
21	5.25	0.60	0.115	(0.299)	0.104	0.012
22	5.50	0.70	0.134	(0.295)	0.121	0.013
23	5.75	0.80	0.154	(0.291)	0.138	0.015
24	6.00	0.80	0.154	(0.287)	0.138	0.015
25	6.25	0.90	0.173	(0.283)	0.155	0.017
26	6.50	0.90	0.173	(0.280)	0.155	0.017
27	6.75	1.00	0.192	(0.276)	0.173	0.019
28	7.00	1.00	0.192	(0.272)	0.173	0.019
29	7.25	1.00	0.192	(0.269)	0.173	0.019
30	7.50	1.10	0.211	(0.265)	0.190	0.021
31	7.75	1.20	0.230	(0.261)	0.207	0.023
32	8.00	1.30	0.250	(0.258)	0.225	0.025
33	8.25	1.50	0.288	0.254	(0.259)	0.034

34	8.50	1.50	0.288	0.251	(	0.259)	0.037
35	8.75	1.60	0.307	0.247	(	0.276)	0.060
36	9.00	1.70	0.326	0.244	(	0.294)	0.083
37	9.25	1.90	0.365	0.240	(	0.328)	0.125
38	9.50	2.00	0.384	0.237	(	0.346)	0.147
39	9.75	2.10	0.403	0.233	(	0.363)	0.170
40	10.00	2.20	0.422	0.230	(	0.380)	0.192
41	10.25	1.50	0.288	0.227	(	0.259)	0.061
42	10.50	1.50	0.288	0.223	(	0.259)	0.065
43	10.75	2.00	0.384	0.220	(	0.346)	0.164
44	11.00	2.00	0.384	0.217	(	0.346)	0.167
45	11.25	1.90	0.365	0.214	(	0.328)	0.151
46	11.50	1.90	0.365	0.211	(	0.328)	0.154
47	11.75	1.70	0.326	0.207	(	0.294)	0.119
48	12.00	1.80	0.346	0.204	(	0.311)	0.141
49	12.25	2.50	0.480	0.201	(	0.432)	0.279
50	12.50	2.60	0.499	0.198	(	0.449)	0.301
51	12.75	2.80	0.537	0.195	(	0.484)	0.342
52	13.00	2.90	0.557	0.192	(	0.501)	0.364
53	13.25	3.40	0.653	0.189	(	0.587)	0.463
54	13.50	3.40	0.653	0.187	(	0.587)	0.466
55	13.75	2.30	0.441	0.184	(	0.397)	0.258
56	14.00	2.30	0.441	0.181	(	0.397)	0.261
57	14.25	2.70	0.518	0.178	(	0.466)	0.340
58	14.50	2.60	0.499	0.175	(	0.449)	0.324
59	14.75	2.60	0.499	0.173	(	0.449)	0.326
60	15.00	2.50	0.480	0.170	(	0.432)	0.310
61	15.25	2.40	0.461	0.168	(	0.415)	0.293
62	15.50	2.30	0.441	0.165	(	0.397)	0.277
63	15.75	1.90	0.365	0.162	(	0.328)	0.202
64	16.00	1.90	0.365	0.160	(	0.328)	0.205
65	16.25	0.40	0.077	(	0.157)	0.069	0.008
66	16.50	0.40	0.077	(	0.155)	0.069	0.008
67	16.75	0.30	0.058	(	0.153)	0.052	0.006
68	17.00	0.30	0.058	(	0.150)	0.052	0.006
69	17.25	0.50	0.096	(	0.148)	0.086	0.010
70	17.50	0.50	0.096	(	0.146)	0.086	0.010
71	17.75	0.50	0.096	(	0.144)	0.086	0.010
72	18.00	0.40	0.077	(	0.142)	0.069	0.008
73	18.25	0.40	0.077	(	0.140)	0.069	0.008
74	18.50	0.40	0.077	(	0.138)	0.069	0.008
75	18.75	0.30	0.058	(	0.136)	0.052	0.006
76	19.00	0.20	0.038	(	0.134)	0.035	0.004
77	19.25	0.30	0.058	(	0.132)	0.052	0.006
78	19.50	0.40	0.077	(	0.130)	0.069	0.008
79	19.75	0.30	0.058	(	0.128)	0.052	0.006
80	20.00	0.20	0.038	(	0.126)	0.035	0.004
81	20.25	0.30	0.058	(	0.125)	0.052	0.006
82	20.50	0.30	0.058	(	0.123)	0.052	0.006
83	20.75	0.30	0.058	(	0.122)	0.052	0.006
84	21.00	0.20	0.038	(	0.120)	0.035	0.004
85	21.25	0.30	0.058	(	0.119)	0.052	0.006
86	21.50	0.20	0.038	(	0.117)	0.035	0.004
87	21.75	0.30	0.058	(	0.116)	0.052	0.006
88	22.00	0.20	0.038	(	0.115)	0.035	0.004
89	22.25	0.30	0.058	(	0.114)	0.052	0.006
90	22.50	0.20	0.038	(	0.113)	0.035	0.004
91	22.75	0.20	0.038	(	0.112)	0.035	0.004
92	23.00	0.20	0.038	(	0.111)	0.035	0.004
93	23.25	0.20	0.038	(	0.110)	0.035	0.004
94	23.50	0.20	0.038	(	0.109)	0.035	0.004
95	23.75	0.20	0.038	(	0.109)	0.035	0.004
96	24.00	0.20	0.038	(	0.108)	0.035	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.86(In)
times area 116.9(Ac.)/[(In)/(Ft.)] = 18.2(Ac.Ft)
Total soil loss = 2.93(In)
Total soil loss = 28.584(Ac.Ft)
Total rainfall = 4.80(In)
Flood volume = 791287.0 Cubic Feet

```
Total soil loss =     1245113.6 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =     50.996(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
-----------------------------------------------------------------------
  0+15       0.0025      0.12  Q         |         |         |         |
  0+30       0.0108      0.40  Q         |         |         |         |
  0+45       0.0226      0.57  Q         |         |         |         |
  1+ 0       0.0368      0.69  Q         |         |         |         |
  1+15       0.0526      0.76  Q         |         |         |         |
  1+30       0.0670      0.70  Q         |         |         |         |
  1+45       0.0812      0.69  Q         |         |         |         |
  2+ 0       0.0966      0.75  Q         |         |         |         |
  2+15       0.1143      0.85  Q         |         |         |         |
  2+30       0.1325      0.88  Q         |         |         |         |
  2+45       0.1522      0.95  Q         |         |         |         |
  3+ 0       0.1742      1.07  Q         |         |         |         |
  3+15       0.1970      1.10  Q         |         |         |         |
  3+30       0.2201      1.12  Q         |         |         |         |
  3+45       0.2434      1.12  Q         |         |         |         |
  4+ 0       0.2680      1.19  Q         |         |         |         |
  4+15       0.2949      1.30  Q         |         |         |         |
  4+30       0.3236      1.39  Q         |         |         |         |
  4+45       0.3549      1.51  VQ        |         |         |         |
  5+ 0       0.3882      1.61  VQ        |         |         |         |
  5+15       0.4216      1.62  VQ        |         |         |         |
  5+30       0.4525      1.50  Q         |         |         |         |
  5+45       0.4862      1.63  |Q        |         |         |         |
  6+ 0       0.5223      1.75  |Q        |         |         |         |
  6+15       0.5603      1.84  |Q        |         |         |         |
  6+30       0.6010      1.97  |Q        |         |         |         |
  6+45       0.6436      2.06  |Q        |         |         |         |
  7+ 0       0.6888      2.19  |Q        |         |         |         |
  7+15       0.7349      2.23  |Q        |         |         |         |
  7+30       0.7826      2.31  |Q        |         |         |         |
  7+45       0.8340      2.49  |Q        |         |         |         |
  8+ 0       0.8896      2.69  |Q        |         |         |         |
  8+15       0.9543      3.13  | Q       |         |         |         |
  8+30       1.0328      3.80  | Q       |         |         |         |
  8+45       1.1338      4.89  | VQ      |         |         |         |
  9+ 0       1.2791      7.03  | V Q     |         |         |         |
  9+15       1.4871     10.07  |  V  Q   |         |         |         |
  9+30       1.7703     13.71  |  V     Q|         |         |         |
  9+45       2.1134     16.60  |   V     |Q        |         |         |
 10+ 0       2.5136     19.37  |    V    | Q       |         |         |
 10+15       2.8692     17.21  |     V   |Q        |         |         |
 10+30       3.0866     10.52  |     VQ  |         |         |         |
 10+45       3.3394     12.23  |      VQ |         |         |         |
 11+ 0       3.6973     17.33  |       V |Q        |         |         |
 11+15       4.0713     18.10  |       V | Q       |         |         |
 11+30       4.4386     17.78  |        V|Q        |         |         |
 11+45       4.7863     16.83  |         VQ        |         |         |
 12+ 0       5.1103     15.68  |         QV        |         |         |
 12+15       5.5420     20.89  |         | VQ      |         |         |
 12+30       6.1522     29.53  |         |  V     Q|         |         |
 12+45       6.8586     34.19  |         |    V    | Q       |         |
 13+ 0       7.6550     38.54  |         |     V   |    Q    |         |
 13+15       8.5691     44.25  |         |       V |        Q|         |
 13+30       9.6228     51.00  |         |         V         |  Q      |
 13+45      10.5843     46.54  |         |         |  V     |Q        |
 14+ 0      11.3204     35.63  |         |         |  QV     |         |
 14+15      12.0575     35.67  |         |         |  Q  V   |         |
 14+30      12.8544     38.57  |         |         |    Q  V |         |
```

```
   14+45      13.6453     38.28  |         |         |    Q    V         |
   15+ 0      14.4258     37.78  |         |         |    Q     V        |
   15+15      15.1753     36.28  |         |         |   Q     |  V      |
   15+30      15.8918     34.67  |         |         |  Q      |   V     |
   15+45      16.5337     31.07  |         |         Q         |     V   |
   16+ 0      17.0806     26.47  |         |      Q  |         |      V  |
   16+15      17.4733     19.01  |         | Q       |         |       V |
   16+30      17.6214      7.16  |   Q     |         |         |       V |
   16+45      17.7003      3.82  | Q       |         |         |       V |
   17+ 0      17.7459      2.21  |Q        |         |         |        V|
   17+15      17.7764      1.48  Q         |         |         |        V|
   17+30      17.8029      1.28  Q         |         |         |        V|
   17+45      17.8253      1.08  Q         |         |         |        V|
   18+ 0      17.8469      1.05  Q         |         |         |        V|
   18+15      17.8665      0.95  Q         |         |         |        V|
   18+30      17.8856      0.93  Q         |         |         |        V|
   18+45      17.9033      0.86  Q         |         |         |        V|
   19+ 0      17.9174      0.68  Q         |         |         |        V|
   19+15      17.9297      0.60  Q         |         |         |        V|
   19+30      17.9447      0.72  Q         |         |         |        V|
   19+45      17.9608      0.78  Q         |         |         |        V|
   20+ 0      17.9741      0.64  Q         |         |         |        V|
   20+15      17.9860      0.58  Q         |         |         |        V|
   20+30      17.9996      0.65  Q         |         |         |        V|
   20+45      18.0134      0.67  Q         |         |         |        V|
   21+ 0      18.0261      0.61  Q         |         |         |        V|
   21+15      18.0377      0.57  Q         |         |         |        V|
   21+30      18.0499      0.59  Q         |         |         |        V|
   21+45      18.0614      0.56  Q         |         |         |        V|
   22+ 0      18.0734      0.58  Q         |         |         |        V|
   22+15      18.0848      0.55  Q         |         |         |        V|
   22+30      18.0967      0.58  Q         |         |         |        V|
   22+45      18.1069      0.49  Q         |         |         |        V|
   23+ 0      18.1166      0.47  Q         |         |         |        V|
   23+15      18.1261      0.46  Q         |         |         |        V|
   23+30      18.1356      0.46  Q         |         |         |        V|
   23+45      18.1450      0.45  Q         |         |         |        V|
   24+ 0      18.1543      0.45  Q         |         |         |        V|
   24+15      18.1611      0.33  Q         |         |         |        V|
   24+30      18.1634      0.11  Q         |         |         |        V|
   24+45      18.1645      0.05  Q         |         |         |        V|
   25+ 0      18.1651      0.03  Q         |         |         |        V|
   25+15      18.1654      0.01  Q         |         |         |        V|
   25+30      18.1654      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

WSD24hrSt1

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/26/12

Watershed D, Stream 1
Existing Condition
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubD124100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 106
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 156.763 (CFS)
Total volume = 53.095 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 51.000 to Point/Station 52.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 680.00 (Ft.)
Elevation difference = 14.00 (Ft.)
Slope of channel = 0.020588 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 680.00(Ft.) Elevation difference = 14.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 36.459(CFS)
Depth of flow = 0.656(Ft.)
Average velocity = 4.909(Ft/s)
Total flow rate = 36.459(CFS)
Channel flow top width = 12.626(Ft.)
Depth of flow in channel = 0.66(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 4.91(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =   36.459(CFS)
Total capacity of improved channels =     36.459(CFS)
Critical Depth in Channel =    0.71(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    156.763(CFS)
Depth of flow =     1.517(Ft.)
Average velocity =     7.928(Ft/s)
Total flow rate =   156.763(CFS)
Channel flow top width =   16.068(Ft.)
Depth of flow in channel =   1.52(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.93(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  156.763(CFS)
Total capacity of improved channels =    156.763(CFS)
Critical Depth in Channel =    1.75(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8234   Travel time =   1.43 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   8.8285
        dt(routing time-step) =   1.18 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       39.2      78.4     117.6     156.8
----------------------------------------------------------------------
  0+15       0.0970      0.11  O         |         |         |         |
  0+30       0.7144      0.77  O         |         |         |         |
  0+45       1.5042      1.57  O         |         |         |         |
  1+ 0       2.0139      2.05  O         |         |         |         |
  1+15       2.4642      2.50  O         |         |         |         |
  1+30       2.5487      2.55  O         |         |         |         |
  1+45       2.4585      2.45  O         |         |         |         |
  2+ 0       2.4835      2.49  O         |         |         |         |
  2+15       2.7574      2.78  O         |         |         |         |
  2+30       3.0037      3.02  O         |         |         |         |
  2+45       3.1552      3.17  O         |         |         |         |
  3+ 0       3.4944      3.52  O         |         |         |         |
  3+15       3.7773      3.80  O         |         |         |         |
  3+30       3.8936      3.90  O         |         |         |         |
  3+45       3.9531      3.96  |O        |         |         |         |
  4+ 0       4.0361      4.04  |O        |         |         |         |
  4+15       4.3376      4.36  |O        |         |         |         |
  4+30       4.6464      4.67  |O        |         |         |         |
  4+45       5.0391      5.07  |O        |         |         |         |
  5+ 0       5.3986      5.43  |O        |         |         |         |
  5+15       5.7226      5.75  |O        |         |         |         |
  5+30       5.5237      5.50  |O        |         |         |         |
```

5+45	5.4922	5.49	
6+ 0	5.8936	5.93	
6+15	6.2289	6.25	
6+30	6.6306	6.66	
6+45	6.9993	7.03	
7+ 0	7.4260	7.46	
7+15	7.7490	7.77	
7+30	7.9374	7.95	
7+45	8.3432	8.38	
8+ 0	8.9702	9.02	
8+15	9.7279	9.79	
8+30	10.7182	10.80	
8+45	11.4675	11.52	
9+ 0	12.1118	12.16	
9+15	13.7491	13.88	
9+30	20.2854	20.83	
9+45	29.4301	30.16	
10+ 0	38.6821	39.41	
10+15	44.7987	45.26	
10+30	33.9728	33.01	
10+45	24.0873	23.33	
11+ 0	32.0506	32.79	
11+15	40.9169	41.61	
11+30	42.4526	42.52	
11+45	42.1831	42.15	
12+ 0	38.5520	38.25	
12+15	41.1759	41.43	
12+30	63.3626	65.23	
12+45	86.3007	88.09	
13+ 0	103.8563	105.20	
13+15	120.6689	121.99	
13+30	143.7071	145.56	
13+45	155.8835	156.76	
14+ 0	132.9760	130.95	
14+15	112.2495	110.66	
14+30	115.1911	115.58	
14+45	118.7935	119.07	
15+ 0	118.4089	118.35	
15+15	116.3683	116.20	
15+30	112.0729	111.72	
15+45	104.9571	104.38	
16+ 0	90.5267	89.35	
16+15	75.6078	74.44	
16+30	47.4908	45.20	
16+45	23.9891	22.18	
17+ 0	13.6961	12.97	
17+15	8.3495	7.96	
17+30	5.9678	5.80	
17+45	5.0848	5.02	
18+ 0	4.5784	4.54	
18+15	4.0056	3.96	
18+30	3.5320	3.50	
18+45	3.2678	3.25	
19+ 0	2.8788	2.85	
19+15	2.3657	2.32	
19+30	2.3344	2.34	
19+45	2.6610	2.69	
20+ 0	2.5956	2.59	
20+15	2.2185	2.19	
20+30	2.2104	2.21	
20+45	2.3382	2.35	
21+ 0	2.3208	2.32	
21+15	2.1005	2.08	

```
 21+30       2.1001      2.10  O          |          |          |          |
 21+45       2.0212      2.01  O          |          |          |          |
 22+ 0       2.0543      2.06  O          |          |          |          |
 22+15       1.9902      1.98  O          |          |          |          |
 22+30       2.0412      2.05  O          |          |          |          |
 22+45       1.9388      1.93  O          |          |          |          |
 23+ 0       1.7544      1.74  O          |          |          |          |
 23+15       1.6830      1.68  O          |          |          |          |
 23+30       1.6486      1.65  O          |          |          |          |
 23+45       1.6278      1.63  O          |          |          |          |
 24+ 0       1.6179      1.62  O          |          |          |          |
 24+15       1.5171      1.51  O          |          |          |          |
 24+30       0.9460      0.90  O          |          |          |          |
 24+45       0.4389      0.40  O          |          |          |          |
 25+ 0       0.2289      0.21  O          |          |          |          |
 25+15       0.1187      0.11  O          |          |          |          |
 25+30       0.0574      0.05  O          |          |          |          |
 25+45       0.0298      0.03  O          |          |          |          |
 26+ 0       0.0178      0.02  O          |          |          |          |
 26+15       0.0100      0.01  O          |          |          |          |
 26+30       0.0035      0.00  O          |          |          |          |
 26+45       0.0000      0.00  O          |          |          |          |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   107
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      155.883 (CFS)
                        Total volume =      53.095 (Ac.Ft)
                 Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                 Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                 Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      520.000 to Point/Station       52.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                        From study/file name: SubD224100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f     H y d r o g r a p h
        ----------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       52.1     104.2     156.4     208.5
  ----------------------------------------------------------------------
   0+15       0.2272      0.32  Q          |          |          |          |
   0+30       0.6962      1.41  Q          |          |          |          |
   0+45       0.9425      2.45  Q          |          |          |          |
   1+ 0       1.1026      3.12  Q          |          |          |          |
   1+15       1.1763      3.64  Q          |          |          |          |
   1+30       1.0347      3.58  Q          |          |          |          |
   1+45       1.0065      3.47  Q          |          |          |          |
   2+ 0       1.1158      3.60  Q          |          |          |          |
   2+15       1.2917      4.05  Q          |          |          |          |
   2+30       1.3260      4.33  Q          |          |          |          |
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 2+45       1.4457      4.60  Q          |          |          |          |
 3+ 0       1.6252      5.12  Q          |          |          |          |
 3+15       1.6595      5.44  qQ         |          |          |          |
 3+30       1.6656      5.56  qQ         |          |          |          |
 3+45       1.6674      5.62  qQ         |          |          |          |
 4+ 0       1.7810      5.82  qQ         |          |          |          |
 4+15       1.9587      6.30  qQ         |          |          |          |
 4+30       2.1066      6.75  qQ         |          |          |          |
 4+45       2.2904      7.33  qQ         |          |          |          |
 5+ 0       2.4401      7.84  qQ         |          |          |          |
 5+15       2.3966      8.12  qQ         |          |          |          |
 5+30       2.1910      7.71  qQ         |          |          |          |
 5+45       2.4198      7.91  qQ         |          |          |          |
 6+ 0       2.6213      8.51  qQ         |          |          |          |
 6+15       2.7717      9.00  qQ         |          |          |          |
 6+30       2.9573      9.59  qQ         |          |          |          |
 6+45       3.1070     10.11  qQ         |          |          |          |
 7+ 0       3.2908     10.72  q Q        |          |          |          |
 7+15       3.3269     11.08  q Q        |          |          |          |
 7+30       3.4466     11.38  q Q        |          |          |          |
 7+45       3.7397     12.08  q Q        |          |          |          |
 8+ 0       4.0653     13.04  q Q        |          |          |          |
 8+15       4.5106     14.24  q Q        |          |          |          |
 8+30       4.9081     15.63  q Q        |          |          |          |
 8+45       5.0982     16.57  q  Q       |          |          |          |
 9+ 0       5.4035     17.52  |q Q       |          |          |          |
 9+15       5.8463     19.60  |q Q       |          |          |          |
 9+30       6.3556     26.64  |q   Q     |          |          |          |
 9+45       7.7419     37.17  |q     Q   |          |          |          |
10+ 0      10.9906     49.67  | q      Q|          |          |          |
10+15      10.4481     55.25  | q       Q          |          |          |
10+30       6.0471     40.02  |q     Q   |          |          |          |
10+45       6.9195     31.01  |q   Q     |          |          |          |
11+ 0       9.7500     41.80  |q      Q  |          |          |          |
11+15       9.8051     50.72  |q       Q|          |          |          |
11+30       8.9195     51.37  |q       Q|          |          |          |
11+45       7.9384     50.12  |q       Q|          |          |          |
12+ 0       6.7130     45.27  |q      Q  |          |          |          |
12+15      15.5197     56.70  | q       Q          |          |          |
12+30      29.8982     93.26  |    q     |       Q  |          |          |
12+45      37.1163    123.42  |      q   |          |  Q       |          |
13+ 0      43.3460    147.20  |       q  |          |       Q  |          |
13+15      52.4319    173.10  |         q          |          |  Q       |
13+30      62.5449    206.25  |          | q       |          |       Q|
13+45      52.5954    208.48  |         q          |          |        Q
14+ 0      34.1015    167.08  |     q    |          |          | Q        |
14+15      35.6822    147.93  |     q    |          |       Q  |          |
14+30      41.6902    156.88  |      q   |          |         Q          |
14+45      41.7855    160.58  |       q  |          |         Q          |
15+ 0      41.2387    159.65  |      q   |          |         Q          |
15+15      39.0149    155.38  |      q   |          |        Q|          |
15+30      36.4092    148.48  |     q    |          |       Q  |          |
15+45      30.3416    135.30  |    q     |          |    Q     |          |
16+ 0      23.4600    113.99  |   q      |         Q|          |          |
16+15      15.3237     90.93  | q        |       Q  |          |          |
16+30       4.0265     51.52  q        Q|          |          |          |
16+45       1.7109     25.70  q   Q     |          |          |          |
17+ 0       1.1551     14.85  q Q       |          |          |          |
17+15       1.2356      9.59  qQ        |          |          |          |
17+30       1.5848      7.55  qQ        |          |          |          |
17+45       1.6516      6.74  qQ        |          |          |          |
18+ 0       1.5502      6.13  qQ        |          |          |          |
18+15       1.3761      5.38  qQ        |          |          |          |
```

```
   18+30       1.3418      4.87  Q          |          |          |          |
   18+45       1.2221      4.49  Q          |          |          |          |
   19+ 0       0.9290      3.81  Q          |          |          |          |
   19+15       0.8307      3.20  Q          |          |          |          |
   19+30       1.0816      3.42  Q          |          |          |          |
   19+45       1.1720      3.83  Q          |          |          |          |
   20+ 0       0.9193      3.51  Q          |          |          |          |
   20+15       0.8289      3.05  Q          |          |          |          |
   20+30       0.9679      3.18  Q          |          |          |          |
   20+45       0.9943      3.33  Q          |          |          |          |
   21+ 0       0.8850      3.21  Q          |          |          |          |
   21+15       0.8228      2.92  Q          |          |          |          |
   21+30       0.8525      2.95  Q          |          |          |          |
   21+45       0.8167      2.84  Q          |          |          |          |
   22+ 0       0.8507      2.91  Q          |          |          |          |
   22+15       0.8167      2.81  Q          |          |          |          |
   22+30       0.8507      2.89  Q          |          |          |          |
   22+45       0.7030      2.64  Q          |          |          |          |
   23+ 0       0.6731      2.43  Q          |          |          |          |
   23+15       0.6688      2.35  Q          |          |          |          |
   23+30       0.6670      2.32  Q          |          |          |          |
   23+45       0.6670      2.29  Q          |          |          |          |
   24+ 0       0.6670      2.28  Q          |          |          |          |
   24+15       0.4397      1.96  Q          |          |          |          |
   24+30       0.0844      1.03  Q          |          |          |          |
   24+45       0.0158      0.45  Q          |          |          |          |
   25+ 0       0.0036      0.23  Q          |          |          |          |
   25+15       0.0000      0.12  Q          |          |          |          |
   25+30       0.0000      0.06  Q          |          |          |          |
   25+45       0.0000      0.03  Q          |          |          |          |
   26+ 0       0.0000      0.02  Q          |          |          |          |
   26+15       0.0000      0.01  Q          |          |          |          |
   26+30       0.0000      0.00  Q          |          |          |          |
   26+45       0.0000      0.00  Q          |          |          |          |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   107
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      208.479 (CFS)
                        Total volume =      70.654 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       52.000 to Point/Station       53.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   4340.00 (Ft.)
        Elevation difference =   74.00 (Ft.)
        Slope of channel =  0.017051 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  4340.00(Ft.)     Elevation difference =  74.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Channel base width  =   10.000(Ft.)
```

```
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     48.841(CFS)
Depth of flow =     0.822(Ft.)
Average velocity =     5.100(Ft/s)
Total flow rate =    48.841(CFS)
Channel flow top width =   13.290(Ft.)
Depth of flow in channel =   0.82(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.10(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   48.841(CFS)
Total capacity of improved channels =     48.841(CFS)
Critical Depth in Channel =    0.85(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    208.479(CFS)
Depth of flow =     1.873(Ft.)
Average velocity =     8.098(Ft/s)
Total flow rate =   208.479(CFS)
Channel flow top width =   17.491(Ft.)
Depth of flow in channel =   1.87(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.10(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  208.479(CFS)
Total capacity of improved channels =    208.479(CFS)
Critical Depth in Channel =    2.06(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8265   Travel time =   8.93 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   1.6879
        dt(routing time-step) =   7.38 (min.),   c* =   0.9480

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       52.1     104.2     156.4     208.5
----------------------------------------------------------------------
  0+15       0.1561      0.32  O         |         |         |         |
  0+30       0.8385      1.41  O         |         |         |         |
  0+45       1.8797      2.45  O         |         |         |         |
  1+ 0       2.7396      3.12  O         |         |         |         |
  1+15       3.3491      3.64  O         |         |         |         |
  1+30       3.5979      3.58  O         |         |         |         |
  1+45       3.5272      3.47  O         |         |         |         |
  2+ 0       3.5329      3.60  O         |         |         |         |
  2+15       3.8125      4.05  O         |         |         |         |
```

```
 2+30       4.1719      4.33  O         |         |         |         |
 2+45       4.4520      4.60  O         |         |         |         |
 3+ 0       4.8429      5.12  O         |         |         |         |
 3+15       5.2579      5.44  |O        |         |         |         |
 3+30       5.4864      5.56  |O        |         |         |         |
 3+45       5.5849      5.62  |O        |         |         |         |
 4+ 0       5.7133      5.82  |O        |         |         |         |
 4+15       6.0424      6.30  |O        |         |         |         |
 4+30       6.5029      6.75  |O        |         |         |         |
 4+45       7.0175      7.33  |O        |         |         |         |
 5+ 0       7.5584      7.84  |O        |         |         |         |
 5+15       7.9591      8.12  |O        |         |         |         |
 5+30       7.9161      7.71  |O        |         |         |         |
 5+45       7.8202      7.91  |O        |         |         |         |
 6+ 0       8.1975      8.51  |O        |         |         |         |
 6+15       8.7323      9.00  |O        |         |         |         |
 6+30       9.2694      9.59  |O        |         |         |         |
 6+45       9.8209     10.11  |O        |         |         |         |
 7+ 0      10.3854     10.72  |OI       |         |         |         |
 7+15      10.8724     11.08  | O       |         |         |         |
 7+30      11.2136     11.38  | O       |         |         |         |
 7+45      11.7116     12.08  | O       |         |         |         |
 8+ 0      12.5222     13.04  | O       |         |         |         |
 8+15      13.5879     14.24  | O       |         |         |         |
 8+30      14.8728     15.63  | O       |         |         |         |
 8+45      16.0394     16.57  |  O      |         |         |         |
 9+ 0      16.9955     17.52  |  O      |         |         |         |
 9+15      18.4897     19.60  |  O      |         |         |         |
 9+30      22.9300     26.64  |   OI    |         |         |         |
 9+45      31.5181     37.17  |     OI  |         |         |         |
10+ 0      42.8963     49.67  |       OI|         |         |         |
10+15      52.0039     55.25  |        OI         |         |         |
10+30      47.7473     40.02  |      I O|         |         |         |
10+45      36.0825     31.01  |    IO   |         |         |         |
11+ 0      36.4673     41.80  |     O I |         |         |         |
11+15      45.8184     50.72  |       OI|         |         |         |
11+30      50.7800     51.37  |        O|         |         |         |
11+45      50.7393     50.12  |        O|         |         |         |
12+ 0      47.8155     45.27  |       IO|         |         |         |
12+15      50.9007     56.70  |        OI         |         |         |
12+30      73.9981     93.26  |         |   O  I  |         |         |
12+45     106.7774    123.42  |         |         O  I      |         |
13+ 0     134.0029    147.20  |         |         |    O  I |         |
13+15     158.9845    173.10  |         |         |         O  I      |
13+30     188.3270    206.25  |         |         |         |     O  I|
13+45     206.3920    208.48  |         |         |         |       OI
14+ 0     188.4382    167.08  |         |         |         | I   O   |
14+15     158.9707    147.93  |         |         |       I O         |
14+30     152.8144    156.88  |         |         |        OI         |
14+45     158.4500    160.58  |         |         |         O         |
15+ 0     160.0199    159.65  |         |         |         O         |
15+15     157.6139    155.38  |         |         |        IO         |
15+30     152.1768    148.48  |         |         |       IO|         |
15+45     142.3272    135.30  |         |         |    I O  |         |
16+ 0     125.4038    113.99  |         |         I  O      |         |
16+15     103.4807     90.93  |         |      I O|         |         |
16+30      72.6086     51.52  |        I|  O      |         |         |
16+45      40.1846     25.70  |   I  O  |         |         |         |
17+ 0      21.2302     14.85  | I O     |         |         |         |
17+15      12.6476      9.59  |IO       |         |         |         |
17+30       8.7658      7.55  |O        |         |         |         |
17+45       7.2227      6.74  |O        |         |         |         |
18+ 0       6.4691      6.13  |O        |         |         |         |
```

```
 18+15       5.7867      5.38  |O         |         |         |         |
 18+30       5.1582      4.87  O          |         |         |         |
 18+45       4.7038      4.49  O          |         |         |         |
 19+ 0       4.1726      3.81  O          |         |         |         |
 19+15       3.5324      3.20  O          |         |         |         |
 19+30       3.3196      3.42  O          |         |         |         |
 19+45       3.6118      3.83  O          |         |         |         |
 20+ 0       3.6684      3.51  O          |         |         |         |
 20+15       3.2978      3.05  O          |         |         |         |
 20+30       3.1235      3.18  O          |         |         |         |
 20+45       3.2497      3.33  O          |         |         |         |
 21+ 0       3.2672      3.21  O          |         |         |         |
 21+15       3.0730      2.92  O          |         |         |         |
 21+30       2.9452      2.95  O          |         |         |         |
 21+45       2.8970      2.84  O          |         |         |         |
 22+ 0       2.8733      2.91  O          |         |         |         |
 22+15       2.8561      2.81  O          |         |         |         |
 22+30       2.8504      2.89  O          |         |         |         |
 22+45       2.7694      2.64  O          |         |         |         |
 23+ 0       2.5453      2.43  O          |         |         |         |
 23+15       2.3971      2.35  O          |         |         |         |
 23+30       2.3366      2.32  O          |         |         |         |
 23+45       2.3066      2.29  O          |         |         |         |
 24+ 0       2.2906      2.28  O          |         |         |         |
 24+15       2.1272      1.96  O          |         |         |         |
 24+30       1.5196      1.03  O          |         |         |         |
 24+45       0.7786      0.45  O          |         |         |         |
 25+ 0       0.3645      0.23  O          |         |         |         |
 25+15       0.1846      0.12  O          |         |         |         |
 25+30       0.0926      0.06  O          |         |         |         |
 25+45       0.0459      0.03  O          |         |         |         |
 26+ 0       0.0249      0.02  O          |         |         |         |
 26+15       0.0144      0.01  O          |         |         |         |
 26+30       0.0071      0.00  O          |         |         |         |
 26+45       0.0020      0.00  O          |         |         |         |
 27+ 0       0.0000      0.00  O          |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =   108
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      206.392 (CFS)
                        Total volume =      70.654 (Ac.Ft)
                Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        -------------------------------------------------------------------

        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       52.000 to Point/Station       53.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ___________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                        From study/file name: SubD324100.rte
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                        R u n o f f     H y d r o g r a p h
        -------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)
```

```
      ---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       63.3     126.7     190.0     253.4
---------------------------------------------------------------------
  0+15       0.1092      0.27  Q         |         |         |         |
  0+30       0.4103      1.25  Q         |         |         |         |
  0+45       0.6071      2.49  Q         |         |         |         |
  1+ 0       0.7321      3.47  Q         |         |         |         |
  1+15       0.8361      4.19  Q         |         |         |         |
  1+30       0.7707      4.37  Q         |         |         |         |
  1+45       0.7636      4.29  Q         |         |         |         |
  2+ 0       0.8192      4.35  Q         |         |         |         |
  2+15       0.9415      4.75  Q         |         |         |         |
  2+30       0.9758      5.15  Q         |         |         |         |
  2+45       1.0462      5.50  Q         |         |         |         |
  3+ 0       1.1763      6.02  Q         |         |         |         |
  3+15       1.2190      6.48  qQ        |         |         |         |
  3+30       1.2392      6.73  qQ        |         |         |         |
  3+45       1.2511      6.84  qQ        |         |         |         |
  4+ 0       1.3116      7.02  qQ        |         |         |         |
  4+15       1.4383      7.48  qQ        |         |         |         |
  4+30       1.5321      8.04  qQ        |         |         |         |
  4+45       1.6722      8.69  qQ        |         |         |         |
  5+ 0       1.7729      9.33  qQ        |         |         |         |
  5+15       1.8096      9.77  qQ        |         |         |         |
  5+30       1.6672      9.58  qQ        |         |         |         |
  5+45       1.7968      9.62  qQ        |         |         |         |
  6+ 0       1.9360     10.13  qQ        |         |         |         |
  6+15       2.0338     10.77  qQ        |         |         |         |
  6+30       2.1749     11.44  qQ        |         |         |         |
  6+45       2.2770     12.10  qQ        |         |         |         |
  7+ 0       2.4215     12.81  q Q       |         |         |         |
  7+15       2.4735     13.35  q Q       |         |         |         |
  7+30       2.5533     13.77  q Q       |         |         |         |
  7+45       2.7440     14.46  q Q       |         |         |         |
  8+ 0       2.9669     15.49  q Q       |         |         |         |
  8+15       3.2564     16.84  q Q       |         |         |         |
  8+30       3.5683     18.44  q Q       |         |         |         |
  8+45       3.7284     19.77  q  Q      |         |         |         |
  9+ 0       3.9586     20.95  q  Q      |         |         |         |
  9+15       5.2150     23.70  q  Q      |         |         |         |
  9+30       8.3569     31.29  |q  Q     |         |         |         |
  9+45      11.2757     42.79  |q    Q   |         |         |         |
 10+ 0      14.2337     57.13  | q      Q|         |         |         |
 10+15      13.4051     65.41  | q       Q         |         |         |
 10+30       7.1413     54.89  |q      Q |         |         |         |
 10+45       7.8889     43.97  |q    Q   |         |         |         |
 11+ 0      12.7637     49.23  | q    Q  |         |         |         |
 11+15      13.8137     59.63  | q      Q|         |         |         |
 11+30      13.4930     64.27  | q       Q         |         |         |
 11+45      12.7422     63.48  | q       Q         |         |         |
 12+ 0      11.2533     59.07  |q       Q|         |         |         |
 12+15      16.1221     67.02  | q       Q         |         |         |
 12+30      25.8676     99.87  |   q     |    Q    |         |         |
 12+45      31.2007    137.98  |   q     |         |Q        |         |
 13+ 0      36.1888    170.19  |    q    |         |     Q   |         |
 13+15      42.1752    201.16  |     q   |         |         |Q        |
 13+30      50.0030    238.33  |      q  |         |         |      Q  |
 13+45      46.9795    253.37  |      q  |         |         |        Q
 14+ 0      35.1417    223.58  |    q    |         |         |    Q    |
 14+15      34.3571    193.33  |    q    |         |         Q         |
 14+30      37.7199    190.53  |    q    |         |         Q         |
 14+45      37.5712    196.02  |    q    |         |         Q         |
```

```
 15+ 0      37.2411    197.26  |    q    |         |         |Q        |
 15+15      35.7153    193.33  |    q    |         |         Q         |
 15+30      33.8610    186.04  |    q    |         |        Q|         |
 15+45      30.4047    172.73  |   q     |         |      Q  |         |
 16+ 0      25.3206    150.72  |  q      |         |   Q     |         |
 16+15      19.2493    122.73  |  q      |        Q|         |         |
 16+30       8.1896     80.80  |q        | Q       |         |         |
 16+45       4.6266     44.81  q      Q |         |         |         |
 17+ 0       2.8359     24.07  q  Q     |         |         |         |
 17+15       1.9824     14.63  q Q      |         |         |         |
 17+30       1.6292     10.39  qQ       |         |         |         |
 17+45       1.4067      8.63  qQ       |         |         |         |
 18+ 0       1.1719      7.64  qQ       |         |         |         |
 18+15       1.0638      6.85  qQ       |         |         |         |
 18+30       1.0364      6.19  Q        |         |         |         |
 18+45       0.9719      5.68  Q        |         |         |         |
 19+ 0       0.7897      4.96  Q        |         |         |         |
 19+15       0.6784      4.21  Q        |         |         |         |
 19+30       0.7993      4.12  Q        |         |         |         |
 19+45       0.8760      4.49  Q        |         |         |         |
 20+ 0       0.7365      4.40  Q        |         |         |         |
 20+15       0.6479      3.95  Q        |         |         |         |
 20+30       0.7268      3.85  Q        |         |         |         |
 20+45       0.7443      3.99  Q        |         |         |         |
 21+ 0       0.6973      3.96  Q        |         |         |         |
 21+15       0.6311      3.70  Q        |         |         |         |
 21+30       0.6629      3.61  Q        |         |         |         |
 21+45       0.6152      3.51  Q        |         |         |         |
 22+ 0       0.6570      3.53  Q        |         |         |         |
 22+15       0.6118      3.47  Q        |         |         |         |
 22+30       0.6536      3.50  Q        |         |         |         |
 22+45       0.5547      3.32  Q        |         |         |         |
 23+ 0       0.5303      3.08  Q        |         |         |         |
 23+15       0.5180      2.92  Q        |         |         |         |
 23+30       0.5135      2.85  Q        |         |         |         |
 23+45       0.5086      2.82  Q        |         |         |         |
 24+ 0       0.5076      2.80  Q        |         |         |         |
 24+15       0.3959      2.52  Q        |         |         |         |
 24+30       0.1494      1.67  Q        |         |         |         |
 24+45       0.0759      0.85  Q        |         |         |         |
 25+ 0       0.0423      0.41  Q        |         |         |         |
 25+15       0.0237      0.21  Q        |         |         |         |
 25+30       0.0119      0.10  Q        |         |         |         |
 25+45       0.0050      0.05  Q        |         |         |         |
 26+ 0       0.0000      0.02  Q        |         |         |         |
 26+15       0.0000      0.01  Q        |         |         |         |
 26+30       0.0000      0.01  Q        |         |         |         |
 26+45       0.0000      0.00  Q        |         |         |         |
 27+ 0       0.0000      0.00  Q        |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                    Number of intervals =   108
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      253.372 (CFS)
                    Total volume =      87.348 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       50.000 to Point/Station       53.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSD24hrSt1.rte
****************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

SubD124100

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 04/25/12 File: SubD124100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed D, Stream 1, Subarea D1
Existing Condition
100-year, 24-hour

Drainage Area = 443.50(Ac.) = 0.693 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 443.50(Ac.) = 0.693 Sq. Mi.
Length along longest watercourse = 13900.00(Ft.)
Length along longest watercourse measured to centroid = 6600.00(Ft.)
Length along longest watercourse = 2.633 Mi.
Length along longest watercourse measured to centroid = 1.250 Mi.
Difference in elevation = 857.00(Ft.)
Slope along watercourse = 325.5367 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.377 Hr.
Lag time = 22.63 Min.
25% of lag time = 5.66 Min.
40% of lag time = 9.05 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
443.50	1.80	798.30

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
443.50	4.50	1995.75

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubD124100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.91 %
Adjusted average point rain = 4.496(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
35.200	46.00	0.000
16.200	66.00	0.000
3.900	77.00	0.000
388.200	83.00	0.000

Total Area Entered = 443.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.079	0.049
66.0	66.0	0.405	0.000	0.405	0.037	0.015
77.0	77.0	0.279	0.000	0.279	0.009	0.002
83.0	83.0	0.210	0.000	0.210	0.875	0.184
					Sum (F) =	0.249

Area averaged mean soil loss (F) (In/Hr) = 0.249
Minimum soil loss rate ((In/Hr)) = 0.125
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	66.287	6.542	29.242
2	0.500	132.575	37.826	169.068
3	0.750	198.862	30.871	137.982
4	1.000	265.150	11.436	51.115
5	1.250	331.437	6.452	28.840
6	1.500	397.724	3.588	16.038
7	1.750	464.012	1.551	6.933
8	2.000	530.299	0.677	3.026
9	2.250	596.587	0.470	2.099
10	2.500	662.874	0.403	1.800
11	2.750	729.161	0.184	0.822
			Sum = 100.000	Sum= 446.965

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.440)	0.032	0.004
2	0.50	0.30	0.054	(0.435)	0.049	0.005
3	0.75	0.30	0.054	(0.430)	0.049	0.005
4	1.00	0.40	0.072	(0.425)	0.065	0.007
5	1.25	0.30	0.054	(0.420)	0.049	0.005
6	1.50	0.30	0.054	(0.415)	0.049	0.005
7	1.75	0.30	0.054	(0.410)	0.049	0.005
8	2.00	0.40	0.072	(0.405)	0.065	0.007

9	2.25	0.40	0.072	(0.400)	0.065	0.007
10	2.50	0.40	0.072	(0.396)	0.065	0.007
11	2.75	0.50	0.090	(0.391)	0.081	0.009
12	3.00	0.50	0.090	(0.386)	0.081	0.009
13	3.25	0.50	0.090	(0.381)	0.081	0.009
14	3.50	0.50	0.090	(0.376)	0.081	0.009
15	3.75	0.50	0.090	(0.372)	0.081	0.009
16	4.00	0.60	0.108	(0.367)	0.097	0.011
17	4.25	0.60	0.108	(0.362)	0.097	0.011
18	4.50	0.70	0.126	(0.358)	0.113	0.013
19	4.75	0.70	0.126	(0.353)	0.113	0.013
20	5.00	0.80	0.144	(0.349)	0.129	0.014
21	5.25	0.60	0.108	(0.344)	0.097	0.011
22	5.50	0.70	0.126	(0.340)	0.113	0.013
23	5.75	0.80	0.144	(0.335)	0.129	0.014
24	6.00	0.80	0.144	(0.331)	0.129	0.014
25	6.25	0.90	0.162	(0.326)	0.146	0.016
26	6.50	0.90	0.162	(0.322)	0.146	0.016
27	6.75	1.00	0.180	(0.318)	0.162	0.018
28	7.00	1.00	0.180	(0.313)	0.162	0.018
29	7.25	1.00	0.180	(0.309)	0.162	0.018
30	7.50	1.10	0.198	(0.305)	0.178	0.020
31	7.75	1.20	0.216	(0.301)	0.194	0.022
32	8.00	1.30	0.234	(0.297)	0.210	0.023
33	8.25	1.50	0.270	(0.292)	0.243	0.027
34	8.50	1.50	0.270	(0.288)	0.243	0.027
35	8.75	1.60	0.288	(0.284)	0.259	0.029
36	9.00	1.70	0.306	(0.280)	0.275	0.031
37	9.25	1.90	0.342	0.276	(0.308)	0.065
38	9.50	2.00	0.360	0.272	(0.324)	0.087
39	9.75	2.10	0.378	0.269	(0.340)	0.109
40	10.00	2.20	0.396	0.265	(0.356)	0.131
41	10.25	1.50	0.270	(0.261)	0.243	0.027
42	10.50	1.50	0.270	(0.257)	0.243	0.027
43	10.75	2.00	0.360	0.253	(0.324)	0.106
44	11.00	2.00	0.360	0.250	(0.324)	0.110
45	11.25	1.90	0.342	0.246	(0.308)	0.096
46	11.50	1.90	0.342	0.242	(0.308)	0.099
47	11.75	1.70	0.306	0.239	(0.275)	0.067
48	12.00	1.80	0.324	0.235	(0.291)	0.089
49	12.25	2.50	0.450	0.232	(0.405)	0.218
50	12.50	2.60	0.468	0.228	(0.421)	0.239
51	12.75	2.80	0.504	0.225	(0.453)	0.279
52	13.00	2.90	0.522	0.221	(0.469)	0.300
53	13.25	3.40	0.611	0.218	(0.550)	0.393
54	13.50	3.40	0.611	0.215	(0.550)	0.397
55	13.75	2.30	0.414	0.211	(0.372)	0.202
56	14.00	2.30	0.414	0.208	(0.372)	0.205
57	14.25	2.70	0.486	0.205	(0.437)	0.281
58	14.50	2.60	0.468	0.202	(0.421)	0.266
59	14.75	2.60	0.468	0.199	(0.421)	0.269
60	15.00	2.50	0.450	0.196	(0.405)	0.254
61	15.25	2.40	0.432	0.193	(0.388)	0.239
62	15.50	2.30	0.414	0.190	(0.372)	0.224
63	15.75	1.90	0.342	0.187	(0.308)	0.155
64	16.00	1.90	0.342	0.184	(0.308)	0.158
65	16.25	0.40	0.072	(0.181)	0.065	0.007
66	16.50	0.40	0.072	(0.179)	0.065	0.007
67	16.75	0.30	0.054	(0.176)	0.049	0.005
68	17.00	0.30	0.054	(0.173)	0.049	0.005
69	17.25	0.50	0.090	(0.171)	0.081	0.009
70	17.50	0.50	0.090	(0.168)	0.081	0.009
71	17.75	0.50	0.090	(0.165)	0.081	0.009

72	18.00	0.40	0.072	(0.163)	0.065	0.007
73	18.25	0.40	0.072	(0.161)	0.065	0.007
74	18.50	0.40	0.072	(0.158)	0.065	0.007
75	18.75	0.30	0.054	(0.156)	0.049	0.005
76	19.00	0.20	0.036	(0.154)	0.032	0.004
77	19.25	0.30	0.054	(0.152)	0.049	0.005
78	19.50	0.40	0.072	(0.150)	0.065	0.007
79	19.75	0.30	0.054	(0.147)	0.049	0.005
80	20.00	0.20	0.036	(0.145)	0.032	0.004
81	20.25	0.30	0.054	(0.144)	0.049	0.005
82	20.50	0.30	0.054	(0.142)	0.049	0.005
83	20.75	0.30	0.054	(0.140)	0.049	0.005
84	21.00	0.20	0.036	(0.138)	0.032	0.004
85	21.25	0.30	0.054	(0.137)	0.049	0.005
86	21.50	0.20	0.036	(0.135)	0.032	0.004
87	21.75	0.30	0.054	(0.134)	0.049	0.005
88	22.00	0.20	0.036	(0.132)	0.032	0.004
89	22.25	0.30	0.054	(0.131)	0.049	0.005
90	22.50	0.20	0.036	(0.130)	0.032	0.004
91	22.75	0.20	0.036	(0.128)	0.032	0.004
92	23.00	0.20	0.036	(0.127)	0.032	0.004
93	23.25	0.20	0.036	(0.127)	0.032	0.004
94	23.50	0.20	0.036	(0.126)	0.032	0.004
95	23.75	0.20	0.036	(0.125)	0.032	0.004
96	24.00	0.20	0.036	(0.125)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.7

Flood volume = Effective rainfall 1.44(In)
times area 443.5(Ac.)/[(In)/(Ft.)] = 53.1(Ac.Ft)
Total soil loss = 3.06(In)
Total soil loss = 113.073(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 2312836.3 Cubic Feet
Total soil loss = 4925460.9 Cubic Feet

Peak flow rate of this hydrograph = 156.763(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+15	0.0022	0.11	Q	|	|	|	|
0+30	0.0180	0.77	Q	|	|	|	|
0+45	0.0504	1.57	Q	|	|	|	|
1+ 0	0.0928	2.05	Q	|	|	|	|
1+15	0.1444	2.50	Q	|	|	|	|
1+30	0.1972	2.55	Q	|	|	|	|
1+45	0.2478	2.45	Q	|	|	|	|
2+ 0	0.2992	2.49	Q	|	|	|	|
2+15	0.3566	2.78	Q	|	|	|	|
2+30	0.4191	3.02	Q	|	|	|	|
2+45	0.4845	3.17	Q	|	|	|	|
3+ 0	0.5573	3.52	Q	|	|	|	|
3+15	0.6358	3.80	Q	|	|	|	|
3+30	0.7164	3.90	Q	|	|	|	|
3+45	0.7981	3.96	Q	|	|	|	|
4+ 0	0.8817	4.04	Q	|	|	|	|
4+15	0.9718	4.36	Q	|	|	|	|

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 4+30       1.0683      4.67  Q         |         |         |         |
 4+45       1.1731      5.07  VQ        |         |         |         |
 5+ 0       1.2852      5.43  VQ        |         |         |         |
 5+15       1.4039      5.75   Q        |         |         |         |
 5+30       1.5177      5.50  |Q        |         |         |         |
 5+45       1.6311      5.49  |Q        |         |         |         |
 6+ 0       1.7536      5.93  |Q        |         |         |         |
 6+15       1.8828      6.25  |Q        |         |         |         |
 6+30       2.0205      6.66  |Q        |         |         |         |
 6+45       2.1657      7.03  |Q        |         |         |         |
 7+ 0       2.3198      7.46  |Q        |         |         |         |
 7+15       2.4804      7.77  |Q        |         |         |         |
 7+30       2.6447      7.95  |Q        |         |         |         |
 7+45       2.8178      8.38  |QV       |         |         |         |
 8+ 0       3.0042      9.02  |QV       |         |         |         |
 8+15       3.2064      9.79  |QV       |         |         |         |
 8+30       3.4295     10.80  | Q       |         |         |         |
 8+45       3.6676     11.52  | Q       |         |         |         |
 9+ 0       3.9189     12.16  | Q       |         |         |         |
 9+15       4.2057     13.88  | QV      |         |         |         |
 9+30       4.6361     20.83  |  VQ     |         |         |         |
 9+45       5.2593     30.16  |  V  Q   |         |         |         |
10+ 0       6.0735     39.41  |   V  Q  |         |         |         |
10+15       7.0086     45.26  |    V   Q|         |         |         |
10+30       7.6907     33.01  |    VQ   |         |         |         |
10+45       8.1726     23.33  |   Q V   |         |         |         |
11+ 0       8.8502     32.79  |     Q   |         |         |         |
11+15       9.7099     41.61  |      VQ |         |         |         |
11+30      10.5885     42.52  |      VQ |         |         |         |
11+45      11.4594     42.15  |       Q |         |         |         |
12+ 0      12.2496     38.25  |      Q V|         |         |         |
12+15      13.1055     41.43  |       QV|         |         |         |
12+30      14.4532     65.23  |         V  Q      |         |         |
12+45      16.2734     88.09  |         | V    Q  |         |         |
13+ 0      18.4469    105.20  |         |  V      Q|         |         |
13+15      20.9673    121.99  |         |    V    |   Q     |         |
13+30      23.9747    145.56  |         |       V |         Q|         |
13+45      27.2136    156.76  |         |         V         |Q        |
14+ 0      29.9192    130.95  |         |         | V   Q   |         |
14+15      32.2055    110.66  |         |         | Q V     |         |
14+30      34.5934    115.58  |         |         |  Q  V   |         |
14+45      37.0535    119.07  |         |         |  Q   V  |         |
15+ 0      39.4988    118.35  |         |         |  Q     V|         |
15+15      41.8996    116.20  |         |         |  Q      V         |
15+30      44.2079    111.72  |         |         | Q        |  V      |
15+45      46.3645    104.38  |         |         Q          |   V    |
16+ 0      48.2105     89.35  |         |      Q  |          |    V   |
16+15      49.7485     74.44  |         |   Q     |          |     V  |
16+30      50.6823     45.20  |        Q|         |          |      V |
16+45      51.1406     22.18  |   Q     |         |          |      V |
17+ 0      51.4087     12.97  | Q       |         |          |      V |
17+15      51.5731      7.96  |Q        |         |          |      V |
17+30      51.6929      5.80  |Q        |         |          |      V |
17+45      51.7967      5.02  |Q        |         |          |       V|
18+ 0      51.8905      4.54  Q         |         |          |       V|
18+15      51.9723      3.96  Q         |         |          |       V|
18+30      52.0445      3.50  Q         |         |          |       V|
18+45      52.1116      3.25  Q         |         |          |       V|
19+ 0      52.1705      2.85  Q         |         |          |       V|
19+15      52.2185      2.32  Q         |         |          |       V|
19+30      52.2667      2.34  Q         |         |          |       V|
19+45      52.3223      2.69  Q         |         |          |       V|
20+ 0      52.3758      2.59  Q         |         |          |       V|
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   20+15      52.4210      2.19  Q          |          |          |         V|
   20+30      52.4667      2.21  Q          |          |          |         V|
   20+45      52.5152      2.35  Q          |          |          |         V|
   21+ 0      52.5631      2.32  Q          |          |          |         V|
   21+15      52.6061      2.08  Q          |          |          |         V|
   21+30      52.6495      2.10  Q          |          |          |         V|
   21+45      52.6912      2.01  Q          |          |          |         V|
   22+ 0      52.7337      2.06  Q          |          |          |         V|
   22+15      52.7747      1.98  Q          |          |          |         V|
   22+30      52.8169      2.05  Q          |          |          |         V|
   22+45      52.8568      1.93  Q          |          |          |         V|
   23+ 0      52.8928      1.74  Q          |          |          |         V|
   23+15      52.9274      1.68  Q          |          |          |         V|
   23+30      52.9614      1.65  Q          |          |          |         V|
   23+45      52.9950      1.63  Q          |          |          |         V|
   24+ 0      53.0284      1.62  Q          |          |          |         V|
   24+15      53.0596      1.51  Q          |          |          |         V|
   24+30      53.0782      0.90  Q          |          |          |         V|
   24+45      53.0864      0.40  Q          |          |          |         V|
   25+ 0      53.0909      0.21  Q          |          |          |         V|
   25+15      53.0931      0.11  Q          |          |          |         V|
   25+30      53.0942      0.05  Q          |          |          |         V|
   25+45      53.0948      0.03  Q          |          |          |         V|
   26+ 0      53.0952      0.02  Q          |          |          |         V|
   26+15      53.0954      0.01  Q          |          |          |         V|
   26+30      53.0954      0.00  Q          |          |          |          V
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SubD224100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubD224100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed D, Stream 1, Subarea D2
Existing Condition
100-year, 24-hour

Drainage Area = 183.80(Ac.) = 0.287 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 183.80(Ac.) = 0.287 Sq. Mi.
Length along longest watercourse = 4950.00(Ft.)
Length along longest watercourse measured to centroid = 2120.00(Ft.)
Length along longest watercourse = 0.938 Mi.
Length along longest watercourse measured to centroid = 0.402 Mi.
Difference in elevation = 461.00(Ft.)
Slope along watercourse = 491.7333 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.153 Hr.
Lag time = 9.18 Min.
25% of lag time = 2.29 Min.
40% of lag time = 3.67 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
183.80	1.80	330.84

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
183.80	4.50	827.10

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubD224100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.96 %
Adjusted average point rain = 4.498(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
22.800	46.00	0.000
35.900	66.00	0.000
8.300	77.00	0.000
116.800	83.00	0.000

Total Area Entered = 183.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.124	0.076
66.0	66.0	0.405	0.000	0.405	0.195	0.079
77.0	77.0	0.279	0.000	0.279	0.045	0.013
83.0	83.0	0.210	0.000	0.210	0.635	0.133
					Sum (F) =	0.301

Area averaged mean soil loss (F) (In/Hr) = 0.301
Minimum soil loss rate ((In/Hr)) = 0.150
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	163.411	34.070	63.110
2	0.500	326.821	53.280	98.693
3	0.750	490.232	10.282	19.046
4	1.000	653.643	1.829	3.388
5	1.250	817.053	0.539	0.999
		Sum =	100.000	Sum= 185.236

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.531)	0.032	0.004
2	0.50	0.30	0.054	(0.525)	0.049	0.005
3	0.75	0.30	0.054	(0.519)	0.049	0.005
4	1.00	0.40	0.072	(0.513)	0.065	0.007
5	1.25	0.30	0.054	(0.507)	0.049	0.005
6	1.50	0.30	0.054	(0.501)	0.049	0.005
7	1.75	0.30	0.054	(0.495)	0.049	0.005
8	2.00	0.40	0.072	(0.489)	0.065	0.007
9	2.25	0.40	0.072	(0.483)	0.065	0.007
10	2.50	0.40	0.072	(0.477)	0.065	0.007
11	2.75	0.50	0.090	(0.471)	0.081	0.009
12	3.00	0.50	0.090	(0.466)	0.081	0.009
13	3.25	0.50	0.090	(0.460)	0.081	0.009
14	3.50	0.50	0.090	(0.454)	0.081	0.009

15	3.75	0.50	0.090	(0.448)	0.081	0.009
16	4.00	0.60	0.108	(0.443)	0.097	0.011
17	4.25	0.60	0.108	(0.437)	0.097	0.011
18	4.50	0.70	0.126	(0.432)	0.113	0.013
19	4.75	0.70	0.126	(0.426)	0.113	0.013
20	5.00	0.80	0.144	(0.421)	0.130	0.014
21	5.25	0.60	0.108	(0.415)	0.097	0.011
22	5.50	0.70	0.126	(0.410)	0.113	0.013
23	5.75	0.80	0.144	(0.404)	0.130	0.014
24	6.00	0.80	0.144	(0.399)	0.130	0.014
25	6.25	0.90	0.162	(0.394)	0.146	0.016
26	6.50	0.90	0.162	(0.388)	0.146	0.016
27	6.75	1.00	0.180	(0.383)	0.162	0.018
28	7.00	1.00	0.180	(0.378)	0.162	0.018
29	7.25	1.00	0.180	(0.373)	0.162	0.018
30	7.50	1.10	0.198	(0.368)	0.178	0.020
31	7.75	1.20	0.216	(0.363)	0.194	0.022
32	8.00	1.30	0.234	(0.358)	0.211	0.023
33	8.25	1.50	0.270	(0.353)	0.243	0.027
34	8.50	1.50	0.270	(0.348)	0.243	0.027
35	8.75	1.60	0.288	(0.343)	0.259	0.029
36	9.00	1.70	0.306	(0.338)	0.275	0.031
37	9.25	1.90	0.342	(0.333)	0.308	0.034
38	9.50	2.00	0.360	(0.329)	0.324	0.036
39	9.75	2.10	0.378	0.324	(0.340)	0.054
40	10.00	2.20	0.396	0.319	(0.356)	0.077
41	10.25	1.50	0.270	(0.315)	0.243	0.027
42	10.50	1.50	0.270	(0.310)	0.243	0.027
43	10.75	2.00	0.360	0.306	(0.324)	0.054
44	11.00	2.00	0.360	0.301	(0.324)	0.059
45	11.25	1.90	0.342	0.297	(0.308)	0.045
46	11.50	1.90	0.342	0.292	(0.308)	0.050
47	11.75	1.70	0.306	(0.288)	0.275	0.031
48	12.00	1.80	0.324	0.284	(0.291)	0.040
49	12.25	2.50	0.450	0.279	(0.405)	0.170
50	12.50	2.60	0.468	0.275	(0.421)	0.193
51	12.75	2.80	0.504	0.271	(0.453)	0.233
52	13.00	2.90	0.522	0.267	(0.470)	0.255
53	13.25	3.40	0.612	0.263	(0.551)	0.349
54	13.50	3.40	0.612	0.259	(0.551)	0.353
55	13.75	2.30	0.414	0.255	(0.372)	0.159
56	14.00	2.30	0.414	0.251	(0.372)	0.163
57	14.25	2.70	0.486	0.247	(0.437)	0.238
58	14.50	2.60	0.468	0.244	(0.421)	0.224
59	14.75	2.60	0.468	0.240	(0.421)	0.228
60	15.00	2.50	0.450	0.236	(0.405)	0.214
61	15.25	2.40	0.432	0.233	(0.389)	0.199
62	15.50	2.30	0.414	0.229	(0.372)	0.185
63	15.75	1.90	0.342	0.226	(0.308)	0.116
64	16.00	1.90	0.342	0.222	(0.308)	0.120
65	16.25	0.40	0.072	(0.219)	0.065	0.007
66	16.50	0.40	0.072	(0.215)	0.065	0.007
67	16.75	0.30	0.054	(0.212)	0.049	0.005
68	17.00	0.30	0.054	(0.209)	0.049	0.005
69	17.25	0.50	0.090	(0.206)	0.081	0.009
70	17.50	0.50	0.090	(0.203)	0.081	0.009
71	17.75	0.50	0.090	(0.200)	0.081	0.009
72	18.00	0.40	0.072	(0.197)	0.065	0.007
73	18.25	0.40	0.072	(0.194)	0.065	0.007
74	18.50	0.40	0.072	(0.191)	0.065	0.007
75	18.75	0.30	0.054	(0.188)	0.049	0.005
76	19.00	0.20	0.036	(0.186)	0.032	0.004
77	19.25	0.30	0.054	(0.183)	0.049	0.005

78	19.50	0.40	0.072	(0.180)	0.065	0.007
79	19.75	0.30	0.054	(0.178)	0.049	0.005
80	20.00	0.20	0.036	(0.176)	0.032	0.004
81	20.25	0.30	0.054	(0.173)	0.049	0.005
82	20.50	0.30	0.054	(0.171)	0.049	0.005
83	20.75	0.30	0.054	(0.169)	0.049	0.005
84	21.00	0.20	0.036	(0.167)	0.032	0.004
85	21.25	0.30	0.054	(0.165)	0.049	0.005
86	21.50	0.20	0.036	(0.163)	0.032	0.004
87	21.75	0.30	0.054	(0.161)	0.049	0.005
88	22.00	0.20	0.036	(0.159)	0.032	0.004
89	22.25	0.30	0.054	(0.158)	0.049	0.005
90	22.50	0.20	0.036	(0.156)	0.032	0.004
91	22.75	0.20	0.036	(0.155)	0.032	0.004
92	23.00	0.20	0.036	(0.154)	0.032	0.004
93	23.25	0.20	0.036	(0.153)	0.032	0.004
94	23.50	0.20	0.036	(0.152)	0.032	0.004
95	23.75	0.20	0.036	(0.151)	0.032	0.004
96	24.00	0.20	0.036	(0.151)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.6

Flood volume = Effective rainfall 1.15(In)
times area 183.8(Ac.)/[(In)/(Ft.)] = 17.6(Ac.Ft)
Total soil loss = 3.35(In)
Total soil loss = 51.341(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 764866.3 Cubic Feet
Total soil loss = 2236428.9 Cubic Feet

Peak flow rate of this hydrograph = 62.545(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
-----------------------------------------------------------------------
  0+15       0.0047      0.23  Q         |         |         |         |
  0+30       0.0191      0.70  Q         |         |         |         |
  0+45       0.0386      0.94  Q         |         |         |         |
  1+ 0       0.0613      1.10  Q         |         |         |         |
  1+15       0.0856      1.18  Q         |         |         |         |
  1+30       0.1070      1.03  Q         |         |         |         |
  1+45       0.1278      1.01  Q         |         |         |         |
  2+ 0       0.1509      1.12  Q         |         |         |         |
  2+15       0.1776      1.29  Q         |         |         |         |
  2+30       0.2050      1.33  Q         |         |         |         |
  2+45       0.2348      1.45  Q         |         |         |         |
  3+ 0       0.2684      1.63  Q         |         |         |         |
  3+15       0.3027      1.66  Q         |         |         |         |
  3+30       0.3371      1.67  Q         |         |         |         |
  3+45       0.3715      1.67  Q         |         |         |         |
  4+ 0       0.4083      1.78  VQ        |         |         |         |
  4+15       0.4488      1.96   Q        |         |         |         |
  4+30       0.4923      2.11  |Q        |         |         |         |
  4+45       0.5397      2.29  |Q        |         |         |         |
  5+ 0       0.5901      2.44  |Q        |         |         |         |
  5+15       0.6396      2.40  |Q        |         |         |         |
  5+30       0.6849      2.19  |Q        |         |         |         |
  5+45       0.7349      2.42  |Q        |         |         |         |
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 6+ 0       0.7890      2.62  |Q         |         |         |         |
 6+15       0.8463      2.77  |Q         |         |         |         |
 6+30       0.9074      2.96  |QV        |         |         |         |
 6+45       0.9716      3.11  |QV        |         |         |         |
 7+ 0       1.0396      3.29  |QV        |         |         |         |
 7+15       1.1083      3.33  |QV        |         |         |         |
 7+30       1.1795      3.45  |QV        |         |         |         |
 7+45       1.2568      3.74  | Q        |         |         |         |
 8+ 0       1.3408      4.07  | QV       |         |         |         |
 8+15       1.4340      4.51  | QV       |         |         |         |
 8+30       1.5354      4.91  | QV       |         |         |         |
 8+45       1.6407      5.10  | QV       |         |         |         |
 9+ 0       1.7524      5.40  |  Q       |         |         |         |
 9+15       1.8731      5.85  |  QV      |         |         |         |
 9+30       2.0045      6.36  |  QV      |         |         |         |
 9+45       2.1644      7.74  |   Q      |         |         |         |
10+ 0       2.3915     10.99  |    VQ    |         |         |         |
10+15       2.6074     10.45  |    Q     |         |         |         |
10+30       2.7323      6.05  |  Q  V    |         |         |         |
10+45       2.8753      6.92  |  Q  V    |         |         |         |
11+ 0       3.0767      9.75  |    Q V   |         |         |         |
11+15       3.2793      9.81  |    Q V   |         |         |         |
11+30       3.4636      8.92  |    Q V   |         |         |         |
11+45       3.6276      7.94  |   Q   V  |         |         |         |
12+ 0       3.7663      6.71  |  Q    V  |         |         |         |
12+15       4.0870     15.52  |       QV|         |         |         |
12+30       4.7047     29.90  |         V      Q  |         |         |
12+45       5.4716     37.12  |         | V       |Q        |         |
13+ 0       6.3671     43.35  |         |   V     |   Q     |         |
13+15       7.4504     52.43  |         |     V   |       Q|         |
13+30       8.7427     62.54  |         |       V|        |    Q    |
13+45       9.8294     52.60  |         |         V       Q         |
14+ 0      10.5339     34.10  |         |       Q|  V     |         |
14+15      11.2712     35.68  |         |        Q    V  |         |
14+30      12.1325     41.69  |         |         |  Q   V |         |
14+45      12.9959     41.79  |         |         |  Q     V|         |
15+ 0      13.8479     41.24  |         |         |  Q       V        |
15+15      14.6540     39.01  |         |         | Q        |  V     |
15+30      15.4063     36.41  |         |        Q         |    V   |
15+45      16.0332     30.34  |         |      Q  |         |     V  |
16+ 0      16.5179     23.46  |         |  Q      |         |      V |
16+15      16.8345     15.32  |       Q |         |         |       V|
16+30      16.9177      4.03  | Q       |         |         |       V|
16+45      16.9530      1.71  Q         |         |         |       V|
17+ 0      16.9769      1.16  Q         |         |         |       V|
17+15      17.0024      1.24  Q         |         |         |       V|
17+30      17.0352      1.58  Q         |         |         |       V|
17+45      17.0693      1.65  Q         |         |         |       V|
18+ 0      17.1013      1.55  Q         |         |         |       V|
18+15      17.1297      1.38  Q         |         |         |        V|
18+30      17.1575      1.34  Q         |         |         |        V|
18+45      17.1827      1.22  Q         |         |         |        V|
19+ 0      17.2019      0.93  Q         |         |         |        V|
19+15      17.2191      0.83  Q         |         |         |        V|
19+30      17.2414      1.08  Q         |         |         |        V|
19+45      17.2656      1.17  Q         |         |         |        V|
20+ 0      17.2846      0.92  Q         |         |         |        V|
20+15      17.3018      0.83  Q         |         |         |        V|
20+30      17.3218      0.97  Q         |         |         |        V|
20+45      17.3423      0.99  Q         |         |         |        V|
21+ 0      17.3606      0.89  Q         |         |         |        V|
21+15      17.3776      0.82  Q         |         |         |        V|
21+30      17.3952      0.85  Q         |         |         |        V|
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   21+45      17.4121      0.82  Q          |          |          |         V|
   22+ 0      17.4296      0.85  Q          |          |          |         V|
   22+15      17.4465      0.82  Q          |          |          |         V|
   22+30      17.4641      0.85  Q          |          |          |         V|
   22+45      17.4786      0.70  Q          |          |          |         V|
   23+ 0      17.4925      0.67  Q          |          |          |         V|
   23+15      17.5063      0.67  Q          |          |          |         V|
   23+30      17.5201      0.67  Q          |          |          |         V|
   23+45      17.5339      0.67  Q          |          |          |         V|
   24+ 0      17.5477      0.67  Q          |          |          |         V|
   24+15      17.5568      0.44  Q          |          |          |         V|
   24+30      17.5585      0.08  Q          |          |          |         V|
   24+45      17.5588      0.02  Q          |          |          |         V|
   25+ 0      17.5589      0.00  Q          |          |          |          V
-----------------------------------------------------------------------
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SubD324100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubD324100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed D, Stream 1, Subarea D3
Existing Condition
100-year, 3-hour

Drainage Area = 139.20(Ac.) = 0.218 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 139.20(Ac.) = 0.218 Sq. Mi.
Length along longest watercourse = 4340.00(Ft.)
Length along longest watercourse measured to centroid = 3080.00(Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.583 Mi.
Difference in elevation = 74.00(Ft.)
Slope along watercourse = 90.0276 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.232 Hr.
Lag time = 13.89 Min.
25% of lag time = 3.47 Min.
40% of lag time = 5.56 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
139.20	1.80	250.56

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
139.20	4.50	626.40

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubD324100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 4.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
83.200	76.00	0.000
56.000	85.00	0.000

Total Area Entered = 139.20(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.598	0.174
85.0	85.0	0.187	0.000	0.187	0.402	0.075
					Sum (F) =	0.249

Area averaged mean soil loss (F) (In/Hr) = 0.249
Minimum soil loss rate ((In/Hr)) = 0.125
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	107.956	21.624	30.336
2	0.500	215.911	48.794	68.452
3	0.750	323.867	14.551	20.413
4	1.000	431.823	6.649	9.328
5	1.250	539.778	3.694	5.182
6	1.500	647.734	2.331	3.270
7	1.750	755.689	1.374	1.927
8	2.000	863.645	0.983	1.379
			Sum = 100.000	Sum= 140.287

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.440)	0.032	0.004
2	0.50	0.30	0.054	(0.435)	0.049	0.005
3	0.75	0.30	0.054	(0.430)	0.049	0.005
4	1.00	0.40	0.072	(0.425)	0.065	0.007
5	1.25	0.30	0.054	(0.420)	0.049	0.005
6	1.50	0.30	0.054	(0.415)	0.049	0.005
7	1.75	0.30	0.054	(0.410)	0.049	0.005
8	2.00	0.40	0.072	(0.405)	0.065	0.007
9	2.25	0.40	0.072	(0.400)	0.065	0.007
10	2.50	0.40	0.072	(0.395)	0.065	0.007
11	2.75	0.50	0.090	(0.390)	0.081	0.009
12	3.00	0.50	0.090	(0.386)	0.081	0.009
13	3.25	0.50	0.090	(0.381)	0.081	0.009
14	3.50	0.50	0.090	(0.376)	0.081	0.009
15	3.75	0.50	0.090	(0.371)	0.081	0.009

16	4.00	0.60	0.108	(0.367)	0.097	0.011
17	4.25	0.60	0.108	(0.362)	0.097	0.011
18	4.50	0.70	0.126	(0.358)	0.113	0.013
19	4.75	0.70	0.126	(0.353)	0.113	0.013
20	5.00	0.80	0.144	(0.348)	0.130	0.014
21	5.25	0.60	0.108	(0.344)	0.097	0.011
22	5.50	0.70	0.126	(0.339)	0.113	0.013
23	5.75	0.80	0.144	(0.335)	0.130	0.014
24	6.00	0.80	0.144	(0.331)	0.130	0.014
25	6.25	0.90	0.162	(0.326)	0.146	0.016
26	6.50	0.90	0.162	(0.322)	0.146	0.016
27	6.75	1.00	0.180	(0.317)	0.162	0.018
28	7.00	1.00	0.180	(0.313)	0.162	0.018
29	7.25	1.00	0.180	(0.309)	0.162	0.018
30	7.50	1.10	0.198	(0.305)	0.178	0.020
31	7.75	1.20	0.216	(0.301)	0.194	0.022
32	8.00	1.30	0.234	(0.296)	0.211	0.023
33	8.25	1.50	0.270	(0.292)	0.243	0.027
34	8.50	1.50	0.270	(0.288)	0.243	0.027
35	8.75	1.60	0.288	(0.284)	0.259	0.029
36	9.00	1.70	0.306	(0.280)	0.275	0.031
37	9.25	1.90	0.342	0.276	(0.308)	0.066
38	9.50	2.00	0.360	0.272	(0.324)	0.088
39	9.75	2.10	0.378	0.268	(0.340)	0.110
40	10.00	2.20	0.396	0.265	(0.356)	0.131
41	10.25	1.50	0.270	(0.261)	0.243	0.027
42	10.50	1.50	0.270	(0.257)	0.243	0.027
43	10.75	2.00	0.360	0.253	(0.324)	0.107
44	11.00	2.00	0.360	0.249	(0.324)	0.110
45	11.25	1.90	0.342	0.246	(0.308)	0.096
46	11.50	1.90	0.342	0.242	(0.308)	0.100
47	11.75	1.70	0.306	0.239	(0.275)	0.067
48	12.00	1.80	0.324	0.235	(0.292)	0.089
49	12.25	2.50	0.450	0.232	(0.405)	0.218
50	12.50	2.60	0.468	0.228	(0.421)	0.240
51	12.75	2.80	0.504	0.225	(0.453)	0.279
52	13.00	2.90	0.522	0.221	(0.470)	0.301
53	13.25	3.40	0.612	0.218	(0.551)	0.394
54	13.50	3.40	0.612	0.215	(0.551)	0.397
55	13.75	2.30	0.414	0.211	(0.372)	0.203
56	14.00	2.30	0.414	0.208	(0.372)	0.206
57	14.25	2.70	0.486	0.205	(0.437)	0.281
58	14.50	2.60	0.468	0.202	(0.421)	0.266
59	14.75	2.60	0.468	0.199	(0.421)	0.269
60	15.00	2.50	0.450	0.196	(0.405)	0.254
61	15.25	2.40	0.432	0.193	(0.389)	0.239
62	15.50	2.30	0.414	0.190	(0.372)	0.224
63	15.75	1.90	0.342	0.187	(0.308)	0.155
64	16.00	1.90	0.342	0.184	(0.308)	0.158
65	16.25	0.40	0.072	(0.181)	0.065	0.007
66	16.50	0.40	0.072	(0.178)	0.065	0.007
67	16.75	0.30	0.054	(0.176)	0.049	0.005
68	17.00	0.30	0.054	(0.173)	0.049	0.005
69	17.25	0.50	0.090	(0.170)	0.081	0.009
70	17.50	0.50	0.090	(0.168)	0.081	0.009
71	17.75	0.50	0.090	(0.165)	0.081	0.009
72	18.00	0.40	0.072	(0.163)	0.065	0.007
73	18.25	0.40	0.072	(0.161)	0.065	0.007
74	18.50	0.40	0.072	(0.158)	0.065	0.007
75	18.75	0.30	0.054	(0.156)	0.049	0.005
76	19.00	0.20	0.036	(0.154)	0.032	0.004
77	19.25	0.30	0.054	(0.152)	0.049	0.005
78	19.50	0.40	0.072	(0.149)	0.065	0.007

79	19.75	0.30	0.054	(0.147)	0.049	0.005
80	20.00	0.20	0.036	(0.145)	0.032	0.004
81	20.25	0.30	0.054	(0.143)	0.049	0.005
82	20.50	0.30	0.054	(0.142)	0.049	0.005
83	20.75	0.30	0.054	(0.140)	0.049	0.005
84	21.00	0.20	0.036	(0.138)	0.032	0.004
85	21.25	0.30	0.054	(0.137)	0.049	0.005
86	21.50	0.20	0.036	(0.135)	0.032	0.004
87	21.75	0.30	0.054	(0.133)	0.049	0.005
88	22.00	0.20	0.036	(0.132)	0.032	0.004
89	22.25	0.30	0.054	(0.131)	0.049	0.005
90	22.50	0.20	0.036	(0.130)	0.032	0.004
91	22.75	0.20	0.036	(0.128)	0.032	0.004
92	23.00	0.20	0.036	(0.127)	0.032	0.004
93	23.25	0.20	0.036	(0.127)	0.032	0.004
94	23.50	0.20	0.036	(0.126)	0.032	0.004
95	23.75	0.20	0.036	(0.125)	0.032	0.004
96	24.00	0.20	0.036	(0.125)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.8

Flood volume = Effective rainfall 1.44(In)
times area 139.2(Ac.)/[(In)/(Ft.)] = 16.7(Ac.Ft)
Total soil loss = 3.06(In)
Total soil loss = 35.492(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 727174.0 Cubic Feet
Total soil loss = 1546039.8 Cubic Feet

Peak flow rate of this hydrograph = 50.003(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+15	0.0023	0.11	Q	|	|	|	|
0+30	0.0107	0.41	Q	|	|	|	|
0+45	0.0233	0.61	Q	|	|	|	|
1+ 0	0.0384	0.73	Q	|	|	|	|
1+15	0.0557	0.84	Q	|	|	|	|
1+30	0.0716	0.77	Q	|	|	|	|
1+45	0.0874	0.76	Q	|	|	|	|
2+ 0	0.1043	0.82	Q	|	|	|	|
2+15	0.1238	0.94	Q	|	|	|	|
2+30	0.1439	0.98	Q	|	|	|	|
2+45	0.1655	1.05	Q	|	|	|	|
3+ 0	0.1898	1.18	Q	|	|	|	|
3+15	0.2150	1.22	Q	|	|	|	|
3+30	0.2406	1.24	Q	|	|	|	|
3+45	0.2665	1.25	Q	|	|	|	|
4+ 0	0.2936	1.31	Q	|	|	|	|
4+15	0.3233	1.44	Q	|	|	|	|
4+30	0.3549	1.53	VQ	|	|	|	|
4+45	0.3895	1.67	VQ	|	|	|	|
5+ 0	0.4261	1.77	Q	|	|	|	|
5+15	0.4635	1.81	|Q	|	|	|	|
5+30	0.4980	1.67	|Q	|	|	|	|
5+45	0.5351	1.80	|Q	|	|	|	|
6+ 0	0.5751	1.94	|Q	|	|	|	|

```
 6+15       0.6171      2.03  |Q         |         |         |         |
 6+30       0.6620      2.17  |Q         |         |         |         |
 6+45       0.7091      2.28  |Q         |         |         |         |
 7+ 0       0.7591      2.42  |Q         |         |         |         |
 7+15       0.8102      2.47  |Q         |         |         |         |
 7+30       0.8630      2.55  |QV        |         |         |         |
 7+45       0.9197      2.74  |QV        |         |         |         |
 8+ 0       0.9810      2.97  |QV        |         |         |         |
 8+15       1.0483      3.26  | Q        |         |         |         |
 8+30       1.1220      3.57  | Q        |         |         |         |
 8+45       1.1990      3.73  | Q        |         |         |         |
 9+ 0       1.2808      3.96  | QV       |         |         |         |
 9+15       1.3885      5.21  |  Q       |         |         |         |
 9+30       1.5612      8.36  |  V Q     |         |         |         |
 9+45       1.7942     11.28  |   V  Q   |         |         |         |
10+ 0       2.0883     14.23  |    V   Q|         |         |         |
10+15       2.3652     13.41  |    V  Q |         |         |         |
10+30       2.5128      7.14  |   Q V    |         |         |         |
10+45       2.6758      7.89  |    QV    |         |         |         |
11+ 0       2.9395     12.76  |      VQ  |         |         |         |
11+15       3.2249     13.81  |      V Q|         |         |         |
11+30       3.5037     13.49  |       Q  |         |         |         |
11+45       3.7669     12.74  |       QV|         |         |         |
12+ 0       3.9994     11.25  |      Q V|         |         |         |
12+15       4.3325     16.12  |         Q         |         |         |
12+30       4.8670     25.87  |          V     Q  |         |         |
12+45       5.5116     31.20  |          |  V      Q         |         |
13+ 0       6.2593     36.19  |          |   V     |   Q     |         |
13+15       7.1307     42.18  |          |      V  |       Q |         |
13+30       8.1639     50.00  |          |        V|         |  Q      |
13+45       9.1345     46.98  |          |          V        |Q        |
14+ 0       9.8606     35.14  |          |          |  Q     |         |
14+15      10.5704     34.36  |          |          | Q  V   |         |
14+30      11.3498     37.72  |          |          |    Q V |         |
14+45      12.1260     37.57  |          |          |    Q   V|        |
15+ 0      12.8955     37.24  |          |          |   Q     V        |
15+15      13.6334     35.72  |          |          |  Q       | V     |
15+30      14.3330     33.86  |          |          | Q        |   V   |
15+45      14.9612     30.40  |          |         Q         |    V  |
16+ 0      15.4844     25.32  |          |      Q   |         |     V |
16+15      15.8821     19.25  |          | Q        |         |      V|
16+30      16.0513      8.19  |     Q    |          |         |      V|
16+45      16.1469      4.63  |   Q      |          |         |      V|
17+ 0      16.2055      2.84  |Q         |          |         |      V|
17+15      16.2464      1.98  |Q         |          |         |      V|
17+30      16.2801      1.63  |Q         |          |         |       V|
17+45      16.3091      1.41  Q          |          |         |       V|
18+ 0      16.3334      1.17  Q          |          |         |       V|
18+15      16.3553      1.06  Q          |          |         |       V|
18+30      16.3767      1.04  Q          |          |         |       V|
18+45      16.3968      0.97  Q          |          |         |       V|
19+ 0      16.4131      0.79  Q          |          |         |       V|
19+15      16.4272      0.68  Q          |          |         |       V|
19+30      16.4437      0.80  Q          |          |         |       V|
19+45      16.4618      0.88  Q          |          |         |       V|
20+ 0      16.4770      0.74  Q          |          |         |       V|
20+15      16.4904      0.65  Q          |          |         |       V|
20+30      16.5054      0.73  Q          |          |         |       V|
20+45      16.5208      0.74  Q          |          |         |       V|
21+ 0      16.5352      0.70  Q          |          |         |       V|
21+15      16.5482      0.63  Q          |          |         |       V|
21+30      16.5619      0.66  Q          |          |         |       V|
21+45      16.5746      0.62  Q          |          |         |       V|
```

```
   22+ 0      16.5882      0.66  Q          |          |          |         V|
   22+15      16.6008      0.61  Q          |          |          |         V|
   22+30      16.6143      0.65  Q          |          |          |         V|
   22+45      16.6258      0.55  Q          |          |          |         V|
   23+ 0      16.6368      0.53  Q          |          |          |         V|
   23+15      16.6475      0.52  Q          |          |          |         V|
   23+30      16.6581      0.51  Q          |          |          |         V|
   23+45      16.6686      0.51  Q          |          |          |         V|
   24+ 0      16.6791      0.51  Q          |          |          |         V|
   24+15      16.6873      0.40  Q          |          |          |         V|
   24+30      16.6903      0.15  Q          |          |          |         V|
   24+45      16.6919      0.08  Q          |          |          |         V|
   25+ 0      16.6928      0.04  Q          |          |          |         V|
   25+15      16.6933      0.02  Q          |          |          |         V|
   25+30      16.6935      0.01  Q          |          |          |         V|
   25+45      16.6936      0.00  Q          |          |          |          V
-----------------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  05/07/12 File: SUBD424100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed D, Stream 2, Subarea D4
Existing Condition
100 Yr. 24 Hr.

-------------------------------------------------------------------
Drainage Area =     211.30(Ac.)  =      0.330 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     211.30(Ac.)  =      0.330 Sq. Mi.
Length along longest watercourse =    4400.00(Ft.)
Length along longest watercourse measured to centroid =    1600.00(Ft.)
Length along longest watercourse =      0.833 Mi.
Length along longest watercourse measured to centroid =      0.303 Mi.
Difference in elevation =     110.00(Ft.)
Slope along watercourse =    132.0000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.169 Hr.
Lag time =    10.13 Min.
25% of lag time =     2.53 Min.
40% of lag time =     4.05 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      211.30           1.80                380.34

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      211.30           4.50                950.85

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    4.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    20.800           76.00         0.000
   185.000           85.00         0.000
```

```
     5.500           92.00         0.000
 Total Area Entered =    211.30(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
76.0  76.0      0.291     0.000        0.291       0.098      0.029
85.0  85.0      0.187     0.000        0.187       0.876      0.164
92.0  92.0      0.104     0.000        0.104       0.026      0.003
                                                  Sum (F) =   0.195
Area averaged mean soil loss (F) (In/Hr) =  0.195
Minimum soil loss rate ((In/Hr)) =  0.098
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

                U n i t  H y d r o g r a p h
                        VALLEY S-Curve
-----------------------------------------------------------------------
                Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.250        148.129         32.719             69.676
    2   0.500        296.258         47.146            100.398
    3   0.750        444.388         11.292             24.047
    4   1.000        592.517          4.940             10.520
    5   1.250        740.646          2.523              5.372
    6   1.500        888.775          1.380              2.938
                              Sum = 100.000   Sum=     212.951
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	0.20	0.036	(0.345)	0.032	0.004
2 0.50	0.30	0.054	(0.341)	0.049	0.005
3 0.75	0.30	0.054	(0.337)	0.049	0.005
4 1.00	0.40	0.072	(0.333)	0.065	0.007
5 1.25	0.30	0.054	(0.329)	0.049	0.005
6 1.50	0.30	0.054	(0.325)	0.049	0.005
7 1.75	0.30	0.054	(0.321)	0.049	0.005
8 2.00	0.40	0.072	(0.317)	0.065	0.007
9 2.25	0.40	0.072	(0.313)	0.065	0.007
10 2.50	0.40	0.072	(0.309)	0.065	0.007
11 2.75	0.50	0.090	(0.306)	0.081	0.009
12 3.00	0.50	0.090	(0.302)	0.081	0.009
13 3.25	0.50	0.090	(0.298)	0.081	0.009
14 3.50	0.50	0.090	(0.294)	0.081	0.009
15 3.75	0.50	0.090	(0.291)	0.081	0.009
16 4.00	0.60	0.108	(0.287)	0.097	0.011
17 4.25	0.60	0.108	(0.283)	0.097	0.011
18 4.50	0.70	0.126	(0.280)	0.113	0.013
19 4.75	0.70	0.126	(0.276)	0.113	0.013
20 5.00	0.80	0.144	(0.273)	0.130	0.014
21 5.25	0.60	0.108	(0.269)	0.097	0.011
22 5.50	0.70	0.126	(0.266)	0.113	0.013
23 5.75	0.80	0.144	(0.262)	0.130	0.014
24 6.00	0.80	0.144	(0.259)	0.130	0.014
25 6.25	0.90	0.162	(0.255)	0.146	0.016
26 6.50	0.90	0.162	(0.252)	0.146	0.016
27 6.75	1.00	0.180	(0.248)	0.162	0.018
28 7.00	1.00	0.180	(0.245)	0.162	0.018
29 7.25	1.00	0.180	(0.242)	0.162	0.018
30 7.50	1.10	0.198	(0.238)	0.178	0.020
31 7.75	1.20	0.216	(0.235)	0.194	0.022
32 8.00	1.30	0.234	(0.232)	0.211	0.023

33	8.25	1.50	0.270	0.229	(	0.243)	0.041
34	8.50	1.50	0.270	0.226	(	0.243)	0.044
35	8.75	1.60	0.288	0.222	(	0.259)	0.065
36	9.00	1.70	0.306	0.219	(	0.275)	0.087
37	9.25	1.90	0.342	0.216	(	0.308)	0.126
38	9.50	2.00	0.360	0.213	(	0.324)	0.147
39	9.75	2.10	0.378	0.210	(	0.340)	0.168
40	10.00	2.20	0.396	0.207	(	0.356)	0.189
41	10.25	1.50	0.270	0.204	(	0.243)	0.066
42	10.50	1.50	0.270	0.201	(	0.243)	0.069
43	10.75	2.00	0.360	0.198	(	0.324)	0.162
44	11.00	2.00	0.360	0.195	(	0.324)	0.165
45	11.25	1.90	0.342	0.192	(	0.308)	0.149
46	11.50	1.90	0.342	0.190	(	0.308)	0.152
47	11.75	1.70	0.306	0.187	(	0.275)	0.119
48	12.00	1.80	0.324	0.184	(	0.291)	0.140
49	12.25	2.50	0.450	0.181	(	0.405)	0.269
50	12.50	2.60	0.468	0.178	(	0.421)	0.289
51	12.75	2.80	0.504	0.176	(	0.453)	0.328
52	13.00	2.90	0.522	0.173	(	0.470)	0.349
53	13.25	3.40	0.612	0.171	(	0.551)	0.441
54	13.50	3.40	0.612	0.168	(	0.551)	0.444
55	13.75	2.30	0.414	0.165	(	0.372)	0.248
56	14.00	2.30	0.414	0.163	(	0.372)	0.251
57	14.25	2.70	0.486	0.160	(	0.437)	0.325
58	14.50	2.60	0.468	0.158	(	0.421)	0.310
59	14.75	2.60	0.468	0.156	(	0.421)	0.312
60	15.00	2.50	0.450	0.153	(	0.405)	0.297
61	15.25	2.40	0.432	0.151	(	0.389)	0.281
62	15.50	2.30	0.414	0.149	(	0.372)	0.265
63	15.75	1.90	0.342	0.146	(	0.308)	0.196
64	16.00	1.90	0.342	0.144	(	0.308)	0.198
65	16.25	0.40	0.072	(0.142)		0.065	0.007
66	16.50	0.40	0.072	(0.140)		0.065	0.007
67	16.75	0.30	0.054	(0.138)		0.049	0.005
68	17.00	0.30	0.054	(0.135)		0.049	0.005
69	17.25	0.50	0.090	(0.133)		0.081	0.009
70	17.50	0.50	0.090	(0.131)		0.081	0.009
71	17.75	0.50	0.090	(0.129)		0.081	0.009
72	18.00	0.40	0.072	(0.128)		0.065	0.007
73	18.25	0.40	0.072	(0.126)		0.065	0.007
74	18.50	0.40	0.072	(0.124)		0.065	0.007
75	18.75	0.30	0.054	(0.122)		0.049	0.005
76	19.00	0.20	0.036	(0.120)		0.032	0.004
77	19.25	0.30	0.054	(0.119)		0.049	0.005
78	19.50	0.40	0.072	(0.117)		0.065	0.007
79	19.75	0.30	0.054	(0.115)		0.049	0.005
80	20.00	0.20	0.036	(0.114)		0.032	0.004
81	20.25	0.30	0.054	(0.112)		0.049	0.005
82	20.50	0.30	0.054	(0.111)		0.049	0.005
83	20.75	0.30	0.054	(0.109)		0.049	0.005
84	21.00	0.20	0.036	(0.108)		0.032	0.004
85	21.25	0.30	0.054	(0.107)		0.049	0.005
86	21.50	0.20	0.036	(0.106)		0.032	0.004
87	21.75	0.30	0.054	(0.104)		0.049	0.005
88	22.00	0.20	0.036	(0.103)		0.032	0.004
89	22.25	0.30	0.054	(0.102)		0.049	0.005
90	22.50	0.20	0.036	(0.101)		0.032	0.004
91	22.75	0.20	0.036	(0.101)		0.032	0.004
92	23.00	0.20	0.036	(0.100)		0.032	0.004
93	23.25	0.20	0.036	(0.099)		0.032	0.004
94	23.50	0.20	0.036	(0.098)		0.032	0.004
95	23.75	0.20	0.036	(0.098)		0.032	0.004
96	24.00	0.20	0.036	(0.098)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.2

Flood volume = Effective rainfall 1.81(In)

times area 211.3(Ac.)/[(In)/(Ft.)] = 31.8(Ac.Ft)

Total soil loss = 2.69(In)

Total soil loss = 47.365(Ac.Ft)

Total rainfall = 4.50(In)

```
Flood volume =     1386942.2 Cubic Feet
Total soil loss =     2063218.9 Cubic Feet
-----------------------------------------------------------------------
 Peak flow rate of this hydrograph =     89.441(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f     H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       22.5      45.0      67.5      90.0
-----------------------------------------------------------------------
  0+15       0.0052      0.25  Q         |         |         |         |
  0+30       0.0204      0.74  Q         |         |         |         |
  0+45       0.0412      1.01  Q         |         |         |         |
  1+ 0       0.0662      1.21  Q         |         |         |         |
  1+15       0.0932      1.31  Q         |         |         |         |
  1+30       0.1177      1.19  Q         |         |         |         |
  1+45       0.1419      1.17  Q         |         |         |         |
  2+ 0       0.1684      1.29  Q         |         |         |         |
  2+15       0.1986      1.46  Q         |         |         |         |
  2+30       0.2296      1.50  Q         |         |         |         |
  2+45       0.2636      1.64  Q         |         |         |         |
  3+ 0       0.3015      1.83  Q         |         |         |         |
  3+15       0.3404      1.88  Q         |         |         |         |
  3+30       0.3797      1.90  Q         |         |         |         |
  3+45       0.4192      1.91  Q         |         |         |         |
  4+ 0       0.4614      2.04  Q         |         |         |         |
  4+15       0.5073      2.22  Q         |         |         |         |
  4+30       0.5567      2.39  VQ        |         |         |         |
  4+45       0.6103      2.59  VQ        |         |         |         |
  5+ 0       0.6675      2.77  VQ        |         |         |         |
  5+15       0.7238      2.72  VQ        |         |         |         |
  5+30       0.7762      2.54  VQ        |         |         |         |
  5+45       0.8338      2.78   Q        |         |         |         |
  6+ 0       0.8954      2.98  |Q        |         |         |         |
  6+15       0.9605      3.15  |Q        |         |         |         |
  6+30       1.0298      3.35  |Q        |         |         |         |
  6+45       1.1029      3.54  |Q        |         |         |         |
  7+ 0       1.1802      3.74  |Q        |         |         |         |
  7+15       1.2586      3.79  |Q        |         |         |         |
  7+30       1.3400      3.94  |Q        |         |         |         |
  7+45       1.4281      4.26  |Q        |         |         |         |
  8+ 0       1.5234      4.61  |VQ       |         |         |         |
  8+15       1.6493      6.09  | Q       |         |         |         |
  8+30       1.8182      8.17  | VQ      |         |         |         |
  8+45       2.0336     10.43  | V Q     |         |         |         |
  9+ 0       2.3292     14.30  | V   Q   |         |         |         |
  9+15       2.7381     19.79  |  V    Q |         |         |         |
  9+30       3.2751     25.99  |   V     |Q        |         |         |
  9+45       3.9127     30.86  |   V     |  Q      |         |         |
 10+ 0       4.6468     35.53  |    V    |    Q    |         |         |
 10+15       5.2681     30.07  |     V   |  Q      |         |         |
 10+30       5.6581     18.88  |      VQ |         |         |         |
 10+45       6.1352     23.09  |      V  Q         |         |         |
 11+ 0       6.7876     31.58  |       V |   Q     |         |         |
 11+15       7.4587     32.48  |        V|   Q     |         |         |
 11+30       8.1169     31.86  |         V   Q     |         |         |
 11+45       8.7369     30.01  |         V  Q      |         |         |
 12+ 0       9.3220     28.32  |         |VQ       |         |         |
 12+15      10.1182     38.54  |         | V    Q  |         |         |
 12+30      11.2139     53.03  |         |   V     |  Q      |         |
 12+45      12.4731     60.95  |         |    V    |      Q  |         |
 13+ 0      13.8810     68.14  |         |      V  |         Q         |
 13+15      15.5043     78.57  |         |        V|         |   Q     |
 13+30      17.3522     89.44  |         |          V        |        Q|
 13+45      18.9802     78.79  |         |          |  V     |    Q    |
 14+ 0      20.2324     60.61  |         |          |    VQ  |         |
 14+15      21.5120     61.93  |         |          |      Q |         |
```

```
   14+30      22.8885     66.62  |         |         |       VQ|         |
   14+45      24.2522     66.00  |         |         |        QV         |
   15+ 0      25.5953     65.01  |         |         |       Q | V       |
   15+15      26.8897     62.65  |         |         |      Q  |  V      |
   15+30      28.1246     59.77  |         |         |     Q   |    V    |
   15+45      29.2146     52.76  |         |         |  Q      |     V   |
   16+ 0      30.1505     45.30  |         |        Q        |      V  |
   16+15      30.7757     30.26  |         |  Q      |         |       V |
   16+30      30.9884     10.30  |   Q     |         |         |       V |
   16+45      31.0955      5.19  | Q       |         |         |        V|
   17+ 0      31.1535      2.81  |Q        |         |         |        V|
   17+15      31.1947      2.00  Q         |         |         |        V|
   17+30      31.2315      1.78  Q         |         |         |        V|
   17+45      31.2698      1.85  Q         |         |         |        V|
   18+ 0      31.3062      1.76  Q         |         |         |        V|
   18+15      31.3392      1.60  Q         |         |         |        V|
   18+30      31.3716      1.57  Q         |         |         |        V|
   18+45      31.4010      1.42  Q         |         |         |        V|
   19+ 0      31.4239      1.11  Q         |         |         |        V|
   19+15      31.4446      1.00  Q         |         |         |        V|
   19+30      31.4704      1.25  Q         |         |         |        V|
   19+45      31.4976      1.32  Q         |         |         |        V|
   20+ 0      31.5194      1.06  Q         |         |         |        V|
   20+15      31.5398      0.98  Q         |         |         |        V|
   20+30      31.5628      1.12  Q         |         |         |        V|
   20+45      31.5863      1.14  Q         |         |         |        V|
   21+ 0      31.6073      1.01  Q         |         |         |        V|
   21+15      31.6272      0.96  Q         |         |         |        V|
   21+30      31.6475      0.98  Q         |         |         |        V|
   21+45      31.6671      0.95  Q         |         |         |        V|
   22+ 0      31.6872      0.97  Q         |         |         |        V|
   22+15      31.7067      0.95  Q         |         |         |        V|
   22+30      31.7268      0.97  Q         |         |         |        V|
   22+45      31.7437      0.82  Q         |         |         |        V|
   23+ 0      31.7601      0.79  Q         |         |         |        V|
   23+15      31.7761      0.78  Q         |         |         |        V|
   23+30      31.7920      0.77  Q         |         |         |        V|
   23+45      31.8079      0.77  Q         |         |         |        V|
   24+ 0      31.8237      0.77  Q         |         |         |        V|
   24+15      31.8344      0.52  Q         |         |         |        V|
   24+30      31.8376      0.15  Q         |         |         |        V|
   24+45      31.8390      0.07  Q         |         |         |        V|
   25+ 0      31.8396      0.03  Q         |         |         |        V|
   25+15      31.8398      0.01  Q         |         |         |        V|
-----------------------------------------------------------------------
```

WSE24hr

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed E
Existing Condition
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubE124100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 108
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 575.561 (CFS)
Total volume = 202.681 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 71.000 to Point/Station 72.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 1070.00 (Ft.)
Elevation difference = 51.00 (Ft.)
Slope of channel = 0.047664 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 1070.00(Ft.) Elevation difference = 51.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 139.636(CFS)
Depth of flow = 1.120(Ft.)
Average velocity = 10.182(Ft/s)
Total flow rate = 139.636(CFS)
Channel flow top width = 14.481(Ft.)
Depth of flow in channel = 1.12(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 10.18(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =  139.636(CFS)
Total capacity of improved channels =    139.636(CFS)
Critical Depth in Channel =    1.63(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    575.561(CFS)
Depth of flow =     2.459(Ft.)
Average velocity =    15.688(Ft/s)
Total flow rate =   575.561(CFS)
Channel flow top width =   19.837(Ft.)
Depth of flow in channel =   2.46(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   15.69(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  575.561(CFS)
Total capacity of improved channels =    575.561(CFS)
Critical Depth in Channel =    3.66(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9022   Travel time =   1.14 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  10.0834
        dt(routing time-step) =   1.03 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f      H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      143.9     287.8     431.7     575.6
----------------------------------------------------------------------
  0+15       0.2777      0.30  O         |         |         |         |
  0+30       1.9295      2.05  O         |         |         |         |
  0+45       4.8039      5.01  O         |         |         |         |
  1+ 0       6.8843      7.02  O         |         |         |         |
  1+15       8.4222      8.52  O         |         |         |         |
  1+30       9.2641      9.32  O         |         |         |         |
  1+45       8.9780      8.95  O         |         |         |         |
  2+ 0       9.0994      9.11  O         |         |         |         |
  2+15       9.8542      9.91  O         |         |         |         |
  2+30      10.9021     10.98  O         |         |         |         |
  2+45      11.4754     11.51  O         |         |         |         |
  3+ 0      12.4748     12.55  O         |         |         |         |
  3+15      13.6946     13.78  O         |         |         |         |
  3+30      14.2302     14.26  O         |         |         |         |
  3+45      14.5135     14.53  |O        |         |         |         |
  4+ 0      14.8189     14.84  |O        |         |         |         |
  4+15      15.6755     15.74  |O        |         |         |         |
  4+30      16.9317     17.02  |O        |         |         |         |
  4+45      18.1587     18.24  |O        |         |         |         |
  5+ 0      19.6144     19.72  |O        |         |         |         |
  5+15      20.6964     20.77  |O        |         |         |         |
  5+30      20.7206     20.72  |O        |         |         |         |
```

5+45	20.1403	20.10	
6+ 0	21.4247	21.52	
6+15	22.7949	22.89	
6+30	24.0558	24.14	
6+45	25.5303	25.63	
7+ 0	26.9127	27.01	
7+15	28.3301	28.43	
7+30	29.1167	29.17	
7+45	30.3620	30.45	
8+ 0	32.5255	32.68	
8+15	35.1832	35.37	
8+30	38.5089	38.74	
8+45	41.6339	41.85	
9+ 0	44.1311	44.30	
9+15	50.9834	51.47	
9+30	73.0353	74.62	
9+45	108.9738	111.50	
10+ 0	143.3210	145.66	
10+15	167.8731	169.50	
10+30	145.6549	143.90	
10+45	98.9060	95.60	
11+ 0	115.1747	116.61	
11+15	155.6991	158.57	
11+30	166.2306	166.79	
11+45	164.7628	164.61	
12+ 0	156.8619	156.29	
12+15	159.5919	159.83	
12+30	221.4435	225.97	
12+45	310.6109	316.82	
13+ 0	373.2493	377.39	
13+15	435.3842	439.64	
13+30	511.2104	516.46	
13+45	571.5198	575.56	
14+ 0	525.1543	521.45	
14+15	436.5646	430.33	
14+30	432.5527	432.72	
14+45	452.5363	453.99	
15+ 0	450.3779	450.11	
15+15	443.4215	442.93	
15+30	428.3214	427.25	
15+45	405.7023	404.12	
16+ 0	362.7815	359.75	
16+15	303.8826	299.78	
16+30	218.6419	212.69	
16+45	115.8545	108.75	
17+ 0	70.4596	67.65	
17+15	45.1467	43.50	
17+30	31.1967	30.29	
17+45	24.2022	23.76	
18+ 0	20.0569	19.79	
18+15	17.3471	17.17	
18+30	15.0058	14.85	
18+45	13.3883	13.28	
19+ 0	11.5742	11.45	
19+15	9.3772	9.23	
19+30	8.6742	8.63	
19+45	9.6426	9.72	
20+ 0	9.8545	9.86	
20+15	8.6136	8.52	
20+30	8.1103	8.08	
20+45	8.6533	8.70	
21+ 0	8.6649	8.66	
21+15	8.0875	8.05	

```
  21+30       7.6721      7.64  O         |         |         |         |
  21+45       7.7080      7.71  O         |         |         |         |
  22+ 0       7.4964      7.48  O         |         |         |         |
  22+15       7.5944      7.60  O         |         |         |         |
  22+30       7.4115      7.40  O         |         |         |         |
  22+45       7.4057      7.41  O         |         |         |         |
  23+ 0       6.6371      6.58  O         |         |         |         |
  23+15       6.3412      6.32  O         |         |         |         |
  23+30       6.1886      6.18  O         |         |         |         |
  23+45       6.0932      6.09  O         |         |         |         |
  24+ 0       6.0341      6.03  O         |         |         |         |
  24+15       5.7243      5.70  O         |         |         |         |
  24+30       4.1968      4.09  O         |         |         |         |
  24+45       2.0727      1.92  O         |         |         |         |
  25+ 0       1.1827      1.13  O         |         |         |         |
  25+15       0.6992      0.67  O         |         |         |         |
  25+30       0.3951      0.38  O         |         |         |         |
  25+45       0.2130      0.20  O         |         |         |         |
  26+ 0       0.1197      0.11  O         |         |         |         |
  26+15       0.0783      0.08  O         |         |         |         |
  26+30       0.0511      0.05  O         |         |         |         |
  26+45       0.0273      0.03  O         |         |         |         |
  27+ 0       0.0098      0.01  O         |         |         |         |
  27+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   109
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      571.520 (CFS)
                      Total volume =     202.681 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *********************************************************************

       -------------------------------------------------------------------

       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station       71.000 to Point/Station       72.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ___________________________________________________________________
       ********************* HYDROGRAPH INFORMATION **********************

                      From study/file name: SubE224100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      143.4     286.8     430.2     573.7
  -------------------------------------------------------------------
    0+15       0.0205      0.30  Q         |         |         |         |
    0+30       0.0404      1.97  Q         |         |         |         |
    0+45       0.0452      4.85  Q         |         |         |         |
    1+ 0       0.0554      6.94  Q         |         |         |         |
    1+15       0.0500      8.47  Q         |         |         |         |
    1+30       0.0452      9.31  Q         |         |         |         |
    1+45       0.0452      9.02  Q         |         |         |         |
    2+ 0       0.0554      9.15  Q         |         |         |         |
```

```
 2+15       0.0603      9.91  Q          |          |          |          |
 2+30       0.0603     10.96  Q          |          |          |          |
 2+45       0.0705     11.55  Q          |          |          |          |
 3+ 0       0.0753     12.55  Q          |          |          |          |
 3+15       0.0753     13.77  Q          |          |          |          |
 3+30       0.0753     14.31  Q          |          |          |          |
 3+45       0.0753     14.59  qQ         |          |          |          |
 4+ 0       0.0856     14.90  qQ         |          |          |          |
 4+15       0.0904     15.77  qQ         |          |          |          |
 4+30       0.1006     17.03  qQ         |          |          |          |
 4+45       0.1054     18.26  qQ         |          |          |          |
 5+ 0       0.1157     19.73  qQ         |          |          |          |
 5+15       0.1001     20.80  qQ         |          |          |          |
 5+30       0.1006     20.82  qQ         |          |          |          |
 5+45       0.1157     20.26  qQ         |          |          |          |
 6+ 0       0.1205     21.55  qQ         |          |          |          |
 6+15       0.1307     22.93  qQ         |          |          |          |
 6+30       0.1356     24.19  qQ         |          |          |          |
 6+45       0.1458     25.68  qQ         |          |          |          |
 7+ 0       0.1506     27.06  qQ         |          |          |          |
 7+15       0.1506     28.48  qQ         |          |          |          |
 7+30       0.1609     29.28  q Q        |          |          |          |
 7+45       0.1759     30.54  q Q        |          |          |          |
 8+ 0       0.1910     32.72  q Q        |          |          |          |
 8+15       0.2163     35.40  q Q        |          |          |          |
 8+30       0.2260     38.73  q Q        |          |          |          |
 8+45       0.2362     41.87  q Q        |          |          |          |
 9+ 0       0.2513     44.38  q  Q       |          |          |          |
 9+15       0.3898     51.37  q  Q       |          |          |          |
 9+30       0.5786     73.61  q    Q     |          |          |          |
 9+45       0.7633    109.74  q      Q   |          |          |          |
10+ 0       0.9477    144.27  q         Q          |          |          |
10+15       0.4765    168.35  q         |Q         |          |          |
10+30       0.2260    145.88  q         Q          |          |          |
10+45       0.6188     99.52  q     Q   |          |          |          |
11+ 0       0.8264    116.00  q       Q |          |          |          |
11+15       0.7562    156.46  q         Q          |          |          |
11+30       0.7396    166.97  q         |Q         |          |          |
11+45       0.5664    165.33  q         |Q         |          |          |
12+ 0       0.6031    157.47  q         Q          |          |          |
12+15       1.3983    160.99  q         |Q         |          |          |
12+30       1.8693    223.31  q         |    Q     |          |          |
12+45       2.1523    312.76  q         |          |Q         |          |
13+ 0       2.3809    375.63  q         |          |     Q    |          |
13+15       2.9700    438.35  q         |          |          Q          |
13+30       3.2406    514.45  q         |          |          |    Q     |
13+45       2.1438    573.66  q         |          |          |         Q
14+ 0       1.6403    526.79  q         |          |          |     Q    |
14+15       2.0773    438.64  q         |          |          Q          |
14+30       2.1958    434.75  q         |          |          Q          |
14+45       2.1745    454.71  q         |          |          |Q         |
15+ 0       2.0988    452.48  q         |          |          |Q         |
15+15       1.9744    445.40  q         |          |          |Q         |
15+30       1.8496    430.17  q         |          |         Q|          |
15+45       1.4175    407.12  q         |          |        Q |          |
16+ 0       1.2492    364.03  q         |          |    Q     |          |
16+15       0.4443    304.33  q         |          |Q         |          |
16+30       0.0603    218.70  q         |    Q     |          |          |
16+45       0.0500    115.90  q       Q |          |          |          |
17+ 0       0.0452     70.50  q   Q     |          |          |          |
17+15       0.0657     45.21  q  Q      |          |          |          |
17+30       0.0753     31.27  q Q       |          |          |          |
17+45       0.0753     24.28  qQ         |          |          |          |
```

```
   18+ 0       0.0651     20.12  qQ         |          |          |          |
   18+15       0.0603     17.41  qQ         |          |          |          |
   18+30       0.0603     15.07  qQ         |          |          |          |
   18+45       0.0500     13.44  Q          |          |          |          |
   19+ 0       0.0350     11.61  Q          |          |          |          |
   19+15       0.0404      9.42  Q          |          |          |          |
   19+30       0.0554      8.73  Q          |          |          |          |
   19+45       0.0500      9.69  Q          |          |          |          |
   20+ 0       0.0350      9.89  Q          |          |          |          |
   20+15       0.0404      8.65  Q          |          |          |          |
   20+30       0.0452      8.16  Q          |          |          |          |
   20+45       0.0452      8.70  Q          |          |          |          |
   21+ 0       0.0350      8.70  Q          |          |          |          |
   21+15       0.0404      8.13  Q          |          |          |          |
   21+30       0.0350      7.71  Q          |          |          |          |
   21+45       0.0404      7.75  Q          |          |          |          |
   22+ 0       0.0350      7.53  Q          |          |          |          |
   22+15       0.0404      7.63  Q          |          |          |          |
   22+30       0.0350      7.45  Q          |          |          |          |
   22+45       0.0301      7.44  Q          |          |          |          |
   23+ 0       0.0301      6.67  Q          |          |          |          |
   23+15       0.0301      6.37  Q          |          |          |          |
   23+30       0.0301      6.22  Q          |          |          |          |
   23+45       0.0301      6.12  Q          |          |          |          |
   24+ 0       0.0301      6.06  Q          |          |          |          |
   24+15       0.0097      5.73  Q          |          |          |          |
   24+30       0.0000      4.20  Q          |          |          |          |
   24+45       0.0000      2.07  Q          |          |          |          |
   25+ 0       0.0000      1.18  Q          |          |          |          |
   25+15       0.0000      0.70  Q          |          |          |          |
   25+30       0.0000      0.40  Q          |          |          |          |
   25+45       0.0000      0.21  Q          |          |          |          |
   26+ 0       0.0000      0.12  Q          |          |          |          |
   26+15       0.0000      0.08  Q          |          |          |          |
   26+30       0.0000      0.05  Q          |          |          |          |
   26+45       0.0000      0.03  Q          |          |          |          |
   27+ 0       0.0000      0.01  Q          |          |          |          |
   27+15       0.0000      0.00  Q          |          |          |          |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =   109
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      573.664 (CFS)
                        Total volume =     203.634 (Ac.Ft)
                 Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                 Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                 Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      720.000 to Point/Station       72.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                        From study/file name: E21and22N72.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f     H y d r o g r a p h
```

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0 213.0 426.0 639.0 852.0
0+15	0.1800	0.48	Q
0+30	1.1256	3.10	Q
0+45	2.4995	7.35	Q
1+ 0	3.4842	10.42	Q
1+15	4.2503	12.72	Q
1+30	4.5331	13.84	Q
1+45	4.4058	13.43	Q
2+ 0	4.4582	13.61	Q
2+15	4.8727	14.79	Q
2+30	5.3373	16.30	Q
2+45	5.6331	17.18	Q
3+ 0	6.1725	18.72	Q
3+15	6.7109	20.48	Q
3+30	6.9556	21.26	Q
3+45	7.0766	21.67	qQ
4+ 0	7.2371	22.14	qQ
4+15	7.7062	23.47	qQ
4+30	8.2886	25.32	qQ
4+45	8.9377	27.20	qQ
5+ 0	9.6160	29.35	qQ
5+15	10.1437	30.94	qQ
5+30	9.9974	30.82	qQ
5+45	9.8592	30.12	qQ
6+ 0	10.4907	32.04	qQ
6+15	11.1324	34.06	qQ
6+30	11.7990	35.99	qQ
6+45	12.4879	38.16	qQ
7+ 0	13.2100	40.27	qQ
7+15	13.8339	42.31	qQ
7+30	14.2144	43.49	q Q
7+45	14.8835	45.42	q Q
8+ 0	15.9600	48.68	q Q
8+15	17.3762	52.78	q Q
8+30	19.1300	57.86	q Q
8+45	20.7912	62.66	q Q
9+ 0	22.2822	66.66	|q Q
9+15	25.6274	77.00	|q Q
9+30	36.9834	110.60	|q Q
9+45	54.0676	163.80	| q Q
10+ 0	70.9316	215.20	| q Q
10+15	81.3435	249.69	| q |Q
10+30	66.5536	212.43	| q Q|
10+45	47.7700	147.29	| q Q |
11+ 0	58.0691	174.07	| q Q |
11+15	75.2435	231.70	| q Q
11+30	79.7201	246.69	| q |Q
11+45	78.9710	244.30	| q |Q
12+ 0	74.1891	231.65	| q Q
12+15	78.2173	239.21	| q |Q
12+30	112.0553	335.37	| q | Q
12+45	153.6854	466.45	| q | |Q
13+ 0	185.1477	560.78	| q | Q |
13+15	215.8596	654.21	| q | Q
13+30	254.5700	769.02	| |q | Q |
13+45	278.3123	851.98	| | q | Q
14+ 0	248.0887	774.88	| |q | Q |
14+15	209.6964	648.34	| q| | Q |

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14+30     209.6532    644.40  |         q|          |          Q         |
14+45     217.3277    672.04  |          q          |          |Q        |
15+ 0     216.6649    669.14  |          q          |          |Q        |
15+15     212.8956    658.29  |         q|          |          Q         |
15+30     205.6791    635.85  |         q|          |         Q|         |
15+45     193.4613    600.58  |         q|          |        Q |         |
16+ 0     170.4178    534.45  |        q |          |    Q     |         |
16+15     141.4717    445.80  |      q   |          Q          |         |
16+30      95.6019    314.30  |   q      |   Q      |          |         |
16+45      50.4420    166.35  | q    Q   |          |          |         |
17+ 0      29.2945     99.80  |q  Q      |          |          |         |
17+15      18.2204     63.43  q Q        |          |          |         |
17+30      12.6988     43.97  q Q        |          |          |         |
17+45      10.1249     34.40  qQ         |          |          |         |
18+ 0       8.8542     28.98  qQ         |          |          |         |
18+15       7.7194     25.13  qQ         |          |          |         |
18+30       6.7434     21.81  qQ         |          |          |         |
18+45       6.0989     19.54  Q          |          |          |         |
19+ 0       5.2992     16.91  Q          |          |          |         |
19+15       4.4140     13.83  Q          |          |          |         |
19+30       4.2229     12.95  Q          |          |          |         |
19+45       4.7087     14.40  Q          |          |          |         |
20+ 0       4.6981     14.59  Q          |          |          |         |
20+15       4.1012     12.76  Q          |          |          |         |
20+30       3.9638     12.12  Q          |          |          |         |
20+45       4.1919     12.89  Q          |          |          |         |
21+ 0       4.1748     12.87  Q          |          |          |         |
21+15       3.8579     11.99  Q          |          |          |         |
21+30       3.7446     11.45  Q          |          |          |         |
21+45       3.6899     11.44  Q          |          |          |         |
22+ 0       3.6636     11.19  Q          |          |          |         |
22+15       3.6322     11.27  Q          |          |          |         |
22+30       3.6277     11.07  Q          |          |          |         |
22+45       3.5292     10.97  Q          |          |          |         |
23+ 0       3.1959      9.86  Q          |          |          |         |
23+15       3.0522      9.42  Q          |          |          |         |
23+30       2.9807      9.20  Q          |          |          |         |
23+45       2.9411      9.06  Q          |          |          |         |
24+ 0       2.9160      8.98  Q          |          |          |         |
24+15       2.7259      8.46  Q          |          |          |         |
24+30       1.8657      6.06  Q          |          |          |         |
24+45       0.9160      2.99  Q          |          |          |         |
25+ 0       0.4918      1.67  Q          |          |          |         |
25+15       0.2722      0.97  Q          |          |          |         |
25+30       0.1431      0.54  Q          |          |          |         |
25+45       0.0726      0.29  Q          |          |          |         |
26+ 0       0.0433      0.16  Q          |          |          |         |
26+15       0.0270      0.11  Q          |          |          |         |
26+30       0.0145      0.07  Q          |          |          |         |
26+45       0.0051      0.03  Q          |          |          |         |
27+ 0       0.0000      0.01  Q          |          |          |         |
27+15       0.0000      0.00  Q          |          |          |         |
----------------------------------------------------------------------
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**********HYDROGRAPH DATA**********

Number of intervals = 109
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 851.976 (CFS)
Total volume = 301.211 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station       72.000 to Point/Station       73.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   2900.00 (Ft.)
Elevation difference =   53.00 (Ft.)
Slope of channel =  0.018276 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  2900.00(Ft.)     Elevation difference =  53.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    207.543(CFS)
Depth of flow =     1.833(Ft.)
Average velocity =     8.286(Ft/s)
Total flow rate =   207.543(CFS)
Channel flow top width =   17.331(Ft.)
Depth of flow in channel =   1.83(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.29(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  207.543(CFS)
Total capacity of improved channels =    207.543(CFS)
Critical Depth in Channel =    2.06(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    851.976(CFS)
Depth of flow =     3.875(Ft.)
Average velocity =    12.389(Ft/s)
Total flow rate =   851.976(CFS)
Channel flow top width =   25.498(Ft.)
Depth of flow in channel =   3.87(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   12.39(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  851.976(CFS)
Total capacity of improved channels =    851.976(CFS)
Critical Depth in Channel =    4.50(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8793   Travel time =   3.90 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.2483
        dt(routing time-step) =   3.43 (min.),   c* =   0.9990

Output hydrograph delayed by 0  unit time increments
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P R I N T O F S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Out = O(CFS)	In = I	0	213.0	426.0	639.0	852.0
0+15	0.3684	0.48	O				
0+30	2.4946	3.10	O				
0+45	6.3719	7.35	O				
1+ 0	9.7171	10.42	O				
1+15	12.1942	12.72	O				
1+30	13.5848	13.84	O				
1+45	13.5236	13.43	O				
2+ 0	13.5709	13.61	O				
2+15	14.5177	14.79	O				
2+30	15.9523	16.30	O				
2+45	16.9768	17.18	O				
3+ 0	18.3681	18.72	O				
3+15	20.0769	20.48	O				
3+30	21.0816	21.26	O				
3+45	21.5725	21.67	|O				
4+ 0	22.0322	22.14	|O				
4+15	23.1666	23.47	|O				
4+30	24.8962	25.32	|O				
4+45	26.7697	27.20	|O				
5+ 0	28.8535	29.35	|O				
5+15	30.5738	30.94	|O				
5+30	30.8462	30.82	|O				
5+45	30.2766	30.12	|O				
6+ 0	31.5953	32.04	|O				
6+15	33.5934	34.06	|O				
6+30	35.5464	35.99	|O				
6+45	37.6646	38.16	|O				
7+ 0	39.7887	40.27	|O				
7+15	41.8456	42.31	|O				
7+30	43.2212	43.49	| O				
7+45	44.9783	45.42	| O				
8+ 0	47.9290	48.68	| O				
8+15	51.8342	52.78	| O				
8+30	56.6959	57.86	| O				
8+45	61.5593	62.66	| O				
9+ 0	65.7447	66.66	| O				
9+15	74.6274	77.00	| O				
9+30	102.8841	110.60	| OI				
9+45	151.5852	163.80	| O |				
10+ 0	203.3919	215.20	| OI				
10+15	241.7644	249.69	| |O				
10+30	220.9774	212.43	| IO				
10+45	162.2537	147.29	| IO |				
11+ 0	167.9406	174.07	| OI |				
11+15	218.4662	231.70	| O				
11+30	243.2359	246.69	| |O				
11+45	244.8451	244.30	| |O				
12+ 0	234.5570	231.65	| IO				
12+15	237.4769	239.21	| |O				
12+30	313.2967	335.37	| | OI				
12+45	436.3416	466.45	| | OI				
13+ 0	539.0972	560.78	| | | OI |			
13+15	632.7470	654.21	| | | | OI			
13+30	742.6496	769.02	| | | | O I |			

13+45	832.9097	851.98	OI
14+ 0	792.5568	774.88	IO
14+15	677.3998	648.34	IO
14+30	645.3354	644.40	O
14+45	665.6966	672.04	O
15+ 0	669.7999	669.14	O
15+15	660.7824	658.29	IO
15+30	641.0032	635.85	IO
15+45	608.6810	600.58	O
16+ 0	549.6349	534.45	O
16+15	466.1602	445.80	IO
16+30	344.5042	314.30	I O
16+45	200.3353	166.35	I O
17+ 0	115.1077	99.80	IO
17+15	71.7951	63.43	IO
17+30	48.4462	43.97	O
17+45	36.6031	34.40	O
18+ 0	30.2239	28.98	O
18+15	26.0115	25.13	O
18+30	22.5717	21.81	O
18+45	20.0595	19.54	O
19+ 0	17.5122	16.91	O
19+15	14.5383	13.83	O
19+30	13.1550	12.95	O
19+45	14.0690	14.40	O
20+ 0	14.5445	14.59	O
20+15	13.1757	12.76	O
20+30	12.2657	12.12	O
20+45	12.7136	12.89	O
21+ 0	12.8780	12.87	O
21+15	12.1898	11.99	O
21+30	11.5744	11.45	O
21+45	11.4415	11.44	O
22+ 0	11.2508	11.19	O
22+15	11.2505	11.27	O
22+30	11.1184	11.07	O
22+45	10.9901	10.97	O
23+ 0	10.1160	9.86	O
23+15	9.5247	9.42	O
23+30	9.2509	9.20	O
23+45	9.0955	9.06	O
24+ 0	8.9995	8.98	O
24+15	8.5793	8.46	O
24+30	6.6129	6.06	O
24+45	3.6947	2.99	O
25+ 0	1.9768	1.67	O
25+15	1.1331	0.97	O
25+30	0.6378	0.54	O
25+45	0.3437	0.29	O
26+ 0	0.1912	0.16	O
26+15	0.1186	0.11	O
26+30	0.0747	0.07	O
26+45	0.0400	0.03	O
27+ 0	0.0150	0.01	O
27+15	0.0023	0.00	O
27+30	0.0000	0.00	O

**********HYDROGRAPH DATA**********

Number of intervals = 110
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 832.910 (CFS)
Total volume = 301.211 (Ac.Ft)

Status of hydrographs being held in storage

WSE24hr

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 72.000 to Point/Station 73.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****

********** HYDROGRAPH INFORMATION **********

From study/file name: SubE324100.rte

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P R I N T O F S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0	213.0	426.1	639.1	852.2
0+15	0.0633	0.43	Q				
0+30	0.2023	2.70	Q				
0+45	0.2785	6.65	Q				
1+ 0	0.3257	10.04	Q				
1+15	0.3513	12.55	Q				
1+30	0.3096	13.89	Q				
1+45	0.3005	13.82	Q				
2+ 0	0.3307	13.90	Q				
2+15	0.3837	14.90	Q				
2+30	0.3949	16.35	Q				
2+45	0.4287	17.41	Q				
3+ 0	0.4831	18.85	Q				
3+15	0.4944	20.57	Q				
3+30	0.4965	21.58	qQ				
3+45	0.4973	22.07	qQ				
4+ 0	0.5289	22.56	qQ				
4+15	0.5826	23.75	qQ				
4+30	0.6255	25.52	qQ				
4+45	0.6813	27.45	qQ				
5+ 0	0.7249	29.58	qQ				
5+15	0.7174	31.29	qQ				
5+30	0.6537	31.50	qQ				
5+45	0.7187	31.00	qQ				
6+ 0	0.7801	32.38	qQ				
6+15	0.8236	34.42	qQ				
6+30	0.8802	36.43	qQ				
6+45	0.9238	38.59	qQ				
7+ 0	0.9797	40.77	qQ				
7+15	0.9916	42.84	q Q				
7+30	1.0254	44.25	q Q				
7+45	1.1115	46.09	q Q				
8+ 0	1.2081	49.14	q Q				
8+15	1.3384	53.17	q Q				
8+30	1.4599	58.16	q Q				
8+45	1.5169	63.08	q Q				
9+ 0	1.9160	67.66	q Q				
9+15	3.2030	77.83	q Q				
9+30	4.8884	107.77	q Q				
9+45	6.1839	157.77	q Q				

10+ 0	7.3966	210.79	q
10+15	6.0616	247.83	q
10+30	2.6400	223.62	q
10+45	3.6572	165.91	q
11+ 0	6.3875	174.33	q
11+15	6.7693	225.24	q
11+30	6.5263	249.76	q
11+45	6.0017	250.85	q
12+ 0	5.4056	239.96	q
12+15	8.1064	245.58	q
12+30	12.4273	325.72	q
12+45	14.5665	450.91	q
13+ 0	16.4007	555.50	q
13+15	18.9900	651.74	q
13+30	22.0060	764.66	|q
13+45	19.2892	852.20	q
14+ 0	13.6660	806.22	q
14+15	13.8964	691.30	q
14+30	15.6510	660.99	q
14+45	15.6416	681.34	q
15+ 0	15.4553	685.26	q
15+15	14.7642	675.55	q
15+30	13.9432	654.95	q
15+45	12.1559	620.84	q
16+ 0	10.0151	559.65	q
16+15	6.7261	472.89	q
16+30	1.7202	346.22	q
16+45	0.6305	200.97	q
17+ 0	0.3802	115.49	q
17+15	0.3646	72.16	q
17+30	0.4697	48.92	q
17+45	0.4915	37.09	qQ
18+ 0	0.4641	30.69	qQ
18+15	0.4119	26.42	qQ
18+30	0.4007	22.97	qQ
18+45	0.3669	20.43	Q
19+ 0	0.2808	17.79	Q
19+15	0.2476	14.79	Q
19+30	0.3195	13.47	Q
19+45	0.3499	14.42	Q
20+ 0	0.2772	14.82	Q
20+15	0.2468	13.42	Q
20+30	0.2879	12.55	Q
20+45	0.2962	13.01	Q
21+ 0	0.2660	13.14	Q
21+15	0.2447	12.43	Q
21+30	0.2555	11.83	Q
21+45	0.2425	11.68	Q
22+ 0	0.2547	11.51	Q
22+15	0.2425	11.49	Q
22+30	0.2547	11.37	Q
22+45	0.2109	11.20	Q
23+ 0	0.2011	10.32	Q
23+15	0.1996	9.72	Q
23+30	0.1989	9.45	Q
23+45	0.1989	9.29	Q
24+ 0	0.1989	9.20	Q
24+15	0.1356	8.71	Q
24+30	0.0282	6.64	Q
24+45	0.0058	3.70	Q
25+ 0	0.0015	1.98	Q
25+15	0.0000	1.13	Q
25+30	0.0000	0.64	Q

```
  25+45       0.0000      0.34  Q         |         |         |         |
  26+ 0       0.0000      0.19  Q         |         |         |         |
  26+15       0.0000      0.12  Q         |         |         |         |
  26+30       0.0000      0.07  Q         |         |         |         |
  26+45       0.0000      0.04  Q         |         |         |         |
  27+ 0       0.0000      0.02  Q         |         |         |         |
  27+15       0.0000      0.00  Q         |         |         |         |
  27+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   110
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      852.199 (CFS)
                        Total volume =     308.349 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       70.000 to Point/Station       73.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file WSE24hr.rte
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =     0
                        Time interval =    0.0 (Min.)
                        Maximum/Peak flow rate =        0.000 (CFS)
                        Total volume =       0.000 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------
```

E21and22N72

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed E, Node 720 to 72
Existing Condition
100-year, 24-hour
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubE2124100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 107
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 275.722 (CFS)
Total volume = 95.034 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 721.000 to Point/Station 72.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 1390.00 (Ft.)
Elevation difference = 39.00 (Ft.)
Slope of channel = 0.028058 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 1390.00(Ft.) Elevation difference = 39.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 64.850(CFS)
Depth of flow = 0.839(Ft.)
Average velocity = 6.619(Ft/s)
Total flow rate = 64.850(CFS)
Channel flow top width = 13.356(Ft.)
Depth of flow in channel = 0.84(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 6.62(Ft/s)
Travel time = 0.00 min.
Individual channel flow = 64.850(CFS)

Total capacity of improved channels = 64.850(CFS)
Critical Depth in Channel = 1.02(Ft.)

Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea = 275.722(CFS)
Depth of flow = 1.905(Ft.)
Average velocity = 10.484(Ft/s)
Total flow rate = 275.722(CFS)
Channel flow top width = 17.618(Ft.)
Depth of flow in channel = 1.90(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 10.48(Ft/s)
Travel time = 0.00 min.
Individual channel flow = 275.722(CFS)
Total capacity of improved channels = 275.722(CFS)
Critical Depth in Channel = 2.42(Ft.)

********** SCS CONVEX CHANNEL ROUTING **********
Convex method of stream routing data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
where c* = 1 - (1-c)^e and dt = c(length)/velocity
c(v/v+1.7) = 0.8605 Travel time = 2.21 (min.)
dt*(unit time interval) = 15.00(min.), e= 5.5924
dt(routing time-step) = 1.90 (min.), c* = 1.0000

Output hydrograph delayed by 0 unit time increments

++
P R I N T O F S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Out = O(CFS)	In = I	0	68.9	137.9	206.8	275.7
0+15	0.1422	0.16	O				
0+30	1.0449	1.17	O				
0+45	2.4058	2.58	O				
1+ 0	3.3711	3.49	O				
1+15	4.1441	4.24	O				
1+30	4.4385	4.47	O				
1+45	4.3116	4.29	O				
2+ 0	4.3452	4.35	O				
2+15	4.7476	4.80	O				
2+30	5.2117	5.27	O				
2+45	5.4886	5.52	O				
3+ 0	6.0160	6.09	O				
3+15	6.5539	6.62	O				
3+30	6.7986	6.82	O				
3+45	6.9196	6.93	|O				
4+ 0	7.0613	7.08	|O				
4+15	7.5183	7.58	|O				
4+30	8.0813	8.15	|O				
4+45	8.7184	8.80	|O				
5+ 0	9.3773	9.46	|O				
5+15	9.9308	10.00	|O				
5+30	9.7892	9.76	|O				
5+45	9.6210	9.60	|O				

```
 6+ 0      10.2400     10.33  |O        |         |         |         |
 6+15      10.8623     10.94  |O        |         |         |         |
 6+30      11.5169     11.60  |O        |         |         |         |
 6+45      12.1864     12.27  |O        |         |         |         |
 7+ 0      12.8965     12.99  |O        |         |         |         |
 7+15      13.5199     13.60  |O        |         |         |         |
 7+30      13.8815     13.92  | O       |         |         |         |
 7+45      14.5197     14.61  | O       |         |         |         |
 8+ 0      15.5649     15.70  | O       |         |         |         |
 8+15      16.8561     17.02  | O       |         |         |         |
 8+30      18.5033     18.72  | O       |         |         |         |
 8+45      19.9166     20.09  | O       |         |         |         |
 9+ 0      21.0421     21.18  |  O      |         |         |         |
 9+15      23.8284     24.21  |  O      |         |         |         |
 9+30      34.6946     36.22  |    O    |         |         |         |
 9+45      51.4049     53.61  |      O  |         |         |         |
10+ 0      67.9004     69.98  |        OI         |         |         |
10+15      79.4542     80.83  |         |O        |         |         |
10+30      65.4483     63.22  |        O|         |         |         |
10+45      45.7025     43.16  |     O   |         |         |         |
11+ 0      55.3475     57.12  |       O |         |         |         |
11+15      72.6343     74.89  |         O         |         |         |
11+30      77.1800     77.51  |         |O        |         |         |
11+45      76.7625     76.65  |         |O        |         |         |
12+ 0      71.9823     71.30  |         O         |         |         |
12+15      74.5292     75.00  |         O         |         |         |
12+30     107.2822    111.97  |         |    OI   |         |         |
12+45     148.3316    153.61  |         |         |OI       |         |
13+ 0     179.3117    183.04  |         |         |     O   |         |
13+15     208.9024    212.66  |         |         |         O         |
13+30     246.9595    251.94  |         |         |         |    OI   |
13+45     272.7072    275.72  |         |         |         |        OI
14+ 0     243.7618    239.12  |         |         |         |   IO    |
14+15     204.6237    199.61  |         |         |       IO|         |
14+30     204.2435    204.92  |         |         |        O|         |
14+45     211.9750    213.00  |         |         |         O         |
15+ 0     211.4627    211.24  |         |         |         O         |
15+15     207.9601    207.48  |         |         |         O         |
15+30     201.0158    200.08  |         |         |        O|         |
15+45     189.6371    188.12  |         |         |      O  |         |
16+ 0     167.0394    163.98  |         |         |  IO     |         |
16+15     140.0503    136.58  |         |        IO         |         |
16+30      95.4254     89.45  |         | IO      |         |         |
16+45      50.3353     44.66  |     IO  |         |         |         |
17+ 0      29.1998     26.96  |  IO     |         |         |         |
17+15      18.0884     16.80  | O       |         |         |         |
17+30      12.5428     11.92  |O        |         |         |         |
17+45       9.9679      9.68  |O        |         |         |         |
18+ 0       8.7161      8.58  |O        |         |         |         |
18+15       7.5933      7.45  |O        |         |         |         |
18+30       6.6178      6.50  O         |         |         |         |
18+45       5.9921      5.92  O         |         |         |         |
19+ 0       5.2234      5.12  O         |         |         |         |
19+15       4.3318      4.22  O         |         |         |         |
19+30       4.1103      4.09  O         |         |         |         |
19+45       4.6025      4.68  O         |         |         |         |
20+ 0       4.6223      4.61  O         |         |         |         |
20+15       4.0191      3.93  O         |         |         |         |
20+30       3.8701      3.86  O         |         |         |         |
20+45       4.0977      4.13  O         |         |         |         |
21+ 0       4.0995      4.09  O         |         |         |         |
21+15       3.7757      3.73  O         |         |         |         |
21+30       3.6698      3.66  O         |         |         |         |
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  21+45       3.6077      3.60  O         |         |         |         |
  22+ 0       3.5888      3.59  O         |         |         |         |
  22+15       3.5500      3.54  O         |         |         |         |
  22+30       3.5529      3.55  O         |         |         |         |
  22+45       3.4659      3.45  O         |         |         |         |
  23+ 0       3.1331      3.09  O         |         |         |         |
  23+15       2.9894      2.98  O         |         |         |         |
  23+30       2.9179      2.91  O         |         |         |         |
  23+45       2.8783      2.87  O         |         |         |         |
  24+ 0       2.8532      2.85  O         |         |         |         |
  24+15       2.7009      2.68  O         |         |         |         |
  24+30       1.8648      1.75  O         |         |         |         |
  24+45       0.9160      0.80  O         |         |         |         |
  25+ 0       0.4918      0.45  O         |         |         |         |
  25+15       0.2722      0.25  O         |         |         |         |
  25+30       0.1431      0.13  O         |         |         |         |
  25+45       0.0726      0.06  O         |         |         |         |
  26+ 0       0.0433      0.04  O         |         |         |         |
  26+15       0.0270      0.03  O         |         |         |         |
  26+30       0.0145      0.01  O         |         |         |         |
  26+45       0.0051      0.00  O         |         |         |         |
  27+ 0       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   108
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      272.707 (CFS)
                        Total volume =      95.034 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------

        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      721.000 to Point/Station       72.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                        From study/file name: SubE2224100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f     H y d r o g r a p h
        ----------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       69.6     139.2     208.7     278.3
  ----------------------------------------------------------------------
    0+15       0.0377      0.18  Q         |         |         |         |
    0+30       0.0807      1.13  Q         |         |         |         |
    0+45       0.0937      2.50  Q         |         |         |         |
    1+ 0       0.1131      3.48  Q         |         |         |         |
    1+15       0.1062      4.25  Q         |         |         |         |
    1+30       0.0947      4.53  Q         |         |         |         |
    1+45       0.0942      4.41  Q         |         |         |         |
    2+ 0       0.1131      4.46  Q         |         |         |         |
    2+15       0.1251      4.87  Q         |         |         |         |
    2+30       0.1256      5.34  Q         |         |         |         |
```

```
 2+45       0.1445      5.63  Q          |          |          |          |
 3+ 0       0.1565      6.17  Q          |          |          |          |
 3+15       0.1570      6.71  Q          |          |          |          |
 3+30       0.1570      6.96  Q          |          |          |          |
 3+45       0.1570      7.08  qQ         |          |          |          |
 4+ 0       0.1759      7.24  qQ         |          |          |          |
 4+15       0.1879      7.71  qQ         |          |          |          |
 4+30       0.2073      8.29  qQ         |          |          |          |
 4+45       0.2193      8.94  qQ         |          |          |          |
 5+ 0       0.2387      9.62  qQ         |          |          |          |
 5+15       0.2129     10.14  qQ         |          |          |          |
 5+30       0.2082     10.00  qQ         |          |          |          |
 5+45       0.2382      9.86  qQ         |          |          |          |
 6+ 0       0.2507     10.49  qQ         |          |          |          |
 6+15       0.2701     11.13  qQ         |          |          |          |
 6+30       0.2821     11.80  qQ         |          |          |          |
 6+45       0.3015     12.49  qQ         |          |          |          |
 7+ 0       0.3135     13.21  qQ         |          |          |          |
 7+15       0.3140     13.83  qQ         |          |          |          |
 7+30       0.3329     14.21  q Q        |          |          |          |
 7+45       0.3638     14.88  q Q        |          |          |          |
 8+ 0       0.3952     15.96  q Q        |          |          |          |
 8+15       0.5201     17.38  q Q        |          |          |          |
 8+30       0.6267     19.13  q Q        |          |          |          |
 8+45       0.8746     20.79  q Q        |          |          |          |
 9+ 0       1.2402     22.28  q  Q       |          |          |          |
 9+15       1.7989     25.63  q  Q       |          |          |          |
 9+30       2.2888     36.98  q    Q     |          |          |          |
 9+45       2.6627     54.07  q      Q   |          |          |          |
10+ 0       3.0312     70.93  q         Q          |          |          |
10+15       1.8893     81.34  q          |Q         |          |          |
10+30       1.1053     66.55  q        Q|          |          |          |
10+45       2.0675     47.77  q     Q   |          |          |          |
11+ 0       2.7216     58.07  q       Q |          |          |          |
11+15       2.6092     75.24  q         Q          |          |          |
11+30       2.5402     79.72  q          |Q         |          |          |
11+45       2.2085     78.97  q          |Q         |          |          |
12+ 0       2.2068     74.19  q         Q          |          |          |
12+15       3.6880     78.22  q          |Q         |          |          |
12+30       4.7731    112.06  q           |     Q   |          |          |
12+45       5.3538    153.69  q           |         | Q        |          |
13+ 0       5.8360    185.15  q           |         |     Q    |          |
13+15       6.9572    215.86  q           |         |          |Q         |
13+30       7.6105    254.57  |q          |         |          |     Q    |
13+45       5.6051    278.31  q           |         |          |          Q
14+ 0       4.3269    248.09  q           |         |          |    Q     |
14+15       5.0728    209.70  q           |         |         Q          |
14+30       5.4097    209.65  q           |         |         Q          |
14+45       5.3527    217.33  q           |         |         |Q         |
15+ 0       5.2021    216.66  q           |         |         |Q         |
15+15       4.9355    212.90  q           |         |         Q          |
15+30       4.6633    205.68  q           |         |        Q|          |
15+45       3.8242    193.46  q           |         |     Q   |          |
16+ 0       3.3784    170.42  q           |         |   Q     |          |
16+15       1.4213    141.47  q           |        Q        |          |
16+30       0.1764     95.60  q           |  Q      |         |          |
16+45       0.1067     50.44  q       Q   |         |         |          |
17+ 0       0.0947     29.29  q    Q      |         |         |          |
17+15       0.1319     18.22  q Q         |         |         |          |
17+30       0.1560     12.70  qQ          |         |         |          |
17+45       0.1570     10.12  qQ          |         |         |          |
18+ 0       0.1381      8.85  qQ          |         |         |          |
18+15       0.1261      7.72  qQ          |         |         |          |
```

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   18+30       0.1256      6.74  Q          |          |          |          |
   18+45       0.1067      6.10  Q          |          |          |          |
   19+ 0       0.0758      5.30  Q          |          |          |          |
   19+15       0.0822      4.41  Q          |          |          |          |
   19+30       0.1126      4.22  Q          |          |          |          |
   19+45       0.1062      4.71  Q          |          |          |          |
   20+ 0       0.0758      4.70  Q          |          |          |          |
   20+15       0.0822      4.10  Q          |          |          |          |
   20+30       0.0937      3.96  Q          |          |          |          |
   20+45       0.0942      4.19  Q          |          |          |          |
   21+ 0       0.0753      4.17  Q          |          |          |          |
   21+15       0.0822      3.86  Q          |          |          |          |
   21+30       0.0748      3.74  Q          |          |          |          |
   21+45       0.0822      3.69  Q          |          |          |          |
   22+ 0       0.0748      3.66  Q          |          |          |          |
   22+15       0.0822      3.63  Q          |          |          |          |
   22+30       0.0748      3.63  Q          |          |          |          |
   22+45       0.0633      3.53  Q          |          |          |          |
   23+ 0       0.0628      3.20  Q          |          |          |          |
   23+15       0.0628      3.05  Q          |          |          |          |
   23+30       0.0628      2.98  Q          |          |          |          |
   23+45       0.0628      2.94  Q          |          |          |          |
   24+ 0       0.0628      2.92  Q          |          |          |          |
   24+15       0.0250      2.73  Q          |          |          |          |
   24+30       0.0010      1.87  Q          |          |          |          |
   24+45       0.0000      0.92  Q          |          |          |          |
   25+ 0       0.0000      0.49  Q          |          |          |          |
   25+15       0.0000      0.27  Q          |          |          |          |
   25+30       0.0000      0.14  Q          |          |          |          |
   25+45       0.0000      0.07  Q          |          |          |          |
   26+ 0       0.0000      0.04  Q          |          |          |          |
   26+15       0.0000      0.03  Q          |          |          |          |
   26+30       0.0000      0.01  Q          |          |          |          |
   26+45       0.0000      0.01  Q          |          |          |          |
   27+ 0       0.0000      0.00  Q          |          |          |          |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =   108
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      278.312 (CFS)
                        Total volume =      97.577 (Ac.Ft)
                Status of hydrographs being held in storage
                            Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        *********************************************************************

        -------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      720.000 to Point/Station       72.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        _____________________________________________________________________
        Current stream hydrograph saved in file E21and22N72.rte
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =     0
                        Time interval =    0.0 (Min.)
                        Maximum/Peak flow rate =        0.000 (CFS)
                        Total volume =       0.000 (Ac.Ft)
                Status of hydrographs being held in storage
                            Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
```

```
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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SubE124100

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 04/25/12 File: SubE124100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E1
Existing Condition
100-year, 24-hour

Drainage Area = 1648.50(Ac.) = 2.576 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 1648.50(Ac.) = 2.576 Sq. Mi.
Length along longest watercourse = 14430.00(Ft.)
Length along longest watercourse measured to centroid = 9640.00(Ft.)
Length along longest watercourse = 2.733 Mi.
Length along longest watercourse measured to centroid = 1.826 Mi.
Difference in elevation = 815.00(Ft.)
Slope along watercourse = 298.2121 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.449 Hr.
Lag time = 26.95 Min.
25% of lag time = 6.74 Min.
40% of lag time = 10.78 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1648.50	1.80	2967.30

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
1648.50	4.50	7418.25

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubE124100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.68 %
Adjusted average point rain = 4.486(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
105.000	46.00	0.000
47.400	66.00	0.000
18.500	77.00	0.000
1477.600	83.00	0.000

Total Area Entered = 1648.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.064	0.039
66.0	66.0	0.405	0.000	0.405	0.029	0.012
77.0	77.0	0.279	0.000	0.279	0.011	0.003
83.0	83.0	0.210	0.000	0.210	0.896	0.188
					Sum (F) =	0.242

Area averaged mean soil loss (F) (In/Hr) = 0.242
Minimum soil loss rate ((In/Hr)) = 0.121
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	55.654	4.998	83.034
2	0.500	111.309	26.859	446.222
3	0.750	166.963	36.143	600.478
4	1.000	222.617	13.228	219.760
5	1.250	278.271	7.651	127.110
6	1.500	333.926	4.833	80.291
7	1.750	389.580	2.918	48.473
8	2.000	445.234	1.465	24.333
9	2.250	500.889	0.637	10.581
10	2.500	556.543	0.443	7.358
11	2.750	612.197	0.397	6.588
12	3.000	667.851	0.285	4.731
13	3.250	723.506	0.146	2.419
		Sum = 100.000	Sum=	1661.379

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.427)	0.032	0.004
2	0.50	0.30	0.054	(0.422)	0.048	0.005
3	0.75	0.30	0.054	(0.417)	0.048	0.005
4	1.00	0.40	0.072	(0.412)	0.065	0.007
5	1.25	0.30	0.054	(0.407)	0.048	0.005
6	1.50	0.30	0.054	(0.402)	0.048	0.005

7	1.75	0.30	0.054	(0.398)	0.048	0.005
8	2.00	0.40	0.072	(0.393)	0.065	0.007
9	2.25	0.40	0.072	(0.388)	0.065	0.007
10	2.50	0.40	0.072	(0.383)	0.065	0.007
11	2.75	0.50	0.090	(0.379)	0.081	0.009
12	3.00	0.50	0.090	(0.374)	0.081	0.009
13	3.25	0.50	0.090	(0.369)	0.081	0.009
14	3.50	0.50	0.090	(0.365)	0.081	0.009
15	3.75	0.50	0.090	(0.360)	0.081	0.009
16	4.00	0.60	0.108	(0.356)	0.097	0.011
17	4.25	0.60	0.108	(0.351)	0.097	0.011
18	4.50	0.70	0.126	(0.347)	0.113	0.013
19	4.75	0.70	0.126	(0.342)	0.113	0.013
20	5.00	0.80	0.144	(0.338)	0.129	0.014
21	5.25	0.60	0.108	(0.333)	0.097	0.011
22	5.50	0.70	0.126	(0.329)	0.113	0.013
23	5.75	0.80	0.144	(0.325)	0.129	0.014
24	6.00	0.80	0.144	(0.321)	0.129	0.014
25	6.25	0.90	0.161	(0.316)	0.145	0.016
26	6.50	0.90	0.161	(0.312)	0.145	0.016
27	6.75	1.00	0.179	(0.308)	0.161	0.018
28	7.00	1.00	0.179	(0.304)	0.161	0.018
29	7.25	1.00	0.179	(0.300)	0.161	0.018
30	7.50	1.10	0.197	(0.296)	0.178	0.020
31	7.75	1.20	0.215	(0.291)	0.194	0.022
32	8.00	1.30	0.233	(0.287)	0.210	0.023
33	8.25	1.50	0.269	(0.283)	0.242	0.027
34	8.50	1.50	0.269	(0.280)	0.242	0.027
35	8.75	1.60	0.287	(0.276)	0.258	0.029
36	9.00	1.70	0.305	0.272	(0.275)	0.033
37	9.25	1.90	0.341	0.268	(0.307)	0.073
38	9.50	2.00	0.359	0.264	(0.323)	0.095
39	9.75	2.10	0.377	0.260	(0.339)	0.116
40	10.00	2.20	0.395	0.257	(0.355)	0.138
41	10.25	1.50	0.269	(0.253)	0.242	0.027
42	10.50	1.50	0.269	(0.249)	0.242	0.027
43	10.75	2.00	0.359	0.246	(0.323)	0.113
44	11.00	2.00	0.359	0.242	(0.323)	0.117
45	11.25	1.90	0.341	0.238	(0.307)	0.103
46	11.50	1.90	0.341	0.235	(0.307)	0.106
47	11.75	1.70	0.305	0.231	(0.275)	0.074
48	12.00	1.80	0.323	0.228	(0.291)	0.095
49	12.25	2.50	0.449	0.225	(0.404)	0.224
50	12.50	2.60	0.466	0.221	(0.420)	0.245
51	12.75	2.80	0.502	0.218	(0.452)	0.285
52	13.00	2.90	0.520	0.215	(0.468)	0.306
53	13.25	3.40	0.610	0.211	(0.549)	0.399
54	13.50	3.40	0.610	0.208	(0.549)	0.402
55	13.75	2.30	0.413	0.205	(0.371)	0.208
56	14.00	2.30	0.413	0.202	(0.371)	0.211
57	14.25	2.70	0.484	0.199	(0.436)	0.286
58	14.50	2.60	0.466	0.196	(0.420)	0.271
59	14.75	2.60	0.466	0.193	(0.420)	0.274
60	15.00	2.50	0.449	0.190	(0.404)	0.259
61	15.25	2.40	0.431	0.187	(0.388)	0.244
62	15.50	2.30	0.413	0.184	(0.371)	0.229
63	15.75	1.90	0.341	0.181	(0.307)	0.160
64	16.00	1.90	0.341	0.178	(0.307)	0.162
65	16.25	0.40	0.072	(0.176)	0.065	0.007
66	16.50	0.40	0.072	(0.173)	0.065	0.007
67	16.75	0.30	0.054	(0.170)	0.048	0.005
68	17.00	0.30	0.054	(0.168)	0.048	0.005
69	17.25	0.50	0.090	(0.165)	0.081	0.009

70	17.50	0.50	0.090	(0.163)	0.081	0.009
71	17.75	0.50	0.090	(0.160)	0.081	0.009
72	18.00	0.40	0.072	(0.158)	0.065	0.007
73	18.25	0.40	0.072	(0.156)	0.065	0.007
74	18.50	0.40	0.072	(0.153)	0.065	0.007
75	18.75	0.30	0.054	(0.151)	0.048	0.005
76	19.00	0.20	0.036	(0.149)	0.032	0.004
77	19.25	0.30	0.054	(0.147)	0.048	0.005
78	19.50	0.40	0.072	(0.145)	0.065	0.007
79	19.75	0.30	0.054	(0.143)	0.048	0.005
80	20.00	0.20	0.036	(0.141)	0.032	0.004
81	20.25	0.30	0.054	(0.139)	0.048	0.005
82	20.50	0.30	0.054	(0.137)	0.048	0.005
83	20.75	0.30	0.054	(0.136)	0.048	0.005
84	21.00	0.20	0.036	(0.134)	0.032	0.004
85	21.25	0.30	0.054	(0.132)	0.048	0.005
86	21.50	0.20	0.036	(0.131)	0.032	0.004
87	21.75	0.30	0.054	(0.129)	0.048	0.005
88	22.00	0.20	0.036	(0.128)	0.032	0.004
89	22.25	0.30	0.054	(0.127)	0.048	0.005
90	22.50	0.20	0.036	(0.126)	0.032	0.004
91	22.75	0.20	0.036	(0.125)	0.032	0.004
92	23.00	0.20	0.036	(0.124)	0.032	0.004
93	23.25	0.20	0.036	(0.123)	0.032	0.004
94	23.50	0.20	0.036	(0.122)	0.032	0.004
95	23.75	0.20	0.036	(0.121)	0.032	0.004
96	24.00	0.20	0.036	(0.121)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.9

Flood volume = Effective rainfall 1.48(In)
times area 1648.5(Ac.)/[(In)/(Ft.)] = 202.7(Ac.Ft)
Total soil loss = 3.01(In)
Total soil loss = 413.516(Ac.Ft)
Total rainfall = 4.49(In)
Flood volume = 8828781.1 Cubic Feet
Total soil loss = 18012764.8 Cubic Feet

Peak flow rate of this hydrograph = 575.561(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

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Time(h+m) Volume Ac.Ft   Q(CFS)  0      150.0     300.0     450.0     600.0
-------------------------------------------------------------------------
  0+15       0.0062      0.30  Q         |         |         |         |
  0+30       0.0485      2.05  Q         |         |         |         |
  0+45       0.1519      5.01  Q         |         |         |         |
  1+ 0       0.2970      7.02  Q         |         |         |         |
  1+15       0.4732      8.52  Q         |         |         |         |
  1+30       0.6657      9.32  Q         |         |         |         |
  1+45       0.8507      8.95  Q         |         |         |         |
  2+ 0       1.0389      9.11  Q         |         |         |         |
  2+15       1.2436      9.91  Q         |         |         |         |
  2+30       1.4704     10.98  Q         |         |         |         |
  2+45       1.7082     11.51  Q         |         |         |         |
  3+ 0       1.9674     12.55  Q         |         |         |         |
  3+15       2.2521     13.78  Q         |         |         |         |
  3+30       2.5468     14.26  Q         |         |         |         |
  3+45       2.8471     14.53  Q         |         |         |         |
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 4+ 0       3.1537     14.84  Q         |         |         |         |
 4+15       3.4788     15.74  VQ        |         |         |         |
 4+30       3.8304     17.02  VQ        |         |         |         |
 4+45       4.2074     18.24  VQ        |         |         |         |
 5+ 0       4.6147     19.72  VQ        |         |         |         |
 5+15       5.0438     20.77  VQ        |         |         |         |
 5+30       5.4718     20.72  |Q        |         |         |         |
 5+45       5.8871     20.10  |Q        |         |         |         |
 6+ 0       6.3317     21.52  |Q        |         |         |         |
 6+15       6.8046     22.89  |Q        |         |         |         |
 6+30       7.3034     24.14  |Q        |         |         |         |
 6+45       7.8330     25.63  |Q        |         |         |         |
 7+ 0       8.3910     27.01  |Q        |         |         |         |
 7+15       8.9784     28.43  |Q        |         |         |         |
 7+30       9.5810     29.17  |Q        |         |         |         |
 7+45      10.2101     30.45  | Q       |         |         |         |
 8+ 0      10.8853     32.68  | Q       |         |         |         |
 8+15      11.6160     35.37  | Q       |         |         |         |
 8+30      12.4164     38.74  | Q       |         |         |         |
 8+45      13.2810     41.85  | Q       |         |         |         |
 9+ 0      14.1963     44.30  | Q       |         |         |         |
 9+15      15.2598     51.47  |  Q      |         |         |         |
 9+30      16.8015     74.62  |  VQ     |         |         |         |
 9+45      19.1051    111.50  |  V   Q  |         |         |         |
10+ 0      22.1145    145.66  |   V    Q|         |         |         |
10+15      25.6167    169.50  |    V    |Q        |         |         |
10+30      28.5899    143.90  |    V   Q|         |         |         |
10+45      30.5652     95.60  |     Q   |         |         |         |
11+ 0      32.9745    116.61  |     VQ  |         |         |         |
11+15      36.2507    158.57  |      V  Q         |         |         |
11+30      39.6968    166.79  |      V  |Q        |         |         |
11+45      43.0979    164.61  |       V Q         |         |         |
12+ 0      46.3271    156.29  |        VQ         |         |         |
12+15      49.6295    159.83  |        VQ         |         |         |
12+30      54.2982    225.97  |         V    Q    |         |         |
12+45      60.8441    316.82  |         | V       |Q        |         |
13+ 0      68.6415    377.39  |         |  V      |    Q    |         |
13+15      77.7249    439.64  |         |    V    |       Q|         |
13+30      88.3957    516.46  |         |      V  |         |   Q     |
13+45     100.2874    575.56  |         |        V|         |      Q  |
14+ 0     111.0613    521.45  |         |         V         |   Q     |
14+15     119.9525    430.33  |         |         |  V    Q |         |
14+30     128.8929    432.72  |         |         |    V  Q |         |
14+45     138.2729    453.99  |         |         |      V  Q         |
15+ 0     147.5727    450.11  |         |         |       VQ          |
15+15     156.7242    442.93  |         |         |       QV          |
15+30     165.5516    427.25  |         |         |      Q | V        |
15+45     173.9012    404.12  |         |         |    Q   |  V       |
16+ 0     181.3340    359.75  |         |         |  Q     |   V      |
16+15     187.5279    299.78  |         |        Q|        |     V    |
16+30     191.9222    212.69  |         |   Q     |        |     V    |
16+45     194.1691    108.75  |      Q  |         |        |      V   |
17+ 0     195.5668     67.65  |   Q     |         |        |      V   |
17+15     196.4655     43.50  | Q       |         |        |      V   |
17+30     197.0914     30.29  | Q       |         |        |      V   |
17+45     197.5822     23.76  |Q        |         |        |      V   |
18+ 0     197.9910     19.79  |Q        |         |        |       V|
18+15     198.3457     17.17  |Q        |         |        |       V|
18+30     198.6524     14.85  Q         |         |        |       V|
18+45     198.9269     13.28  Q         |         |        |       V|
19+ 0     199.1634     11.45  Q         |         |        |       V|
19+15     199.3540      9.23  Q         |         |        |       V|
19+30     199.5324      8.63  Q         |         |        |       V|
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   19+45     199.7331      9.72  Q          |          |          |         V|
   20+ 0     199.9370      9.86  Q          |          |          |         V|
   20+15     200.1130      8.52  Q          |          |          |         V|
   20+30     200.2800      8.08  Q          |          |          |         V|
   20+45     200.4596      8.70  Q          |          |          |         V|
   21+ 0     200.6386      8.66  Q          |          |          |         V|
   21+15     200.8048      8.05  Q          |          |          |         V|
   21+30     200.9628      7.64  Q          |          |          |         V|
   21+45     201.1221      7.71  Q          |          |          |         V|
   22+ 0     201.2767      7.48  Q          |          |          |         V|
   22+15     201.4338      7.60  Q          |          |          |         V|
   22+30     201.5866      7.40  Q          |          |          |         V|
   22+45     201.7396      7.41  Q          |          |          |         V|
   23+ 0     201.8756      6.58  Q          |          |          |         V|
   23+15     202.0063      6.32  Q          |          |          |         V|
   23+30     202.1339      6.18  Q          |          |          |         V|
   23+45     202.2597      6.09  Q          |          |          |         V|
   24+ 0     202.3843      6.03  Q          |          |          |         V|
   24+15     202.5021      5.70  Q          |          |          |         V|
   24+30     202.5865      4.09  Q          |          |          |         V|
   24+45     202.6263      1.92  Q          |          |          |         V|
   25+ 0     202.6496      1.13  Q          |          |          |         V|
   25+15     202.6634      0.67  Q          |          |          |         V|
   25+30     202.6711      0.38  Q          |          |          |         V|
   25+45     202.6753      0.20  Q          |          |          |         V|
   26+ 0     202.6776      0.11  Q          |          |          |         V|
   26+15     202.6792      0.08  Q          |          |          |         V|
   26+30     202.6802      0.05  Q          |          |          |         V|
   26+45     202.6807      0.03  Q          |          |          |         V|
   27+ 0     202.6809      0.01  Q          |          |          |          V
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SubE224100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubE224100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E2
Existing Condition
100-year, 24-hour

Drainage Area = 8.30(Ac.) = 0.013 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 8.30(Ac.) = 0.013 Sq. Mi.
Length along longest watercourse = 1070.00(Ft.)
Length along longest watercourse measured to centroid = 630.00(Ft.)
Length along longest watercourse = 0.203 Mi.
Length along longest watercourse measured to centroid = 0.119 Mi.
Difference in elevation = 51.00(Ft.)
Slope along watercourse = 251.6636 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.061 Hr.
Lag time = 3.67 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
8.30	1.80	14.94

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
8.30	4.50	37.35

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubE224100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.800	76.00	0.000
2.500	85.00	0.000

Total Area Entered = 8.30(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.699	0.203
85.0	85.0	0.187	0.000	0.187	0.301	0.056
					Sum (F) =	0.260

Area averaged mean soil loss (F) (In/Hr) = 0.260
Minimum soil loss rate ((In/Hr)) = 0.130
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	408.366	67.914	5.681
2 0.500	816.733	32.086	2.684
		Sum = 100.000	Sum= 8.365

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.459)	0.032	0.004
2	0.50	0.30	0.054	(0.453)	0.049	0.005
3	0.75	0.30	0.054	(0.448)	0.049	0.005
4	1.00	0.40	0.072	(0.443)	0.065	0.007
5	1.25	0.30	0.054	(0.438)	0.049	0.005
6	1.50	0.30	0.054	(0.432)	0.049	0.005
7	1.75	0.30	0.054	(0.427)	0.049	0.005
8	2.00	0.40	0.072	(0.422)	0.065	0.007
9	2.25	0.40	0.072	(0.417)	0.065	0.007
10	2.50	0.40	0.072	(0.412)	0.065	0.007
11	2.75	0.50	0.090	(0.407)	0.081	0.009
12	3.00	0.50	0.090	(0.402)	0.081	0.009
13	3.25	0.50	0.090	(0.397)	0.081	0.009
14	3.50	0.50	0.090	(0.392)	0.081	0.009
15	3.75	0.50	0.090	(0.387)	0.081	0.009
16	4.00	0.60	0.108	(0.382)	0.097	0.011
17	4.25	0.60	0.108	(0.377)	0.097	0.011
18	4.50	0.70	0.126	(0.373)	0.113	0.013
19	4.75	0.70	0.126	(0.368)	0.113	0.013
20	5.00	0.80	0.144	(0.363)	0.130	0.014
21	5.25	0.60	0.108	(0.358)	0.097	0.011

22	5.50	0.70	0.126	(0.354)	0.113	0.013
23	5.75	0.80	0.144	(0.349)	0.130	0.014
24	6.00	0.80	0.144	(0.344)	0.130	0.014
25	6.25	0.90	0.162	(0.340)	0.146	0.016
26	6.50	0.90	0.162	(0.335)	0.146	0.016
27	6.75	1.00	0.180	(0.331)	0.162	0.018
28	7.00	1.00	0.180	(0.326)	0.162	0.018
29	7.25	1.00	0.180	(0.322)	0.162	0.018
30	7.50	1.10	0.198	(0.318)	0.178	0.020
31	7.75	1.20	0.216	(0.313)	0.194	0.022
32	8.00	1.30	0.234	(0.309)	0.211	0.023
33	8.25	1.50	0.270	(0.305)	0.243	0.027
34	8.50	1.50	0.270	(0.300)	0.243	0.027
35	8.75	1.60	0.288	(0.296)	0.259	0.029
36	9.00	1.70	0.306	(0.292)	0.275	0.031
37	9.25	1.90	0.342	0.288	(0.308)	0.054
38	9.50	2.00	0.360	0.284	(0.324)	0.076
39	9.75	2.10	0.378	0.280	(0.340)	0.098
40	10.00	2.20	0.396	0.276	(0.356)	0.120
41	10.25	1.50	0.270	(0.272)	0.243	0.027
42	10.50	1.50	0.270	(0.268)	0.243	0.027
43	10.75	2.00	0.360	0.264	(0.324)	0.096
44	11.00	2.00	0.360	0.260	(0.324)	0.100
45	11.25	1.90	0.342	0.256	(0.308)	0.086
46	11.50	1.90	0.342	0.252	(0.308)	0.090
47	11.75	1.70	0.306	0.249	(0.275)	0.057
48	12.00	1.80	0.324	0.245	(0.292)	0.079
49	12.25	2.50	0.450	0.241	(0.405)	0.209
50	12.50	2.60	0.468	0.238	(0.421)	0.230
51	12.75	2.80	0.504	0.234	(0.454)	0.270
52	13.00	2.90	0.522	0.231	(0.470)	0.291
53	13.25	3.40	0.612	0.227	(0.551)	0.385
54	13.50	3.40	0.612	0.224	(0.551)	0.388
55	13.75	2.30	0.414	0.220	(0.373)	0.194
56	14.00	2.30	0.414	0.217	(0.373)	0.197
57	14.25	2.70	0.486	0.214	(0.437)	0.272
58	14.50	2.60	0.468	0.210	(0.421)	0.258
59	14.75	2.60	0.468	0.207	(0.421)	0.261
60	15.00	2.50	0.450	0.204	(0.405)	0.246
61	15.25	2.40	0.432	0.201	(0.389)	0.231
62	15.50	2.30	0.414	0.198	(0.373)	0.216
63	15.75	1.90	0.342	0.195	(0.308)	0.147
64	16.00	1.90	0.342	0.192	(0.308)	0.150
65	16.25	0.40	0.072	(0.189)	0.065	0.007
66	16.50	0.40	0.072	(0.186)	0.065	0.007
67	16.75	0.30	0.054	(0.183)	0.049	0.005
68	17.00	0.30	0.054	(0.180)	0.049	0.005
69	17.25	0.50	0.090	(0.178)	0.081	0.009
70	17.50	0.50	0.090	(0.175)	0.081	0.009
71	17.75	0.50	0.090	(0.172)	0.081	0.009
72	18.00	0.40	0.072	(0.170)	0.065	0.007
73	18.25	0.40	0.072	(0.167)	0.065	0.007
74	18.50	0.40	0.072	(0.165)	0.065	0.007
75	18.75	0.30	0.054	(0.163)	0.049	0.005
76	19.00	0.20	0.036	(0.160)	0.032	0.004
77	19.25	0.30	0.054	(0.158)	0.049	0.005
78	19.50	0.40	0.072	(0.156)	0.065	0.007
79	19.75	0.30	0.054	(0.154)	0.049	0.005
80	20.00	0.20	0.036	(0.152)	0.032	0.004
81	20.25	0.30	0.054	(0.150)	0.049	0.005
82	20.50	0.30	0.054	(0.148)	0.049	0.005
83	20.75	0.30	0.054	(0.146)	0.049	0.005
84	21.00	0.20	0.036	(0.144)	0.032	0.004

85	21.25	0.30	0.054	(0.142)	0.049	0.005
86	21.50	0.20	0.036	(0.141)	0.032	0.004
87	21.75	0.30	0.054	(0.139)	0.049	0.005
88	22.00	0.20	0.036	(0.138)	0.032	0.004
89	22.25	0.30	0.054	(0.136)	0.049	0.005
90	22.50	0.20	0.036	(0.135)	0.032	0.004
91	22.75	0.20	0.036	(0.134)	0.032	0.004
92	23.00	0.20	0.036	(0.133)	0.032	0.004
93	23.25	0.20	0.036	(0.132)	0.032	0.004
94	23.50	0.20	0.036	(0.131)	0.032	0.004
95	23.75	0.20	0.036	(0.130)	0.032	0.004
96	24.00	0.20	0.036	(0.130)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.5

Flood volume = Effective rainfall 1.38(In)
times area 8.3(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 3.12(In)
Total soil loss = 2.159(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 41516.7 Cubic Feet
Total soil loss = 94061.6 Cubic Feet

Peak flow rate of this hydrograph = 3.241(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0004	0.02	Q	|	|	|	|
0+30	0.0013	0.04	Q	|	|	|	|
0+45	0.0022	0.05	Q	|	|	|	|
1+ 0	0.0033	0.06	Q	|	|	|	|
1+15	0.0044	0.05	Q	|	|	|	|
1+30	0.0053	0.05	Q	|	|	|	|
1+45	0.0062	0.05	Q	|	|	|	|
2+ 0	0.0074	0.06	Q	|	|	|	|
2+15	0.0086	0.06	Q	|	|	|	|
2+30	0.0099	0.06	Q	|	|	|	|
2+45	0.0113	0.07	Q	|	|	|	|
3+ 0	0.0129	0.08	Q	|	|	|	|
3+15	0.0144	0.08	Q	|	|	|	|
3+30	0.0160	0.08	Q	|	|	|	|
3+45	0.0176	0.08	Q	|	|	|	|
4+ 0	0.0193	0.09	Q	|	|	|	|
4+15	0.0212	0.09	Q	|	|	|	|
4+30	0.0233	0.10	Q	|	|	|	|
4+45	0.0254	0.11	QV	|	|	|	|
5+ 0	0.0278	0.12	QV	|	|	|	|
5+15	0.0299	0.10	QV	|	|	|	|
5+30	0.0320	0.10	QV	|	|	|	|
5+45	0.0344	0.12	QV	|	|	|	|
6+ 0	0.0369	0.12	QV	|	|	|	|
6+15	0.0396	0.13	QV	|	|	|	|
6+30	0.0424	0.14	QV	|	|	|	|
6+45	0.0454	0.15	QV	|	|	|	|
7+ 0	0.0485	0.15	Q V	|	|	|	|
7+15	0.0516	0.15	Q V	|	|	|	|
7+30	0.0549	0.16	Q V	|	|	|	|

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 7+45       0.0586      0.18  Q V        |          |          |          |
 8+ 0       0.0625      0.19  Q V        |          |          |          |
 8+15       0.0670      0.22  Q V        |          |          |          |
 8+30       0.0716      0.23  Q  V       |          |          |          |
 8+45       0.0765      0.24  Q  V       |          |          |          |
 9+ 0       0.0817      0.25  |Q V       |          |          |          |
 9+15       0.0898      0.39  |Q V       |          |          |          |
 9+30       0.1017      0.58  | Q V      |          |          |          |
 9+45       0.1175      0.76  |  QV      |          |          |          |
10+ 0       0.1371      0.95  |  Q V     |          |          |          |
10+15       0.1469      0.48  |Q    V    |          |          |          |
10+30       0.1516      0.23  Q     V    |          |          |          |
10+45       0.1644      0.62  | Q   V    |          |          |          |
11+ 0       0.1814      0.83  |  Q   V   |          |          |          |
11+15       0.1971      0.76  |  Q    V  |          |          |          |
11+30       0.2124      0.74  | Q     V  |          |          |          |
11+45       0.2241      0.57  | Q      V|          |          |          |
12+ 0       0.2365      0.60  | Q      V|          |          |          |
12+15       0.2654      1.40  |    Q     V          |          |          |
12+30       0.3040      1.87  |      Q  | V         |          |          |
12+45       0.3485      2.15  |       Q |   V       |          |          |
13+ 0       0.3977      2.38  |        Q|     V     |          |          |
13+15       0.4591      2.97  |         |Q       V|          |          |
13+30       0.5260      3.24  |         | Q         V          |          |
13+45       0.5703      2.14  |       Q |           | V        |          |
14+ 0       0.6042      1.64  |     Q   |           |    V     |          |
14+15       0.6471      2.08  |       Q |           |      V   |          |
14+30       0.6925      2.20  |       Q |           |        V|          |
14+45       0.7374      2.17  |       Q |           |         V          |
15+ 0       0.7808      2.10  |       Q |           |          | V       |
15+15       0.8216      1.97  |      Q  |           |          |   V     |
15+30       0.8598      1.85  |      Q  |           |          |     V   |
15+45       0.8891      1.42  |    Q    |           |          |      V  |
16+ 0       0.9149      1.25  |   Q     |           |          |       V |
16+15       0.9241      0.44  |Q        |           |          |       V |
16+30       0.9253      0.06  Q         |           |          |       V |
16+45       0.9263      0.05  Q         |           |          |       V |
17+ 0       0.9273      0.05  Q         |           |          |       V |
17+15       0.9286      0.07  Q         |           |          |       V |
17+30       0.9302      0.08  Q         |           |          |        V|
17+45       0.9317      0.08  Q         |           |          |        V|
18+ 0       0.9331      0.07  Q         |           |          |        V|
18+15       0.9343      0.06  Q         |           |          |        V|
18+30       0.9356      0.06  Q         |           |          |        V|
18+45       0.9366      0.05  Q         |           |          |        V|
19+ 0       0.9373      0.03  Q         |           |          |        V|
19+15       0.9382      0.04  Q         |           |          |        V|
19+30       0.9393      0.06  Q         |           |          |        V|
19+45       0.9403      0.05  Q         |           |          |        V|
20+ 0       0.9411      0.03  Q         |           |          |        V|
20+15       0.9419      0.04  Q         |           |          |        V|
20+30       0.9428      0.05  Q         |           |          |        V|
20+45       0.9438      0.05  Q         |           |          |        V|
21+ 0       0.9445      0.03  Q         |           |          |        V|
21+15       0.9453      0.04  Q         |           |          |        V|
21+30       0.9460      0.03  Q         |           |          |        V|
21+45       0.9469      0.04  Q         |           |          |        V|
22+ 0       0.9476      0.03  Q         |           |          |        V|
22+15       0.9484      0.04  Q         |           |          |        V|
22+30       0.9492      0.03  Q         |           |          |        V|
22+45       0.9498      0.03  Q         |           |          |        V|
23+ 0       0.9504      0.03  Q         |           |          |        V|
23+15       0.9510      0.03  Q         |           |          |        V|
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   23+30       0.9516      0.03  Q         |         |         |        V|
   23+45       0.9523      0.03  Q         |         |         |        V|
   24+ 0       0.9529      0.03  Q         |         |         |        V|
   24+15       0.9531      0.01  Q         |         |         |         V
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SubE2124100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubE2124100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E21
Existing Condition
100-year, 24-hour

Drainage Area = 780.80(Ac.) = 1.220 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 780.80(Ac.) = 1.220 Sq. Mi.
Length along longest watercourse = 14080.00(Ft.)
Length along longest watercourse measured to centroid = 8100.00(Ft.)
Length along longest watercourse = 2.667 Mi.
Length along longest watercourse measured to centroid = 1.534 Mi.
Difference in elevation = 877.00(Ft.)
Slope along watercourse = 328.8750 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.409 Hr.
Lag time = 24.53 Min.
25% of lag time = 6.13 Min.
40% of lag time = 9.81 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
780.80	1.80	1405.44

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
780.80	4.50	3513.60

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubE2124100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.85 %
Adjusted average point rain = 4.493(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
62.200	46.00	0.000
11.200	66.00	0.000
4.800	77.00	0.000
702.600	83.00	0.000

Total Area Entered = 780.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.080	0.049
66.0	66.0	0.405	0.000	0.405	0.014	0.006
77.0	77.0	0.279	0.000	0.279	0.006	0.002
83.0	83.0	0.210	0.000	0.210	0.900	0.189
					Sum (F) =	0.245

Area averaged mean soil loss (F) (In/Hr) = 0.245
Minimum soil loss rate ((In/Hr)) = 0.123
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	61.144	5.754	45.282
2	0.500	122.287	32.815	258.222
3	0.750	183.431	33.484	263.483
4	1.000	244.575	12.198	95.988
5	1.250	305.719	7.029	55.312
6	1.500	366.862	4.194	33.004
7	1.750	428.006	2.244	17.661
8	2.000	489.150	0.859	6.758
9	2.250	550.293	0.537	4.223
10	2.500	611.437	0.428	3.369
11	2.750	672.581	0.317	2.495
12	3.000	733.725	0.140	1.104
			Sum = 100.000	Sum= 786.900

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.433)	0.032	0.004
2	0.50	0.30	0.054	(0.428)	0.049	0.005
3	0.75	0.30	0.054	(0.423)	0.049	0.005
4	1.00	0.40	0.072	(0.418)	0.065	0.007
5	1.25	0.30	0.054	(0.413)	0.049	0.005
6	1.50	0.30	0.054	(0.408)	0.049	0.005
7	1.75	0.30	0.054	(0.403)	0.049	0.005

8	2.00	0.40	0.072	(0.398)	0.065	0.007
9	2.25	0.40	0.072	(0.393)	0.065	0.007
10	2.50	0.40	0.072	(0.389)	0.065	0.007
11	2.75	0.50	0.090	(0.384)	0.081	0.009
12	3.00	0.50	0.090	(0.379)	0.081	0.009
13	3.25	0.50	0.090	(0.374)	0.081	0.009
14	3.50	0.50	0.090	(0.370)	0.081	0.009
15	3.75	0.50	0.090	(0.365)	0.081	0.009
16	4.00	0.60	0.108	(0.360)	0.097	0.011
17	4.25	0.60	0.108	(0.356)	0.097	0.011
18	4.50	0.70	0.126	(0.351)	0.113	0.013
19	4.75	0.70	0.126	(0.347)	0.113	0.013
20	5.00	0.80	0.144	(0.342)	0.129	0.014
21	5.25	0.60	0.108	(0.338)	0.097	0.011
22	5.50	0.70	0.126	(0.334)	0.113	0.013
23	5.75	0.80	0.144	(0.329)	0.129	0.014
24	6.00	0.80	0.144	(0.325)	0.129	0.014
25	6.25	0.90	0.162	(0.321)	0.146	0.016
26	6.50	0.90	0.162	(0.316)	0.146	0.016
27	6.75	1.00	0.180	(0.312)	0.162	0.018
28	7.00	1.00	0.180	(0.308)	0.162	0.018
29	7.25	1.00	0.180	(0.304)	0.162	0.018
30	7.50	1.10	0.198	(0.299)	0.178	0.020
31	7.75	1.20	0.216	(0.295)	0.194	0.022
32	8.00	1.30	0.234	(0.291)	0.210	0.023
33	8.25	1.50	0.270	(0.287)	0.243	0.027
34	8.50	1.50	0.270	(0.283)	0.243	0.027
35	8.75	1.60	0.288	(0.279)	0.259	0.029
36	9.00	1.70	0.306	(0.275)	0.275	0.031
37	9.25	1.90	0.341	0.271	(0.307)	0.070
38	9.50	2.00	0.359	0.268	(0.324)	0.092
39	9.75	2.10	0.377	0.264	(0.340)	0.114
40	10.00	2.20	0.395	0.260	(0.356)	0.135
41	10.25	1.50	0.270	(0.256)	0.243	0.027
42	10.50	1.50	0.270	(0.253)	0.243	0.027
43	10.75	2.00	0.359	0.249	(0.324)	0.111
44	11.00	2.00	0.359	0.245	(0.324)	0.114
45	11.25	1.90	0.341	0.242	(0.307)	0.100
46	11.50	1.90	0.341	0.238	(0.307)	0.103
47	11.75	1.70	0.306	0.234	(0.275)	0.071
48	12.00	1.80	0.324	0.231	(0.291)	0.092
49	12.25	2.50	0.449	0.228	(0.404)	0.222
50	12.50	2.60	0.467	0.224	(0.421)	0.243
51	12.75	2.80	0.503	0.221	(0.453)	0.282
52	13.00	2.90	0.521	0.217	(0.469)	0.304
53	13.25	3.40	0.611	0.214	(0.550)	0.397
54	13.50	3.40	0.611	0.211	(0.550)	0.400
55	13.75	2.30	0.413	0.208	(0.372)	0.206
56	14.00	2.30	0.413	0.205	(0.372)	0.209
57	14.25	2.70	0.485	0.201	(0.437)	0.284
58	14.50	2.60	0.467	0.198	(0.421)	0.269
59	14.75	2.60	0.467	0.195	(0.421)	0.272
60	15.00	2.50	0.449	0.192	(0.404)	0.257
61	15.25	2.40	0.431	0.189	(0.388)	0.242
62	15.50	2.30	0.413	0.187	(0.372)	0.227
63	15.75	1.90	0.341	0.184	(0.307)	0.158
64	16.00	1.90	0.341	0.181	(0.307)	0.161
65	16.25	0.40	0.072	(0.178)	0.065	0.007
66	16.50	0.40	0.072	(0.175)	0.065	0.007
67	16.75	0.30	0.054	(0.173)	0.049	0.005
68	17.00	0.30	0.054	(0.170)	0.049	0.005
69	17.25	0.50	0.090	(0.168)	0.081	0.009
70	17.50	0.50	0.090	(0.165)	0.081	0.009

71	17.75	0.50	0.090	(0.163)	0.081	0.009
72	18.00	0.40	0.072	(0.160)	0.065	0.007
73	18.25	0.40	0.072	(0.158)	0.065	0.007
74	18.50	0.40	0.072	(0.155)	0.065	0.007
75	18.75	0.30	0.054	(0.153)	0.049	0.005
76	19.00	0.20	0.036	(0.151)	0.032	0.004
77	19.25	0.30	0.054	(0.149)	0.049	0.005
78	19.50	0.40	0.072	(0.147)	0.065	0.007
79	19.75	0.30	0.054	(0.145)	0.049	0.005
80	20.00	0.20	0.036	(0.143)	0.032	0.004
81	20.25	0.30	0.054	(0.141)	0.049	0.005
82	20.50	0.30	0.054	(0.139)	0.049	0.005
83	20.75	0.30	0.054	(0.137)	0.049	0.005
84	21.00	0.20	0.036	(0.136)	0.032	0.004
85	21.25	0.30	0.054	(0.134)	0.049	0.005
86	21.50	0.20	0.036	(0.133)	0.032	0.004
87	21.75	0.30	0.054	(0.131)	0.049	0.005
88	22.00	0.20	0.036	(0.130)	0.032	0.004
89	22.25	0.30	0.054	(0.129)	0.049	0.005
90	22.50	0.20	0.036	(0.127)	0.032	0.004
91	22.75	0.20	0.036	(0.126)	0.032	0.004
92	23.00	0.20	0.036	(0.125)	0.032	0.004
93	23.25	0.20	0.036	(0.124)	0.032	0.004
94	23.50	0.20	0.036	(0.124)	0.032	0.004
95	23.75	0.20	0.036	(0.123)	0.032	0.004
96	24.00	0.20	0.036	(0.123)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.8

Flood volume = Effective rainfall 1.46(In)
times area 780.8(Ac.)/[(In)/(Ft.)] = 95.0(Ac.Ft)
Total soil loss = 3.03(In)
Total soil loss = 197.319(Ac.Ft)
Total rainfall = 4.49(In)
Flood volume = 4139699.7 Cubic Feet
Total soil loss = 8595217.9 Cubic Feet

Peak flow rate of this hydrograph = 275.722(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	75.0	150.0	225.0	300.0
0+15	0.0034	0.16	Q	|	|	|	|
0+30	0.0276	1.17	Q	|	|	|	|
0+45	0.0810	2.58	Q	|	|	|	|
1+ 0	0.1530	3.49	Q	|	|	|	|
1+15	0.2406	4.24	Q	|	|	|	|
1+30	0.3329	4.47	Q	|	|	|	|
1+45	0.4215	4.29	Q	|	|	|	|
2+ 0	0.5115	4.35	Q	|	|	|	|
2+15	0.6107	4.80	Q	|	|	|	|
2+30	0.7196	5.27	Q	|	|	|	|
2+45	0.8337	5.52	Q	|	|	|	|
3+ 0	0.9595	6.09	Q	|	|	|	|
3+15	1.0963	6.62	Q	|	|	|	|
3+30	1.2373	6.82	Q	|	|	|	|
3+45	1.3805	6.93	Q	|	|	|	|
4+ 0	1.5268	7.08	Q	|	|	|	|

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 4+15       1.6835      7.58  VQ         |          |          |          |
 4+30       1.8519      8.15  VQ         |          |          |          |
 4+45       2.0338      8.80  VQ         |          |          |          |
 5+ 0       2.2292      9.46  VQ         |          |          |          |
 5+15       2.4358     10.00   Q         |          |          |          |
 5+30       2.6375      9.76  |Q         |          |          |          |
 5+45       2.8358      9.60  |Q         |          |          |          |
 6+ 0       3.0493     10.33  |Q         |          |          |          |
 6+15       3.2753     10.94  |Q         |          |          |          |
 6+30       3.5150     11.60  |Q         |          |          |          |
 6+45       3.7686     12.27  |Q         |          |          |          |
 7+ 0       4.0369     12.99  |Q         |          |          |          |
 7+15       4.3178     13.60  |Q         |          |          |          |
 7+30       4.6055     13.92  |Q         |          |          |          |
 7+45       4.9073     14.61  |QV        |          |          |          |
 8+ 0       5.2317     15.70  | Q        |          |          |          |
 8+15       5.5835     17.02  | Q        |          |          |          |
 8+30       5.9702     18.72  | Q        |          |          |          |
 8+45       6.3853     20.09  | Q        |          |          |          |
 9+ 0       6.8229     21.18  | Q        |          |          |          |
 9+15       7.3232     24.21  |  Q       |          |          |          |
 9+30       8.0714     36.22  |  VQ      |          |          |          |
 9+45       9.1791     53.61  |  V   Q   |          |          |          |
10+ 0      10.6249     69.98  |   V    Q|          |          |          |
10+15      12.2949     80.83  |    V    Q          |          |          |
10+30      13.6010     63.22  |    V  Q |          |          |          |
10+45      14.4927     43.16  |    QV   |          |          |          |
11+ 0      15.6728     57.12  |     VQ  |          |          |          |
11+15      17.2201     74.89  |      V Q|          |          |          |
11+30      18.8216     77.51  |      V  Q          |          |          |
11+45      20.4053     76.65  |       V Q          |          |          |
12+ 0      21.8786     71.30  |        Q|          |          |          |
12+15      23.4281     75.00  |        Q|          |          |          |
12+30      25.7415    111.97  |         V   Q      |          |          |
12+45      28.9153    153.61  |          | V       Q          |          |
13+ 0      32.6972    183.04  |          |  V      |   Q      |          |
13+15      37.0909    212.66  |          |    V    |       Q  |          |
13+30      42.2963    251.94  |          |      V  |          |  Q       |
13+45      47.9930    275.72  |          |         V          |     Q    |
14+ 0      52.9336    239.12  |          |           V        |Q         |
14+15      57.0578    199.61  |          |          |   V Q   |          |
14+30      61.2916    204.92  |          |          |    V Q  |          |
14+45      65.6925    213.00  |          |          |      VQ |          |
15+ 0      70.0569    211.24  |          |          |       QV|          |
15+15      74.3438    207.48  |          |          |      Q  V          |
15+30      78.4776    200.08  |          |          |     Q   |  V       |
15+45      82.3644    188.12  |          |          |    Q    |   V      |
16+ 0      85.7524    163.98  |          |         |Q         |     V    |
16+15      88.5742    136.58  |          |       Q |          |      V   |
16+30      90.4224     89.45  |          |Q        |          |       V  |
16+45      91.3450     44.66  |     Q    |         |          |       V  |
17+ 0      91.9020     26.96  |   Q      |         |          |       V  |
17+15      92.2491     16.80  | Q        |         |          |       V  |
17+30      92.4955     11.92  |Q         |         |          |       V  |
17+45      92.6955      9.68  |Q         |         |          |        V|
18+ 0      92.8727      8.58  |Q         |         |          |        V|
18+15      93.0267      7.45  Q         |         |          |        V|
18+30      93.1609      6.50  Q         |         |          |        V|
18+45      93.2832      5.92  Q         |         |          |        V|
19+ 0      93.3890      5.12  Q         |         |          |        V|
19+15      93.4761      4.22  Q         |         |          |        V|
19+30      93.5607      4.09  Q         |         |          |        V|
19+45      93.6574      4.68  Q         |         |          |        V|
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   20+ 0      93.7527      4.61  Q          |          |          |         V|
   20+15      93.8340      3.93  Q          |          |          |         V|
   20+30      93.9137      3.86  Q          |          |          |         V|
   20+45      93.9991      4.13  Q          |          |          |         V|
   21+ 0      94.0837      4.09  Q          |          |          |         V|
   21+15      94.1608      3.73  Q          |          |          |         V|
   21+30      94.2364      3.66  Q          |          |          |         V|
   21+45      94.3108      3.60  Q          |          |          |         V|
   22+ 0      94.3849      3.59  Q          |          |          |         V|
   22+15      94.4581      3.54  Q          |          |          |         V|
   22+30      94.5316      3.55  Q          |          |          |         V|
   22+45      94.6029      3.45  Q          |          |          |         V|
   23+ 0      94.6667      3.09  Q          |          |          |         V|
   23+15      94.7281      2.98  Q          |          |          |         V|
   23+30      94.7883      2.91  Q          |          |          |         V|
   23+45      94.8476      2.87  Q          |          |          |         V|
   24+ 0      94.9065      2.85  Q          |          |          |         V|
   24+15      94.9619      2.68  Q          |          |          |         V|
   24+30      94.9980      1.75  Q          |          |          |         V|
   24+45      95.0144      0.80  Q          |          |          |         V|
   25+ 0      95.0237      0.45  Q          |          |          |         V|
   25+15      95.0287      0.25  Q          |          |          |         V|
   25+30      95.0314      0.13  Q          |          |          |         V|
   25+45      95.0327      0.06  Q          |          |          |         V|
   26+ 0      95.0336      0.04  Q          |          |          |         V|
   26+15      95.0341      0.03  Q          |          |          |         V|
   26+30      95.0343      0.01  Q          |          |          |         V|
   26+45      95.0344      0.00  Q          |          |          |          V
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SubE2224100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubE2224100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E22
Existing Condition
100-year, 3-hour

Drainage Area = 17.30(Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.30(Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1390.00(Ft.)
Length along longest watercourse measured to centroid = 700.00(Ft.)
Length along longest watercourse = 0.263 Mi.
Length along longest watercourse measured to centroid = 0.133 Mi.
Difference in elevation = 39.00(Ft.)
Slope along watercourse = 148.1439 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.078 Hr.
Lag time = 4.67 Min.
25% of lag time = 1.17 Min.
40% of lag time = 1.87 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.30	1.80	31.14

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.30	4.50	77.85

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubE2224100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.900	76.00	0.000
13.400	85.00	0.000
1.000	90.00	0.000

Total Area Entered = 17.30(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.168	0.049
85.0	85.0	0.187	0.000	0.187	0.775	0.145
90.0	90.0	0.130	0.000	0.130	0.058	0.008
					Sum (F) =	0.201

Area averaged mean soil loss (F) (In/Hr) = 0.201
Minimum soil loss rate ((In/Hr)) = 0.101
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	321.186	60.110	10.480
2	0.500	642.372	38.326	6.682
3	0.750	963.557	1.564	0.273
		Sum = 100.000	Sum=	17.435

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.355)	0.032	0.004
2	0.50	0.30	0.054	(0.351)	0.049	0.005
3	0.75	0.30	0.054	(0.347)	0.049	0.005
4	1.00	0.40	0.072	(0.343)	0.065	0.007
5	1.25	0.30	0.054	(0.339)	0.049	0.005
6	1.50	0.30	0.054	(0.335)	0.049	0.005
7	1.75	0.30	0.054	(0.331)	0.049	0.005
8	2.00	0.40	0.072	(0.327)	0.065	0.007
9	2.25	0.40	0.072	(0.323)	0.065	0.007
10	2.50	0.40	0.072	(0.319)	0.065	0.007
11	2.75	0.50	0.090	(0.315)	0.081	0.009
12	3.00	0.50	0.090	(0.311)	0.081	0.009
13	3.25	0.50	0.090	(0.307)	0.081	0.009
14	3.50	0.50	0.090	(0.304)	0.081	0.009
15	3.75	0.50	0.090	(0.300)	0.081	0.009
16	4.00	0.60	0.108	(0.296)	0.097	0.011
17	4.25	0.60	0.108	(0.292)	0.097	0.011
18	4.50	0.70	0.126	(0.289)	0.113	0.013

19	4.75	0.70	0.126	(0.285)	0.113	0.013
20	5.00	0.80	0.144	(0.281)	0.130	0.014
21	5.25	0.60	0.108	(0.278)	0.097	0.011
22	5.50	0.70	0.126	(0.274)	0.113	0.013
23	5.75	0.80	0.144	(0.270)	0.130	0.014
24	6.00	0.80	0.144	(0.267)	0.130	0.014
25	6.25	0.90	0.162	(0.263)	0.146	0.016
26	6.50	0.90	0.162	(0.260)	0.146	0.016
27	6.75	1.00	0.180	(0.256)	0.162	0.018
28	7.00	1.00	0.180	(0.253)	0.162	0.018
29	7.25	1.00	0.180	(0.249)	0.162	0.018
30	7.50	1.10	0.198	(0.246)	0.178	0.020
31	7.75	1.20	0.216	(0.243)	0.194	0.022
32	8.00	1.30	0.234	(0.239)	0.211	0.023
33	8.25	1.50	0.270	0.236	(0.243)	0.034
34	8.50	1.50	0.270	0.233	(0.243)	0.037
35	8.75	1.60	0.288	0.229	(0.259)	0.059
36	9.00	1.70	0.306	0.226	(0.275)	0.080
37	9.25	1.90	0.342	0.223	(0.308)	0.119
38	9.50	2.00	0.360	0.220	(0.324)	0.140
39	9.75	2.10	0.378	0.217	(0.340)	0.161
40	10.00	2.20	0.396	0.213	(0.356)	0.183
41	10.25	1.50	0.270	0.210	(0.243)	0.060
42	10.50	1.50	0.270	0.207	(0.243)	0.063
43	10.75	2.00	0.360	0.204	(0.324)	0.156
44	11.00	2.00	0.360	0.201	(0.324)	0.159
45	11.25	1.90	0.342	0.198	(0.308)	0.144
46	11.50	1.90	0.342	0.195	(0.308)	0.147
47	11.75	1.70	0.306	0.193	(0.275)	0.113
48	12.00	1.80	0.324	0.190	(0.292)	0.134
49	12.25	2.50	0.450	0.187	(0.405)	0.263
50	12.50	2.60	0.468	0.184	(0.421)	0.284
51	12.75	2.80	0.504	0.181	(0.454)	0.323
52	13.00	2.90	0.522	0.179	(0.470)	0.343
53	13.25	3.40	0.612	0.176	(0.551)	0.436
54	13.50	3.40	0.612	0.173	(0.551)	0.439
55	13.75	2.30	0.414	0.171	(0.373)	0.243
56	14.00	2.30	0.414	0.168	(0.373)	0.246
57	14.25	2.70	0.486	0.165	(0.437)	0.321
58	14.50	2.60	0.468	0.163	(0.421)	0.305
59	14.75	2.60	0.468	0.160	(0.421)	0.308
60	15.00	2.50	0.450	0.158	(0.405)	0.292
61	15.25	2.40	0.432	0.156	(0.389)	0.276
62	15.50	2.30	0.414	0.153	(0.373)	0.261
63	15.75	1.90	0.342	0.151	(0.308)	0.191
64	16.00	1.90	0.342	0.148	(0.308)	0.193
65	16.25	0.40	0.072	(0.146)	0.065	0.007
66	16.50	0.40	0.072	(0.144)	0.065	0.007
67	16.75	0.30	0.054	(0.142)	0.049	0.005
68	17.00	0.30	0.054	(0.140)	0.049	0.005
69	17.25	0.50	0.090	(0.138)	0.081	0.009
70	17.50	0.50	0.090	(0.135)	0.081	0.009
71	17.75	0.50	0.090	(0.133)	0.081	0.009
72	18.00	0.40	0.072	(0.132)	0.065	0.007
73	18.25	0.40	0.072	(0.130)	0.065	0.007
74	18.50	0.40	0.072	(0.128)	0.065	0.007
75	18.75	0.30	0.054	(0.126)	0.049	0.005
76	19.00	0.20	0.036	(0.124)	0.032	0.004
77	19.25	0.30	0.054	(0.122)	0.049	0.005
78	19.50	0.40	0.072	(0.121)	0.065	0.007
79	19.75	0.30	0.054	(0.119)	0.049	0.005
80	20.00	0.20	0.036	(0.117)	0.032	0.004
81	20.25	0.30	0.054	(0.116)	0.049	0.005

82	20.50	0.30	0.054	(0.114)	0.049	0.005
83	20.75	0.30	0.054	(0.113)	0.049	0.005
84	21.00	0.20	0.036	(0.111)	0.032	0.004
85	21.25	0.30	0.054	(0.110)	0.049	0.005
86	21.50	0.20	0.036	(0.109)	0.032	0.004
87	21.75	0.30	0.054	(0.108)	0.049	0.005
88	22.00	0.20	0.036	(0.107)	0.032	0.004
89	22.25	0.30	0.054	(0.106)	0.049	0.005
90	22.50	0.20	0.036	(0.105)	0.032	0.004
91	22.75	0.20	0.036	(0.104)	0.032	0.004
92	23.00	0.20	0.036	(0.103)	0.032	0.004
93	23.25	0.20	0.036	(0.102)	0.032	0.004
94	23.50	0.20	0.036	(0.101)	0.032	0.004
95	23.75	0.20	0.036	(0.101)	0.032	0.004
96	24.00	0.20	0.036	(0.101)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.1

Flood volume = Effective rainfall 1.76(In)
times area 17.3(Ac.)/[(In)/(Ft.)] = 2.5(Ac.Ft)
Total soil loss = 2.74(In)
Total soil loss = 3.945(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 110755.3 Cubic Feet
Total soil loss = 171830.6 Cubic Feet

Peak flow rate of this hydrograph = 7.610(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0008	0.04	Q	|	|	|	|
0+30	0.0024	0.08	Q	|	|	|	|
0+45	0.0044	0.09	Q	|	|	|	|
1+ 0	0.0067	0.11	Q	|	|	|	|
1+15	0.0089	0.11	Q	|	|	|	|
1+30	0.0109	0.09	Q	|	|	|	|
1+45	0.0128	0.09	Q	|	|	|	|
2+ 0	0.0152	0.11	Q	|	|	|	|
2+15	0.0177	0.13	Q	|	|	|	|
2+30	0.0203	0.13	Q	|	|	|	|
2+45	0.0233	0.14	Q	|	|	|	|
3+ 0	0.0266	0.16	Q	|	|	|	|
3+15	0.0298	0.16	Q	|	|	|	|
3+30	0.0330	0.16	Q	|	|	|	|
3+45	0.0363	0.16	Q	|	|	|	|
4+ 0	0.0399	0.18	Q	|	|	|	|
4+15	0.0438	0.19	Q	|	|	|	|
4+30	0.0481	0.21	Q	|	|	|	|
4+45	0.0526	0.22	Q	|	|	|	|
5+ 0	0.0575	0.24	Q	|	|	|	|
5+15	0.0619	0.21	Q	|	|	|	|
5+30	0.0662	0.21	QV	|	|	|	|
5+45	0.0712	0.24	QV	|	|	|	|
6+ 0	0.0763	0.25	|Q	|	|	|	|
6+15	0.0819	0.27	|Q	|	|	|	|
6+30	0.0878	0.28	|Q	|	|	|	|
6+45	0.0940	0.30	|Q	|	|	|	|

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 7+ 0       0.1005      0.31  |Q         |          |          |          |
 7+15       0.1069      0.31  |Q         |          |          |          |
 7+30       0.1138      0.33  |Q         |          |          |          |
 7+45       0.1213      0.36  |Q         |          |          |          |
 8+ 0       0.1295      0.40  |QV        |          |          |          |
 8+15       0.1402      0.52  | Q        |          |          |          |
 8+30       0.1532      0.63  | Q        |          |          |          |
 8+45       0.1713      0.87  | VQ       |          |          |          |
 9+ 0       0.1969      1.24  |  VQ      |          |          |          |
 9+15       0.2341      1.80  |  V   Q   |          |          |          |
 9+30       0.2813      2.29  |   V    Q|          |          |          |
 9+45       0.3364      2.66  |    V    Q          |          |          |
10+ 0       0.3990      3.03  |     V    | Q        |          |          |
10+15       0.4380      1.89  |     VQ   |          |          |          |
10+30       0.4609      1.11  |   Q  V   |          |          |          |
10+45       0.5036      2.07  |      VQ  |          |          |          |
11+ 0       0.5598      2.72  |       V Q          |          |          |
11+15       0.6137      2.61  |        VQ          |          |          |
11+30       0.6662      2.54  |         Q          |          |          |
11+45       0.7118      2.21  |       Q  V         |          |          |
12+ 0       0.7574      2.21  |       Q |V         |          |          |
12+15       0.8336      3.69  |         |  VQ      |          |          |
12+30       0.9322      4.77  |         |   V    Q|          |          |
12+45       1.0429      5.35  |         |     V   |Q         |          |
13+ 0       1.1634      5.84  |         |       V |  Q       |          |
13+15       1.3072      6.96  |         |         V      Q  |          |
13+30       1.4644      7.61  |         |          |  V      Q          |
13+45       1.5802      5.61  |         |          | Q V     |          |
14+ 0       1.6696      4.33  |         |      Q  |     V   |          |
14+15       1.7744      5.07  |         |         Q      V  |          |
14+30       1.8862      5.41  |         |         |Q       V|          |
14+45       1.9968      5.35  |         |         |Q         V          |
15+ 0       2.1043      5.20  |         |         Q          |  V       |
15+15       2.2063      4.94  |         |        Q|          |   V      |
15+30       2.3026      4.66  |         |      Q  |          |     V    |
15+45       2.3816      3.82  |         |    Q    |          |      V   |
16+ 0       2.4514      3.38  |         |  Q      |          |       V  |
16+15       2.4808      1.42  |    Q    |         |          |        V|
16+30       2.4844      0.18  Q         |         |          |        V|
16+45       2.4866      0.11  Q         |         |          |        V|
17+ 0       2.4886      0.09  Q         |         |          |        V|
17+15       2.4913      0.13  Q         |         |          |        V|
17+30       2.4945      0.16  Q         |         |          |        V|
17+45       2.4978      0.16  Q         |         |          |        V|
18+ 0       2.5006      0.14  Q         |         |          |        V|
18+15       2.5032      0.13  Q         |         |          |        V|
18+30       2.5058      0.13  Q         |         |          |        V|
18+45       2.5080      0.11  Q         |         |          |        V|
19+ 0       2.5096      0.08  Q         |         |          |        V|
19+15       2.5113      0.08  Q         |         |          |        V|
19+30       2.5136      0.11  Q         |         |          |        V|
19+45       2.5158      0.11  Q         |         |          |        V|
20+ 0       2.5174      0.08  Q         |         |          |        V|
20+15       2.5191      0.08  Q         |         |          |        V|
20+30       2.5210      0.09  Q         |         |          |        V|
20+45       2.5230      0.09  Q         |         |          |        V|
21+ 0       2.5245      0.08  Q         |         |          |        V|
21+15       2.5262      0.08  Q         |         |          |        V|
21+30       2.5278      0.07  Q         |         |          |        V|
21+45       2.5295      0.08  Q         |         |          |        V|
22+ 0       2.5310      0.07  Q         |         |          |        V|
22+15       2.5327      0.08  Q         |         |          |        V|
22+30       2.5343      0.07  Q         |         |          |        V|
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   22+45       2.5356      0.06  Q          |          |          |         V|
   23+ 0       2.5369      0.06  Q          |          |          |         V|
   23+15       2.5382      0.06  Q          |          |          |         V|
   23+30       2.5395      0.06  Q          |          |          |         V|
   23+45       2.5408      0.06  Q          |          |          |         V|
   24+ 0       2.5421      0.06  Q          |          |          |         V|
   24+15       2.5426      0.03  Q          |          |          |         V|
   24+30       2.5426      0.00  Q          |          |          |         V|
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SubE324100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: SubE324100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed E, Subarea E3
Existing Condition
100-your, 24-hour

Drainage Area = 54.80(Ac.) = 0.086 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 54.80(Ac.) = 0.086 Sq. Mi.
Length along longest watercourse = 2900.00(Ft.)
Length along longest watercourse measured to centroid = 1850.00(Ft.)
Length along longest watercourse = 0.549 Mi.
Length along longest watercourse measured to centroid = 0.350 Mi.
Difference in elevation = 53.00(Ft.)
Slope along watercourse = 96.4966 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.162 Hr.
Lag time = 9.69 Min.
25% of lag time = 2.42 Min.
40% of lag time = 3.88 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.80	1.80	98.64

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.80	4.50	246.60

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubE324100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
22.300	76.00	0.000
32.500	85.00	0.000

Total Area Entered = 54.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.407	0.118
85.0	85.0	0.187	0.000	0.187	0.593	0.111
					Sum (F) =	0.229

Area averaged mean soil loss (F) (In/Hr) = 0.229
Minimum soil loss rate ((In/Hr)) = 0.115
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	154.750	31.833	17.581
2	0.500	309.500	53.965	29.804
3	0.750	464.249	11.299	6.240
4	1.000	618.999	2.163	1.194
5	1.250	773.749	0.741	0.409
			Sum = 100.000	Sum= 55.228

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.405)	0.032	0.004
2	0.50	0.30	0.054	(0.400)	0.049	0.005
3	0.75	0.30	0.054	(0.396)	0.049	0.005
4	1.00	0.40	0.072	(0.391)	0.065	0.007
5	1.25	0.30	0.054	(0.386)	0.049	0.005
6	1.50	0.30	0.054	(0.382)	0.049	0.005
7	1.75	0.30	0.054	(0.377)	0.049	0.005
8	2.00	0.40	0.072	(0.373)	0.065	0.007
9	2.25	0.40	0.072	(0.368)	0.065	0.007
10	2.50	0.40	0.072	(0.364)	0.065	0.007
11	2.75	0.50	0.090	(0.359)	0.081	0.009
12	3.00	0.50	0.090	(0.355)	0.081	0.009
13	3.25	0.50	0.090	(0.351)	0.081	0.009
14	3.50	0.50	0.090	(0.346)	0.081	0.009
15	3.75	0.50	0.090	(0.342)	0.081	0.009
16	4.00	0.60	0.108	(0.338)	0.097	0.011
17	4.25	0.60	0.108	(0.333)	0.097	0.011
18	4.50	0.70	0.126	(0.329)	0.113	0.013

19	4.75	0.70	0.126	(0.325)	0.113	0.013
20	5.00	0.80	0.144	(0.321)	0.130	0.014
21	5.25	0.60	0.108	(0.316)	0.097	0.011
22	5.50	0.70	0.126	(0.312)	0.113	0.013
23	5.75	0.80	0.144	(0.308)	0.130	0.014
24	6.00	0.80	0.144	(0.304)	0.130	0.014
25	6.25	0.90	0.162	(0.300)	0.146	0.016
26	6.50	0.90	0.162	(0.296)	0.146	0.016
27	6.75	1.00	0.180	(0.292)	0.162	0.018
28	7.00	1.00	0.180	(0.288)	0.162	0.018
29	7.25	1.00	0.180	(0.284)	0.162	0.018
30	7.50	1.10	0.198	(0.280)	0.178	0.020
31	7.75	1.20	0.216	(0.277)	0.194	0.022
32	8.00	1.30	0.234	(0.273)	0.211	0.023
33	8.25	1.50	0.270	(0.269)	0.243	0.027
34	8.50	1.50	0.270	(0.265)	0.243	0.027
35	8.75	1.60	0.288	(0.262)	0.259	0.029
36	9.00	1.70	0.306	0.258	(0.275)	0.048
37	9.25	1.90	0.342	0.254	(0.308)	0.088
38	9.50	2.00	0.360	0.251	(0.324)	0.109
39	9.75	2.10	0.378	0.247	(0.340)	0.131
40	10.00	2.20	0.396	0.243	(0.356)	0.153
41	10.25	1.50	0.270	0.240	(0.243)	0.030
42	10.50	1.50	0.270	0.236	(0.243)	0.034
43	10.75	2.00	0.360	0.233	(0.324)	0.127
44	11.00	2.00	0.360	0.230	(0.324)	0.130
45	11.25	1.90	0.342	0.226	(0.308)	0.116
46	11.50	1.90	0.342	0.223	(0.308)	0.119
47	11.75	1.70	0.306	0.220	(0.275)	0.086
48	12.00	1.80	0.324	0.216	(0.292)	0.108
49	12.25	2.50	0.450	0.213	(0.405)	0.237
50	12.50	2.60	0.468	0.210	(0.421)	0.258
51	12.75	2.80	0.504	0.207	(0.454)	0.297
52	13.00	2.90	0.522	0.204	(0.470)	0.318
53	13.25	3.40	0.612	0.201	(0.551)	0.411
54	13.50	3.40	0.612	0.197	(0.551)	0.414
55	13.75	2.30	0.414	0.194	(0.373)	0.219
56	14.00	2.30	0.414	0.192	(0.373)	0.222
57	14.25	2.70	0.486	0.189	(0.437)	0.297
58	14.50	2.60	0.468	0.186	(0.421)	0.282
59	14.75	2.60	0.468	0.183	(0.421)	0.285
60	15.00	2.50	0.450	0.180	(0.405)	0.270
61	15.25	2.40	0.432	0.177	(0.389)	0.255
62	15.50	2.30	0.414	0.175	(0.373)	0.239
63	15.75	1.90	0.342	0.172	(0.308)	0.170
64	16.00	1.90	0.342	0.169	(0.308)	0.173
65	16.25	0.40	0.072	(0.167)	0.065	0.007
66	16.50	0.40	0.072	(0.164)	0.065	0.007
67	16.75	0.30	0.054	(0.162)	0.049	0.005
68	17.00	0.30	0.054	(0.159)	0.049	0.005
69	17.25	0.50	0.090	(0.157)	0.081	0.009
70	17.50	0.50	0.090	(0.155)	0.081	0.009
71	17.75	0.50	0.090	(0.152)	0.081	0.009
72	18.00	0.40	0.072	(0.150)	0.065	0.007
73	18.25	0.40	0.072	(0.148)	0.065	0.007
74	18.50	0.40	0.072	(0.146)	0.065	0.007
75	18.75	0.30	0.054	(0.143)	0.049	0.005
76	19.00	0.20	0.036	(0.141)	0.032	0.004
77	19.25	0.30	0.054	(0.139)	0.049	0.005
78	19.50	0.40	0.072	(0.138)	0.065	0.007
79	19.75	0.30	0.054	(0.136)	0.049	0.005
80	20.00	0.20	0.036	(0.134)	0.032	0.004
81	20.25	0.30	0.054	(0.132)	0.049	0.005

82	20.50	0.30	0.054	(0.130)	0.049	0.005
83	20.75	0.30	0.054	(0.129)	0.049	0.005
84	21.00	0.20	0.036	(0.127)	0.032	0.004
85	21.25	0.30	0.054	(0.126)	0.049	0.005
86	21.50	0.20	0.036	(0.124)	0.032	0.004
87	21.75	0.30	0.054	(0.123)	0.049	0.005
88	22.00	0.20	0.036	(0.122)	0.032	0.004
89	22.25	0.30	0.054	(0.120)	0.049	0.005
90	22.50	0.20	0.036	(0.119)	0.032	0.004
91	22.75	0.20	0.036	(0.118)	0.032	0.004
92	23.00	0.20	0.036	(0.117)	0.032	0.004
93	23.25	0.20	0.036	(0.116)	0.032	0.004
94	23.50	0.20	0.036	(0.116)	0.032	0.004
95	23.75	0.20	0.036	(0.115)	0.032	0.004
96	24.00	0.20	0.036	(0.115)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.3

Flood volume = Effective rainfall 1.56(In)
times area 54.8(Ac.)/[(In)/(Ft.)] = 7.1(Ac.Ft)
Total soil loss = 2.94(In)
Total soil loss = 13.409(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 310947.3 Cubic Feet
Total soil loss = 584114.9 Cubic Feet

Peak flow rate of this hydrograph = 22.006(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+15	0.0013	0.06	Q	|	|	|	|
0+30	0.0055	0.20	Q	|	|	|	|
0+45	0.0112	0.28	Q	|	|	|	|
1+ 0	0.0180	0.33	Q	|	|	|	|
1+15	0.0252	0.35	Q	|	|	|	|
1+30	0.0316	0.31	Q	|	|	|	|
1+45	0.0378	0.30	Q	|	|	|	|
2+ 0	0.0447	0.33	Q	|	|	|	|
2+15	0.0526	0.38	Q	|	|	|	|
2+30	0.0608	0.39	Q	|	|	|	|
2+45	0.0696	0.43	Q	|	|	|	|
3+ 0	0.0796	0.48	Q	|	|	|	|
3+15	0.0898	0.49	Q	|	|	|	|
3+30	0.1001	0.50	Q	|	|	|	|
3+45	0.1103	0.50	Q	|	|	|	|
4+ 0	0.1213	0.53	Q	|	|	|	|
4+15	0.1333	0.58	Q	|	|	|	|
4+30	0.1462	0.63	Q	|	|	|	|
4+45	0.1603	0.68	Q	|	|	|	|
5+ 0	0.1753	0.72	Q	|	|	|	|
5+15	0.1901	0.72	QV	|	|	|	|
5+30	0.2036	0.65	QV	|	|	|	|
5+45	0.2185	0.72	QV	|	|	|	|
6+ 0	0.2346	0.78	|Q	|	|	|	|
6+15	0.2516	0.82	|Q	|	|	|	|
6+30	0.2698	0.88	|Q	|	|	|	|
6+45	0.2889	0.92	|Q	|	|	|	|

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 7+ 0       0.3091      0.98  |Q         |         |         |         |
 7+15       0.3296      0.99  |Q         |         |         |         |
 7+30       0.3508      1.03  |Q         |         |         |         |
 7+45       0.3738      1.11  |QV        |         |         |         |
 8+ 0       0.3987      1.21  |QV        |         |         |         |
 8+15       0.4264      1.34  |QV        |         |         |         |
 8+30       0.4565      1.46  |QV        |         |         |         |
 8+45       0.4879      1.52  | Q        |         |         |         |
 9+ 0       0.5275      1.92  | Q        |         |         |         |
 9+15       0.5936      3.20  |  VQ      |         |         |         |
 9+30       0.6946      4.89  |  V  Q    |         |         |         |
 9+45       0.8224      6.18  |   V   Q  |         |         |         |
10+ 0       0.9752      7.40  |    V   Q|         |         |         |
10+15       1.1005      6.06  |      V Q |         |         |         |
10+30       1.1550      2.64  |  Q  V    |         |         |         |
10+45       1.2306      3.66  |   Q V    |         |         |         |
11+ 0       1.3625      6.39  |      VQ  |         |         |         |
11+15       1.5024      6.77  |       VQ|         |         |         |
11+30       1.6372      6.53  |       QV|         |         |         |
11+45       1.7612      6.00  |       QV|         |         |         |
12+ 0       1.8729      5.41  |      Q  V         |         |         |
12+15       2.0404      8.11  |         QV        |         |         |
12+30       2.2972     12.43  |          | V   Q  |         |         |
12+45       2.5981     14.57  |          |   V    Q|         |         |
13+ 0       2.9370     16.40  |          |     V   |Q        |         |
13+15       3.3294     18.99  |          |       V |    Q    |         |
13+30       3.7840     22.01  |          |         V       Q|         |
13+45       4.1826     19.29  |          |          |  V Q   |         |
14+ 0       4.4649     13.67  |          |       Q |    V   |         |
14+15       4.7520     13.90  |          |       Q |     V  |         |
14+30       5.0754     15.65  |          |         Q       V |         |
14+45       5.3986     15.64  |          |         Q         V        |
15+ 0       5.7179     15.46  |          |         Q           V      |
15+15       6.0229     14.76  |          |        Q|          |  V    |
15+30       6.3110     13.94  |          |       Q |          |    V  |
15+45       6.5622     12.16  |          |     Q   |          |     V |
16+ 0       6.7691     10.02  |          |  Q      |          |      V|
16+15       6.9081      6.73  |       Q  |         |          |       V|
16+30       6.9436      1.72  | Q        |         |          |       V|
16+45       6.9566      0.63  Q          |         |          |       V|
17+ 0       6.9645      0.38  Q          |         |          |        V|
17+15       6.9720      0.36  Q          |         |          |        V|
17+30       6.9817      0.47  Q          |         |          |        V|
17+45       6.9919      0.49  Q          |         |          |        V|
18+ 0       7.0015      0.46  Q          |         |          |        V|
18+15       7.0100      0.41  Q          |         |          |        V|
18+30       7.0183      0.40  Q          |         |          |        V|
18+45       7.0258      0.37  Q          |         |          |        V|
19+ 0       7.0317      0.28  Q          |         |          |        V|
19+15       7.0368      0.25  Q          |         |          |        V|
19+30       7.0434      0.32  Q          |         |          |        V|
19+45       7.0506      0.35  Q          |         |          |        V|
20+ 0       7.0563      0.28  Q          |         |          |        V|
20+15       7.0614      0.25  Q          |         |          |        V|
20+30       7.0674      0.29  Q          |         |          |        V|
20+45       7.0735      0.30  Q          |         |          |        V|
21+ 0       7.0790      0.27  Q          |         |          |        V|
21+15       7.0840      0.24  Q          |         |          |        V|
21+30       7.0893      0.26  Q          |         |          |        V|
21+45       7.0943      0.24  Q          |         |          |        V|
22+ 0       7.0996      0.25  Q          |         |          |        V|
22+15       7.1046      0.24  Q          |         |          |        V|
22+30       7.1099      0.25  Q          |         |          |        V|
```

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   22+45       7.1142      0.21  Q         |         |         |        V|
   23+ 0       7.1184      0.20  Q         |         |         |        V|
   23+15       7.1225      0.20  Q         |         |         |        V|
   23+30       7.1266      0.20  Q         |         |         |        V|
   23+45       7.1307      0.20  Q         |         |         |        V|
   24+ 0       7.1348      0.20  Q         |         |         |        V|
   24+15       7.1376      0.14  Q         |         |         |        V|
   24+30       7.1382      0.03  Q         |         |         |        V|
   24+45       7.1383      0.01  Q         |         |         |        V|
   25+ 0       7.1384      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

SubF124100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream1/SubF124100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 1, Subarea F1
Existing Condition
100-year, 24-hour

Drainage Area = 98.90(Ac.) = 0.155 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 98.90(Ac.) = 0.155 Sq. Mi.
Length along longest watercourse = 3020.00(Ft.)
Length along longest watercourse measured to centroid = 1040.00(Ft.)
Length along longest watercourse = 0.572 Mi.
Length along longest watercourse measured to centroid = 0.197 Mi.
Difference in elevation = 85.00(Ft.)
Slope along watercourse = 148.6093 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.121 Hr.
Lag time = 7.29 Min.
25% of lag time = 1.82 Min.
40% of lag time = 2.91 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
98.90	1.80	178.02

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
98.90	4.50	445.05

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF124100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 4.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
50.000	76.00	0.000
47.000	85.00	0.000
1.900	90.00	0.000

Total Area Entered = 98.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
76.0	76.0	0.291	0.000	0.291	0.506	0.147
85.0	85.0	0.187	0.000	0.187	0.475	0.089
90.0	90.0	0.130	0.000	0.130	0.019	0.002
					Sum (F) =	0.239

Area averaged mean soil loss (F) (In/Hr) = 0.239
Minimum soil loss rate ((In/Hr)) = 0.119
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	205.884	44.400	44.255
2	0.500	411.768	42.959	42.818
3	0.750	617.652	8.559	8.531
4	1.000	823.536	4.082	4.069
			Sum = 100.000	Sum= 99.673

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	0.20	0.036	(0.421)	0.032	0.004
2 0.50	0.30	0.054	(0.416)	0.049	0.005
3 0.75	0.30	0.054	(0.412)	0.049	0.005
4 1.00	0.40	0.072	(0.407)	0.065	0.007
5 1.25	0.30	0.054	(0.402)	0.049	0.005
6 1.50	0.30	0.054	(0.397)	0.049	0.005
7 1.75	0.30	0.054	(0.392)	0.049	0.005
8 2.00	0.40	0.072	(0.388)	0.065	0.007
9 2.25	0.40	0.072	(0.383)	0.065	0.007
10 2.50	0.40	0.072	(0.378)	0.065	0.007
11 2.75	0.50	0.090	(0.374)	0.081	0.009
12 3.00	0.50	0.090	(0.369)	0.081	0.009
13 3.25	0.50	0.090	(0.365)	0.081	0.009
14 3.50	0.50	0.090	(0.360)	0.081	0.009
15 3.75	0.50	0.090	(0.356)	0.081	0.009
16 4.00	0.60	0.108	(0.351)	0.097	0.011
17 4.25	0.60	0.108	(0.347)	0.097	0.011

18	4.50	0.70	0.126	(0.342)	0.113	0.013
19	4.75	0.70	0.126	(0.338)	0.113	0.013
20	5.00	0.80	0.144	(0.333)	0.130	0.014
21	5.25	0.60	0.108	(0.329)	0.097	0.011
22	5.50	0.70	0.126	(0.325)	0.113	0.013
23	5.75	0.80	0.144	(0.321)	0.130	0.014
24	6.00	0.80	0.144	(0.316)	0.130	0.014
25	6.25	0.90	0.162	(0.312)	0.146	0.016
26	6.50	0.90	0.162	(0.308)	0.146	0.016
27	6.75	1.00	0.180	(0.304)	0.162	0.018
28	7.00	1.00	0.180	(0.300)	0.162	0.018
29	7.25	1.00	0.180	(0.296)	0.162	0.018
30	7.50	1.10	0.198	(0.292)	0.178	0.020
31	7.75	1.20	0.216	(0.288)	0.194	0.022
32	8.00	1.30	0.234	(0.284)	0.211	0.023
33	8.25	1.50	0.270	(0.280)	0.243	0.027
34	8.50	1.50	0.270	(0.276)	0.243	0.027
35	8.75	1.60	0.288	(0.272)	0.259	0.029
36	9.00	1.70	0.306	0.268	(0.275)	0.038
37	9.25	1.90	0.342	0.264	(0.308)	0.078
38	9.50	2.00	0.360	0.261	(0.324)	0.099
39	9.75	2.10	0.378	0.257	(0.340)	0.121
40	10.00	2.20	0.396	0.253	(0.356)	0.143
41	10.25	1.50	0.270	(0.250)	0.243	0.027
42	10.50	1.50	0.270	(0.246)	0.243	0.027
43	10.75	2.00	0.360	0.242	(0.324)	0.118
44	11.00	2.00	0.360	0.239	(0.324)	0.121
45	11.25	1.90	0.342	0.235	(0.308)	0.107
46	11.50	1.90	0.342	0.232	(0.308)	0.110
47	11.75	1.70	0.306	0.228	(0.275)	0.078
48	12.00	1.80	0.324	0.225	(0.292)	0.099
49	12.25	2.50	0.450	0.222	(0.405)	0.228
50	12.50	2.60	0.468	0.218	(0.421)	0.250
51	12.75	2.80	0.504	0.215	(0.454)	0.289
52	13.00	2.90	0.522	0.212	(0.470)	0.310
53	13.25	3.40	0.612	0.209	(0.551)	0.403
54	13.50	3.40	0.612	0.205	(0.551)	0.406
55	13.75	2.30	0.414	0.202	(0.373)	0.212
56	14.00	2.30	0.414	0.199	(0.373)	0.215
57	14.25	2.70	0.486	0.196	(0.437)	0.290
58	14.50	2.60	0.468	0.193	(0.421)	0.275
59	14.75	2.60	0.468	0.190	(0.421)	0.278
60	15.00	2.50	0.450	0.187	(0.405)	0.263
61	15.25	2.40	0.432	0.184	(0.389)	0.247
62	15.50	2.30	0.414	0.182	(0.373)	0.232
63	15.75	1.90	0.342	0.179	(0.308)	0.163
64	16.00	1.90	0.342	0.176	(0.308)	0.166
65	16.25	0.40	0.072	(0.173)	0.065	0.007
66	16.50	0.40	0.072	(0.171)	0.065	0.007
67	16.75	0.30	0.054	(0.168)	0.049	0.005
68	17.00	0.30	0.054	(0.166)	0.049	0.005
69	17.25	0.50	0.090	(0.163)	0.081	0.009
70	17.50	0.50	0.090	(0.161)	0.081	0.009
71	17.75	0.50	0.090	(0.158)	0.081	0.009
72	18.00	0.40	0.072	(0.156)	0.065	0.007
73	18.25	0.40	0.072	(0.154)	0.065	0.007
74	18.50	0.40	0.072	(0.151)	0.065	0.007
75	18.75	0.30	0.054	(0.149)	0.049	0.005
76	19.00	0.20	0.036	(0.147)	0.032	0.004
77	19.25	0.30	0.054	(0.145)	0.049	0.005
78	19.50	0.40	0.072	(0.143)	0.065	0.007
79	19.75	0.30	0.054	(0.141)	0.049	0.005
80	20.00	0.20	0.036	(0.139)	0.032	0.004

81	20.25	0.30	0.054	(0.137)	0.049	0.005
82	20.50	0.30	0.054	(0.136)	0.049	0.005
83	20.75	0.30	0.054	(0.134)	0.049	0.005
84	21.00	0.20	0.036	(0.132)	0.032	0.004
85	21.25	0.30	0.054	(0.131)	0.049	0.005
86	21.50	0.20	0.036	(0.129)	0.032	0.004
87	21.75	0.30	0.054	(0.128)	0.049	0.005
88	22.00	0.20	0.036	(0.126)	0.032	0.004
89	22.25	0.30	0.054	(0.125)	0.049	0.005
90	22.50	0.20	0.036	(0.124)	0.032	0.004
91	22.75	0.20	0.036	(0.123)	0.032	0.004
92	23.00	0.20	0.036	(0.122)	0.032	0.004
93	23.25	0.20	0.036	(0.121)	0.032	0.004
94	23.50	0.20	0.036	(0.120)	0.032	0.004
95	23.75	0.20	0.036	(0.120)	0.032	0.004
96	24.00	0.20	0.036	(0.119)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.0

Flood volume = Effective rainfall 1.50(In)
times area 98.9(Ac.)/[(In)/(Ft.)] = 12.4(Ac.Ft)
Total soil loss = 3.00(In)
Total soil loss = 24.685(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 539935.5 Cubic Feet
Total soil loss = 1075284.0 Cubic Feet

Peak flow rate of this hydrograph = 39.100(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
----------------------------------------------------------------------
  0+15       0.0033      0.16  Q         |         |         |         |
  0+30       0.0114      0.39  Q         |         |         |         |
  0+45       0.0218      0.50  Q         |         |         |         |
  1+ 0       0.0344      0.61  Q         |         |         |         |
  1+15       0.0471      0.62  Q         |         |         |         |
  1+30       0.0585      0.55  Q         |         |         |         |
  1+45       0.0698      0.55  Q         |         |         |         |
  2+ 0       0.0826      0.62  Q         |         |         |         |
  2+15       0.0970      0.70  Q         |         |         |         |
  2+30       0.1116      0.71  Q         |         |         |         |
  2+45       0.1281      0.80  Q         |         |         |         |
  3+ 0       0.1462      0.87  Q         |         |         |         |
  3+15       0.1646      0.89  Q         |         |         |         |
  3+30       0.1831      0.90  Q         |         |         |         |
  3+45       0.2017      0.90  Q         |         |         |         |
  4+ 0       0.2218      0.98  Q         |         |         |         |
  4+15       0.2436      1.05  VQ        |         |         |         |
  4+30       0.2674      1.15  VQ        |         |         |         |
  4+45       0.2929      1.23  VQ        |         |         |         |
  5+ 0       0.3203      1.33   Q        |         |         |         |
  5+15       0.3462      1.25  |Q        |         |         |         |
  5+30       0.3709      1.19  |Q        |         |         |         |
  5+45       0.3983      1.33  |Q        |         |         |         |
  6+ 0       0.4274      1.41  |Q        |         |         |         |
  6+15       0.4585      1.51  |Q        |         |         |         |
  6+30       0.4914      1.59  |Q        |         |         |         |
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 6+45       0.5263      1.69  |Q         |         |         |         |
 7+ 0       0.5629      1.77  |Q         |         |         |         |
 7+15       0.5998      1.79  |Q         |         |         |         |
 7+30       0.6386      1.87  |QV        |         |         |         |
 7+45       0.6805      2.03  | Q        |         |         |         |
 8+ 0       0.7261      2.20  | Q        |         |         |         |
 8+15       0.7769      2.46  | Q        |         |         |         |
 8+30       0.8315      2.64  | Q        |         |         |         |
 8+45       0.8884      2.76  | Q        |         |         |         |
 9+ 0       0.9555      3.25  |  Q       |         |         |         |
 9+15       1.0673      5.41  |  V Q     |         |         |         |
 9+30       1.2360      8.16  |  V    Q  |         |         |         |
 9+45       1.4515     10.43  |   V     Q|         |         |         |
10+ 0       1.7133     12.67  |    V     | Q       |         |         |
10+15       1.8941      8.75  |     V Q  |         |         |         |
10+30       1.9780      4.06  |   Q V    |         |         |         |
10+45       2.1263      7.18  |     VQ   |         |         |         |
11+ 0       2.3483     10.74  |      V  Q|         |         |         |
11+15       2.5761     11.03  |       V |Q         |         |         |
11+30       2.8026     10.96  |        VQ         |         |         |
11+45       3.0001      9.56  |        Q|         |         |         |
12+ 0       3.1877      9.08  |        QV         |         |         |
12+15       3.5071     15.46  |          V   Q    |         |         |
12+30       3.9615     21.99  |          | V      |Q        |         |
12+45       4.4954     25.84  |          |   V    |    Q    |         |
13+ 0       5.0981     29.17  |          |     V  |         Q|         |
13+15       5.8135     34.63  |          |       V|         |   Q     |
13+30       6.6213     39.10  |          |        V        |         Q|
13+45       7.2720     31.49  |          |         |  V      |Q        |
14+ 0       7.7613     23.69  |          |         |  Q V    |         |
14+15       8.2880     25.49  |          |         |   QV    |         |
14+30       8.8514     27.27  |          |         |     QV  |         |
14+45       9.4178     27.41  |          |         |     Q  V        |
15+ 0       9.9767     27.05  |          |         |     Q    V      |
15+15      10.5076     25.70  |          |         |   Q     |  V     |
15+30      11.0088     24.26  |          |         |  Q      |    V   |
15+45      11.4294     20.35  |          |        Q        |     V  |
16+ 0      11.7873     17.32  |          |      Q  |         |       V|
16+15      11.9889      9.76  |        Q|         |         |       V|
16+30      12.0448      2.71  | Q        |         |         |       V|
16+45      12.0714      1.28  |Q         |         |         |       V|
17+ 0      12.0830      0.56  Q          |         |         |       V|
17+15      12.0975      0.71  Q          |         |         |        V|
17+30      12.1151      0.85  Q          |         |         |        V|
17+45      12.1334      0.88  Q          |         |         |        V|
18+ 0      12.1503      0.82  Q          |         |         |        V|
18+15      12.1656      0.74  Q          |         |         |        V|
18+30      12.1805      0.73  Q          |         |         |        V|
18+45      12.1937      0.64  Q          |         |         |        V|
19+ 0      12.2037      0.48  Q          |         |         |        V|
19+15      12.2134      0.47  Q          |         |         |        V|
19+30      12.2258      0.60  Q          |         |         |        V|
19+45      12.2384      0.61  Q          |         |         |        V|
20+ 0      12.2482      0.47  Q          |         |         |        V|
20+15      12.2579      0.47  Q          |         |         |        V|
20+30      12.2687      0.52  Q          |         |         |        V|
20+45      12.2796      0.53  Q          |         |         |        V|
21+ 0      12.2891      0.46  Q          |         |         |        V|
21+15      12.2986      0.46  Q          |         |         |        V|
21+30      12.3078      0.44  Q          |         |         |        V|
21+45      12.3172      0.45  Q          |         |         |        V|
22+ 0      12.3263      0.44  Q          |         |         |        V|
22+15      12.3357      0.45  Q          |         |         |        V|
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   22+30      12.3449      0.44  Q         |         |         |        V|
   22+45      12.3526      0.37  Q         |         |         |        V|
   23+ 0      12.3602      0.37  Q         |         |         |        V|
   23+15      12.3676      0.36  Q         |         |         |        V|
   23+30      12.3750      0.36  Q         |         |         |        V|
   23+45      12.3824      0.36  Q         |         |         |        V|
   24+ 0      12.3898      0.36  Q         |         |         |        V|
   24+15      12.3940      0.20  Q         |         |         |        V|
   24+30      12.3949      0.05  Q         |         |         |        V|
   24+45      12.3952      0.01  Q         |         |         |        V|
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WSF24hrSt2

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Study date: 04/27/12

Watershed F, Stream 2
Existing Condition
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF224100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 98
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 5.714 (CFS)
Total volume = 1.980 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 91.000 to Point/Station 92.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 950.00 (Ft.)
Elevation difference = 28.00 (Ft.)
Slope of channel = 0.029474 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 950.00(Ft.) Elevation difference = 28.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 1.432(CFS)
Depth of flow = 0.086(Ft.)
Average velocity = 1.635(Ft/s)
Total flow rate = 1.432(CFS)
Channel flow top width = 10.344(Ft.)
Depth of flow in channel = 0.09(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 1.64(Ft/s)
Travel time = 0.00 min.

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Individual channel flow =    1.432(CFS)
Total capacity of improved channels =      1.432(CFS)
Critical Depth in Channel =    0.09(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =      5.714(CFS)
Depth of flow =     0.197(Ft.)
Average velocity =     2.792(Ft/s)
Total flow rate =     5.714(CFS)
Channel flow top width =   10.788(Ft.)
Depth of flow in channel =   0.20(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    2.79(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    5.714(CFS)
Total capacity of improved channels =      5.714(CFS)
Critical Depth in Channel =    0.21(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.6215   Travel time =   5.67 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.1702
        dt(routing time-step) =   3.52 (min.),   c* =   0.9541

Output hydrograph delayed by 0  unit time increments


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                  P R I N T  O F  S T O R M
               R u n o f f      H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        1.4       2.9       4.3       5.7
----------------------------------------------------------------------
  0+15       0.0206      0.03  O         |         |         |         |
  0+30       0.0499      0.06  O         |         |         |         |
  0+45       0.0651      0.07  O         |         |         |         |
  1+ 0       0.0791      0.08  O         |         |         |         |
  1+15       0.0786      0.08  O         |         |         |         |
  1+30       0.0721      0.07  O         |         |         |         |
  1+45       0.0695      0.07  O         |         |         |         |
  2+ 0       0.0795      0.08  O         |         |         |         |
  2+15       0.0889      0.09  O         |         |         |         |
  2+30       0.0918      0.09  O         |         |         |         |
  2+45       0.1025      0.11  O         |         |         |         |
  3+ 0       0.1120      0.11  O         |         |         |         |
  3+15       0.1149      0.12  O         |         |         |         |
  3+30       0.1152      0.12  O         |         |         |         |
  3+45       0.1152      0.12  O         |         |         |         |
  4+ 0       0.1256      0.13  O         |         |         |         |
  4+15       0.1350      0.14  O         |         |         |         |
  4+30       0.1483      0.15  |O        |         |         |         |
  4+45       0.1581      0.16  |O        |         |         |         |
  5+ 0       0.1713      0.18  |O        |         |         |         |
  5+15       0.1605      0.16  |O        |         |         |         |
  5+30       0.1548      0.15  |O        |         |         |         |
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 5+45       0.1691      0.17  |O        |         |         |         |
 6+ 0       0.1808      0.18  |O        |         |         |         |
 6+15       0.1943      0.20  |O        |         |         |         |
 6+30       0.2042      0.21  |O        |         |         |         |
 6+45       0.2174      0.22  |O        |         |         |         |
 7+ 0       0.2272      0.23  |O        |         |         |         |
 7+15       0.2301      0.23  |O        |         |         |         |
 7+30       0.2408      0.24  |O        |         |         |         |
 7+45       0.2606      0.27  |O        |         |         |         |
 8+ 0       0.2833      0.29  |OI       |         |         |         |
 8+15       0.4528      0.51  |  O      |         |         |         |
 8+30       0.6171      0.66  |   O     |         |         |         |
 8+45       0.7984      0.85  |    O    |         |         |         |
 9+ 0       1.0395      1.11  |      O  |         |         |         |
 9+15       1.4081      1.52  |        OI         |         |         |
 9+30       1.7709      1.87  |         | OI      |         |         |
 9+45       2.0682      2.15  |         |   OI    |         |         |
10+ 0       2.3395      2.42  |         |     O   |         |         |
10+15       1.7811      1.55  |         I O       |         |         |
10+30       1.1892      1.04  |      IO |         |         |         |
10+45       1.5414      1.72  |         O I       |         |         |
11+ 0       2.0253      2.15  |         |   OI    |         |         |
11+15       2.1021      2.09  |         |   O     |         |         |
11+30       2.0602      2.05  |         |   O     |         |         |
11+45       1.8600      1.79  |         | IO      |         |         |
12+ 0       1.8053      1.81  |         | O       |         |         |
12+15       2.5980      2.89  |         |       O I         |         |
12+30       3.4183      3.63  |         |         |  O I    |         |
12+45       3.9596      4.09  |         |         |     OI  |         |
13+ 0       4.3382      4.44  |         |         |        OI         |
13+15       5.0442      5.28  |         |         |         |    OI   |
13+30       5.5848      5.71  |         |         |         |       OI
13+45       4.6302      4.24  |         |         |       I| O        |
14+ 0       3.6399      3.39  |         |         |  I O    |         |
14+15       3.7640      3.89  |         |         |    OI   |         |
14+30       4.0307      4.09  |         |         |      O  |         |
14+45       4.0809      4.08  |         |         |      O  |         |
15+ 0       3.9919      3.96  |         |         |     O   |         |
15+15       3.8204      3.77  |         |         |    O    |         |
15+30       3.6221      3.57  |         |         |   IO    |         |
15+45       3.1102      2.94  |         |        IO         |         |
16+ 0       2.7273      2.64  |         |       IO|         |         |
16+15       1.4937      1.06  |      I  O         |         |         |
16+30       0.4508      0.20  |I O      |         |         |         |
16+45       0.1218      0.08  O         |         |         |         |
17+ 0       0.0743      0.07  O         |         |         |         |
17+15       0.0902      0.10  O         |         |         |         |
17+30       0.1087      0.11  O         |         |         |         |
17+45       0.1145      0.12  O         |         |         |         |
18+ 0       0.1049      0.10  O         |         |         |         |
18+15       0.0955      0.09  O         |         |         |         |
18+30       0.0926      0.09  O         |         |         |         |
18+45       0.0819      0.08  O         |         |         |         |
19+ 0       0.0621      0.06  O         |         |         |         |
19+15       0.0601      0.06  O         |         |         |         |
19+30       0.0766      0.08  O         |         |         |         |
19+45       0.0782      0.08  O         |         |         |         |
20+ 0       0.0617      0.06  O         |         |         |         |
20+15       0.0601      0.06  O         |         |         |         |
20+30       0.0663      0.07  O         |         |         |         |
20+45       0.0688      0.07  O         |         |         |         |
21+ 0       0.0588      0.06  O         |         |         |         |
21+15       0.0597      0.06  O         |         |         |         |
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 21+30       0.0559      0.05  O         |         |         |         |
 21+45       0.0594      0.06  O         |         |         |         |
 22+ 0       0.0559      0.05  O         |         |         |         |
 22+15       0.0594      0.06  O         |         |         |         |
 22+30       0.0559      0.05  O         |         |         |         |
 22+45       0.0490      0.05  O         |         |         |         |
 23+ 0       0.0464      0.05  O         |         |         |         |
 23+15       0.0461      0.05  O         |         |         |         |
 23+30       0.0461      0.05  O         |         |         |         |
 23+45       0.0461      0.05  O         |         |         |         |
 24+ 0       0.0461      0.05  O         |         |         |         |
 24+15       0.0255      0.02  O         |         |         |         |
 24+30       0.0066      0.00  O         |         |         |         |
 24+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =    99
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =        5.585 (CFS)
                        Total volume =       1.980 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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        Process from Point/Station       91.000 to Point/Station       92.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
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        ******************** HYDROGRAPH INFORMATION **********************

                        From study/file name: SubF324100.rte
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                        R u n o f f     H y d r o g r a p h
        -------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0        2.1       4.3       6.4       8.5
  -------------------------------------------------------------------
    0+15       0.0152      0.04  Q         |         |         |         |
    0+30       0.0305      0.08  Q         |         |         |         |
    0+45       0.0350      0.10  Q         |         |         |         |
    1+ 0       0.0430      0.12  Q         |         |         |         |
    1+15       0.0392      0.12  Q         |         |         |         |
    1+30       0.0357      0.11  Q         |         |         |         |
    1+45       0.0354      0.10  Q         |         |         |         |
    2+ 0       0.0430      0.12  Q         |         |         |         |
    2+15       0.0468      0.14  Q         |         |         |         |
    2+30       0.0472      0.14  Q         |         |         |         |
    2+45       0.0548      0.16  Q         |         |         |         |
    3+ 0       0.0586      0.17  Q         |         |         |         |
    3+15       0.0590      0.17  Q         |         |         |         |
    3+30       0.0590      0.17  Q         |         |         |         |
    3+45       0.0590      0.17  Q         |         |         |         |
    4+ 0       0.0666      0.19  Q         |         |         |         |
    4+15       0.0704      0.21  Q         |         |         |         |
    4+30       0.0784      0.23  qQ        |         |         |         |
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 4+45       0.0822      0.24  qQ         |          |          |          |
 5+ 0       0.0902      0.26  qQ         |          |          |          |
 5+15       0.0788      0.24  qQ         |          |          |          |
 5+30       0.0791      0.23  qQ         |          |          |          |
 5+45       0.0898      0.26  qQ         |          |          |          |
 6+ 0       0.0940      0.27  qQ         |          |          |          |
 6+15       0.1020      0.30  qQ         |          |          |          |
 6+30       0.1058      0.31  qQ         |          |          |          |
 6+45       0.1138      0.33  qQ         |          |          |          |
 7+ 0       0.1176      0.34  qQ         |          |          |          |
 7+15       0.1180      0.35  qQ         |          |          |          |
 7+30       0.1256      0.37  qQ         |          |          |          |
 7+45       0.1370      0.40  qQ         |          |          |          |
 8+ 0       0.1488      0.43  q Q        |          |          |          |
 8+15       0.2684      0.72  |q Q       |          |          |          |
 8+30       0.3401      0.96  |q  Q      |          |          |          |
 8+45       0.4407      1.24  | q  Q     |          |          |          |
 9+ 0       0.5749      1.61  | q    Q   |          |          |          |
 9+15       0.7884      2.20  |  q      Q|          |          |          |
 9+30       0.9643      2.74  |   q      | Q        |          |          |
 9+45       1.1050      3.17  |    q     |   Q      |          |          |
10+ 0       1.2420      3.58  |    q     |     Q    |          |          |
10+15       0.7712      2.55  |  q      |Q         |          |          |
10+30       0.5239      1.71  | q     Q |          |          |          |
10+45       0.8975      2.44  |   q     |Q         |          |          |
11+ 0       1.1082      3.13  |    q     |   Q      |          |          |
11+15       1.0680      3.17  |    q     |   Q      |          |          |
11+30       1.0474      3.11  |   q      |   Q      |          |          |
11+45       0.9097      2.77  |   q      |  Q       |          |          |
12+ 0       0.9262      2.73  |   q      | Q        |          |          |
12+15       1.5066      4.10  |      q   |        Q|          |          |
12+30       1.8727      5.29  |       q  |          |   Q      |          |
12+45       2.1047      6.06  |        q|          |       Q  |          |
13+ 0       2.2779      6.62  |         q          |         |Q         |
13+15       2.7197      7.76  |          | q       |          |     Q    |
13+30       2.9320      8.52  |          |  q      |          |         Q
13+45       2.1303      6.76  |         q          |         |Q         |
14+ 0       1.7228      5.36  |       q  |          |    Q     |          |
14+15       2.0035      5.77  |        q|          |      Q   |          |
14+30       2.0970      6.13  |        q|          |       Q  |          |
14+45       2.0878      6.17  |        q|          |       Q  |          |
15+ 0       2.0234      6.02  |        q|          |       Q  |          |
15+15       1.9238      5.74  |        q|          |     Q    |          |
15+30       1.8204      5.44  |       q  |          |    Q     |          |
15+45       1.4889      4.60  |     q    |         Q|          |          |
16+ 0       1.3455      4.07  |     q    |        Q|          |          |
16+15       0.5061      2.00  | q      Q|          |          |          |
16+30       0.0858      0.54  q Q        |          |          |          |
16+45       0.0396      0.16  Q          |          |          |          |
17+ 0       0.0357      0.11  Q          |          |          |          |
17+15       0.0506      0.14  Q          |          |          |          |
17+30       0.0583      0.17  Q          |          |          |          |
17+45       0.0590      0.17  Q          |          |          |          |
18+ 0       0.0514      0.16  Q          |          |          |          |
18+15       0.0475      0.14  Q          |          |          |          |
18+30       0.0472      0.14  Q          |          |          |          |
18+45       0.0396      0.12  Q          |          |          |          |
19+ 0       0.0281      0.09  Q          |          |          |          |
19+15       0.0315      0.09  Q          |          |          |          |
19+30       0.0426      0.12  Q          |          |          |          |
19+45       0.0392      0.12  Q          |          |          |          |
20+ 0       0.0281      0.09  Q          |          |          |          |
20+15       0.0315      0.09  Q          |          |          |          |
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  20+30       0.0350      0.10  Q          |          |          |          |
  20+45       0.0354      0.10  Q          |          |          |          |
  21+ 0       0.0278      0.09  Q          |          |          |          |
  21+15       0.0315      0.09  Q          |          |          |          |
  21+30       0.0274      0.08  Q          |          |          |          |
  21+45       0.0315      0.09  Q          |          |          |          |
  22+ 0       0.0274      0.08  Q          |          |          |          |
  22+15       0.0315      0.09  Q          |          |          |          |
  22+30       0.0274      0.08  Q          |          |          |          |
  22+45       0.0239      0.07  Q          |          |          |          |
  23+ 0       0.0236      0.07  Q          |          |          |          |
  23+15       0.0236      0.07  Q          |          |          |          |
  23+30       0.0236      0.07  Q          |          |          |          |
  23+45       0.0236      0.07  Q          |          |          |          |
  24+ 0       0.0236      0.07  Q          |          |          |          |
  24+15       0.0084      0.03  Q          |          |          |          |
  24+30       0.0007      0.01  Q          |          |          |          |
  24+45       0.0000      0.00  Q          |          |          |          |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =    99
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =        8.517 (CFS)
                        Total volume =       2.993 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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        Process from Point/Station      921.000 to Point/Station       92.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        _____________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                        From study/file name: F31and32N92.rte
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f      H y d r o g r a p h
        ---------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0        6.9      13.7      20.6      27.5
  -------------------------------------------------------------------------
    0+15       0.0621      0.10  Q          |          |          |          |
    0+30       0.1685      0.25  Q          |          |          |          |
    0+45       0.2314      0.33  Q          |          |          |          |
    1+ 0       0.2830      0.41  Q          |          |          |          |
    1+15       0.2945      0.41  Q          |          |          |          |
    1+30       0.2700      0.38  Q          |          |          |          |
    1+45       0.2615      0.37  Q          |          |          |          |
    2+ 0       0.2890      0.41  Q          |          |          |          |
    2+15       0.3263      0.46  Q          |          |          |          |
    2+30       0.3389      0.48  Q          |          |          |          |
    2+45       0.3739      0.53  Q          |          |          |          |
    3+ 0       0.4120      0.58  Q          |          |          |          |
    3+15       0.4247      0.60  Q          |          |          |          |
    3+30       0.4287      0.60  Q          |          |          |          |
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 3+45       0.4291      0.60  Q          |          |          |          |
 4+ 0       0.4603      0.65  Q          |          |          |          |
 4+15       0.4979      0.70  qQ         |          |          |          |
 4+30       0.5416      0.77  qQ         |          |          |          |
 4+45       0.5833      0.82  qQ         |          |          |          |
 5+ 0       0.6273      0.89  qQ         |          |          |          |
 5+15       0.6070      0.85  qQ         |          |          |          |
 5+30       0.5757      0.81  qQ         |          |          |          |
 5+45       0.6233      0.88  qQ         |          |          |          |
 6+ 0       0.6660      0.94  qQ         |          |          |          |
 6+15       0.7130      1.01  |Q         |          |          |          |
 6+30       0.7549      1.06  |Q         |          |          |          |
 6+45       0.7990      1.13  |Q         |          |          |          |
 7+ 0       0.8408      1.19  |Q         |          |          |          |
 7+15       0.8538      1.20  |Q         |          |          |          |
 7+30       0.8890      1.26  |Q         |          |          |          |
 7+45       0.9581      1.36  |Q         |          |          |          |
 8+ 0       1.0395      1.47  |qQ        |          |          |          |
 8+15       1.5389      2.26  | qQ       |          |          |          |
 8+30       2.0410      3.00  | q Q      |          |          |          |
 8+45       2.4698      3.71  |  q Q     |          |          |          |
 9+ 0       3.0925      4.71  |   q Q    |          |          |          |
 9+15       3.9772      6.17  |    q  Q  |          |          |          |
 9+30       4.9003      7.64  |      q  |Q          |          |          |
 9+45       5.7292      8.90  |       q  | Q        |          |          |
10+ 0       6.6779     10.26  |        q|   Q      |          |          |
10+15       5.4404      7.99  |      q  |Q         |          |          |
10+30       3.6218      5.33  |    q Q  |          |          |          |
10+45       4.5133      6.95  |     q   Q          |          |          |
11+ 0       5.8549      8.99  |       q |  Q       |          |          |
11+15       6.0556      9.23  |       q |  Q       |          |          |
11+30       5.9727      9.08  |       q |  Q       |          |          |
11+45       5.4050      8.17  |      q  |Q         |          |          |
12+ 0       5.0963      7.83  |      q  |Q         |          |          |
12+15       7.5254     11.63  |         q     Q    |          |          |
12+30      10.6521     15.94  |          |    q     |  Q       |          |
12+45      12.7088     18.77  |          |       q |       Q  |          |
13+ 0      14.3260     20.94  |          |         q        Q
13+15      16.7206     24.48  |          |           |   q      |     Q    |
13+30      18.9635     27.48  |          |           |     q    |          Q
13+45      16.3697     23.13  |          |           |  q       |  Q       |
14+ 0      12.5709     17.93  |          |       q |     Q    |          |
14+15      12.5848     18.35  |          |       q |     Q    |          |
14+30      13.4826     19.61  |          |        q|       Q  |          |
14+45      13.7008     19.87  |          |        q|       Q  |          |
15+ 0      13.5459     19.56  |          |        q|       Q  |          |
15+15      12.9625     18.71  |          |       q |      Q   |          |
15+30      12.2762     17.72  |          |      q  |    Q     |          |
15+45      10.6171     15.22  |          |    q    | Q        |          |
16+ 0       9.0641     13.14  |          |  q     Q|          |          |
16+15       5.4641      7.46  |      q  Q          |          |          |
16+30       1.7945      2.33  | qQ       |          |          |          |
16+45       0.7127      0.87  |Q         |          |          |          |
17+ 0       0.3098      0.42  Q          |          |          |          |
17+15       0.3320      0.47  Q          |          |          |          |
17+30       0.3973      0.56  Q          |          |          |          |
17+45       0.4207      0.59  Q          |          |          |          |
18+ 0       0.3973      0.55  Q          |          |          |          |
18+15       0.3603      0.50  Q          |          |          |          |
18+30       0.3478      0.49  Q          |          |          |          |
18+45       0.3128      0.43  Q          |          |          |          |
19+ 0       0.2437      0.33  Q          |          |          |          |
19+15       0.2244      0.32  Q          |          |          |          |
```

```
   19+30       0.2765      0.40  Q          |          |          |          |
   19+45       0.2913      0.41  Q          |          |          |          |
   20+ 0       0.2387      0.33  Q          |          |          |          |
   20+15       0.2238      0.32  Q          |          |          |          |
   20+30       0.2453      0.35  Q          |          |          |          |
   20+45       0.2536      0.36  Q          |          |          |          |
   21+ 0       0.2261      0.31  Q          |          |          |          |
   21+15       0.2198      0.31  Q          |          |          |          |
   21+30       0.2139      0.30  Q          |          |          |          |
   21+45       0.2159      0.31  Q          |          |          |          |
   22+ 0       0.2135      0.30  Q          |          |          |          |
   22+15       0.2158      0.31  Q          |          |          |          |
   22+30       0.2134      0.30  Q          |          |          |          |
   22+45       0.1847      0.26  Q          |          |          |          |
   23+ 0       0.1758      0.25  Q          |          |          |          |
   23+15       0.1721      0.24  Q          |          |          |          |
   23+30       0.1718      0.24  Q          |          |          |          |
   23+45       0.1717      0.24  Q          |          |          |          |
   24+ 0       0.1717      0.24  Q          |          |          |          |
   24+15       0.1096      0.14  Q          |          |          |          |
   24+30       0.0342      0.04  Q          |          |          |          |
   24+45       0.0090      0.01  Q          |          |          |          |
   25+ 0       0.0010      0.00  Q          |          |          |          |
   25+15       0.0000      0.00  Q          |          |          |          |
--------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   101
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =       27.480 (CFS)
                        Total volume =       9.453 (Ac.Ft)
                Status of hydrographs being held in storage
                            Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       92.000 to Point/Station       93.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =    980.00 (Ft.)
        Elevation difference =   25.00 (Ft.)
        Slope of channel =  0.025510 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =   980.00(Ft.)     Elevation difference =  25.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   2.000
        Slope or 'Z' of right channel bank =   2.000
        Manning's 'N'    = 0.030
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =      6.715(CFS)
        Depth of flow =     0.226(Ft.)
        Average velocity =     2.838(Ft/s)
        Total flow rate =     6.715(CFS)
        Channel flow top width =   10.905(Ft.)
        Depth of flow in channel =   0.23(Ft.)
```

```
Total number of channels (same dimensions) = 1
Flow Velocity =    2.84(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    6.715(CFS)
Total capacity of improved channels =      6.715(CFS)
Critical Depth in Channel =    0.24(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     27.480(CFS)
Depth of flow =     0.522(Ft.)
Average velocity =     4.765(Ft/s)
Total flow rate =    27.480(CFS)
Channel flow top width =   12.089(Ft.)
Depth of flow in channel =   0.52(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    4.77(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   27.480(CFS)
Total capacity of improved channels =     27.480(CFS)
Critical Depth in Channel =    0.59(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.7371   Travel time =   3.43 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   4.2918
        dt(routing time-step) =   2.53 (min.),   c* =   0.9968

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        6.9      13.7      20.6      27.5
----------------------------------------------------------------------
  0+15       0.0812      0.10  O         |         |         |         |
  0+30       0.2230      0.25  O         |         |         |         |
  0+45       0.3173      0.33  O         |         |         |         |
  1+ 0       0.3925      0.41  O         |         |         |         |
  1+15       0.4110      0.41  O         |         |         |         |
  1+30       0.3837      0.38  O         |         |         |         |
  1+45       0.3683      0.37  O         |         |         |         |
  2+ 0       0.4038      0.41  O         |         |         |         |
  2+15       0.4534      0.46  O         |         |         |         |
  2+30       0.4752      0.48  O         |         |         |         |
  2+45       0.5221      0.53  O         |         |         |         |
  3+ 0       0.5738      0.58  O         |         |         |         |
  3+15       0.5958      0.60  O         |         |         |         |
  3+30       0.6022      0.60  O         |         |         |         |
  3+45       0.6033      0.60  O         |         |         |         |
  4+ 0       0.6440      0.65  O         |         |         |         |
  4+15       0.6946      0.70  |O        |         |         |         |
  4+30       0.7571      0.77  |O        |         |         |         |
  4+45       0.8141      0.82  |O        |         |         |         |
```

```
 5+ 0       0.8776      0.89  |O        |         |         |         |
 5+15       0.8535      0.85  |O        |         |         |         |
 5+30       0.8159      0.81  |O        |         |         |         |
 5+45       0.8698      0.88  |O        |         |         |         |
 6+ 0       0.9308      0.94  |O        |         |         |         |
 6+15       0.9976      1.01  |O        |         |         |         |
 6+30       1.0553      1.06  |O        |         |         |         |
 6+45       1.1190      1.13  |O        |         |         |         |
 7+ 0       1.1761      1.19  |O        |         |         |         |
 7+15       1.1991      1.20  |O        |         |         |         |
 7+30       1.2462      1.26  |O        |         |         |         |
 7+45       1.3385      1.36  |O        |         |         |         |
 8+ 0       1.4517      1.47  | O       |         |         |         |
 8+15       2.1251      2.26  |  O      |         |         |         |
 8+30       2.8714      3.00  |   O     |         |         |         |
 8+45       3.5869      3.71  |    O    |         |         |         |
 9+ 0       4.5358      4.71  |     O   |         |         |         |
 9+15       5.9222      6.17  |       O |         |         |         |
 9+30       7.3846      7.64  |         OI        |         |         |
 9+45       8.6849      8.90  |         | O       |         |         |
10+ 0      10.0265     10.26  |         |   O     |         |         |
10+15       8.3798      7.99  |         IO        |         |         |
10+30       5.7909      5.33  |      IO |         |         |         |
10+45       6.6769      6.95  |        OI         |         |         |
11+ 0       8.6392      8.99  |         | OI      |         |         |
11+15       9.1841      9.23  |         |  O      |         |         |
11+30       9.1051      9.08  |         |  O      |         |         |
11+45       8.3298      8.17  |         IO        |         |         |
12+ 0       7.8876      7.83  |         O         |         |         |
12+15      10.9796     11.63  |         |    OI   |         |         |
12+30      15.2030     15.94  |         |         | OI      |         |
12+45      18.2865     18.77  |         |         |    OI   |         |
13+ 0      20.5694     20.94  |         |         |       OI        |
13+15      23.8772     24.48  |         |         |         |   OI    |
13+30      26.9658     27.48  |         |         |         |       OI
13+45      23.8729     23.13  |         |         |         | IO      |
14+ 0      18.8252     17.93  |         |         |    IO   |         |
14+15      18.2835     18.35  |         |         |    O    |         |
14+30      19.3948     19.61  |         |         |      O  |         |
14+45      19.8245     19.87  |         |         |      O  |         |
15+ 0      19.6138     19.56  |         |         |      O  |         |
15+15      18.8531     18.71  |         |         |     O   |         |
15+30      17.8882     17.72  |         |         |   IO    |         |
15+45      15.6450     15.22  |         |         | O       |         |
16+ 0      13.4941     13.14  |         |       O |         |         |
16+15       8.4357      7.46  |         I O       |         |         |
16+30       3.2125      2.33  |  IO     |         |         |         |
16+45       1.1262      0.87  |O        |         |         |         |
17+ 0       0.4984      0.42  O         |         |         |         |
17+15       0.4641      0.47  O         |         |         |         |
17+30       0.5486      0.56  O         |         |         |         |
17+45       0.5891      0.59  O         |         |         |         |
18+ 0       0.5605      0.55  O         |         |         |         |
18+15       0.5119      0.50  O         |         |         |         |
18+30       0.4903      0.49  O         |         |         |         |
18+45       0.4434      0.43  O         |         |         |         |
19+ 0       0.3512      0.33  O         |         |         |         |
19+15       0.3191      0.32  O         |         |         |         |
19+30       0.3821      0.40  O         |         |         |         |
19+45       0.4065      0.41  O         |         |         |         |
20+ 0       0.3423      0.33  O         |         |         |         |
20+15       0.3177      0.32  O         |         |         |         |
20+30       0.3413      0.35  O         |         |         |         |
```

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  20+45       0.3559      0.36  O         |         |         |         |
  21+ 0       0.3204      0.31  O         |         |         |         |
  21+15       0.3113      0.31  O         |         |         |         |
  21+30       0.2996      0.30  O         |         |         |         |
  21+45       0.3051      0.31  O         |         |         |         |
  22+ 0       0.2985      0.30  O         |         |         |         |
  22+15       0.3050      0.31  O         |         |         |         |
  22+30       0.2985      0.30  O         |         |         |         |
  22+45       0.2644      0.26  O         |         |         |         |
  23+ 0       0.2479      0.25  O         |         |         |         |
  23+15       0.2425      0.24  O         |         |         |         |
  23+30       0.2415      0.24  O         |         |         |         |
  23+45       0.2414      0.24  O         |         |         |         |
  24+ 0       0.2414      0.24  O         |         |         |         |
  24+15       0.1602      0.14  O         |         |         |         |
  24+30       0.0590      0.04  O         |         |         |         |
  24+45       0.0146      0.01  O         |         |         |         |
  25+ 0       0.0024      0.00  O         |         |         |         |
  25+15       0.0002      0.00  O         |         |         |         |
  25+30       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   102
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =       26.966 (CFS)
                       Total volume =       9.453 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------

        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       92.000 to Point/Station       93.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ********************* HYDROGRAPH INFORMATION **********************

                       From study/file name: SubF424100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
        -------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       11.8      23.7      35.5      47.3
  -------------------------------------------------------------------
    0+15       0.0892      0.17  Q         |         |         |         |
    0+30       0.2305      0.45  Q         |         |         |         |
    0+45       0.2898      0.61  Q         |         |         |         |
    1+ 0       0.3416      0.73  Q         |         |         |         |
    1+15       0.3461      0.76  Q         |         |         |         |
    1+30       0.3033      0.69  Q         |         |         |         |
    1+45       0.2986      0.67  Q         |         |         |         |
    2+ 0       0.3424      0.75  Q         |         |         |         |
    2+15       0.3907      0.84  Q         |         |         |         |
    2+30       0.3963      0.87  Q         |         |         |         |
    2+45       0.4417      0.96  Q         |         |         |         |
    3+ 0       0.4900      1.06  Q         |         |         |         |
```

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 3+15       0.4955      1.09  Q          |          |          |          |
 3+30       0.4963      1.10  Q          |          |          |          |
 3+45       0.4963      1.10  Q          |          |          |          |
 4+ 0       0.5410      1.18  qQ         |          |          |          |
 4+15       0.5893      1.28  qQ         |          |          |          |
 4+30       0.6394      1.40  qQ         |          |          |          |
 4+45       0.6886      1.50  qQ         |          |          |          |
 5+ 0       0.7387      1.62  qQ         |          |          |          |
 5+15       0.6986      1.55  qQ         |          |          |          |
 5+30       0.6521      1.47  qQ         |          |          |          |
 5+45       0.7348      1.60  qQ         |          |          |          |
 6+ 0       0.7870      1.72  qQ         |          |          |          |
 6+15       0.8380      1.84  qQ         |          |          |          |
 6+30       0.8871      1.94  qQ         |          |          |          |
 6+45       0.9372      2.06  qQ         |          |          |          |
 7+ 0       0.9864      2.16  qQ         |          |          |          |
 7+15       0.9919      2.19  qQ         |          |          |          |
 7+30       1.0373      2.28  qQ         |          |          |          |
 7+45       1.1302      2.47  q Q        |          |          |          |
 8+ 0       1.2287      2.68  |qQ        |          |          |          |
 8+15       1.3726      3.50  |qQ        |          |          |          |
 8+30       1.4756      4.35  |q Q       |          |          |          |
 8+45       1.5320      5.12  |q  Q      |          |          |          |
 9+ 0       1.6266      6.16  |q   Q     |          |          |          |
 9+15       1.9180      7.84  |q    Q    |          |          |          |
 9+30       2.7342     10.12  | q     Q  |          |          |          |
 9+45       3.9145     12.60  |  q      Q|          |          |          |
10+ 0       5.1352     15.16  |   q     | Q         |          |          |
10+15       3.8283     12.21  |  q      Q|          |          |          |
10+30       1.7604      7.55  |q    Q    |          |          |          |
10+45       2.9217      9.60  | q     Q  |          |          |          |
11+ 0       4.4983     13.14  |  q      |Q          |          |          |
11+15       4.4329     13.62  |  q      |Q          |          |          |
11+30       4.1934     13.30  |  q      |Q          |          |          |
11+45       3.4636     11.79  | q      Q|          |          |          |
12+ 0       3.1505     11.04  | q      Q|          |          |          |
12+15       6.8593     17.84  |    q    |    Q     |          |          |
12+30      10.9372     26.14  |        q|          | Q        |          |
12+45      12.9154     31.20  |         q          |     Q    |          |
13+ 0      14.6458     35.22  |         | q        |        Q|          |
13+15      17.6814     41.56  |         |   q      |          |    Q     |
13+30      20.3694     47.34  |         |     q    |          |         Q|
13+45      15.9440     39.82  |         |  q       |          |  Q       |
14+ 0      10.8650     29.69  |        q|          |    Q     |          |
14+15      12.2352     30.52  |         q          |    Q     |          |
14+30      13.8225     33.22  |         |q         |       Q  |          |
14+45      13.7478     33.57  |         |q         |       Q  |          |
15+ 0      13.4639     33.08  |         |q         |      Q   |          |
15+15      12.7086     31.56  |         q          |     Q    |          |
15+30      11.9035     29.79  |         q          |    Q     |          |
15+45       9.7490     25.39  |       q |          |Q         |          |
16+ 0       7.9266     21.42  |     q   |       Q  |          |          |
16+15       4.4779     12.91  |  q      Q          |          |          |
16+30       0.8664      4.08  q  Q      |          |          |          |
16+45       0.4130      1.54  qQ         |          |          |          |
17+ 0       0.3041      0.80  Q          |          |          |          |
17+15       0.3879      0.85  Q          |          |          |          |
17+30       0.4837      1.03  Q          |          |          |          |
17+45       0.4947      1.08  Q          |          |          |          |
18+ 0       0.4517      1.01  Q          |          |          |          |
18+15       0.4034      0.92  Q          |          |          |          |
18+30       0.3979      0.89  Q          |          |          |          |
18+45       0.3525      0.80  Q          |          |          |          |
```

```
 19+ 0       0.2595      0.61  Q          |          |          |          |
 19+15       0.2503      0.57  Q          |          |          |          |
 19+30       0.3369      0.72  Q          |          |          |          |
 19+45       0.3453      0.75  Q          |          |          |          |
 20+ 0       0.2587      0.60  Q          |          |          |          |
 20+15       0.2503      0.57  Q          |          |          |          |
 20+30       0.2923      0.63  Q          |          |          |          |
 20+45       0.2970      0.65  Q          |          |          |          |
 21+ 0       0.2532      0.57  Q          |          |          |          |
 21+15       0.2495      0.56  Q          |          |          |          |
 21+30       0.2477      0.55  Q          |          |          |          |
 21+45       0.2487      0.55  Q          |          |          |          |
 22+ 0       0.2477      0.55  Q          |          |          |          |
 22+15       0.2487      0.55  Q          |          |          |          |
 22+30       0.2477      0.55  Q          |          |          |          |
 22+45       0.2041      0.47  Q          |          |          |          |
 23+ 0       0.1994      0.45  Q          |          |          |          |
 23+15       0.1985      0.44  Q          |          |          |          |
 23+30       0.1985      0.44  Q          |          |          |          |
 23+45       0.1985      0.44  Q          |          |          |          |
 24+ 0       0.1985      0.44  Q          |          |          |          |
 24+15       0.1093      0.27  Q          |          |          |          |
 24+30       0.0127      0.07  Q          |          |          |          |
 24+45       0.0016      0.02  Q          |          |          |          |
 25+ 0       0.0000      0.00  Q          |          |          |          |
 25+15       0.0000      0.00  Q          |          |          |          |
 25+30       0.0000      0.00  Q          |          |          |          |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   102
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =       47.335 (CFS)
                        Total volume =      15.396 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        -----------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       90.000 to Point/Station       93.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        _______________________________________________________________________
        Current stream hydrograph saved in file WSF24hrSt2.rte
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =     0
                        Time interval =    0.0 (Min.)
                        Maximum/Peak flow rate =        0.000 (CFS)
                        Total volume =       0.000 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        -----------------------------------------------------------------------
```

F31and32N92

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed F, Stream 2, Node 920 to 92
Existing Condition
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF3124100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 97
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 6.330 (CFS)
Total volume = 1.736 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 921.000 to Point/Station 92.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 2360.00 (Ft.)
Elevation difference = 69.00 (Ft.)
Slope of channel = 0.029237 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 2360.00(Ft.) Elevation difference = 69.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 1.200(CFS)
Depth of flow = 0.078(Ft.)
Average velocity = 1.522(Ft/s)
Total flow rate = 1.200(CFS)
Channel flow top width = 10.311(Ft.)
Depth of flow in channel = 0.08(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 1.52(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =    1.200(CFS)
Total capacity of improved channels =      1.200(CFS)
Critical Depth in Channel =    0.08(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =      6.330(CFS)
Depth of flow =     0.210(Ft.)
Average velocity =     2.895(Ft/s)
Total flow rate =     6.330(CFS)
Channel flow top width =   10.839(Ft.)
Depth of flow in channel =   0.21(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    2.90(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    6.330(CFS)
Total capacity of improved channels =      6.330(CFS)
Critical Depth in Channel =    0.23(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.6301   Travel time =  13.58 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   1.5016
        dt(routing time-step) =   8.56 (min.),   c* =   0.7754

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        1.6       3.2       4.7       6.3
-------------------------------------------------------------------
  0+15       0.0140      0.04  O         |         |         |         |
  0+30       0.0499      0.08  O         |         |         |         |
  0+45       0.0804      0.10  O         |         |         |         |
  1+ 0       0.0989      0.12  O         |         |         |         |
  1+15       0.1090      0.11  O         |         |         |         |
  1+30       0.1031      0.10  O         |         |         |         |
  1+45       0.0970      0.10  O         |         |         |         |
  2+ 0       0.1027      0.12  O         |         |         |         |
  2+15       0.1168      0.13  O         |         |         |         |
  2+30       0.1248      0.13  O         |         |         |         |
  2+45       0.1335      0.15  O         |         |         |         |
  3+ 0       0.1484      0.16  OI        |         |         |         |
  3+15       0.1565      0.16  OI        |         |         |         |
  3+30       0.1583      0.16  |O        |         |         |         |
  3+45       0.1587      0.16  |O        |         |         |         |
  4+ 0       0.1658      0.18  |O        |         |         |         |
  4+15       0.1803      0.19  |O        |         |         |         |
  4+30       0.1953      0.21  |O        |         |         |         |
  4+45       0.2115      0.22  |O        |         |         |         |
  5+ 0       0.2269      0.24  |O        |         |         |         |
  5+15       0.2292      0.21  |O        |         |         |         |
  5+30       0.2157      0.21  |O        |         |         |         |
```

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 5+45       0.2231      0.24  |O        |         |         |         |
 6+ 0       0.2424      0.25  |O        |         |         |         |
 6+15       0.2585      0.28  |O        |         |         |         |
 6+30       0.2750      0.29  |O        |         |         |         |
 6+45       0.2904      0.31  |O        |         |         |         |
 7+ 0       0.3068      0.32  |OI       |         |         |         |
 7+15       0.3152      0.32  |OI       |         |         |         |
 7+30       0.3241      0.34  | O       |         |         |         |
 7+45       0.3460      0.37  | O       |         |         |         |
 8+ 0       0.3755      0.40  | O       |         |         |         |
 8+15       0.4138      0.45  | O       |         |         |         |
 8+30       0.4529      0.48  | OI      |         |         |         |
 8+45       0.4781      0.50  |  O      |         |         |         |
 9+ 0       0.5037      0.53  |  O      |         |         |         |
 9+15       0.5411      0.58  |  O      |         |         |         |
 9+30       0.6039      0.68  |  OI     |         |         |         |
 9+45       0.7595      0.98  |   O I   |         |         |         |
10+ 0       1.0598      1.37  |     O I |         |         |         |
10+15       1.1204      0.82  |    I O  |         |         |         |
10+30       0.7751      0.48  |  IO     |         |         |         |
10+45       0.6828      0.89  |   OI    |         |         |         |
11+ 0       0.9349      1.16  |    O I  |         |         |         |
11+15       1.0636      1.02  |     O   |         |         |         |
11+30       1.0226      0.99  |     O   |         |         |         |
11+45       0.9023      0.70  |   IO    |         |         |         |
12+ 0       0.7607      0.74  |   O     |         |         |         |
12+15       1.2888      2.37  |       O |   I     |         |         |
12+30       2.4704      3.40  |         |    O    |I        |         |
12+45       3.3923      4.00  |         |         |O   I    |         |
13+ 0       4.0295      4.50  |         |         |    O  I |         |
13+15       4.8008      5.73  |         |         |         O     I   |
13+30       5.7191      6.33  |         |         |         |     O   I
13+45       5.4449      4.08  |         |         |    I    |   O     |
14+ 0       4.0190      2.97  |         |       I |    O    |         |
14+15       3.5088      3.88  |         |         | O I     |         |
14+30       3.8901      4.16  |         |         |   O I   |         |
14+45       4.0869      4.12  |         |         |    OI   |         |
15+ 0       4.0632      3.97  |         |         |    O    |         |
15+15       3.9077      3.72  |         |         |  IO     |         |
15+30       3.6746      3.46  |         |         |I O      |         |
15+45       3.2131      2.57  |         |     I   O       |         |
16+ 0       2.5934      2.20  |         |  I  O   |         |         |
16+15       1.8351      0.83  |    I    |O        |         |         |
16+30       0.8237      0.13  I    O    |         |         |         |
16+45       0.2765      0.11  IO        |         |         |         |
17+ 0       0.1407      0.10  O         |         |         |         |
17+15       0.1195      0.14  O         |         |         |         |
17+30       0.1405      0.16  OI        |         |         |         |
17+45       0.1547      0.16  OI        |         |         |         |
18+ 0       0.1509      0.14  O         |         |         |         |
18+15       0.1371      0.13  O         |         |         |         |
18+30       0.1293      0.13  O         |         |         |         |
18+45       0.1206      0.11  O         |         |         |         |
19+ 0       0.0987      0.07  O         |         |         |         |
19+15       0.0832      0.08  O         |         |         |         |
19+30       0.0948      0.12  O         |         |         |         |
19+45       0.1081      0.11  O         |         |         |         |
20+ 0       0.0959      0.07  O         |         |         |         |
20+15       0.0825      0.08  O         |         |         |         |
20+30       0.0877      0.10  O         |         |         |         |
20+45       0.0936      0.10  O         |         |         |         |
21+ 0       0.0879      0.07  O         |         |         |         |
21+15       0.0807      0.08  O         |         |         |         |
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  21+30       0.0803      0.07  O         |         |         |         |
  21+45       0.0790      0.08  O         |         |         |         |
  22+ 0       0.0799      0.07  O         |         |         |         |
  22+15       0.0789      0.08  O         |         |         |         |
  22+30       0.0799      0.07  O         |         |         |         |
  22+45       0.0719      0.06  O         |         |         |         |
  23+ 0       0.0654      0.06  O         |         |         |         |
  23+15       0.0639      0.06  O         |         |         |         |
  23+30       0.0636      0.06  O         |         |         |         |
  23+45       0.0635      0.06  O         |         |         |         |
  24+ 0       0.0635      0.06  O         |         |         |         |
  24+15       0.0495      0.02  O         |         |         |         |
  24+30       0.0206      0.00  O         |         |         |         |
  24+45       0.0046      0.00  O         |         |         |         |
  25+ 0       0.0010      0.00  O         |         |         |         |
  25+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   101
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =        5.719 (CFS)
                       Total volume =       1.736 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------

        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      921.000 to Point/Station       92.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                       From study/file name: SubF3224100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
        ----------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)

        ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0        4.7       9.5      14.2      19.0
  ----------------------------------------------------------------------
    0+15       0.0481      0.06  Q         |         |         |         |
    0+30       0.1186      0.17  Q         |         |         |         |
    0+45       0.1510      0.23  Q         |         |         |         |
    1+ 0       0.1841      0.28  Q         |         |         |         |
    1+15       0.1855      0.29  Q         |         |         |         |
    1+30       0.1669      0.27  Q         |         |         |         |
    1+45       0.1644      0.26  Q         |         |         |         |
    2+ 0       0.1863      0.29  Q         |         |         |         |
    2+15       0.2095      0.33  Q         |         |         |         |
    2+30       0.2141      0.34  Q         |         |         |         |
    2+45       0.2404      0.37  Q         |         |         |         |
    3+ 0       0.2636      0.41  Q         |         |         |         |
    3+15       0.2682      0.42  Q         |         |         |         |
    3+30       0.2704      0.43  Q         |         |         |         |
    3+45       0.2704      0.43  Q         |         |         |         |
    4+ 0       0.2945      0.46  Q         |         |         |         |
```

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 4+15       0.3177      0.50  qQ         |          |          |          |
 4+30       0.3464      0.54  qQ         |          |          |          |
 4+45       0.3718      0.58  qQ         |          |          |          |
 5+ 0       0.4004      0.63  qQ         |          |          |          |
 5+15       0.3778      0.61  qQ         |          |          |          |
 5+30       0.3600      0.58  qQ         |          |          |          |
 5+45       0.4002      0.62  qQ         |          |          |          |
 6+ 0       0.4237      0.67  qQ         |          |          |          |
 6+15       0.4545      0.71  qQ         |          |          |          |
 6+30       0.4799      0.75  |Q         |          |          |          |
 6+45       0.5086      0.80  |Q         |          |          |          |
 7+ 0       0.5340      0.84  |Q         |          |          |          |
 7+15       0.5386      0.85  |Q         |          |          |          |
 7+30       0.5649      0.89  |Q         |          |          |          |
 7+45       0.6122      0.96  |qQ        |          |          |          |
 8+ 0       0.6640      1.04  |qQ        |          |          |          |
 8+15       1.1251      1.54  | qQ       |          |          |          |
 8+30       1.5881      2.04  |  qQ      |          |          |          |
 8+45       1.9917      2.47  |   qQ     |          |          |          |
 9+ 0       2.5888      3.09  |    qQ    |          |          |          |
 9+15       3.4361      3.98  |      qQ  |          |          |          |
 9+30       4.2963      4.90  |        qQ          |          |          |
 9+45       4.9698      5.73  |         q Q        |          |          |
10+ 0       5.6181      6.68  |         |q  Q      |          |          |
10+15       4.3199      5.44  |        q|Q         |          |          |
10+30       2.8466      3.62  |     qQ  |          |          |          |
10+45       3.8305      4.51  |       qQ|          |          |          |
11+ 0       4.9200      5.85  |         q Q        |          |          |
11+15       4.9920      6.06  |         q Q        |          |          |
11+30       4.9501      5.97  |         q Q        |          |          |
11+45       4.5027      5.40  |        q|Q         |          |          |
12+ 0       4.3356      5.10  |        qQ          |          |          |
12+15       6.2366      7.53  |          |  q Q    |          |          |
12+30       8.1818     10.65  |          |      q  | Q        |          |
12+45       9.3165     12.71  |          |        q|     Q    |          |
13+ 0      10.2966     14.33  |          |         |q        Q|          |
13+15      11.9198     16.72  |          |         |    q     |     Q    |
13+30      13.2444     18.96  |          |         |      q   |         Q
13+45      10.9248     16.37  |          |         |  q       |    Q     |
14+ 0       8.5519     12.57  |          |       q |     Q    |          |
14+15       9.0761     12.58  |          |        q|     Q    |          |
14+30       9.5925     13.48  |          |         q       Q |          |
14+45       9.6138     13.70  |          |         q       Q |          |
15+ 0       9.4827     13.55  |          |         q       Q |          |
15+15       9.0548     12.96  |          |        q|      Q  |          |
15+30       8.6016     12.28  |          |       q |    Q    |          |
15+45       7.4041     10.62  |          |    q    | Q       |          |
16+ 0       6.4707      9.06  |          |  q     Q|         |          |
16+15       3.6289      5.46  |      q   |Q         |         |          |
16+30       0.9707      1.79  | qQ       |          |         |          |
16+45       0.4361      0.71  qQ         |          |         |          |
17+ 0       0.1691      0.31  Q          |          |         |          |
17+15       0.2125      0.33  Q          |          |         |          |
17+30       0.2568      0.40  Q          |          |         |          |
17+45       0.2660      0.42  Q          |          |         |          |
18+ 0       0.2464      0.40  Q          |          |         |          |
18+15       0.2232      0.36  Q          |          |         |          |
18+30       0.2185      0.35  Q          |          |         |          |
18+45       0.1923      0.31  Q          |          |         |          |
19+ 0       0.1450      0.24  Q          |          |         |          |
19+15       0.1412      0.22  Q          |          |         |          |
19+30       0.1817      0.28  Q          |          |         |          |
19+45       0.1833      0.29  Q          |          |         |          |
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  20+ 0       0.1428      0.24  Q          |          |          |          |
  20+15       0.1412      0.22  Q          |          |          |          |
  20+30       0.1576      0.25  Q          |          |          |          |
  20+45       0.1601      0.25  Q          |          |          |          |
  21+ 0       0.1382      0.23  Q          |          |          |          |
  21+15       0.1390      0.22  Q          |          |          |          |
  21+30       0.1336      0.21  Q          |          |          |          |
  21+45       0.1368      0.22  Q          |          |          |          |
  22+ 0       0.1336      0.21  Q          |          |          |          |
  22+15       0.1368      0.22  Q          |          |          |          |
  22+30       0.1336      0.21  Q          |          |          |          |
  22+45       0.1128      0.18  Q          |          |          |          |
  23+ 0       0.1104      0.18  Q          |          |          |          |
  23+15       0.1082      0.17  Q          |          |          |          |
  23+30       0.1082      0.17  Q          |          |          |          |
  23+45       0.1082      0.17  Q          |          |          |          |
  24+ 0       0.1082      0.17  Q          |          |          |          |
  24+15       0.0601      0.11  Q          |          |          |          |
  24+30       0.0136      0.03  Q          |          |          |          |
  24+45       0.0044      0.01  Q          |          |          |          |
  25+ 0       0.0000      0.00  Q          |          |          |          |
  25+15       0.0000      0.00  Q          |          |          |          |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   101
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =       18.963 (CFS)
                        Total volume =       6.460 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      921.000 to Point/Station       92.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file F31and32N92.rte
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =     0
                        Time interval =    0.0 (Min.)
                        Maximum/Peak flow rate =        0.000 (CFS)
                        Total volume =       0.000 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------
```

SubF224100

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 04/25/12 File: Stream2/SubF224100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F2
Existing Condition
100-year, 24-hour

Drainage Area = 12.70(Ac.) = 0.020 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 12.70(Ac.) = 0.020 Sq. Mi.
Length along longest watercourse = 980.00(Ft.)
Length along longest watercourse measured to centroid = 750.00(Ft.)
Length along longest watercourse = 0.186 Mi.
Length along longest watercourse measured to centroid = 0.142 Mi.
Difference in elevation = 25.00(Ft.)
Slope along watercourse = 134.6939 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.071 Hr.
Lag time = 4.27 Min.
25% of lag time = 1.07 Min.
40% of lag time = 1.71 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	1.80	22.86

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	4.50	57.15

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF224100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
12.700	85.00	0.000

Total Area Entered = 12.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	350.910	61.373	7.855
2	0.500	701.821	34.479	4.413
3	0.750	1052.731	4.148	0.531
		Sum = 100.000	Sum=	12.799

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.130	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013

23	5.75	0.80	0.144	(0.251)	0.130	0.014
24	6.00	0.80	0.144	(0.248)	0.130	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.211	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.051
34	8.50	1.50	0.270	0.216	(0.243)	0.054
35	8.75	1.60	0.288	0.213	(0.259)	0.075
36	9.00	1.70	0.306	0.210	(0.275)	0.096
37	9.25	1.90	0.342	0.207	(0.308)	0.135
38	9.50	2.00	0.360	0.204	(0.324)	0.156
39	9.75	2.10	0.378	0.201	(0.340)	0.177
40	10.00	2.20	0.396	0.198	(0.356)	0.198
41	10.25	1.50	0.270	0.196	(0.243)	0.074
42	10.50	1.50	0.270	0.193	(0.243)	0.077
43	10.75	2.00	0.360	0.190	(0.324)	0.170
44	11.00	2.00	0.360	0.187	(0.324)	0.173
45	11.25	1.90	0.342	0.184	(0.308)	0.158
46	11.50	1.90	0.342	0.182	(0.308)	0.160
47	11.75	1.70	0.306	0.179	(0.275)	0.127
48	12.00	1.80	0.324	0.176	(0.292)	0.148
49	12.25	2.50	0.450	0.174	(0.405)	0.276
50	12.50	2.60	0.468	0.171	(0.421)	0.297
51	12.75	2.80	0.504	0.169	(0.454)	0.335
52	13.00	2.90	0.522	0.166	(0.470)	0.356
53	13.25	3.40	0.612	0.163	(0.551)	0.449
54	13.50	3.40	0.612	0.161	(0.551)	0.451
55	13.75	2.30	0.414	0.159	(0.373)	0.255
56	14.00	2.30	0.414	0.156	(0.373)	0.258
57	14.25	2.70	0.486	0.154	(0.437)	0.332
58	14.50	2.60	0.468	0.151	(0.421)	0.317
59	14.75	2.60	0.468	0.149	(0.421)	0.319
60	15.00	2.50	0.450	0.147	(0.405)	0.303
61	15.25	2.40	0.432	0.145	(0.389)	0.287
62	15.50	2.30	0.414	0.142	(0.373)	0.272
63	15.75	1.90	0.342	0.140	(0.308)	0.202
64	16.00	1.90	0.342	0.138	(0.308)	0.204
65	16.25	0.40	0.072	(0.136)	0.065	0.007
66	16.50	0.40	0.072	(0.134)	0.065	0.007
67	16.75	0.30	0.054	(0.132)	0.049	0.005
68	17.00	0.30	0.054	(0.130)	0.049	0.005
69	17.25	0.50	0.090	(0.128)	0.081	0.009
70	17.50	0.50	0.090	(0.126)	0.081	0.009
71	17.75	0.50	0.090	(0.124)	0.081	0.009
72	18.00	0.40	0.072	(0.122)	0.065	0.007
73	18.25	0.40	0.072	(0.120)	0.065	0.007
74	18.50	0.40	0.072	(0.119)	0.065	0.007
75	18.75	0.30	0.054	(0.117)	0.049	0.005
76	19.00	0.20	0.036	(0.115)	0.032	0.004
77	19.25	0.30	0.054	(0.114)	0.049	0.005
78	19.50	0.40	0.072	(0.112)	0.065	0.007
79	19.75	0.30	0.054	(0.111)	0.049	0.005
80	20.00	0.20	0.036	(0.109)	0.032	0.004
81	20.25	0.30	0.054	(0.108)	0.049	0.005
82	20.50	0.30	0.054	(0.106)	0.049	0.005
83	20.75	0.30	0.054	(0.105)	0.049	0.005
84	21.00	0.20	0.036	(0.104)	0.032	0.004
85	21.25	0.30	0.054	(0.102)	0.049	0.005

86	21.50	0.20	0.036	(0.101)	0.032	0.004
87	21.75	0.30	0.054	(0.100)	0.049	0.005
88	22.00	0.20	0.036	(0.099)	0.032	0.004
89	22.25	0.30	0.054	(0.098)	0.049	0.005
90	22.50	0.20	0.036	(0.097)	0.032	0.004
91	22.75	0.20	0.036	(0.096)	0.032	0.004
92	23.00	0.20	0.036	(0.096)	0.032	0.004
93	23.25	0.20	0.036	(0.095)	0.032	0.004
94	23.50	0.20	0.036	(0.094)	0.032	0.004
95	23.75	0.20	0.036	(0.094)	0.032	0.004
96	24.00	0.20	0.036	(0.094)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.87(In)
times area 12.7(Ac.)/[(In)/(Ft.)] = 2.0(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 2.783(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 86234.7 Cubic Feet
Total soil loss = 121214.6 Cubic Feet

Peak flow rate of this hydrograph = 5.714(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0006	0.03	Q	|	|	|	|
0+30	0.0018	0.06	Q	|	|	|	|
0+45	0.0032	0.07	Q	|	|	|	|
1+ 0	0.0049	0.08	Q	|	|	|	|
1+15	0.0065	0.08	Q	|	|	|	|
1+30	0.0080	0.07	Q	|	|	|	|
1+45	0.0094	0.07	Q	|	|	|	|
2+ 0	0.0111	0.08	Q	|	|	|	|
2+15	0.0130	0.09	Q	|	|	|	|
2+30	0.0149	0.09	Q	|	|	|	|
2+45	0.0171	0.11	Q	|	|	|	|
3+ 0	0.0195	0.11	Q	|	|	|	|
3+15	0.0218	0.12	Q	|	|	|	|
3+30	0.0242	0.12	Q	|	|	|	|
3+45	0.0266	0.12	Q	|	|	|	|
4+ 0	0.0293	0.13	Q	|	|	|	|
4+15	0.0321	0.14	Q	|	|	|	|
4+30	0.0353	0.15	Q	|	|	|	|
4+45	0.0386	0.16	Q	|	|	|	|
5+ 0	0.0422	0.18	Q	|	|	|	|
5+15	0.0454	0.16	Q	|	|	|	|
5+30	0.0486	0.15	Q	|	|	|	|
5+45	0.0522	0.17	QV	|	|	|	|
6+ 0	0.0560	0.18	QV	|	|	|	|
6+15	0.0601	0.20	QV	|	|	|	|
6+30	0.0644	0.21	QV	|	|	|	|
6+45	0.0689	0.22	QV	|	|	|	|
7+ 0	0.0737	0.23	QV	|	|	|	|
7+15	0.0784	0.23	QV	|	|	|	|
7+30	0.0835	0.24	QV	|	|	|	|
7+45	0.0890	0.27	|Q	|	|	|	|

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 8+ 0       0.0950      0.29  |Q         |         |         |         |
 8+15       0.1056      0.51  | Q        |         |         |         |
 8+30       0.1192      0.66  | Q        |         |         |         |
 8+45       0.1368      0.85  | VQ       |         |         |         |
 9+ 0       0.1598      1.11  |  VQ      |         |         |         |
 9+15       0.1913      1.52  |  V  Q    |         |         |         |
 9+30       0.2299      1.87  |   V  Q   |         |         |         |
 9+45       0.2743      2.15  |    V  Q  |         |         |         |
10+ 0       0.3242      2.42  |     V  Q|         |         |         |
10+15       0.3562      1.55  |     QV   |         |         |         |
10+30       0.3777      1.04  |   Q  V   |         |         |         |
10+45       0.4132      1.72  |     Q V  |         |         |         |
11+ 0       0.4577      2.15  |       QV|         |         |         |
11+15       0.5009      2.09  |       Q V         |         |         |
11+30       0.5432      2.05  |       Q V         |         |         |
11+45       0.5802      1.79  |      Q  |V        |         |         |
12+ 0       0.6175      1.81  |      Q  | V       |         |         |
12+15       0.6772      2.89  |         |Q V      |         |         |
12+30       0.7523      3.63  |         |   QV    |         |         |
12+45       0.8369      4.09  |         |     Q   |         |         |
13+ 0       0.9285      4.44  |         |      QV |         |         |
13+15       1.0375      5.28  |         |         VQ        |         |
13+30       1.1556      5.71  |         |         | QV      |         |
13+45       1.2431      4.24  |         |     Q   |    V    |         |
14+ 0       1.3133      3.39  |         |  Q      |     V   |         |
14+15       1.3935      3.89  |         |    Q    |       V |         |
14+30       1.4781      4.09  |         |     Q   |        V|         |
14+45       1.5624      4.08  |         |     Q   |         V         |
15+ 0       1.6442      3.96  |         |    Q    |          |  V     |
15+15       1.7220      3.77  |         |    Q    |          |   V    |
15+30       1.7957      3.57  |         |   Q     |          |     V  |
15+45       1.8564      2.94  |         |Q        |          |      V |
16+ 0       1.9109      2.64  |         Q         |          |       V|
16+15       1.9329      1.06  |   Q     |         |          |        V|
16+30       1.9370      0.20  Q         |         |          |        V|
16+45       1.9386      0.08  Q         |         |          |        V|
17+ 0       1.9400      0.07  Q         |         |          |        V|
17+15       1.9420      0.10  Q         |         |          |        V|
17+30       1.9444      0.11  Q         |         |          |        V|
17+45       1.9468      0.12  Q         |         |          |        V|
18+ 0       1.9488      0.10  Q         |         |          |        V|
18+15       1.9508      0.09  Q         |         |          |        V|
18+30       1.9527      0.09  Q         |         |          |        V|
18+45       1.9543      0.08  Q         |         |          |        V|
19+ 0       1.9554      0.06  Q         |         |          |        V|
19+15       1.9567      0.06  Q         |         |          |        V|
19+30       1.9584      0.08  Q         |         |          |        V|
19+45       1.9600      0.08  Q         |         |          |        V|
20+ 0       1.9612      0.06  Q         |         |          |        V|
20+15       1.9624      0.06  Q         |         |          |        V|
20+30       1.9638      0.07  Q         |         |          |        V|
20+45       1.9653      0.07  Q         |         |          |        V|
21+ 0       1.9664      0.06  Q         |         |          |        V|
21+15       1.9677      0.06  Q         |         |          |        V|
21+30       1.9688      0.05  Q         |         |          |        V|
21+45       1.9700      0.06  Q         |         |          |        V|
22+ 0       1.9712      0.05  Q         |         |          |        V|
22+15       1.9724      0.06  Q         |         |          |        V|
22+30       1.9735      0.05  Q         |         |          |        V|
22+45       1.9745      0.05  Q         |         |          |        V|
23+ 0       1.9755      0.05  Q         |         |          |        V|
23+15       1.9764      0.05  Q         |         |          |        V|
23+30       1.9774      0.05  Q         |         |          |        V|
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   23+45       1.9783      0.05  Q         |         |         |        V|
   24+ 0       1.9793      0.05  Q         |         |         |        V|
   24+15       1.9796      0.02  Q         |         |         |        V|
   24+30       1.9797      0.00  Q         |         |         |        V|
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SubF324100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF324100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F3
Existing Condition
100-year, 24-hour

Drainage Area = 6.50(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.50(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 950.00(Ft.)
Length along longest watercourse measured to centroid = 630.00(Ft.)
Length along longest watercourse = 0.180 Mi.
Length along longest watercourse measured to centroid = 0.119 Mi.
Difference in elevation = 28.00(Ft.)
Slope along watercourse = 155.6211 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.064 Hr.
Lag time = 3.85 Min.
25% of lag time = 0.96 Min.
40% of lag time = 1.54 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.50	1.80	11.70

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.50	4.50	29.25

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF324100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.500	85.00	0.000

Total Area Entered = 6.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	389.958	64.380	4.217
2	0.500	779.916	32.630	2.138
3	0.750	1169.874	2.990	0.196
		Sum =	100.000	Sum= 6.551

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.130	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013

23	5.75	0.80	0.144	(0.251)	0.130	0.014
24	6.00	0.80	0.144	(0.248)	0.130	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.211	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.051
34	8.50	1.50	0.270	0.216	(0.243)	0.054
35	8.75	1.60	0.288	0.213	(0.259)	0.075
36	9.00	1.70	0.306	0.210	(0.275)	0.096
37	9.25	1.90	0.342	0.207	(0.308)	0.135
38	9.50	2.00	0.360	0.204	(0.324)	0.156
39	9.75	2.10	0.378	0.201	(0.340)	0.177
40	10.00	2.20	0.396	0.198	(0.356)	0.198
41	10.25	1.50	0.270	0.196	(0.243)	0.074
42	10.50	1.50	0.270	0.193	(0.243)	0.077
43	10.75	2.00	0.360	0.190	(0.324)	0.170
44	11.00	2.00	0.360	0.187	(0.324)	0.173
45	11.25	1.90	0.342	0.184	(0.308)	0.158
46	11.50	1.90	0.342	0.182	(0.308)	0.160
47	11.75	1.70	0.306	0.179	(0.275)	0.127
48	12.00	1.80	0.324	0.176	(0.292)	0.148
49	12.25	2.50	0.450	0.174	(0.405)	0.276
50	12.50	2.60	0.468	0.171	(0.421)	0.297
51	12.75	2.80	0.504	0.169	(0.454)	0.335
52	13.00	2.90	0.522	0.166	(0.470)	0.356
53	13.25	3.40	0.612	0.163	(0.551)	0.449
54	13.50	3.40	0.612	0.161	(0.551)	0.451
55	13.75	2.30	0.414	0.159	(0.373)	0.255
56	14.00	2.30	0.414	0.156	(0.373)	0.258
57	14.25	2.70	0.486	0.154	(0.437)	0.332
58	14.50	2.60	0.468	0.151	(0.421)	0.317
59	14.75	2.60	0.468	0.149	(0.421)	0.319
60	15.00	2.50	0.450	0.147	(0.405)	0.303
61	15.25	2.40	0.432	0.145	(0.389)	0.287
62	15.50	2.30	0.414	0.142	(0.373)	0.272
63	15.75	1.90	0.342	0.140	(0.308)	0.202
64	16.00	1.90	0.342	0.138	(0.308)	0.204
65	16.25	0.40	0.072	(0.136)	0.065	0.007
66	16.50	0.40	0.072	(0.134)	0.065	0.007
67	16.75	0.30	0.054	(0.132)	0.049	0.005
68	17.00	0.30	0.054	(0.130)	0.049	0.005
69	17.25	0.50	0.090	(0.128)	0.081	0.009
70	17.50	0.50	0.090	(0.126)	0.081	0.009
71	17.75	0.50	0.090	(0.124)	0.081	0.009
72	18.00	0.40	0.072	(0.122)	0.065	0.007
73	18.25	0.40	0.072	(0.120)	0.065	0.007
74	18.50	0.40	0.072	(0.119)	0.065	0.007
75	18.75	0.30	0.054	(0.117)	0.049	0.005
76	19.00	0.20	0.036	(0.115)	0.032	0.004
77	19.25	0.30	0.054	(0.114)	0.049	0.005
78	19.50	0.40	0.072	(0.112)	0.065	0.007
79	19.75	0.30	0.054	(0.111)	0.049	0.005
80	20.00	0.20	0.036	(0.109)	0.032	0.004
81	20.25	0.30	0.054	(0.108)	0.049	0.005
82	20.50	0.30	0.054	(0.106)	0.049	0.005
83	20.75	0.30	0.054	(0.105)	0.049	0.005
84	21.00	0.20	0.036	(0.104)	0.032	0.004
85	21.25	0.30	0.054	(0.102)	0.049	0.005

86	21.50	0.20	0.036	(0.101)	0.032	0.004
87	21.75	0.30	0.054	(0.100)	0.049	0.005
88	22.00	0.20	0.036	(0.099)	0.032	0.004
89	22.25	0.30	0.054	(0.098)	0.049	0.005
90	22.50	0.20	0.036	(0.097)	0.032	0.004
91	22.75	0.20	0.036	(0.096)	0.032	0.004
92	23.00	0.20	0.036	(0.096)	0.032	0.004
93	23.25	0.20	0.036	(0.095)	0.032	0.004
94	23.50	0.20	0.036	(0.094)	0.032	0.004
95	23.75	0.20	0.036	(0.094)	0.032	0.004
96	24.00	0.20	0.036	(0.094)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.87(In)
times area 6.5(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 1.424(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 44136.8 Cubic Feet
Total soil loss = 62039.3 Cubic Feet

Peak flow rate of this hydrograph = 2.932(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0003	0.02	Q	|	|	|	|
0+30	0.0009	0.03	Q	|	|	|	|
0+45	0.0017	0.04	Q	|	|	|	|
1+ 0	0.0026	0.04	Q	|	|	|	|
1+15	0.0034	0.04	Q	|	|	|	|
1+30	0.0041	0.04	Q	|	|	|	|
1+45	0.0048	0.04	Q	|	|	|	|
2+ 0	0.0057	0.04	Q	|	|	|	|
2+15	0.0067	0.05	Q	|	|	|	|
2+30	0.0077	0.05	Q	|	|	|	|
2+45	0.0088	0.05	Q	|	|	|	|
3+ 0	0.0100	0.06	Q	|	|	|	|
3+15	0.0112	0.06	Q	|	|	|	|
3+30	0.0124	0.06	Q	|	|	|	|
3+45	0.0137	0.06	Q	|	|	|	|
4+ 0	0.0150	0.07	Q	|	|	|	|
4+15	0.0165	0.07	Q	|	|	|	|
4+30	0.0181	0.08	Q	|	|	|	|
4+45	0.0198	0.08	Q	|	|	|	|
5+ 0	0.0217	0.09	Q	|	|	|	|
5+15	0.0233	0.08	Q	|	|	|	|
5+30	0.0249	0.08	Q	|	|	|	|
5+45	0.0268	0.09	QV	|	|	|	|
6+ 0	0.0287	0.09	QV	|	|	|	|
6+15	0.0308	0.10	QV	|	|	|	|
6+30	0.0330	0.11	QV	|	|	|	|
6+45	0.0354	0.11	QV	|	|	|	|
7+ 0	0.0378	0.12	QV	|	|	|	|
7+15	0.0403	0.12	QV	|	|	|	|
7+30	0.0428	0.13	QV	|	|	|	|
7+45	0.0457	0.14	QV	|	|	|	|

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 8+ 0       0.0488      0.15  QV        |         |         |         |
 8+15       0.0543      0.27  |QV       |         |         |         |
 8+30       0.0613      0.34  |QV       |         |         |         |
 8+45       0.0704      0.44  |QV       |         |         |         |
 9+ 0       0.0823      0.57  | QV      |         |         |         |
 9+15       0.0986      0.79  |  Q      |         |         |         |
 9+30       0.1185      0.96  |  QV     |         |         |         |
 9+45       0.1414      1.10  |   QV    |         |         |         |
10+ 0       0.1670      1.24  |   Q V   |         |         |         |
10+15       0.1829      0.77  |  Q   V  |         |         |         |
10+30       0.1938      0.52  | Q    V  |         |         |         |
10+45       0.2123      0.90  |  Q    V |         |         |         |
11+ 0       0.2352      1.11  |   Q    V|         |         |         |
11+15       0.2573      1.07  |   Q     V         |         |         |
11+30       0.2789      1.05  |   Q      V        |         |         |
11+45       0.2977      0.91  |  Q      |V        |         |         |
12+ 0       0.3169      0.93  |  Q      | V       |         |         |
12+15       0.3480      1.51  |     Q   |  V      |         |         |
12+30       0.3867      1.87  |      Q  |    V    |         |         |
12+45       0.4302      2.10  |       Q |     V   |         |         |
13+ 0       0.4772      2.28  |        Q|       V |         |         |
13+15       0.5334      2.72  |         Q         V         |         |
13+30       0.5940      2.93  |         |Q        |  V      |         |
13+45       0.6380      2.13  |       Q |         |    V    |         |
14+ 0       0.6736      1.72  |     Q   |         |     V   |         |
14+15       0.7150      2.00  |       Q |         |       V |         |
14+30       0.7583      2.10  |       Q |         |        V|         |
14+45       0.8015      2.09  |       Q |         |         V         |
15+ 0       0.8433      2.02  |       Q |         |          |  V     |
15+15       0.8830      1.92  |      Q  |         |          |   V    |
15+30       0.9206      1.82  |      Q  |         |          |    V   |
15+45       0.9514      1.49  |    Q    |         |          |     V  |
16+ 0       0.9792      1.35  |    Q    |         |          |      V |
16+15       0.9896      0.51  | Q       |         |          |       V|
16+30       0.9914      0.09  Q         |         |          |       V|
16+45       0.9922      0.04  Q         |         |          |       V|
17+ 0       0.9930      0.04  Q         |         |          |       V|
17+15       0.9940      0.05  Q         |         |          |       V|
17+30       0.9952      0.06  Q         |         |          |       V|
17+45       0.9964      0.06  Q         |         |          |       V|
18+ 0       0.9975      0.05  Q         |         |          |       V|
18+15       0.9985      0.05  Q         |         |          |       V|
18+30       0.9995      0.05  Q         |         |          |       V|
18+45       1.0003      0.04  Q         |         |          |       V|
19+ 0       1.0009      0.03  Q         |         |          |       V|
19+15       1.0015      0.03  Q         |         |          |       V|
19+30       1.0024      0.04  Q         |         |          |       V|
19+45       1.0032      0.04  Q         |         |          |       V|
20+ 0       1.0038      0.03  Q         |         |          |       V|
20+15       1.0044      0.03  Q         |         |          |       V|
20+30       1.0052      0.04  Q         |         |          |       V|
20+45       1.0059      0.04  Q         |         |          |       V|
21+ 0       1.0065      0.03  Q         |         |          |       V|
21+15       1.0071      0.03  Q         |         |          |       V|
21+30       1.0077      0.03  Q         |         |          |       V|
21+45       1.0083      0.03  Q         |         |          |       V|
22+ 0       1.0089      0.03  Q         |         |          |       V|
22+15       1.0096      0.03  Q         |         |          |       V|
22+30       1.0101      0.03  Q         |         |          |       V|
22+45       1.0106      0.02  Q         |         |          |       V|
23+ 0       1.0111      0.02  Q         |         |          |       V|
23+15       1.0116      0.02  Q         |         |          |       V|
23+30       1.0121      0.02  Q         |         |          |       V|
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   23+45       1.0126      0.02  Q         |         |         |        V|
   24+ 0       1.0131      0.02  Q         |         |         |        V|
   24+15       1.0132      0.01  Q         |         |         |        V|
   24+30       1.0132      0.00  Q         |         |         |        V|
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SubF3124100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF3124100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F31
Existing Condition
100-year, 3-hour

Drainage Area = 17.50(Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.50(Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1610.00(Ft.)
Length along longest watercourse measured to centroid = 650.00(Ft.)
Length along longest watercourse = 0.305 Mi.
Length along longest watercourse measured to centroid = 0.123 Mi.
Difference in elevation = 139.00(Ft.)
Slope along watercourse = 455.8509 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.065 Hr.
Lag time = 3.88 Min.
25% of lag time = 0.97 Min.
40% of lag time = 1.55 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.50	1.80	31.50

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
17.50	4.50	78.75

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF3124100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.200	46.00	0.000
2.900	66.00	0.000
12.400	83.00	0.000

Total Area Entered = 17.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.126	0.077
66.0	66.0	0.405	0.000	0.405	0.166	0.067
83.0	83.0	0.210	0.000	0.210	0.709	0.149
					Sum (F) =	0.293

Area averaged mean soil loss (F) (In/Hr) = 0.293
Minimum soil loss rate ((In/Hr)) = 0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	386.798	66.248	11.684
2	0.500	773.597	33.752	5.953
			Sum = 100.000	Sum= 17.637

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.517)	0.032	0.004
2	0.50	0.30	0.054	(0.511)	0.049	0.005
3	0.75	0.30	0.054	(0.505)	0.049	0.005
4	1.00	0.40	0.072	(0.499)	0.065	0.007
5	1.25	0.30	0.054	(0.493)	0.049	0.005
6	1.50	0.30	0.054	(0.487)	0.049	0.005
7	1.75	0.30	0.054	(0.481)	0.049	0.005
8	2.00	0.40	0.072	(0.476)	0.065	0.007
9	2.25	0.40	0.072	(0.470)	0.065	0.007
10	2.50	0.40	0.072	(0.464)	0.065	0.007
11	2.75	0.50	0.090	(0.458)	0.081	0.009
12	3.00	0.50	0.090	(0.453)	0.081	0.009
13	3.25	0.50	0.090	(0.447)	0.081	0.009
14	3.50	0.50	0.090	(0.442)	0.081	0.009
15	3.75	0.50	0.090	(0.436)	0.081	0.009
16	4.00	0.60	0.108	(0.431)	0.097	0.011
17	4.25	0.60	0.108	(0.425)	0.097	0.011
18	4.50	0.70	0.126	(0.420)	0.113	0.013
19	4.75	0.70	0.126	(0.414)	0.113	0.013

20	5.00	0.80	0.144	(0.409)	0.130	0.014
21	5.25	0.60	0.108	(0.404)	0.097	0.011
22	5.50	0.70	0.126	(0.398)	0.113	0.013
23	5.75	0.80	0.144	(0.393)	0.130	0.014
24	6.00	0.80	0.144	(0.388)	0.130	0.014
25	6.25	0.90	0.162	(0.383)	0.146	0.016
26	6.50	0.90	0.162	(0.378)	0.146	0.016
27	6.75	1.00	0.180	(0.373)	0.162	0.018
28	7.00	1.00	0.180	(0.368)	0.162	0.018
29	7.25	1.00	0.180	(0.363)	0.162	0.018
30	7.50	1.10	0.198	(0.358)	0.178	0.020
31	7.75	1.20	0.216	(0.353)	0.194	0.022
32	8.00	1.30	0.234	(0.348)	0.211	0.023
33	8.25	1.50	0.270	(0.343)	0.243	0.027
34	8.50	1.50	0.270	(0.338)	0.243	0.027
35	8.75	1.60	0.288	(0.334)	0.259	0.029
36	9.00	1.70	0.306	(0.329)	0.275	0.031
37	9.25	1.90	0.342	(0.324)	0.308	0.034
38	9.50	2.00	0.360	0.320	(0.324)	0.040
39	9.75	2.10	0.378	0.315	(0.340)	0.063
40	10.00	2.20	0.396	0.311	(0.356)	0.085
41	10.25	1.50	0.270	(0.306)	0.243	0.027
42	10.50	1.50	0.270	(0.302)	0.243	0.027
43	10.75	2.00	0.360	0.297	(0.324)	0.063
44	11.00	2.00	0.360	0.293	(0.324)	0.067
45	11.25	1.90	0.342	0.289	(0.308)	0.053
46	11.50	1.90	0.342	0.284	(0.308)	0.058
47	11.75	1.70	0.306	(0.280)	0.275	0.031
48	12.00	1.80	0.324	0.276	(0.292)	0.048
49	12.25	2.50	0.450	0.272	(0.405)	0.178
50	12.50	2.60	0.468	0.268	(0.421)	0.200
51	12.75	2.80	0.504	0.264	(0.454)	0.240
52	13.00	2.90	0.522	0.260	(0.470)	0.262
53	13.25	3.40	0.612	0.256	(0.551)	0.356
54	13.50	3.40	0.612	0.252	(0.551)	0.360
55	13.75	2.30	0.414	0.248	(0.373)	0.166
56	14.00	2.30	0.414	0.244	(0.373)	0.170
57	14.25	2.70	0.486	0.241	(0.437)	0.245
58	14.50	2.60	0.468	0.237	(0.421)	0.231
59	14.75	2.60	0.468	0.233	(0.421)	0.235
60	15.00	2.50	0.450	0.230	(0.405)	0.220
61	15.25	2.40	0.432	0.226	(0.389)	0.206
62	15.50	2.30	0.414	0.223	(0.373)	0.191
63	15.75	1.90	0.342	0.219	(0.308)	0.123
64	16.00	1.90	0.342	0.216	(0.308)	0.126
65	16.25	0.40	0.072	(0.213)	0.065	0.007
66	16.50	0.40	0.072	(0.209)	0.065	0.007
67	16.75	0.30	0.054	(0.206)	0.049	0.005
68	17.00	0.30	0.054	(0.203)	0.049	0.005
69	17.25	0.50	0.090	(0.200)	0.081	0.009
70	17.50	0.50	0.090	(0.197)	0.081	0.009
71	17.75	0.50	0.090	(0.194)	0.081	0.009
72	18.00	0.40	0.072	(0.191)	0.065	0.007
73	18.25	0.40	0.072	(0.188)	0.065	0.007
74	18.50	0.40	0.072	(0.186)	0.065	0.007
75	18.75	0.30	0.054	(0.183)	0.049	0.005
76	19.00	0.20	0.036	(0.180)	0.032	0.004
77	19.25	0.30	0.054	(0.178)	0.049	0.005
78	19.50	0.40	0.072	(0.175)	0.065	0.007
79	19.75	0.30	0.054	(0.173)	0.049	0.005
80	20.00	0.20	0.036	(0.171)	0.032	0.004
81	20.25	0.30	0.054	(0.168)	0.049	0.005
82	20.50	0.30	0.054	(0.166)	0.049	0.005

83	20.75	0.30	0.054	(0.164)	0.049	0.005
84	21.00	0.20	0.036	(0.162)	0.032	0.004
85	21.25	0.30	0.054	(0.160)	0.049	0.005
86	21.50	0.20	0.036	(0.158)	0.032	0.004
87	21.75	0.30	0.054	(0.157)	0.049	0.005
88	22.00	0.20	0.036	(0.155)	0.032	0.004
89	22.25	0.30	0.054	(0.154)	0.049	0.005
90	22.50	0.20	0.036	(0.152)	0.032	0.004
91	22.75	0.20	0.036	(0.151)	0.032	0.004
92	23.00	0.20	0.036	(0.150)	0.032	0.004
93	23.25	0.20	0.036	(0.149)	0.032	0.004
94	23.50	0.20	0.036	(0.148)	0.032	0.004
95	23.75	0.20	0.036	(0.147)	0.032	0.004
96	24.00	0.20	0.036	(0.146)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.8

Flood volume = Effective rainfall 1.19(In)
times area 17.5(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)
Total soil loss = 3.31(In)
Total soil loss = 4.826(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 75617.2 Cubic Feet
Total soil loss = 210235.6 Cubic Feet

Peak flow rate of this hydrograph = 6.330(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0009	0.04	Q	|	|	|	|
0+30	0.0026	0.08	Q	|	|	|	|
0+45	0.0046	0.10	Q	|	|	|	|
1+ 0	0.0070	0.12	Q	|	|	|	|
1+15	0.0092	0.11	Q	|	|	|	|
1+30	0.0111	0.10	Q	|	|	|	|
1+45	0.0131	0.10	Q	|	|	|	|
2+ 0	0.0155	0.12	Q	|	|	|	|
2+15	0.0181	0.13	Q	|	|	|	|
2+30	0.0208	0.13	Q	|	|	|	|
2+45	0.0238	0.15	Q	|	|	|	|
3+ 0	0.0271	0.16	Q	|	|	|	|
3+15	0.0304	0.16	Q	|	|	|	|
3+30	0.0337	0.16	Q	|	|	|	|
3+45	0.0370	0.16	Q	|	|	|	|
4+ 0	0.0407	0.18	Q	|	|	|	|
4+15	0.0446	0.19	QV	|	|	|	|
4+30	0.0490	0.21	QV	|	|	|	|
4+45	0.0536	0.22	QV	|	|	|	|
5+ 0	0.0586	0.24	QV	|	|	|	|
5+15	0.0630	0.21	QV	|	|	|	|
5+30	0.0674	0.21	QV	|	|	|	|
5+45	0.0724	0.24	QV	|	|	|	|
6+ 0	0.0776	0.25	|Q	|	|	|	|
6+15	0.0833	0.28	|Q	|	|	|	|
6+30	0.0892	0.29	|QV	|	|	|	|
6+45	0.0956	0.31	|QV	|	|	|	|
7+ 0	0.1021	0.32	|QV	|	|	|	|

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 7+15       0.1087      0.32  |QV        |         |         |         |
 7+30       0.1157      0.34  |QV        |         |         |         |
 7+45       0.1233      0.37  |QV        |         |         |         |
 8+ 0       0.1316      0.40  |Q V       |         |         |         |
 8+15       0.1410      0.45  |Q V       |         |         |         |
 8+30       0.1509      0.48  |Q V       |         |         |         |
 8+45       0.1612      0.50  |Q V       |         |         |         |
 9+ 0       0.1721      0.53  | QV       |         |         |         |
 9+15       0.1841      0.58  | Q V      |         |         |         |
 9+30       0.1981      0.68  | Q V      |         |         |         |
 9+45       0.2183      0.98  |  Q V     |         |         |         |
10+ 0       0.2466      1.37  |     Q    |         |         |         |
10+15       0.2637      0.82  |   Q  V   |         |         |         |
10+30       0.2735      0.48  |Q    V    |         |         |         |
10+45       0.2920      0.89  |  Q  V    |         |         |         |
11+ 0       0.3159      1.16  |    Q  V  |         |         |         |
11+15       0.3371      1.02  |    Q  V  |         |         |         |
11+30       0.3576      0.99  |   Q    V |         |         |         |
11+45       0.3721      0.70  | Q      V |         |         |         |
12+ 0       0.3875      0.74  | Q      V |         |         |         |
12+15       0.4364      2.37  |         QV         |         |         |
12+30       0.5067      3.40  |          V Q       |         |         |
12+45       0.5894      4.00  |          |  V  Q   |         |         |
13+ 0       0.6823      4.50  |          |    V Q  |         |         |
13+15       0.8006      5.73  |          |       V | Q       |         |
13+30       0.9314      6.33  |          |         V   Q     |         |
13+45       1.0157      4.08  |          |     Q   |  V      |         |
14+ 0       1.0771      2.97  |          Q         |   V     |         |
14+15       1.1573      3.88  |          |    Q    |     V   |         |
14+30       1.2433      4.16  |          |     Q   |       V |         |
14+45       1.3284      4.12  |          |     Q   |         V         |
15+ 0       1.4105      3.97  |          |    Q    |         | V       |
15+15       1.4873      3.72  |          |   Q     |         |   V     |
15+30       1.5588      3.46  |          |  Q      |         |    V    |
15+45       1.6119      2.57  |         Q          |         |      V  |
16+ 0       1.6574      2.20  |       Q |          |         |       V |
16+15       1.6747      0.83  |  Q      |          |         |       V |
16+30       1.6773      0.13 Q         |          |         |       V |
16+45       1.6795      0.11 Q         |          |         |       V |
17+ 0       1.6815      0.10 Q         |          |         |       V |
17+15       1.6843      0.14 Q         |          |         |       V |
17+30       1.6876      0.16 Q         |          |         |       V |
17+45       1.6909      0.16 Q         |          |         |       V |
18+ 0       1.6937      0.14 Q         |          |         |        V|
18+15       1.6963      0.13 Q         |          |         |        V|
18+30       1.6990      0.13 Q         |          |         |        V|
18+45       1.7011      0.11 Q         |          |         |        V|
19+ 0       1.7027      0.07 Q         |          |         |        V|
19+15       1.7044      0.08 Q         |          |         |        V|
19+30       1.7068      0.12 Q         |          |         |        V|
19+45       1.7090      0.11 Q         |          |         |        V|
20+ 0       1.7106      0.07 Q         |          |         |        V|
20+15       1.7123      0.08 Q         |          |         |        V|
20+30       1.7143      0.10 Q         |          |         |        V|
20+45       1.7162      0.10 Q         |          |         |        V|
21+ 0       1.7178      0.07 Q         |          |         |        V|
21+15       1.7195      0.08 Q         |          |         |        V|
21+30       1.7211      0.07 Q         |          |         |        V|
21+45       1.7228      0.08 Q         |          |         |        V|
22+ 0       1.7243      0.07 Q         |          |         |        V|
22+15       1.7261      0.08 Q         |          |         |        V|
22+30       1.7276      0.07 Q         |          |         |        V|
22+45       1.7289      0.06 Q         |          |         |        V|
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   23+ 0       1.7302      0.06  Q         |         |         |        V|
   23+15       1.7316      0.06  Q         |         |         |        V|
   23+30       1.7329      0.06  Q         |         |         |        V|
   23+45       1.7342      0.06  Q         |         |         |        V|
   24+ 0       1.7355      0.06  Q         |         |         |        V|
   24+15       1.7359      0.02  Q         |         |         |        V|
-----------------------------------------------------------------------
```

SubF3224100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF3224100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F32
Existing Condition
100-year, 24-hour

Drainage Area = 29.80(Ac.) = 0.047 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 29.80(Ac.) = 0.047 Sq. Mi.
Length along longest watercourse = 2360.00(Ft.)
Length along longest watercourse measured to centroid = 1350.00(Ft.)
Length along longest watercourse = 0.447 Mi.
Length along longest watercourse measured to centroid = 0.256 Mi.
Difference in elevation = 69.00(Ft.)
Slope along watercourse = 154.3729 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.121 Hr.
Lag time = 7.27 Min.
25% of lag time = 1.82 Min.
40% of lag time = 2.91 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
29.80	1.80	53.64

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
29.80	4.50	134.10

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF3224100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
27.600	85.00	0.000
2.200	90.00	0.000

Total Area Entered = 29.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	0.926	0.173
90.0	90.0	0.130	0.000	0.130	0.074	0.010
					Sum (F) =	0.183

Area averaged mean soil loss (F) (In/Hr) = 0.183
Minimum soil loss rate ((In/Hr)) = 0.091
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	206.255	44.462	13.353
2	0.500	412.510	42.933	12.894
3	0.750	618.765	8.544	2.566
4	1.000	825.020	4.061	1.219
			Sum = 100.000	Sum= 30.033

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.323)	0.032	0.004
2	0.50	0.30	0.054	(0.319)	0.049	0.005
3	0.75	0.30	0.054	(0.315)	0.049	0.005
4	1.00	0.40	0.072	(0.312)	0.065	0.007
5	1.25	0.30	0.054	(0.308)	0.049	0.005
6	1.50	0.30	0.054	(0.304)	0.049	0.005
7	1.75	0.30	0.054	(0.301)	0.049	0.005
8	2.00	0.40	0.072	(0.297)	0.065	0.007
9	2.25	0.40	0.072	(0.293)	0.065	0.007
10	2.50	0.40	0.072	(0.290)	0.065	0.007
11	2.75	0.50	0.090	(0.286)	0.081	0.009
12	3.00	0.50	0.090	(0.283)	0.081	0.009
13	3.25	0.50	0.090	(0.279)	0.081	0.009
14	3.50	0.50	0.090	(0.276)	0.081	0.009
15	3.75	0.50	0.090	(0.272)	0.081	0.009
16	4.00	0.60	0.108	(0.269)	0.097	0.011
17	4.25	0.60	0.108	(0.266)	0.097	0.011
18	4.50	0.70	0.126	(0.262)	0.113	0.013
19	4.75	0.70	0.126	(0.259)	0.113	0.013

20	5.00	0.80	0.144	(0.255)	0.130	0.014
21	5.25	0.60	0.108	(0.252)	0.097	0.011
22	5.50	0.70	0.126	(0.249)	0.113	0.013
23	5.75	0.80	0.144	(0.246)	0.130	0.014
24	6.00	0.80	0.144	(0.242)	0.130	0.014
25	6.25	0.90	0.162	(0.239)	0.146	0.016
26	6.50	0.90	0.162	(0.236)	0.146	0.016
27	6.75	1.00	0.180	(0.233)	0.162	0.018
28	7.00	1.00	0.180	(0.230)	0.162	0.018
29	7.25	1.00	0.180	(0.227)	0.162	0.018
30	7.50	1.10	0.198	(0.223)	0.178	0.020
31	7.75	1.20	0.216	(0.220)	0.194	0.022
32	8.00	1.30	0.234	(0.217)	0.211	0.023
33	8.25	1.50	0.270	0.214	(0.243)	0.056
34	8.50	1.50	0.270	0.211	(0.243)	0.059
35	8.75	1.60	0.288	0.208	(0.259)	0.080
36	9.00	1.70	0.306	0.205	(0.275)	0.101
37	9.25	1.90	0.342	0.203	(0.308)	0.139
38	9.50	2.00	0.360	0.200	(0.324)	0.160
39	9.75	2.10	0.378	0.197	(0.340)	0.181
40	10.00	2.20	0.396	0.194	(0.356)	0.202
41	10.25	1.50	0.270	0.191	(0.243)	0.079
42	10.50	1.50	0.270	0.188	(0.243)	0.082
43	10.75	2.00	0.360	0.186	(0.324)	0.174
44	11.00	2.00	0.360	0.183	(0.324)	0.177
45	11.25	1.90	0.342	0.180	(0.308)	0.162
46	11.50	1.90	0.342	0.178	(0.308)	0.164
47	11.75	1.70	0.306	0.175	(0.275)	0.131
48	12.00	1.80	0.324	0.172	(0.292)	0.152
49	12.25	2.50	0.450	0.170	(0.405)	0.280
50	12.50	2.60	0.468	0.167	(0.421)	0.301
51	12.75	2.80	0.504	0.165	(0.454)	0.339
52	13.00	2.90	0.522	0.162	(0.470)	0.360
53	13.25	3.40	0.612	0.160	(0.551)	0.452
54	13.50	3.40	0.612	0.157	(0.551)	0.455
55	13.75	2.30	0.414	0.155	(0.373)	0.259
56	14.00	2.30	0.414	0.153	(0.373)	0.261
57	14.25	2.70	0.486	0.150	(0.437)	0.336
58	14.50	2.60	0.468	0.148	(0.421)	0.320
59	14.75	2.60	0.468	0.146	(0.421)	0.322
60	15.00	2.50	0.450	0.144	(0.405)	0.306
61	15.25	2.40	0.432	0.141	(0.389)	0.291
62	15.50	2.30	0.414	0.139	(0.373)	0.275
63	15.75	1.90	0.342	0.137	(0.308)	0.205
64	16.00	1.90	0.342	0.135	(0.308)	0.207
65	16.25	0.40	0.072	(0.133)	0.065	0.007
66	16.50	0.40	0.072	(0.131)	0.065	0.007
67	16.75	0.30	0.054	(0.129)	0.049	0.005
68	17.00	0.30	0.054	(0.127)	0.049	0.005
69	17.25	0.50	0.090	(0.125)	0.081	0.009
70	17.50	0.50	0.090	(0.123)	0.081	0.009
71	17.75	0.50	0.090	(0.121)	0.081	0.009
72	18.00	0.40	0.072	(0.119)	0.065	0.007
73	18.25	0.40	0.072	(0.118)	0.065	0.007
74	18.50	0.40	0.072	(0.116)	0.065	0.007
75	18.75	0.30	0.054	(0.114)	0.049	0.005
76	19.00	0.20	0.036	(0.113)	0.032	0.004
77	19.25	0.30	0.054	(0.111)	0.049	0.005
78	19.50	0.40	0.072	(0.110)	0.065	0.007
79	19.75	0.30	0.054	(0.108)	0.049	0.005
80	20.00	0.20	0.036	(0.107)	0.032	0.004
81	20.25	0.30	0.054	(0.105)	0.049	0.005
82	20.50	0.30	0.054	(0.104)	0.049	0.005

83	20.75	0.30	0.054	(0.103)	0.049	0.005
84	21.00	0.20	0.036	(0.101)	0.032	0.004
85	21.25	0.30	0.054	(0.100)	0.049	0.005
86	21.50	0.20	0.036	(0.099)	0.032	0.004
87	21.75	0.30	0.054	(0.098)	0.049	0.005
88	22.00	0.20	0.036	(0.097)	0.032	0.004
89	22.25	0.30	0.054	(0.096)	0.049	0.005
90	22.50	0.20	0.036	(0.095)	0.032	0.004
91	22.75	0.20	0.036	(0.094)	0.032	0.004
92	23.00	0.20	0.036	(0.093)	0.032	0.004
93	23.25	0.20	0.036	(0.093)	0.032	0.004
94	23.50	0.20	0.036	(0.092)	0.032	0.004
95	23.75	0.20	0.036	(0.092)	0.032	0.004
96	24.00	0.20	0.036	(0.091)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.6

Flood volume = Effective rainfall 1.90(In)
times area 29.8(Ac.)/[(In)/(Ft.)] = 4.7(Ac.Ft)
Total soil loss = 2.60(In)
Total soil loss = 6.451(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 205767.2 Cubic Feet
Total soil loss = 280987.4 Cubic Feet

Peak flow rate of this hydrograph = 13.244(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-----------------------------------------------------------------------
  0+15       0.0010      0.05  Q         |         |         |         |
  0+30       0.0034      0.12  Q         |         |         |         |
  0+45       0.0066      0.15  Q         |         |         |         |
  1+ 0       0.0104      0.18  Q         |         |         |         |
  1+15       0.0142      0.19  Q         |         |         |         |
  1+30       0.0176      0.17  Q         |         |         |         |
  1+45       0.0210      0.16  Q         |         |         |         |
  2+ 0       0.0249      0.19  Q         |         |         |         |
  2+15       0.0292      0.21  Q         |         |         |         |
  2+30       0.0336      0.21  Q         |         |         |         |
  2+45       0.0386      0.24  Q         |         |         |         |
  3+ 0       0.0441      0.26  Q         |         |         |         |
  3+15       0.0496      0.27  Q         |         |         |         |
  3+30       0.0552      0.27  Q         |         |         |         |
  3+45       0.0608      0.27  Q         |         |         |         |
  4+ 0       0.0669      0.29  Q         |         |         |         |
  4+15       0.0734      0.32  Q         |         |         |         |
  4+30       0.0806      0.35  Q         |         |         |         |
  4+45       0.0883      0.37  Q         |         |         |         |
  5+ 0       0.0965      0.40  Q         |         |         |         |
  5+15       0.1043      0.38  Q         |         |         |         |
  5+30       0.1118      0.36  Q         |         |         |         |
  5+45       0.1200      0.40  QV        |         |         |         |
  6+ 0       0.1288      0.42  QV        |         |         |         |
  6+15       0.1382      0.45  QV        |         |         |         |
  6+30       0.1481      0.48  QV        |         |         |         |
  6+45       0.1586      0.51  |Q        |         |         |         |
  7+ 0       0.1696      0.53  |Q        |         |         |         |
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 7+15       0.1808      0.54  |Q         |          |          |          |
 7+30       0.1924      0.56  |Q         |          |          |          |
 7+45       0.2051      0.61  |Q         |          |          |          |
 8+ 0       0.2188      0.66  |Q         |          |          |          |
 8+15       0.2421      1.13  | Q        |          |          |          |
 8+30       0.2749      1.59  | VQ       |          |          |          |
 8+45       0.3160      1.99  | VQ       |          |          |          |
 9+ 0       0.3695      2.59  |  V Q     |          |          |          |
 9+15       0.4405      3.44  |  V  Q    |          |          |          |
 9+30       0.5293      4.30  |   V   Q  |          |          |          |
 9+45       0.6320      4.97  |    V   Q|          |          |          |
10+ 0       0.7480      5.62  |     V    |Q         |          |          |
10+15       0.8373      4.32  |      VQ  |          |          |          |
10+30       0.8961      2.85  |    Q V   |          |          |          |
10+45       0.9752      3.83  |      QV  |          |          |          |
11+ 0       1.0769      4.92  |        Q|          |          |          |
11+15       1.1800      4.99  |        Q|          |          |          |
11+30       1.2823      4.95  |        QV          |          |          |
11+45       1.3753      4.50  |        Q|V         |          |          |
12+ 0       1.4649      4.34  |       Q  V         |          |          |
12+15       1.5938      6.24  |          QV        |          |          |
12+30       1.7628      8.18  |            V Q     |          |          |
12+45       1.9553      9.32  |              V Q   |          |          |
13+ 0       2.1681     10.30  |                V Q |          |          |
13+15       2.4143     11.92  |                 V  Q          |          |
13+30       2.6880     13.24  |                  | V   Q     |          |
13+45       2.9137     10.92  |                  |Q  V       |          |
14+ 0       3.0904      8.55  |              Q   |     V     |          |
14+15       3.2779      9.08  |               Q  |      V    |          |
14+30       3.4761      9.59  |                Q|        V|           |
14+45       3.6747      9.61  |                Q|         V           |
15+ 0       3.8707      9.48  |               Q  |          | V        |
15+15       4.0577      9.05  |               Q  |          |   V      |
15+30       4.2355      8.60  |              Q   |          |    V     |
15+45       4.3884      7.40  |            Q     |          |      V   |
16+ 0       4.5221      6.47  |          Q       |          |       V  |
16+15       4.5971      3.63  |       Q          |          |       V  |
16+30       4.6172      0.97  |Q                 |          |        V|
16+45       4.6262      0.44  Q                  |          |        V|
17+ 0       4.6297      0.17  Q                  |          |        V|
17+15       4.6341      0.21  Q                  |          |        V|
17+30       4.6394      0.26  Q                  |          |        V|
17+45       4.6449      0.27  Q                  |          |        V|
18+ 0       4.6500      0.25  Q                  |          |        V|
18+15       4.6546      0.22  Q                  |          |        V|
18+30       4.6591      0.22  Q                  |          |        V|
18+45       4.6631      0.19  Q                  |          |        V|
19+ 0       4.6660      0.15  Q                  |          |        V|
19+15       4.6690      0.14  Q                  |          |        V|
19+30       4.6727      0.18  Q                  |          |        V|
19+45       4.6765      0.18  Q                  |          |        V|
20+ 0       4.6795      0.14  Q                  |          |        V|
20+15       4.6824      0.14  Q                  |          |        V|
20+30       4.6856      0.16  Q                  |          |        V|
20+45       4.6889      0.16  Q                  |          |        V|
21+ 0       4.6918      0.14  Q                  |          |        V|
21+15       4.6947      0.14  Q                  |          |        V|
21+30       4.6974      0.13  Q                  |          |        V|
21+45       4.7003      0.14  Q                  |          |        V|
22+ 0       4.7030      0.13  Q                  |          |        V|
22+15       4.7058      0.14  Q                  |          |        V|
22+30       4.7086      0.13  Q                  |          |        V|
22+45       4.7109      0.11  Q                  |          |        V|
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   23+ 0       4.7132      0.11  Q         |         |         |        V|
   23+15       4.7154      0.11  Q         |         |         |        V|
   23+30       4.7177      0.11  Q         |         |         |        V|
   23+45       4.7199      0.11  Q         |         |         |        V|
   24+ 0       4.7222      0.11  Q         |         |         |        V|
   24+15       4.7234      0.06  Q         |         |         |        V|
   24+30       4.7237      0.01  Q         |         |         |        V|
   24+45       4.7238      0.00  Q         |         |         |        V|
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SubF424100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream2/SubF424100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 2, Subarea F4
Existing Condition
100-year, 3-hour

Drainage Area = 54.70(Ac.) = 0.085 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 54.70(Ac.) = 0.085 Sq. Mi.
Length along longest watercourse = 3200.00(Ft.)
Length along longest watercourse measured to centroid = 1700.00(Ft.)
Length along longest watercourse = 0.606 Mi.
Length along longest watercourse measured to centroid = 0.322 Mi.
Difference in elevation = 330.00(Ft.)
Slope along watercourse = 544.5000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.117 Hr.
Lag time = 7.01 Min.
25% of lag time = 1.75 Min.
40% of lag time = 2.81 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.70	1.80	98.46

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
54.70	4.50	246.15

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF424100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.000	46.00	0.000
9.300	66.00	0.000
41.400	83.00	0.000

Total Area Entered = 54.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.073	0.045
66.0	66.0	0.405	0.000	0.405	0.170	0.069
83.0	83.0	0.210	0.000	0.210	0.757	0.159
					Sum (F) =	0.272

Area averaged mean soil loss (F) (In/Hr) = 0.272
Minimum soil loss rate ((In/Hr)) = 0.136
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	213.856	44.943	24.776
2	0.500	427.712	48.675	26.833
3	0.750	641.568	5.562	3.066
4	1.000	855.424	0.820	0.452
		Sum =	100.000	Sum= 55.127

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.481)	0.032	0.004
2	0.50	0.30	0.054	(0.475)	0.049	0.005
3	0.75	0.30	0.054	(0.470)	0.049	0.005
4	1.00	0.40	0.072	(0.464)	0.065	0.007
5	1.25	0.30	0.054	(0.459)	0.049	0.005
6	1.50	0.30	0.054	(0.453)	0.049	0.005
7	1.75	0.30	0.054	(0.448)	0.049	0.005
8	2.00	0.40	0.072	(0.443)	0.065	0.007
9	2.25	0.40	0.072	(0.437)	0.065	0.007
10	2.50	0.40	0.072	(0.432)	0.065	0.007
11	2.75	0.50	0.090	(0.427)	0.081	0.009
12	3.00	0.50	0.090	(0.421)	0.081	0.009
13	3.25	0.50	0.090	(0.416)	0.081	0.009
14	3.50	0.50	0.090	(0.411)	0.081	0.009
15	3.75	0.50	0.090	(0.406)	0.081	0.009
16	4.00	0.60	0.108	(0.401)	0.097	0.011
17	4.25	0.60	0.108	(0.396)	0.097	0.011

18	4.50	0.70	0.126	(0.391)	0.113	0.013
19	4.75	0.70	0.126	(0.386)	0.113	0.013
20	5.00	0.80	0.144	(0.381)	0.130	0.014
21	5.25	0.60	0.108	(0.376)	0.097	0.011
22	5.50	0.70	0.126	(0.371)	0.113	0.013
23	5.75	0.80	0.144	(0.366)	0.130	0.014
24	6.00	0.80	0.144	(0.361)	0.130	0.014
25	6.25	0.90	0.162	(0.356)	0.146	0.016
26	6.50	0.90	0.162	(0.352)	0.146	0.016
27	6.75	1.00	0.180	(0.347)	0.162	0.018
28	7.00	1.00	0.180	(0.342)	0.162	0.018
29	7.25	1.00	0.180	(0.338)	0.162	0.018
30	7.50	1.10	0.198	(0.333)	0.178	0.020
31	7.75	1.20	0.216	(0.328)	0.194	0.022
32	8.00	1.30	0.234	(0.324)	0.211	0.023
33	8.25	1.50	0.270	(0.319)	0.243	0.027
34	8.50	1.50	0.270	(0.315)	0.243	0.027
35	8.75	1.60	0.288	(0.310)	0.259	0.029
36	9.00	1.70	0.306	(0.306)	0.275	0.031
37	9.25	1.90	0.342	0.302	(0.308)	0.040
38	9.50	2.00	0.360	0.297	(0.324)	0.062
39	9.75	2.10	0.378	0.293	(0.340)	0.085
40	10.00	2.20	0.396	0.289	(0.356)	0.107
41	10.25	1.50	0.270	(0.285)	0.243	0.027
42	10.50	1.50	0.270	(0.281)	0.243	0.027
43	10.75	2.00	0.360	0.277	(0.324)	0.083
44	11.00	2.00	0.360	0.273	(0.324)	0.087
45	11.25	1.90	0.342	0.269	(0.308)	0.073
46	11.50	1.90	0.342	0.265	(0.308)	0.077
47	11.75	1.70	0.306	0.261	(0.275)	0.045
48	12.00	1.80	0.324	0.257	(0.292)	0.067
49	12.25	2.50	0.450	0.253	(0.405)	0.197
50	12.50	2.60	0.468	0.249	(0.421)	0.219
51	12.75	2.80	0.504	0.245	(0.454)	0.258
52	13.00	2.90	0.522	0.242	(0.470)	0.280
53	13.25	3.40	0.612	0.238	(0.551)	0.374
54	13.50	3.40	0.612	0.234	(0.551)	0.377
55	13.75	2.30	0.414	0.231	(0.373)	0.183
56	14.00	2.30	0.414	0.227	(0.373)	0.187
57	14.25	2.70	0.486	0.224	(0.437)	0.262
58	14.50	2.60	0.468	0.221	(0.421)	0.247
59	14.75	2.60	0.468	0.217	(0.421)	0.251
60	15.00	2.50	0.450	0.214	(0.405)	0.236
61	15.25	2.40	0.432	0.211	(0.389)	0.221
62	15.50	2.30	0.414	0.207	(0.373)	0.207
63	15.75	1.90	0.342	0.204	(0.308)	0.138
64	16.00	1.90	0.342	0.201	(0.308)	0.141
65	16.25	0.40	0.072	(0.198)	0.065	0.007
66	16.50	0.40	0.072	(0.195)	0.065	0.007
67	16.75	0.30	0.054	(0.192)	0.049	0.005
68	17.00	0.30	0.054	(0.189)	0.049	0.005
69	17.25	0.50	0.090	(0.186)	0.081	0.009
70	17.50	0.50	0.090	(0.183)	0.081	0.009
71	17.75	0.50	0.090	(0.181)	0.081	0.009
72	18.00	0.40	0.072	(0.178)	0.065	0.007
73	18.25	0.40	0.072	(0.175)	0.065	0.007
74	18.50	0.40	0.072	(0.173)	0.065	0.007
75	18.75	0.30	0.054	(0.170)	0.049	0.005
76	19.00	0.20	0.036	(0.168)	0.032	0.004
77	19.25	0.30	0.054	(0.166)	0.049	0.005
78	19.50	0.40	0.072	(0.163)	0.065	0.007
79	19.75	0.30	0.054	(0.161)	0.049	0.005
80	20.00	0.20	0.036	(0.159)	0.032	0.004

81	20.25	0.30	0.054	(0.157)	0.049	0.005
82	20.50	0.30	0.054	(0.155)	0.049	0.005
83	20.75	0.30	0.054	(0.153)	0.049	0.005
84	21.00	0.20	0.036	(0.151)	0.032	0.004
85	21.25	0.30	0.054	(0.149)	0.049	0.005
86	21.50	0.20	0.036	(0.147)	0.032	0.004
87	21.75	0.30	0.054	(0.146)	0.049	0.005
88	22.00	0.20	0.036	(0.144)	0.032	0.004
89	22.25	0.30	0.054	(0.143)	0.049	0.005
90	22.50	0.20	0.036	(0.142)	0.032	0.004
91	22.75	0.20	0.036	(0.140)	0.032	0.004
92	23.00	0.20	0.036	(0.139)	0.032	0.004
93	23.25	0.20	0.036	(0.138)	0.032	0.004
94	23.50	0.20	0.036	(0.137)	0.032	0.004
95	23.75	0.20	0.036	(0.137)	0.032	0.004
96	24.00	0.20	0.036	(0.136)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.2

Flood volume = Effective rainfall 1.30(In)
times area 54.7(Ac.)/[(In)/(Ft.)] = 5.9(Ac.Ft)
Total soil loss = 3.20(In)
Total soil loss = 14.567(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 258907.3 Cubic Feet
Total soil loss = 634521.7 Cubic Feet

Peak flow rate of this hydrograph = 20.369(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+15	0.0018	0.09	Q	|	|	|	|
0+30	0.0066	0.23	Q	|	|	|	|
0+45	0.0126	0.29	Q	|	|	|	|
1+ 0	0.0197	0.34	Q	|	|	|	|
1+15	0.0268	0.35	Q	|	|	|	|
1+30	0.0331	0.30	Q	|	|	|	|
1+45	0.0392	0.30	Q	|	|	|	|
2+ 0	0.0463	0.34	Q	|	|	|	|
2+15	0.0544	0.39	Q	|	|	|	|
2+30	0.0626	0.40	Q	|	|	|	|
2+45	0.0717	0.44	Q	|	|	|	|
3+ 0	0.0818	0.49	Q	|	|	|	|
3+15	0.0921	0.50	Q	|	|	|	|
3+30	0.1023	0.50	Q	|	|	|	|
3+45	0.1126	0.50	Q	|	|	|	|
4+ 0	0.1238	0.54	Q	|	|	|	|
4+15	0.1359	0.59	Q	|	|	|	|
4+30	0.1491	0.64	QV	|	|	|	|
4+45	0.1634	0.69	QV	|	|	|	|
5+ 0	0.1786	0.74	QV	|	|	|	|
5+15	0.1931	0.70	QV	|	|	|	|
5+30	0.2065	0.65	QV	|	|	|	|
5+45	0.2217	0.73	QV	|	|	|	|
6+ 0	0.2380	0.79	|Q	|	|	|	|
6+15	0.2553	0.84	|Q	|	|	|	|
6+30	0.2736	0.89	|Q	|	|	|	|

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 6+45       0.2930      0.94  |Q         |         |         |         |
 7+ 0       0.3134      0.99  |QV        |         |         |         |
 7+15       0.3339      0.99  |QV        |         |         |         |
 7+30       0.3553      1.04  |QV        |         |         |         |
 7+45       0.3786      1.13  |QV        |         |         |         |
 8+ 0       0.4040      1.23  |QV        |         |         |         |
 8+15       0.4324      1.37  |QV        |         |         |         |
 8+30       0.4629      1.48  |Q V       |         |         |         |
 8+45       0.4945      1.53  | QV       |         |         |         |
 9+ 0       0.5281      1.63  | QV       |         |         |         |
 9+15       0.5678      1.92  | QV       |         |         |         |
 9+30       0.6243      2.73  |  QV      |         |         |         |
 9+45       0.7051      3.91  |   VQ     |         |         |         |
10+ 0       0.8112      5.14  |    VQ    |         |         |         |
10+15       0.8903      3.83  |    Q     |         |         |         |
10+30       0.9267      1.76  | Q   V    |         |         |         |
10+45       0.9871      2.92  |  Q  V    |         |         |         |
11+ 0       1.0800      4.50  |    Q V   |         |         |         |
11+15       1.1716      4.43  |    Q V   |         |         |         |
11+30       1.2582      4.19  |    Q  V  |         |         |         |
11+45       1.3298      3.46  |   Q   V  |         |         |         |
12+ 0       1.3949      3.15  |   Q    V|         |         |         |
12+15       1.5366      6.86  |        QV         |         |         |
12+30       1.7626     10.94  |          V  Q     |         |         |
12+45       2.0294     12.92  |         |  V   Q  |         |         |
13+ 0       2.3320     14.65  |         |    V   Q|         |         |
13+15       2.6973     17.68  |         |       V |   Q     |         |
13+30       3.1182     20.37  |         |         V      Q  |         |
13+45       3.4476     15.94  |         |         |Q V      |         |
14+ 0       3.6721     10.87  |         |   Q     |   V     |         |
14+15       3.9249     12.24  |         |     Q   |     V   |         |
14+30       4.2105     13.82  |         |       Q |       V |         |
14+45       4.4945     13.75  |         |       Q |         V         |
15+ 0       4.7727     13.46  |         |      Q  |           V       |
15+15       5.0353     12.71  |         |     Q   |           |  V    |
15+30       5.2812     11.90  |         |    Q    |           |    V  |
15+45       5.4827      9.75  |         | Q       |           |     V |
16+ 0       5.6464      7.93  |        Q          |           |      V|
16+15       5.7389      4.48  |    Q    |         |           |       V|
16+30       5.7568      0.87  |Q        |         |           |       V|
16+45       5.7654      0.41  Q         |         |           |       V|
17+ 0       5.7717      0.30  Q         |         |           |       V|
17+15       5.7797      0.39  Q         |         |           |       V|
17+30       5.7897      0.48  Q         |         |           |       V|
17+45       5.7999      0.49  Q         |         |           |        V|
18+ 0       5.8092      0.45  Q         |         |           |        V|
18+15       5.8176      0.40  Q         |         |           |        V|
18+30       5.8258      0.40  Q         |         |           |        V|
18+45       5.8331      0.35  Q         |         |           |        V|
19+ 0       5.8384      0.26  Q         |         |           |        V|
19+15       5.8436      0.25  Q         |         |           |        V|
19+30       5.8506      0.34  Q         |         |           |        V|
19+45       5.8577      0.35  Q         |         |           |        V|
20+ 0       5.8630      0.26  Q         |         |           |        V|
20+15       5.8682      0.25  Q         |         |           |        V|
20+30       5.8742      0.29  Q         |         |           |        V|
20+45       5.8804      0.30  Q         |         |           |        V|
21+ 0       5.8856      0.25  Q         |         |           |        V|
21+15       5.8908      0.25  Q         |         |           |        V|
21+30       5.8959      0.25  Q         |         |           |        V|
21+45       5.9010      0.25  Q         |         |           |        V|
22+ 0       5.9061      0.25  Q         |         |           |        V|
22+15       5.9113      0.25  Q         |         |           |        V|
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   22+30       5.9164      0.25  Q          |          |          |         V|
   22+45       5.9206      0.20  Q          |          |          |         V|
   23+ 0       5.9247      0.20  Q          |          |          |         V|
   23+15       5.9288      0.20  Q          |          |          |         V|
   23+30       5.9329      0.20  Q          |          |          |         V|
   23+45       5.9370      0.20  Q          |          |          |         V|
   24+ 0       5.9411      0.20  Q          |          |          |         V|
   24+15       5.9434      0.11  Q          |          |          |         V|
   24+30       5.9437      0.01  Q          |          |          |         V|
   24+45       5.9437      0.00  Q          |          |          |         V|
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WSF24hrSt3

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Waterhsed F, Stream 3
Existing Condition
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF524100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 101
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 53.141 (CFS)
Total volume = 16.347 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

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Process from Point/Station 101.000 to Point/Station 102.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 980.00 (Ft.)
Elevation difference = 29.00 (Ft.)
Slope of channel = 0.029592 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 980.00(Ft.) Elevation difference = 29.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 11.507(CFS)
Depth of flow = 0.298(Ft.)
Average velocity = 3.638(Ft/s)
Total flow rate = 11.507(CFS)
Channel flow top width = 11.194(Ft.)
Depth of flow in channel = 0.30(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 3.64(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =   11.507(CFS)
Total capacity of improved channels =     11.507(CFS)
Critical Depth in Channel =    0.34(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     53.141(CFS)
Depth of flow =     0.736(Ft.)
Average velocity =     6.296(Ft/s)
Total flow rate =    53.141(CFS)
Channel flow top width =   12.943(Ft.)
Depth of flow in channel =   0.74(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.30(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   53.141(CFS)
Total capacity of improved channels =     53.141(CFS)
Critical Depth in Channel =    0.90(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.7874   Travel time =   2.59 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   5.2286
        dt(routing time-step) =   2.04 (min.),   c* =   0.9997

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       13.3      26.6      39.9      53.1
---------------------------------------------------------------------
  0+15       0.1134      0.13  O         |         |         |         |
  0+30       0.4436      0.49  O         |         |         |         |
  0+45       0.6863      0.72  O         |         |         |         |
  1+ 0       0.8243      0.84  O         |         |         |         |
  1+15       0.9262      0.94  O         |         |         |         |
  1+30       0.8491      0.83  O         |         |         |         |
  1+45       0.8121      0.81  O         |         |         |         |
  2+ 0       0.8585      0.87  O         |         |         |         |
  2+15       0.9929      1.01  O         |         |         |         |
  2+30       1.0446      1.05  O         |         |         |         |
  2+45       1.1153      1.13  O         |         |         |         |
  3+ 0       1.2559      1.28  O         |         |         |         |
  3+15       1.3103      1.32  O         |         |         |         |
  3+30       1.3246      1.33  O         |         |         |         |
  3+45       1.3284      1.33  OI        |         |         |         |
  4+ 0       1.3865      1.40  |O        |         |         |         |
  4+15       1.5235      1.54  |O        |         |         |         |
  4+30       1.6331      1.65  |O        |         |         |         |
  4+45       1.7841      1.81  |O        |         |         |         |
  5+ 0       1.8976      1.91  |O        |         |         |         |
  5+15       1.9365      1.94  |O        |         |         |         |
  5+30       1.7766      1.75  |O        |         |         |         |
```

5+45	1.8798	1.90	|O
6+ 0	2.0451	2.07	|O
6+15	2.1627	2.18	|O
6+30	2.3149	2.34	|O
6+45	2.4294	2.44	|O
7+ 0	2.5819	2.60	|O
7+15	2.6389	2.64	|O
7+30	2.7112	2.72		O
7+45	2.9086	2.94		O
8+ 0	3.1564	3.19		O
8+15	3.4739	3.52		O
8+30	3.8184	3.87		O
8+45	4.0004	4.02		O
9+ 0	4.2277	4.26		O
9+15	4.9328	5.04		O
9+30	6.9233	7.22		O
9+45	9.7993	10.21		O
10+ 0	12.9653	13.40		OI
10+15	12.7951	12.70		O|
10+30	7.1346	6.26		IO
10+45	6.8025	6.89		O
11+ 0	11.0454	11.70		O
11+15	12.5721	12.71		O|
11+30	12.1675	12.08		O|
11+45	11.1902	11.05		O
12+ 0	9.4930	9.25		IO
12+15	14.2993	15.10		OI
12+30	25.2258	26.83		O I
12+45	32.0472	32.87		O
13+ 0	37.4263	38.15		O
13+15	43.6436	44.51		OI
13+30	51.9630	53.14		OI
13+45	49.1404	48.51		O
14+ 0	35.3919	33.32		IO
14+15	32.5524	32.43		O
14+30	36.4668	37.10		O
14+45	37.3018	37.33		O
15+ 0	37.1076	37.07		O
15+15	35.6469	35.42		O
15+30	33.6754	33.40		O
15+45	29.8278	29.26		O
16+ 0	24.1058	23.29		IO
16+15	17.8026	16.94		IO
16+30	6.8152	5.22		I O
16+45	2.5626	2.14	|O
17+ 0	1.2869	1.15	O
17+15	1.0512	1.04	O
17+30	1.2028	1.23	O
17+45	1.2924	1.30	O
18+ 0	1.2627	1.26	O
18+15	1.1334	1.11	O
18+30	1.0833	1.08	O
18+45	1.0127	1.00	O
19+ 0	0.8154	0.79	O
19+15	0.6810	0.66	O
19+30	0.8071	0.83	O
19+45	0.9221	0.94	O
20+ 0	0.7906	0.77	O
20+15	0.6741	0.66	O
20+30	0.7487	0.76	O
20+45	0.7852	0.79	O
21+ 0	0.7377	0.73	O
21+15	0.6598	0.65	O

```
  21+30       0.6882      0.69  O         |         |         |         |
  21+45       0.6470      0.64  O         |         |         |         |
  22+ 0       0.6845      0.69  O         |         |         |         |
  22+15       0.6456      0.64  O         |         |         |         |
  22+30       0.6844      0.69  O         |         |         |         |
  22+45       0.5889      0.57  O         |         |         |         |
  23+ 0       0.5476      0.54  O         |         |         |         |
  23+15       0.5360      0.53  O         |         |         |         |
  23+30       0.5334      0.53  O         |         |         |         |
  23+45       0.5322      0.53  O         |         |         |         |
  24+ 0       0.5320      0.53  O         |         |         |         |
  24+15       0.4186      0.40  O         |         |         |         |
  24+30       0.1451      0.10  O         |         |         |         |
  24+45       0.0392      0.03  O         |         |         |         |
  25+ 0       0.0108      0.01  O         |         |         |         |
  25+15       0.0031      0.00  O         |         |         |         |
  25+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   102
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       51.963 (CFS)
                      Total volume =      16.347 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       -------------------------------------------------------------------

       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station      101.000 to Point/Station      102.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ___________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: SubF624100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f      H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       13.5      27.1      40.6      54.2
  ---------------------------------------------------------------------
    0+15       0.0119      0.13  Q         |         |         |         |
    0+30       0.0237      0.47  Q         |         |         |         |
    0+45       0.0267      0.71  Q         |         |         |         |
    1+ 0       0.0326      0.86  Q         |         |         |         |
    1+15       0.0296      0.96  Q         |         |         |         |
    1+30       0.0267      0.88  Q         |         |         |         |
    1+45       0.0267      0.84  Q         |         |         |         |
    2+ 0       0.0326      0.89  Q         |         |         |         |
    2+15       0.0356      1.03  Q         |         |         |         |
    2+30       0.0356      1.08  Q         |         |         |         |
    2+45       0.0415      1.16  Q         |         |         |         |
    3+ 0       0.0445      1.30  Q         |         |         |         |
    3+15       0.0445      1.35  qQ        |         |         |         |
    3+30       0.0445      1.37  qQ        |         |         |         |
    3+45       0.0445      1.37  qQ        |         |         |         |
```

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 4+ 0       0.0504      1.44  qQ         |          |          |          |
 4+15       0.0534      1.58  qQ         |          |          |          |
 4+30       0.0593      1.69  qQ         |          |          |          |
 4+45       0.0623      1.85  qQ         |          |          |          |
 5+ 0       0.0682      1.97  qQ         |          |          |          |
 5+15       0.0592      2.00  qQ         |          |          |          |
 5+30       0.0593      1.84  qQ         |          |          |          |
 5+45       0.0682      1.95  qQ         |          |          |          |
 6+ 0       0.0711      2.12  qQ         |          |          |          |
 6+15       0.0771      2.24  qQ         |          |          |          |
 6+30       0.0800      2.39  qQ         |          |          |          |
 6+45       0.0860      2.52  qQ         |          |          |          |
 7+ 0       0.0889      2.67  qQ         |          |          |          |
 7+15       0.0889      2.73  q Q        |          |          |          |
 7+30       0.0949      2.81  q Q        |          |          |          |
 7+45       0.1038      3.01  q Q        |          |          |          |
 8+ 0       0.1127      3.27  q Q        |          |          |          |
 8+15       0.2060      3.68  q Q        |          |          |          |
 8+30       0.2608      4.08  q  Q       |          |          |          |
 8+45       0.3353      4.34  q  Q       |          |          |          |
 9+ 0       0.4391      4.67  q  Q       |          |          |          |
 9+15       0.6023      5.54  q   Q      |          |          |          |
 9+30       0.7353      7.66  q    Q     |          |          |          |
 9+45       0.8387     10.64  q      Q   |          |          |          |
10+ 0       0.9420     13.91  q         Q|          |          |          |
10+15       0.5691     13.36  q        Q|          |          |          |
10+30       0.3771      7.51  q    Q     |          |          |          |
10+45       0.6885      7.49  q    Q     |          |          |          |
11+ 0       0.8495     11.89  q       Q  |          |          |          |
11+15       0.8036     13.38  q        Q|          |          |          |
11+30       0.7877     12.96  q        Q|          |          |          |
11+45       0.6820     11.87  q       Q  |          |          |          |
12+ 0       0.6959     10.19  q      Q   |          |          |          |
12+15       1.1548     15.45  q         |Q         |          |          |
12+30       1.4333     26.66  |q        |         Q|          |          |
12+45       1.5945     33.64  |q        |          |   Q      |          |
13+ 0       1.7254     39.15  |q        |          |       Q  |          |
13+15       2.0648     45.71  |q        |          |          |  Q       |
13+30       2.2243     54.19  |q        |          |          |          |Q
13+45       1.5820     50.72  |q        |          |          |      Q   |
14+ 0       1.2701     36.66  q         |          |      Q   |          |
14+15       1.5199     34.07  |q        |          |    Q     |          |
14+30       1.5898     38.06  |q        |          |       Q  |          |
14+45       1.5719     38.87  |q        |          |       Q  |          |
15+ 0       1.5237     38.63  |q        |          |       Q  |          |
15+15       1.4459     37.09  |q        |          |      Q   |          |
15+30       1.3680     35.04  |q        |          |    Q     |          |
15+45       1.1114     30.94  q         |          | Q        |          |
16+ 0       1.0043     25.11  q         |        Q |          |          |
16+15       0.3574     18.16  q         |  Q       |          |          |
16+30       0.0356      6.85  q    Q    |          |          |          |
16+45       0.0296      2.59  qQ        |          |          |          |
17+ 0       0.0267      1.31  Q         |          |          |          |
17+15       0.0386      1.09  Q         |          |          |          |
17+30       0.0445      1.25  Q         |          |          |          |
17+45       0.0445      1.34  Q         |          |          |          |
18+ 0       0.0385      1.30  Q         |          |          |          |
18+15       0.0356      1.17  Q         |          |          |          |
18+30       0.0356      1.12  Q         |          |          |          |
18+45       0.0296      1.04  Q         |          |          |          |
19+ 0       0.0207      0.84  Q         |          |          |          |
19+15       0.0237      0.70  Q         |          |          |          |
19+30       0.0326      0.84  Q         |          |          |          |
```

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   19+45       0.0296      0.95  Q          |          |          |          |
   20+ 0       0.0207      0.81  Q          |          |          |          |
   20+15       0.0237      0.70  Q          |          |          |          |
   20+30       0.0267      0.78  Q          |          |          |          |
   20+45       0.0267      0.81  Q          |          |          |          |
   21+ 0       0.0207      0.76  Q          |          |          |          |
   21+15       0.0237      0.68  Q          |          |          |          |
   21+30       0.0207      0.71  Q          |          |          |          |
   21+45       0.0237      0.67  Q          |          |          |          |
   22+ 0       0.0207      0.71  Q          |          |          |          |
   22+15       0.0237      0.67  Q          |          |          |          |
   22+30       0.0207      0.71  Q          |          |          |          |
   22+45       0.0178      0.61  Q          |          |          |          |
   23+ 0       0.0178      0.57  Q          |          |          |          |
   23+15       0.0178      0.55  Q          |          |          |          |
   23+30       0.0178      0.55  Q          |          |          |          |
   23+45       0.0178      0.55  Q          |          |          |          |
   24+ 0       0.0178      0.55  Q          |          |          |          |
   24+15       0.0059      0.42  Q          |          |          |          |
   24+30       0.0000      0.15  Q          |          |          |          |
   24+45       0.0000      0.04  Q          |          |          |          |
   25+ 0       0.0000      0.01  Q          |          |          |          |
   25+15       0.0000      0.00  Q          |          |          |          |
   25+30       0.0000      0.00  Q          |          |          |          |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   102
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =       54.187 (CFS)
                        Total volume =      17.111 (Ac.Ft)
                Status of hydrographs being held in storage
                            Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      100.000 to Point/Station      102.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file WSF24hrSt3.rte
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =     0
                        Time interval =    0.0 (Min.)
                        Maximum/Peak flow rate =        0.000 (CFS)
                        Total volume =       0.000 (Ac.Ft)
                Status of hydrographs being held in storage
                            Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------
```

SubF524100

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 04/25/12 File: Stream3/SubF524100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Steam 3, Subarea F5
Existing Condition
100-year, 24-hour

Drainage Area = 146.60(Ac.) = 0.229 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 146.60(Ac.) = 0.229 Sq. Mi.
Length along longest watercourse = 5600.00(Ft.)
Length along longest watercourse measured to centroid = 3020.00(Ft.)
Length along longest watercourse = 1.061 Mi.
Length along longest watercourse measured to centroid = 0.572 Mi.
Difference in elevation = 408.00(Ft.)
Slope along watercourse = 384.6857 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.192 Hr.
Lag time = 11.53 Min.
25% of lag time = 2.88 Min.
40% of lag time = 4.61 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
146.60	1.80	263.88

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
146.60	4.50	659.70

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF524100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 4.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
15.100	46.00	0.000
11.500	66.00	0.000
120.000	83.00	0.000

Total Area Entered = 146.60(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.103	0.063
66.0	66.0	0.405	0.000	0.405	0.078	0.032
83.0	83.0	0.210	0.000	0.210	0.819	0.172
					Sum (F) =	0.266

Area averaged mean soil loss (F) (In/Hr) = 0.266
Minimum soil loss rate ((In/Hr)) = 0.133
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	130.096	24.683	36.468
2	0.500	260.193	55.636	82.200
3	0.750	390.289	14.262	21.072
4	1.000	520.386	3.932	5.809
5	1.250	650.482	1.037	1.532
6	1.500	780.579	0.449	0.663
			Sum = 100.000	Sum= 147.745

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.471)	0.032	0.004
2	0.50	0.30	0.054	(0.465)	0.049	0.005
3	0.75	0.30	0.054	(0.460)	0.049	0.005
4	1.00	0.40	0.072	(0.454)	0.065	0.007
5	1.25	0.30	0.054	(0.449)	0.049	0.005
6	1.50	0.30	0.054	(0.444)	0.049	0.005
7	1.75	0.30	0.054	(0.438)	0.049	0.005
8	2.00	0.40	0.072	(0.433)	0.065	0.007
9	2.25	0.40	0.072	(0.428)	0.065	0.007
10	2.50	0.40	0.072	(0.423)	0.065	0.007
11	2.75	0.50	0.090	(0.417)	0.081	0.009
12	3.00	0.50	0.090	(0.412)	0.081	0.009
13	3.25	0.50	0.090	(0.407)	0.081	0.009
14	3.50	0.50	0.090	(0.402)	0.081	0.009
15	3.75	0.50	0.090	(0.397)	0.081	0.009

16	4.00	0.60	0.108	(0.392)	0.097	0.011
17	4.25	0.60	0.108	(0.387)	0.097	0.011
18	4.50	0.70	0.126	(0.382)	0.113	0.013
19	4.75	0.70	0.126	(0.377)	0.113	0.013
20	5.00	0.80	0.144	(0.372)	0.130	0.014
21	5.25	0.60	0.108	(0.368)	0.097	0.011
22	5.50	0.70	0.126	(0.363)	0.113	0.013
23	5.75	0.80	0.144	(0.358)	0.130	0.014
24	6.00	0.80	0.144	(0.353)	0.130	0.014
25	6.25	0.90	0.162	(0.349)	0.146	0.016
26	6.50	0.90	0.162	(0.344)	0.146	0.016
27	6.75	1.00	0.180	(0.339)	0.162	0.018
28	7.00	1.00	0.180	(0.335)	0.162	0.018
29	7.25	1.00	0.180	(0.330)	0.162	0.018
30	7.50	1.10	0.198	(0.326)	0.178	0.020
31	7.75	1.20	0.216	(0.321)	0.194	0.022
32	8.00	1.30	0.234	(0.317)	0.211	0.023
33	8.25	1.50	0.270	(0.312)	0.243	0.027
34	8.50	1.50	0.270	(0.308)	0.243	0.027
35	8.75	1.60	0.288	(0.304)	0.259	0.029
36	9.00	1.70	0.306	(0.299)	0.275	0.031
37	9.25	1.90	0.342	0.295	(0.308)	0.047
38	9.50	2.00	0.360	0.291	(0.324)	0.069
39	9.75	2.10	0.378	0.287	(0.340)	0.091
40	10.00	2.20	0.396	0.283	(0.356)	0.113
41	10.25	1.50	0.270	(0.279)	0.243	0.027
42	10.50	1.50	0.270	(0.275)	0.243	0.027
43	10.75	2.00	0.360	0.271	(0.324)	0.089
44	11.00	2.00	0.360	0.267	(0.324)	0.093
45	11.25	1.90	0.342	0.263	(0.308)	0.079
46	11.50	1.90	0.342	0.259	(0.308)	0.083
47	11.75	1.70	0.306	0.255	(0.275)	0.051
48	12.00	1.80	0.324	0.251	(0.292)	0.073
49	12.25	2.50	0.450	0.248	(0.405)	0.202
50	12.50	2.60	0.468	0.244	(0.421)	0.224
51	12.75	2.80	0.504	0.240	(0.453)	0.264
52	13.00	2.90	0.522	0.237	(0.470)	0.285
53	13.25	3.40	0.612	0.233	(0.551)	0.379
54	13.50	3.40	0.612	0.229	(0.551)	0.382
55	13.75	2.30	0.414	0.226	(0.372)	0.188
56	14.00	2.30	0.414	0.222	(0.372)	0.191
57	14.25	2.70	0.486	0.219	(0.437)	0.267
58	14.50	2.60	0.468	0.216	(0.421)	0.252
59	14.75	2.60	0.468	0.212	(0.421)	0.255
60	15.00	2.50	0.450	0.209	(0.405)	0.241
61	15.25	2.40	0.432	0.206	(0.389)	0.226
62	15.50	2.30	0.414	0.203	(0.372)	0.211
63	15.75	1.90	0.342	0.200	(0.308)	0.142
64	16.00	1.90	0.342	0.197	(0.308)	0.145
65	16.25	0.40	0.072	(0.194)	0.065	0.007
66	16.50	0.40	0.072	(0.191)	0.065	0.007
67	16.75	0.30	0.054	(0.188)	0.049	0.005
68	17.00	0.30	0.054	(0.185)	0.049	0.005
69	17.25	0.50	0.090	(0.182)	0.081	0.009
70	17.50	0.50	0.090	(0.179)	0.081	0.009
71	17.75	0.50	0.090	(0.177)	0.081	0.009
72	18.00	0.40	0.072	(0.174)	0.065	0.007
73	18.25	0.40	0.072	(0.172)	0.065	0.007
74	18.50	0.40	0.072	(0.169)	0.065	0.007
75	18.75	0.30	0.054	(0.167)	0.049	0.005
76	19.00	0.20	0.036	(0.164)	0.032	0.004
77	19.25	0.30	0.054	(0.162)	0.049	0.005
78	19.50	0.40	0.072	(0.160)	0.065	0.007

79	19.75	0.30	0.054	(0.158)	0.049	0.005
80	20.00	0.20	0.036	(0.155)	0.032	0.004
81	20.25	0.30	0.054	(0.153)	0.049	0.005
82	20.50	0.30	0.054	(0.151)	0.049	0.005
83	20.75	0.30	0.054	(0.149)	0.049	0.005
84	21.00	0.20	0.036	(0.148)	0.032	0.004
85	21.25	0.30	0.054	(0.146)	0.049	0.005
86	21.50	0.20	0.036	(0.144)	0.032	0.004
87	21.75	0.30	0.054	(0.143)	0.049	0.005
88	22.00	0.20	0.036	(0.141)	0.032	0.004
89	22.25	0.30	0.054	(0.140)	0.049	0.005
90	22.50	0.20	0.036	(0.138)	0.032	0.004
91	22.75	0.20	0.036	(0.137)	0.032	0.004
92	23.00	0.20	0.036	(0.136)	0.032	0.004
93	23.25	0.20	0.036	(0.135)	0.032	0.004
94	23.50	0.20	0.036	(0.134)	0.032	0.004
95	23.75	0.20	0.036	(0.134)	0.032	0.004
96	24.00	0.20	0.036	(0.133)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.4

Flood volume = Effective rainfall 1.34(In)
times area 146.6(Ac.)/[(In)/(Ft.)] = 16.3(Ac.Ft)
Total soil loss = 3.16(In)
Total soil loss = 38.613(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 712062.5 Cubic Feet
Total soil loss = 1681962.8 Cubic Feet

Peak flow rate of this hydrograph = 53.141(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+15	0.0027	0.13	Q	|	|	|	|
0+30	0.0129	0.49	Q	|	|	|	|
0+45	0.0277	0.72	Q	|	|	|	|
1+ 0	0.0451	0.84	Q	|	|	|	|
1+15	0.0645	0.94	Q	|	|	|	|
1+30	0.0818	0.83	Q	|	|	|	|
1+45	0.0985	0.81	Q	|	|	|	|
2+ 0	0.1164	0.87	Q	|	|	|	|
2+15	0.1373	1.01	Q	|	|	|	|
2+30	0.1590	1.05	Q	|	|	|	|
2+45	0.1822	1.13	Q	|	|	|	|
3+ 0	0.2086	1.28	Q	|	|	|	|
3+15	0.2358	1.32	Q	|	|	|	|
3+30	0.2632	1.33	Q	|	|	|	|
3+45	0.2906	1.33	Q	|	|	|	|
4+ 0	0.3195	1.40	Q	|	|	|	|
4+15	0.3514	1.54	VQ	|	|	|	|
4+30	0.3854	1.65	VQ	|	|	|	|
4+45	0.4227	1.81	Q	|	|	|	|
5+ 0	0.4622	1.91	|Q	|	|	|	|
5+15	0.5023	1.94	|Q	|	|	|	|
5+30	0.5385	1.75	|Q	|	|	|	|
5+45	0.5777	1.90	|Q	|	|	|	|
6+ 0	0.6205	2.07	|Q	|	|	|	|

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 6+15       0.6655      2.18  |Q         |         |         |         |
 6+30       0.7137      2.34  |Q         |         |         |         |
 6+45       0.7642      2.44  |Q         |         |         |         |
 7+ 0       0.8180      2.60  |QV        |         |         |         |
 7+15       0.8727      2.64  |QV        |         |         |         |
 7+30       0.9289      2.72  |QV        |         |         |         |
 7+45       0.9896      2.94  |QV        |         |         |         |
 8+ 0       1.0555      3.19  | Q        |         |         |         |
 8+15       1.1282      3.52  | Q        |         |         |         |
 8+30       1.2081      3.87  | Q        |         |         |         |
 8+45       1.2912      4.02  | QV       |         |         |         |
 9+ 0       1.3792      4.26  | QV       |         |         |         |
 9+15       1.4833      5.04  |  Q       |         |         |         |
 9+30       1.6325      7.22  |  VQ      |         |         |         |
 9+45       1.8434     10.21  |   V Q    |         |         |         |
10+ 0       2.1203     13.40  |    V  Q  |         |         |         |
10+15       2.3827     12.70  |    V  Q  |         |         |         |
10+30       2.5119      6.26  |   Q V    |         |         |         |
10+45       2.6543      6.89  |   Q V    |         |         |         |
11+ 0       2.8960     11.70  |      Q   |         |         |         |
11+15       3.1586     12.71  |      VQ  |         |         |         |
11+30       3.4083     12.08  |       Q  |         |         |         |
11+45       3.6365     11.05  |      QV  |         |         |         |
12+ 0       3.8276      9.25  |     Q  V|         |         |         |
12+15       4.1395     15.10  |         Q         |         |         |
12+30       4.6938     26.83  |          V     Q  |         |         |
12+45       5.3730     32.87  |          |  V     |Q        |         |
13+ 0       6.1611     38.15  |          |    V   |    Q    |         |
13+15       7.0808     44.51  |          |      V |       Q|         |
13+30       8.1788     53.14  |          |         V         |    Q    |
13+45       9.1810     48.51  |          |           V       | Q       |
14+ 0       9.8694     33.32  |          |          | Q V    |         |
14+15      10.5395     32.43  |          |          Q   V    |         |
14+30      11.3061     37.10  |          |          |   Q  V |         |
14+45      12.0774     37.33  |          |          |   Q    V|         |
15+ 0      12.8434     37.07  |          |          |   Q      V        |
15+15      13.5752     35.42  |          |          |  Q       |  V     |
15+30      14.2653     33.40  |          |          | Q        |   V    |
15+45      14.8699     29.26  |          |        Q|         |     V  |
16+ 0      15.3511     23.29  |          |    Q    |         |      V |
16+15      15.7010     16.94  |          |Q        |         |       V|
16+30      15.8088      5.22  |  Q       |         |         |       V|
16+45      15.8531      2.14  |Q         |         |         |       V|
17+ 0      15.8769      1.15  Q         |         |         |       V|
17+15      15.8983      1.04  Q         |         |         |       V|
17+30      15.9237      1.23  Q         |         |         |       V|
17+45      15.9506      1.30  Q         |         |         |        V|
18+ 0      15.9765      1.26  Q         |         |         |        V|
18+15      15.9995      1.11  Q         |         |         |        V|
18+30      16.0218      1.08  Q         |         |         |        V|
18+45      16.0425      1.00  Q         |         |         |        V|
19+ 0      16.0588      0.79  Q         |         |         |        V|
19+15      16.0725      0.66  Q         |         |         |        V|
19+30      16.0896      0.83  Q         |         |         |        V|
19+45      16.1090      0.94  Q         |         |         |        V|
20+ 0      16.1249      0.77  Q         |         |         |        V|
20+15      16.1385      0.66  Q         |         |         |        V|
20+30      16.1542      0.76  Q         |         |         |        V|
20+45      16.1705      0.79  Q         |         |         |        V|
21+ 0      16.1856      0.73  Q         |         |         |        V|
21+15      16.1990      0.65  Q         |         |         |        V|
21+30      16.2134      0.69  Q         |         |         |        V|
21+45      16.2266      0.64  Q         |         |         |        V|
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   22+ 0      16.2409      0.69  Q          |          |          |         V|
   22+15      16.2541      0.64  Q          |          |          |         V|
   22+30      16.2683      0.69  Q          |          |          |         V|
   22+45      16.2802      0.57  Q          |          |          |         V|
   23+ 0      16.2914      0.54  Q          |          |          |         V|
   23+15      16.3025      0.53  Q          |          |          |         V|
   23+30      16.3135      0.53  Q          |          |          |         V|
   23+45      16.3245      0.53  Q          |          |          |         V|
   24+ 0      16.3355      0.53  Q          |          |          |         V|
   24+15      16.3437      0.40  Q          |          |          |         V|
   24+30      16.3459      0.10  Q          |          |          |         V|
   24+45      16.3465      0.03  Q          |          |          |         V|
   25+ 0      16.3467      0.01  Q          |          |          |         V|
   25+15      16.3467      0.00  Q          |          |          |          V
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SubF624100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream3/SubF624100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 3, Subarea F6
Existing Condition
100-year, 24-hour

Drainage Area = 4.90(Ac.) = 0.008 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.90(Ac.) = 0.008 Sq. Mi.
Length along longest watercourse = 980.00(Ft.)
Length along longest watercourse measured to centroid = 480.00(Ft.)
Length along longest watercourse = 0.186 Mi.
Length along longest watercourse measured to centroid = 0.091 Mi.
Difference in elevation = 29.00(Ft.)
Slope along watercourse = 156.2449 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.058 Hr.
Lag time = 3.51 Min.
25% of lag time = 0.88 Min.
40% of lag time = 1.40 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.90	1.80	8.82

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.90	4.50	22.05

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF624100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.900	85.00	0.000

Total Area Entered = 4.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	427.656	66.899	3.304
2	0.500	855.313	33.101	1.635
		Sum = 100.000	Sum=	4.938

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.130	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013
23	5.75	0.80	0.144	(0.251)	0.130	0.014

24	6.00	0.80	0.144	(0.248)	0.130	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.211	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.051
34	8.50	1.50	0.270	0.216	(0.243)	0.054
35	8.75	1.60	0.288	0.213	(0.259)	0.075
36	9.00	1.70	0.306	0.210	(0.275)	0.096
37	9.25	1.90	0.342	0.207	(0.308)	0.135
38	9.50	2.00	0.360	0.204	(0.324)	0.156
39	9.75	2.10	0.378	0.201	(0.340)	0.177
40	10.00	2.20	0.396	0.198	(0.356)	0.198
41	10.25	1.50	0.270	0.196	(0.243)	0.074
42	10.50	1.50	0.270	0.193	(0.243)	0.077
43	10.75	2.00	0.360	0.190	(0.324)	0.170
44	11.00	2.00	0.360	0.187	(0.324)	0.173
45	11.25	1.90	0.342	0.184	(0.308)	0.158
46	11.50	1.90	0.342	0.182	(0.308)	0.160
47	11.75	1.70	0.306	0.179	(0.275)	0.127
48	12.00	1.80	0.324	0.176	(0.292)	0.148
49	12.25	2.50	0.450	0.174	(0.405)	0.276
50	12.50	2.60	0.468	0.171	(0.421)	0.297
51	12.75	2.80	0.504	0.169	(0.454)	0.335
52	13.00	2.90	0.522	0.166	(0.470)	0.356
53	13.25	3.40	0.612	0.163	(0.551)	0.449
54	13.50	3.40	0.612	0.161	(0.551)	0.451
55	13.75	2.30	0.414	0.159	(0.373)	0.255
56	14.00	2.30	0.414	0.156	(0.373)	0.258
57	14.25	2.70	0.486	0.154	(0.437)	0.332
58	14.50	2.60	0.468	0.151	(0.421)	0.317
59	14.75	2.60	0.468	0.149	(0.421)	0.319
60	15.00	2.50	0.450	0.147	(0.405)	0.303
61	15.25	2.40	0.432	0.145	(0.389)	0.287
62	15.50	2.30	0.414	0.142	(0.373)	0.272
63	15.75	1.90	0.342	0.140	(0.308)	0.202
64	16.00	1.90	0.342	0.138	(0.308)	0.204
65	16.25	0.40	0.072	(0.136)	0.065	0.007
66	16.50	0.40	0.072	(0.134)	0.065	0.007
67	16.75	0.30	0.054	(0.132)	0.049	0.005
68	17.00	0.30	0.054	(0.130)	0.049	0.005
69	17.25	0.50	0.090	(0.128)	0.081	0.009
70	17.50	0.50	0.090	(0.126)	0.081	0.009
71	17.75	0.50	0.090	(0.124)	0.081	0.009
72	18.00	0.40	0.072	(0.122)	0.065	0.007
73	18.25	0.40	0.072	(0.120)	0.065	0.007
74	18.50	0.40	0.072	(0.119)	0.065	0.007
75	18.75	0.30	0.054	(0.117)	0.049	0.005
76	19.00	0.20	0.036	(0.115)	0.032	0.004
77	19.25	0.30	0.054	(0.114)	0.049	0.005
78	19.50	0.40	0.072	(0.112)	0.065	0.007
79	19.75	0.30	0.054	(0.111)	0.049	0.005
80	20.00	0.20	0.036	(0.109)	0.032	0.004
81	20.25	0.30	0.054	(0.108)	0.049	0.005
82	20.50	0.30	0.054	(0.106)	0.049	0.005
83	20.75	0.30	0.054	(0.105)	0.049	0.005
84	21.00	0.20	0.036	(0.104)	0.032	0.004
85	21.25	0.30	0.054	(0.102)	0.049	0.005
86	21.50	0.20	0.036	(0.101)	0.032	0.004

87	21.75	0.30	0.054	(0.100)	0.049	0.005
88	22.00	0.20	0.036	(0.099)	0.032	0.004
89	22.25	0.30	0.054	(0.098)	0.049	0.005
90	22.50	0.20	0.036	(0.097)	0.032	0.004
91	22.75	0.20	0.036	(0.096)	0.032	0.004
92	23.00	0.20	0.036	(0.096)	0.032	0.004
93	23.25	0.20	0.036	(0.095)	0.032	0.004
94	23.50	0.20	0.036	(0.094)	0.032	0.004
95	23.75	0.20	0.036	(0.094)	0.032	0.004
96	24.00	0.20	0.036	(0.094)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.87(In)
times area 4.9(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 1.074(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 33272.6 Cubic Feet
Total soil loss = 46768.2 Cubic Feet

Peak flow rate of this hydrograph = 2.224(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0002	0.01	Q	|	|	|	|
0+30	0.0007	0.02	Q	|	|	|	|
0+45	0.0013	0.03	Q	|	|	|	|
1+ 0	0.0020	0.03	Q	|	|	|	|
1+15	0.0026	0.03	Q	|	|	|	|
1+30	0.0031	0.03	Q	|	|	|	|
1+45	0.0037	0.03	Q	|	|	|	|
2+ 0	0.0044	0.03	Q	|	|	|	|
2+15	0.0051	0.04	Q	|	|	|	|
2+30	0.0058	0.04	Q	|	|	|	|
2+45	0.0067	0.04	Q	|	|	|	|
3+ 0	0.0076	0.04	Q	|	|	|	|
3+15	0.0085	0.04	Q	|	|	|	|
3+30	0.0094	0.04	Q	|	|	|	|
3+45	0.0104	0.04	Q	|	|	|	|
4+ 0	0.0114	0.05	Q	|	|	|	|
4+15	0.0125	0.05	Q	|	|	|	|
4+30	0.0137	0.06	Q	|	|	|	|
4+45	0.0150	0.06	Q	|	|	|	|
5+ 0	0.0164	0.07	Q	|	|	|	|
5+15	0.0176	0.06	Q	|	|	|	|
5+30	0.0189	0.06	Q	|	|	|	|
5+45	0.0203	0.07	QV	|	|	|	|
6+ 0	0.0217	0.07	QV	|	|	|	|
6+15	0.0233	0.08	QV	|	|	|	|
6+30	0.0250	0.08	QV	|	|	|	|
6+45	0.0268	0.09	QV	|	|	|	|
7+ 0	0.0286	0.09	QV	|	|	|	|
7+15	0.0304	0.09	QV	|	|	|	|
7+30	0.0324	0.09	QV	|	|	|	|
7+45	0.0345	0.10	QV	|	|	|	|
8+ 0	0.0369	0.11	QV	|	|	|	|

```
 8+15       0.0411      0.21  Q V        |          |          |          |
 8+30       0.0465      0.26  |QV        |          |          |          |
 8+45       0.0535      0.34  |QV        |          |          |          |
 9+ 0       0.0625      0.44  |Q V       |          |          |          |
 9+15       0.0750      0.60  | QV       |          |          |          |
 9+30       0.0902      0.74  | Q V      |          |          |          |
 9+45       0.1075      0.84  |  Q V     |          |          |          |
10+ 0       0.1270      0.94  |  Q  V    |          |          |          |
10+15       0.1387      0.57  | Q    V   |          |          |          |
10+30       0.1465      0.38  |Q     V   |          |          |          |
10+45       0.1607      0.69  | Q     V  |          |          |          |
11+ 0       0.1783      0.85  |  Q     V|          |          |          |
11+15       0.1949      0.80  |  Q      V          |          |          |
11+30       0.2112      0.79  |  Q       V         |          |          |
11+45       0.2252      0.68  | Q       |V         |          |          |
12+ 0       0.2396      0.70  | Q       | V        |          |          |
12+15       0.2635      1.15  |   Q     |  V       |          |          |
12+30       0.2931      1.43  |    Q    |    V     |          |          |
12+45       0.3260      1.59  |     Q   |      V   |          |          |
13+ 0       0.3617      1.73  |     Q   |       V  |          |          |
13+15       0.4044      2.06  |       Q |          V          |          |
13+30       0.4503      2.22  |       Q |          |  V       |          |
13+45       0.4830      1.58  |     Q   |          |    V     |          |
14+ 0       0.5092      1.27  |    Q    |          |     V    |          |
14+15       0.5406      1.52  |     Q   |          |       V  |          |
14+30       0.5735      1.59  |     Q   |          |         V          |
14+45       0.6060      1.57  |     Q   |          |          V         |
15+ 0       0.6375      1.52  |     Q   |          |          |  V      |
15+15       0.6673      1.45  |    Q    |          |          |   V     |
15+30       0.6956      1.37  |    Q    |          |          |     V   |
15+45       0.7186      1.11  |   Q     |          |          |      V  |
16+ 0       0.7393      1.00  |   Q     |          |          |       V |
16+15       0.7467      0.36  |Q        |          |          |        V|
16+30       0.7474      0.04  Q         |          |          |        V|
16+45       0.7480      0.03  Q         |          |          |        V|
17+ 0       0.7486      0.03  Q         |          |          |        V|
17+15       0.7494      0.04  Q         |          |          |        V|
17+30       0.7503      0.04  Q         |          |          |        V|
17+45       0.7512      0.04  Q         |          |          |        V|
18+ 0       0.7520      0.04  Q         |          |          |        V|
18+15       0.7527      0.04  Q         |          |          |        V|
18+30       0.7535      0.04  Q         |          |          |        V|
18+45       0.7541      0.03  Q         |          |          |        V|
19+ 0       0.7545      0.02  Q         |          |          |        V|
19+15       0.7550      0.02  Q         |          |          |        V|
19+30       0.7557      0.03  Q         |          |          |        V|
19+45       0.7563      0.03  Q         |          |          |        V|
20+ 0       0.7567      0.02  Q         |          |          |        V|
20+15       0.7572      0.02  Q         |          |          |        V|
20+30       0.7578      0.03  Q         |          |          |        V|
20+45       0.7583      0.03  Q         |          |          |        V|
21+ 0       0.7587      0.02  Q         |          |          |        V|
21+15       0.7592      0.02  Q         |          |          |        V|
21+30       0.7597      0.02  Q         |          |          |        V|
21+45       0.7602      0.02  Q         |          |          |        V|
22+ 0       0.7606      0.02  Q         |          |          |        V|
22+15       0.7611      0.02  Q         |          |          |        V|
22+30       0.7615      0.02  Q         |          |          |        V|
22+45       0.7619      0.02  Q         |          |          |        V|
23+ 0       0.7622      0.02  Q         |          |          |        V|
23+15       0.7626      0.02  Q         |          |          |        V|
23+30       0.7630      0.02  Q         |          |          |        V|
23+45       0.7633      0.02  Q         |          |          |        V|
```

```
   24+ 0       0.7637      0.02  Q          |          |          |        V|
   24+15       0.7638      0.01  Q          |          |          |        V|
-------------------------------------------------------------------------
```

WSF24hrSt4

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 04/27/12

Watershed F, Stream 4
Existing Condition
100-year, 24-hour

Program License Serial Number 6097

********** HYDROGRAPH INFORMATION **********

From study/file name: SubF724100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 99
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 25.151 (CFS)
Total volume = 7.276 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 111.000 to Point/Station 112.000
**** STREAM ROUTING SCS CONVEX METHOD ****

HYDROGRAPH STREAM ROUTING DATA:
Length of stream = 350.00 (Ft.)
Elevation difference = 11.00 (Ft.)
Slope of channel = 0.031429 (Vert/Horiz)
Channel type - Improved Channel

Channel length = 350.00(Ft.) Elevation difference = 11.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width = 10.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Manning's 'N' = 0.030
Maximum depth of channel = 5.000(Ft.)
Flow(q) thru subarea = 5.063(CFS)
Depth of flow = 0.180(Ft.)
Average velocity = 2.719(Ft/s)
Total flow rate = 5.063(CFS)
Channel flow top width = 10.719(Ft.)
Depth of flow in channel = 0.18(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity = 2.72(Ft/s)
Travel time = 0.00 min.

```
Individual channel flow =    5.063(CFS)
Total capacity of improved channels =      5.063(CFS)
Critical Depth in Channel =    0.20(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =     25.151(CFS)
Depth of flow =     0.466(Ft.)
Average velocity =     4.937(Ft/s)
Total flow rate =    25.151(CFS)
Channel flow top width =   11.864(Ft.)
Depth of flow in channel =   0.47(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    4.94(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   25.151(CFS)
Total capacity of improved channels =     25.151(CFS)
Critical Depth in Channel =    0.56(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.7439   Travel time =   1.18 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  11.7113
        dt(routing time-step) =   0.88 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        6.3      12.6      18.9      25.2
----------------------------------------------------------------------
  0+15       0.0930      0.10  O         |         |         |         |
  0+30       0.2673      0.28  O         |         |         |         |
  0+45       0.3578      0.36  O         |         |         |         |
  1+ 0       0.4222      0.43  O         |         |         |         |
  1+15       0.4422      0.44  O         |         |         |         |
  1+30       0.3916      0.39  O         |         |         |         |
  1+45       0.3807      0.38  O         |         |         |         |
  2+ 0       0.4250      0.43  O         |         |         |         |
  2+15       0.4888      0.49  O         |         |         |         |
  2+30       0.5020      0.50  O         |         |         |         |
  2+45       0.5509      0.55  O         |         |         |         |
  3+ 0       0.6149      0.62  O         |         |         |         |
  3+15       0.6282      0.63  O         |         |         |         |
  3+30       0.6305      0.63  |O        |         |         |         |
  3+45       0.6306      0.63  |O        |         |         |         |
  4+ 0       0.6771      0.68  |O        |         |         |         |
  4+15       0.7410      0.74  |O        |         |         |         |
  4+30       0.8008      0.80  |O        |         |         |         |
  4+45       0.8671      0.87  |O        |         |         |         |
  5+ 0       0.9269      0.93  |O        |         |         |         |
  5+15       0.9002      0.90  |O        |         |         |         |
  5+30       0.8322      0.83  |O        |         |         |         |
```

5+45	0.9185	0.92	|O
6+ 0	0.9911	1.00	|O
6+15	1.0529	1.06	|O
6+30	1.1193	1.12	|O
6+45	1.1792	1.18	|O
7+ 0	1.2454	1.25	|O
7+15	1.2588	1.26		O
7+30	1.3077	1.31		O
7+45	1.4182	1.42		O
8+ 0	1.5419	1.55		O
8+15	1.7144	1.72		O
8+30	1.8579	1.87		O
8+45	1.9334	1.94		O
9+ 0	2.0486	2.06		O
9+15	2.2190	2.23		O
9+30	2.8602	2.90		O
9+45	4.1517	4.23		O
10+ 0	5.6703	5.76		O
10+15	4.8143	4.76		O
10+30	2.4813	2.34		O
10+45	3.2267	3.28		O
11+ 0	4.9462	5.05		OI
11+15	5.0847	5.09		O
11+30	4.7908	4.77		O
11+45	4.0162	3.97		O
12+ 0	3.4619	3.43		O
12+15	7.3696	7.61		OI
12+30	12.6702	12.98		O
12+45	15.4613	15.62		O
13+ 0	17.7719	17.91		O
13+15	21.2989	21.51		OI
13+30	24.9380	25.15		OI
13+45	20.7704	20.50		IO
14+ 0	14.1147	13.72		IO
14+15	14.7755	14.84		O
14+30	16.8587	16.98		OI
14+45	16.9838	16.98		O
15+ 0	16.7225	16.71		O
15+15	15.8383	15.78		O
15+30	14.8359	14.78		O
15+45	12.4123	12.27		O
16+ 0	9.9269	9.78		O
16+15	6.2170	6.00		O
16+30	1.6181	1.35		O
16+45	0.6317	0.59		IO
17+ 0	0.4018	0.39		O
17+15	0.4738	0.48		O
17+30	0.5993	0.61		O
17+45	0.6257	0.63		O
18+ 0	0.5839	0.58		O
18+15	0.5202	0.52		O
18+30	0.5070	0.51		O
18+45	0.4581	0.46		O
19+ 0	0.3476	0.34		O
19+15	0.3169	0.32		O
19+30	0.4117	0.42		O
19+45	0.4399	0.44		O
20+ 0	0.3450	0.34		O
20+15	0.3168	0.32		O
20+30	0.3652	0.37		O
20+45	0.3760	0.38		O
21+ 0	0.3318	0.33		O
21+15	0.3145	0.31		O

```
  21+30       0.3186      0.32  O          |          |          |          |
  21+45       0.3121      0.31  O          |          |          |          |
  22+ 0       0.3185      0.32  O          |          |          |          |
  22+15       0.3121      0.31  O          |          |          |          |
  22+30       0.3185      0.32  O          |          |          |          |
  22+45       0.2656      0.26  O          |          |          |          |
  23+ 0       0.2546      0.25  O          |          |          |          |
  23+15       0.2524      0.25  O          |          |          |          |
  23+30       0.2523      0.25  O          |          |          |          |
  23+45       0.2523      0.25  O          |          |          |          |
  24+ 0       0.2523      0.25  O          |          |          |          |
  24+15       0.1592      0.15  O          |          |          |          |
  24+30       0.0314      0.02  O          |          |          |          |
  24+45       0.0049      0.00  O          |          |          |          |
  25+ 0       0.0000      0.00  O          |          |          |          |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =   100
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =       24.938 (CFS)
                        Total volume =       7.276 (Ac.Ft)
                Status of hydrographs being held in storage
                            Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        -------------------------------------------------------------------

        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      111.000 to Point/Station      112.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ___________________________________________________________________
        ******************** HYDROGRAPH INFORMATION *********************

                        From study/file name: SubF824100.rte
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                        R u n o f f     H y d r o g r a p h
        -------------------------------------------------------------------
                     Hydrograph in  15   Minute intervals (CFS)

        -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0        6.7      13.4      20.1      26.8
  -------------------------------------------------------------------
    0+15       0.0149      0.11  Q          |          |          |          |
    0+30       0.0223      0.29  Q          |          |          |          |
    0+45       0.0223      0.38  Q          |          |          |          |
    1+ 0       0.0298      0.45  Q          |          |          |          |
    1+15       0.0223      0.46  Q          |          |          |          |
    1+30       0.0223      0.41  Q          |          |          |          |
    1+45       0.0223      0.40  Q          |          |          |          |
    2+ 0       0.0298      0.45  Q          |          |          |          |
    2+15       0.0298      0.52  Q          |          |          |          |
    2+30       0.0298      0.53  Q          |          |          |          |
    2+45       0.0372      0.59  Q          |          |          |          |
    3+ 0       0.0372      0.65  Q          |          |          |          |
    3+15       0.0372      0.67  Q          |          |          |          |
    3+30       0.0372      0.67  Q          |          |          |          |
    3+45       0.0372      0.67  Q          |          |          |          |
    4+ 0       0.0446      0.72  qQ         |          |          |          |
    4+15       0.0446      0.79  qQ         |          |          |          |
```

4+30	0.0521	0.85	qQ
4+45	0.0521	0.92	qQ
5+ 0	0.0595	0.99	qQ
5+15	0.0446	0.94	qQ
5+30	0.0521	0.88	qQ
5+45	0.0595	0.98	qQ
6+ 0	0.0595	1.05	qQ
6+15	0.0670	1.12	qQ
6+30	0.0670	1.19	qQ
6+45	0.0744	1.25	qQ
7+ 0	0.0744	1.32	qQ
7+15	0.0744	1.33	qQ
7+30	0.0819	1.39	q Q
7+45	0.0893	1.51	q Q
8+ 0	0.0967	1.64	q Q
8+15	0.2098	1.92	q Q
8+30	0.2224	2.08	q Q
8+45	0.3094	2.24	q Q
9+ 0	0.3962	2.44	q Q
9+15	0.5573	2.78	q Q
9+30	0.6439	3.50	q Q
9+45	0.7304	4.88	|q Q
10+ 0	0.8168	6.49	|q Q|
10+15	0.3077	5.12	q Q
10+30	0.3194	2.80	q Q
10+45	0.7031	3.93	|q Q
11+ 0	0.7146	5.66	|q Q
11+15	0.6516	5.74	q Q
11+30	0.6628	5.45	q Q
11+45	0.5251	4.54	q Q
12+ 0	0.6105	4.07	q Q
12+15	1.1423	8.51	|q Q
12+30	1.2275	13.90	|q Q
12+45	1.3869	16.85	| q Q
13+ 0	1.4719	19.24	| q Q
13+15	1.8543	23.15	| q Q
13+30	1.8645	26.80	| q Q
13+45	1.0561	21.83	|q Q
14+ 0	1.0661	15.18	|q Q
14+15	1.3736	16.15	| q Q
14+30	1.3089	18.17	|q Q
14+45	1.3184	18.30	|q Q
15+ 0	1.2534	17.98	|q Q
15+15	1.1883	17.03	|q Q
15+30	1.1230	15.96	|q Q
15+45	0.8344	13.25	|q Q
16+ 0	0.8432	10.77	|q Q
16+15	0.0298	6.25	q Q|
16+30	0.0298	1.65	q Q
16+45	0.0223	0.65	Q
17+ 0	0.0223	0.42	Q
17+15	0.0372	0.51	Q
17+30	0.0372	0.64	Q
17+45	0.0372	0.66	Q
18+ 0	0.0298	0.61	Q
18+15	0.0298	0.55	Q
18+30	0.0298	0.54	Q
18+45	0.0223	0.48	Q
19+ 0	0.0149	0.36	Q
19+15	0.0223	0.34	Q
19+30	0.0298	0.44	Q
19+45	0.0223	0.46	Q
20+ 0	0.0149	0.36	Q

```
   20+15       0.0223      0.34  Q          |          |          |          |
   20+30       0.0223      0.39  Q          |          |          |          |
   20+45       0.0223      0.40  Q          |          |          |          |
   21+ 0       0.0149      0.35  Q          |          |          |          |
   21+15       0.0223      0.34  Q          |          |          |          |
   21+30       0.0149      0.33  Q          |          |          |          |
   21+45       0.0223      0.33  Q          |          |          |          |
   22+ 0       0.0149      0.33  Q          |          |          |          |
   22+15       0.0223      0.33  Q          |          |          |          |
   22+30       0.0149      0.33  Q          |          |          |          |
   22+45       0.0149      0.28  Q          |          |          |          |
   23+ 0       0.0149      0.27  Q          |          |          |          |
   23+15       0.0149      0.27  Q          |          |          |          |
   23+30       0.0149      0.27  Q          |          |          |          |
   23+45       0.0149      0.27  Q          |          |          |          |
   24+ 0       0.0149      0.27  Q          |          |          |          |
   24+15       0.0000      0.16  Q          |          |          |          |
   24+30       0.0000      0.03  Q          |          |          |          |
   24+45       0.0000      0.00  Q          |          |          |          |
   25+ 0       0.0000      0.00  Q          |          |          |          |
-------------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =   100
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =       26.803 (CFS)
                        Total volume =       7.915 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------

        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      110.000 to Point/Station      112.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        _____________________________________________________________________
        Current stream hydrograph saved in file WSF24hrSt4.rte
        ****************************HYDROGRAPH DATA****************************
                        Number of intervals =     0
                        Time interval =    0.0 (Min.)
                        Maximum/Peak flow rate =        0.000 (CFS)
                        Total volume =       0.000 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------
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SubF724100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream4/SubF724100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 4, Subarea F7
Existing Condition
100-year, 3-hour

Drainage Area = 69.50(Ac.) = 0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 69.50(Ac.) = 0.109 Sq. Mi.
Length along longest watercourse = 3750.00(Ft.)
Length along longest watercourse measured to centroid = 1820.00(Ft.)
Length along longest watercourse = 0.710 Mi.
Length along longest watercourse measured to centroid = 0.345 Mi.
Difference in elevation = 285.00(Ft.)
Slope along watercourse = 401.2800 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.135 Hr.
Lag time = 8.10 Min.
25% of lag time = 2.03 Min.
40% of lag time = 3.24 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.50	1.80	125.10

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
69.50	4.50	312.75

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF724100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.499(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.300	46.00	0.000
14.300	66.00	0.000
49.900	83.00	0.000

Total Area Entered = 69.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.076	0.047
66.0	66.0	0.405	0.000	0.405	0.206	0.083
83.0	83.0	0.210	0.000	0.210	0.718	0.151
					Sum (F) =	0.281

Area averaged mean soil loss (F) (In/Hr) = 0.281
Minimum soil loss rate ((In/Hr)) = 0.140
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	185.142	39.169	27.435
2	0.500	370.284	51.389	35.994
3	0.750	555.426	7.965	5.579
4	1.000	740.569	1.478	1.035
		Sum = 100.000	Sum=	70.043

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.496)	0.032	0.004
2	0.50	0.30	0.054	(0.490)	0.049	0.005
3	0.75	0.30	0.054	(0.484)	0.049	0.005
4	1.00	0.40	0.072	(0.478)	0.065	0.007
5	1.25	0.30	0.054	(0.473)	0.049	0.005
6	1.50	0.30	0.054	(0.467)	0.049	0.005
7	1.75	0.30	0.054	(0.462)	0.049	0.005
8	2.00	0.40	0.072	(0.456)	0.065	0.007
9	2.25	0.40	0.072	(0.450)	0.065	0.007
10	2.50	0.40	0.072	(0.445)	0.065	0.007
11	2.75	0.50	0.090	(0.440)	0.081	0.009
12	3.00	0.50	0.090	(0.434)	0.081	0.009
13	3.25	0.50	0.090	(0.429)	0.081	0.009
14	3.50	0.50	0.090	(0.423)	0.081	0.009
15	3.75	0.50	0.090	(0.418)	0.081	0.009
16	4.00	0.60	0.108	(0.413)	0.097	0.011
17	4.25	0.60	0.108	(0.408)	0.097	0.011

18	4.50	0.70	0.126	(0.402)	0.113	0.013
19	4.75	0.70	0.126	(0.397)	0.113	0.013
20	5.00	0.80	0.144	(0.392)	0.130	0.014
21	5.25	0.60	0.108	(0.387)	0.097	0.011
22	5.50	0.70	0.126	(0.382)	0.113	0.013
23	5.75	0.80	0.144	(0.377)	0.130	0.014
24	6.00	0.80	0.144	(0.372)	0.130	0.014
25	6.25	0.90	0.162	(0.367)	0.146	0.016
26	6.50	0.90	0.162	(0.362)	0.146	0.016
27	6.75	1.00	0.180	(0.357)	0.162	0.018
28	7.00	1.00	0.180	(0.353)	0.162	0.018
29	7.25	1.00	0.180	(0.348)	0.162	0.018
30	7.50	1.10	0.198	(0.343)	0.178	0.020
31	7.75	1.20	0.216	(0.338)	0.194	0.022
32	8.00	1.30	0.234	(0.334)	0.211	0.023
33	8.25	1.50	0.270	(0.329)	0.243	0.027
34	8.50	1.50	0.270	(0.324)	0.243	0.027
35	8.75	1.60	0.288	(0.320)	0.259	0.029
36	9.00	1.70	0.306	(0.315)	0.275	0.031
37	9.25	1.90	0.342	(0.311)	0.308	0.034
38	9.50	2.00	0.360	0.306	(0.324)	0.053
39	9.75	2.10	0.378	0.302	(0.340)	0.076
40	10.00	2.20	0.396	0.298	(0.356)	0.098
41	10.25	1.50	0.270	(0.293)	0.243	0.027
42	10.50	1.50	0.270	(0.289)	0.243	0.027
43	10.75	2.00	0.360	0.285	(0.324)	0.075
44	11.00	2.00	0.360	0.281	(0.324)	0.079
45	11.25	1.90	0.342	0.277	(0.308)	0.065
46	11.50	1.90	0.342	0.273	(0.308)	0.069
47	11.75	1.70	0.306	0.269	(0.275)	0.037
48	12.00	1.80	0.324	0.265	(0.292)	0.059
49	12.25	2.50	0.450	0.261	(0.405)	0.189
50	12.50	2.60	0.468	0.257	(0.421)	0.211
51	12.75	2.80	0.504	0.253	(0.454)	0.251
52	13.00	2.90	0.522	0.249	(0.470)	0.273
53	13.25	3.40	0.612	0.245	(0.551)	0.367
54	13.50	3.40	0.612	0.242	(0.551)	0.370
55	13.75	2.30	0.414	0.238	(0.373)	0.176
56	14.00	2.30	0.414	0.234	(0.373)	0.180
57	14.25	2.70	0.486	0.231	(0.437)	0.255
58	14.50	2.60	0.468	0.227	(0.421)	0.241
59	14.75	2.60	0.468	0.224	(0.421)	0.244
60	15.00	2.50	0.450	0.220	(0.405)	0.230
61	15.25	2.40	0.432	0.217	(0.389)	0.215
62	15.50	2.30	0.414	0.214	(0.373)	0.200
63	15.75	1.90	0.342	0.210	(0.308)	0.132
64	16.00	1.90	0.342	0.207	(0.308)	0.135
65	16.25	0.40	0.072	(0.204)	0.065	0.007
66	16.50	0.40	0.072	(0.201)	0.065	0.007
67	16.75	0.30	0.054	(0.198)	0.049	0.005
68	17.00	0.30	0.054	(0.195)	0.049	0.005
69	17.25	0.50	0.090	(0.192)	0.081	0.009
70	17.50	0.50	0.090	(0.189)	0.081	0.009
71	17.75	0.50	0.090	(0.186)	0.081	0.009
72	18.00	0.40	0.072	(0.183)	0.065	0.007
73	18.25	0.40	0.072	(0.181)	0.065	0.007
74	18.50	0.40	0.072	(0.178)	0.065	0.007
75	18.75	0.30	0.054	(0.176)	0.049	0.005
76	19.00	0.20	0.036	(0.173)	0.032	0.004
77	19.25	0.30	0.054	(0.171)	0.049	0.005
78	19.50	0.40	0.072	(0.168)	0.065	0.007
79	19.75	0.30	0.054	(0.166)	0.049	0.005
80	20.00	0.20	0.036	(0.164)	0.032	0.004

81	20.25	0.30	0.054	(0.162)	0.049	0.005
82	20.50	0.30	0.054	(0.159)	0.049	0.005
83	20.75	0.30	0.054	(0.157)	0.049	0.005
84	21.00	0.20	0.036	(0.156)	0.032	0.004
85	21.25	0.30	0.054	(0.154)	0.049	0.005
86	21.50	0.20	0.036	(0.152)	0.032	0.004
87	21.75	0.30	0.054	(0.150)	0.049	0.005
88	22.00	0.20	0.036	(0.149)	0.032	0.004
89	22.25	0.30	0.054	(0.147)	0.049	0.005
90	22.50	0.20	0.036	(0.146)	0.032	0.004
91	22.75	0.20	0.036	(0.145)	0.032	0.004
92	23.00	0.20	0.036	(0.143)	0.032	0.004
93	23.25	0.20	0.036	(0.142)	0.032	0.004
94	23.50	0.20	0.036	(0.142)	0.032	0.004
95	23.75	0.20	0.036	(0.141)	0.032	0.004
96	24.00	0.20	0.036	(0.140)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.0

Flood volume = Effective rainfall 1.26(In)
times area 69.5(Ac.)/[(In)/(Ft.)] = 7.3(Ac.Ft)
Total soil loss = 3.24(In)
Total soil loss = 18.783(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 316923.9 Cubic Feet
Total soil loss = 818204.5 Cubic Feet

Peak flow rate of this hydrograph = 25.151(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-------------------------------------------------------------------------
  0+15       0.0020      0.10  Q         |         |         |         |
  0+30       0.0078      0.28  Q         |         |         |         |
  0+45       0.0153      0.36  Q         |         |         |         |
  1+ 0       0.0241      0.43  Q         |         |         |         |
  1+15       0.0332      0.44  Q         |         |         |         |
  1+30       0.0413      0.39  Q         |         |         |         |
  1+45       0.0491      0.38  Q         |         |         |         |
  2+ 0       0.0580      0.43  Q         |         |         |         |
  2+15       0.0681      0.49  Q         |         |         |         |
  2+30       0.0785      0.50  Q         |         |         |         |
  2+45       0.0900      0.55  Q         |         |         |         |
  3+ 0       0.1027      0.62  Q         |         |         |         |
  3+15       0.1157      0.63  Q         |         |         |         |
  3+30       0.1288      0.63  Q         |         |         |         |
  3+45       0.1418      0.63  Q         |         |         |         |
  4+ 0       0.1558      0.68  Q         |         |         |         |
  4+15       0.1712      0.74  Q         |         |         |         |
  4+30       0.1879      0.80   Q        |         |         |         |
  4+45       0.2058      0.87  |Q        |         |         |         |
  5+ 0       0.2251      0.93  |Q        |         |         |         |
  5+15       0.2436      0.90  |Q        |         |         |         |
  5+30       0.2607      0.83  |Q        |         |         |         |
  5+45       0.2798      0.92  |Q        |         |         |         |
  6+ 0       0.3004      1.00  |Q        |         |         |         |
  6+15       0.3222      1.06  |Q        |         |         |         |
  6+30       0.3454      1.12  |Q        |         |         |         |
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 6+45       0.3699      1.18  |QV        |         |         |         |
 7+ 0       0.3957      1.25  |QV        |         |         |         |
 7+15       0.4217      1.26  |QV        |         |         |         |
 7+30       0.4488      1.31  |QV        |         |         |         |
 7+45       0.4782      1.42  |QV        |         |         |         |
 8+ 0       0.5102      1.55  | Q        |         |         |         |
 8+15       0.5459      1.72  | QV       |         |         |         |
 8+30       0.5844      1.87  | QV       |         |         |         |
 8+45       0.6244      1.94  | QV       |         |         |         |
 9+ 0       0.6669      2.06  | QV       |         |         |         |
 9+15       0.7130      2.23  | QV       |         |         |         |
 9+30       0.7729      2.90  |  QV      |         |         |         |
 9+45       0.8603      4.23  |   VQ     |         |         |         |
10+ 0       0.9793      5.76  |    V Q   |         |         |         |
10+15       1.0775      4.76  |    VQ    |         |         |         |
10+30       1.1259      2.34  |  Q  V    |         |         |         |
10+45       1.1937      3.28  |   Q V    |         |         |         |
11+ 0       1.2980      5.05  |     QV   |         |         |         |
11+15       1.4031      5.09  |     QV   |         |         |         |
11+30       1.5017      4.77  |     Q V  |         |         |         |
11+45       1.5837      3.97  |    Q  V  |         |         |         |
12+ 0       1.6546      3.43  |   Q    V|         |         |         |
12+15       1.8119      7.61  |        VQ         |         |         |
12+30       2.0802     12.98  |          V     Q  |         |         |
12+45       2.4028     15.62  |         |  V      Q         |         |
13+ 0       2.7728     17.91  |         |    V    |  Q      |         |
13+15       3.2172     21.51  |         |      V  |       Q |         |
13+30       3.7369     25.15  |         |         V         |  Q      |
13+45       4.1604     20.50  |         |         | V    Q  |         |
14+ 0       4.4438     13.72  |         |       Q |   V     |         |
14+15       4.7504     14.84  |         |        Q|     V   |         |
14+30       5.1014     16.98  |         |         | Q     V |         |
14+45       5.4523     16.98  |         |         | Q      V|         |
15+ 0       5.7974     16.71  |         |         | Q        V        |
15+15       6.1236     15.78  |         |         Q         |  V      |
15+30       6.4289     14.78  |         |       Q|          |    V    |
15+45       6.6823     12.27  |         |     Q   |          |     V   |
16+ 0       6.8844      9.78  |         |  Q      |          |      V  |
16+15       7.0082      6.00  |       Q |         |          |       V |
16+30       7.0360      1.35  |Q        |         |          |       V |
16+45       7.0482      0.59  Q         |         |          |       V |
17+ 0       7.0562      0.39  Q         |         |          |       V |
17+15       7.0661      0.48  Q         |         |          |       V |
17+30       7.0787      0.61  Q         |         |          |       V |
17+45       7.0916      0.63  Q         |         |          |       V |
18+ 0       7.1036      0.58  Q         |         |          |        V|
18+15       7.1143      0.52  Q         |         |          |        V|
18+30       7.1248      0.51  Q         |         |          |        V|
18+45       7.1342      0.46  Q         |         |          |        V|
19+ 0       7.1412      0.34  Q         |         |          |        V|
19+15       7.1477      0.32  Q         |         |          |        V|
19+30       7.1564      0.42  Q         |         |          |        V|
19+45       7.1655      0.44  Q         |         |          |        V|
20+ 0       7.1725      0.34  Q         |         |          |        V|
20+15       7.1790      0.32  Q         |         |          |        V|
20+30       7.1866      0.37  Q         |         |          |        V|
20+45       7.1944      0.38  Q         |         |          |        V|
21+ 0       7.2012      0.33  Q         |         |          |        V|
21+15       7.2077      0.31  Q         |         |          |        V|
21+30       7.2143      0.32  Q         |         |          |        V|
21+45       7.2207      0.31  Q         |         |          |        V|
22+ 0       7.2273      0.32  Q         |         |          |        V|
22+15       7.2337      0.31  Q         |         |          |        V|
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   22+30       7.2403      0.32  Q          |          |          |         V|
   22+45       7.2457      0.26  Q          |          |          |         V|
   23+ 0       7.2510      0.25  Q          |          |          |         V|
   23+15       7.2562      0.25  Q          |          |          |         V|
   23+30       7.2614      0.25  Q          |          |          |         V|
   23+45       7.2666      0.25  Q          |          |          |         V|
   24+ 0       7.2718      0.25  Q          |          |          |         V|
   24+15       7.2750      0.15  Q          |          |          |         V|
   24+30       7.2755      0.02  Q          |          |          |         V|
   24+45       7.2756      0.00  Q          |          |          |         V|
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SubF824100

U n i t H y d r o g r a p h A n a l y s i s

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Study date 04/25/12 File: Stream4/SubF824100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6097

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Watershed F, Stream 4, Subarea F8
Existing Condition
100-year, 24-hour

Drainage Area = 4.10(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 4.10(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 350.00(Ft.)
Length along longest watercourse measured to centroid = 200.00(Ft.)
Length along longest watercourse = 0.066 Mi.
Length along longest watercourse measured to centroid = 0.038 Mi.
Difference in elevation = 11.00(Ft.)
Slope along watercourse = 165.9429 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.028 Hr.
Lag time = 1.68 Min.
25% of lag time = 0.42 Min.
40% of lag time = 0.67 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.10	1.80	7.38

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
4.10	4.50	18.45

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

SubF824100

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.100	85.00	0.000

Total Area Entered = 4.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	892.204	100.000	4.132
		Sum =	100.000	Sum= 4.132

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.130	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013
23	5.75	0.80	0.144	(0.251)	0.130	0.014
24	6.00	0.80	0.144	(0.248)	0.130	0.014

25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.211	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.051
34	8.50	1.50	0.270	0.216	(0.243)	0.054
35	8.75	1.60	0.288	0.213	(0.259)	0.075
36	9.00	1.70	0.306	0.210	(0.275)	0.096
37	9.25	1.90	0.342	0.207	(0.308)	0.135
38	9.50	2.00	0.360	0.204	(0.324)	0.156
39	9.75	2.10	0.378	0.201	(0.340)	0.177
40	10.00	2.20	0.396	0.198	(0.356)	0.198
41	10.25	1.50	0.270	0.196	(0.243)	0.074
42	10.50	1.50	0.270	0.193	(0.243)	0.077
43	10.75	2.00	0.360	0.190	(0.324)	0.170
44	11.00	2.00	0.360	0.187	(0.324)	0.173
45	11.25	1.90	0.342	0.184	(0.308)	0.158
46	11.50	1.90	0.342	0.182	(0.308)	0.160
47	11.75	1.70	0.306	0.179	(0.275)	0.127
48	12.00	1.80	0.324	0.176	(0.292)	0.148
49	12.25	2.50	0.450	0.174	(0.405)	0.276
50	12.50	2.60	0.468	0.171	(0.421)	0.297
51	12.75	2.80	0.504	0.169	(0.454)	0.335
52	13.00	2.90	0.522	0.166	(0.470)	0.356
53	13.25	3.40	0.612	0.163	(0.551)	0.449
54	13.50	3.40	0.612	0.161	(0.551)	0.451
55	13.75	2.30	0.414	0.159	(0.373)	0.255
56	14.00	2.30	0.414	0.156	(0.373)	0.258
57	14.25	2.70	0.486	0.154	(0.437)	0.332
58	14.50	2.60	0.468	0.151	(0.421)	0.317
59	14.75	2.60	0.468	0.149	(0.421)	0.319
60	15.00	2.50	0.450	0.147	(0.405)	0.303
61	15.25	2.40	0.432	0.145	(0.389)	0.287
62	15.50	2.30	0.414	0.142	(0.373)	0.272
63	15.75	1.90	0.342	0.140	(0.308)	0.202
64	16.00	1.90	0.342	0.138	(0.308)	0.204
65	16.25	0.40	0.072	(0.136)	0.065	0.007
66	16.50	0.40	0.072	(0.134)	0.065	0.007
67	16.75	0.30	0.054	(0.132)	0.049	0.005
68	17.00	0.30	0.054	(0.130)	0.049	0.005
69	17.25	0.50	0.090	(0.128)	0.081	0.009
70	17.50	0.50	0.090	(0.126)	0.081	0.009
71	17.75	0.50	0.090	(0.124)	0.081	0.009
72	18.00	0.40	0.072	(0.122)	0.065	0.007
73	18.25	0.40	0.072	(0.120)	0.065	0.007
74	18.50	0.40	0.072	(0.119)	0.065	0.007
75	18.75	0.30	0.054	(0.117)	0.049	0.005
76	19.00	0.20	0.036	(0.115)	0.032	0.004
77	19.25	0.30	0.054	(0.114)	0.049	0.005
78	19.50	0.40	0.072	(0.112)	0.065	0.007
79	19.75	0.30	0.054	(0.111)	0.049	0.005
80	20.00	0.20	0.036	(0.109)	0.032	0.004
81	20.25	0.30	0.054	(0.108)	0.049	0.005
82	20.50	0.30	0.054	(0.106)	0.049	0.005
83	20.75	0.30	0.054	(0.105)	0.049	0.005
84	21.00	0.20	0.036	(0.104)	0.032	0.004
85	21.25	0.30	0.054	(0.102)	0.049	0.005
86	21.50	0.20	0.036	(0.101)	0.032	0.004
87	21.75	0.30	0.054	(0.100)	0.049	0.005

88	22.00	0.20	0.036	(0.099)	0.032	0.004
89	22.25	0.30	0.054	(0.098)	0.049	0.005
90	22.50	0.20	0.036	(0.097)	0.032	0.004
91	22.75	0.20	0.036	(0.096)	0.032	0.004
92	23.00	0.20	0.036	(0.096)	0.032	0.004
93	23.25	0.20	0.036	(0.095)	0.032	0.004
94	23.50	0.20	0.036	(0.094)	0.032	0.004
95	23.75	0.20	0.036	(0.094)	0.032	0.004
96	24.00	0.20	0.036	(0.094)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 7.5

Flood volume = Effective rainfall 1.87(In)
times area 4.1(Ac.)/[(In)/(Ft.)] = 0.6(Ac.Ft)
Total soil loss = 2.63(In)
Total soil loss = 0.898(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 27840.4 Cubic Feet
Total soil loss = 39132.6 Cubic Feet

Peak flow rate of this hydrograph = 1.865(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0003	0.01	Q	|	|	|	|
0+30	0.0008	0.02	Q	|	|	|	|
0+45	0.0012	0.02	Q	|	|	|	|
1+ 0	0.0018	0.03	Q	|	|	|	|
1+15	0.0023	0.02	Q	|	|	|	|
1+30	0.0028	0.02	Q	|	|	|	|
1+45	0.0032	0.02	Q	|	|	|	|
2+ 0	0.0038	0.03	Q	|	|	|	|
2+15	0.0045	0.03	Q	|	|	|	|
2+30	0.0051	0.03	Q	|	|	|	|
2+45	0.0058	0.04	Q	|	|	|	|
3+ 0	0.0066	0.04	Q	|	|	|	|
3+15	0.0074	0.04	Q	|	|	|	|
3+30	0.0081	0.04	Q	|	|	|	|
3+45	0.0089	0.04	Q	|	|	|	|
4+ 0	0.0098	0.04	Q	|	|	|	|
4+15	0.0108	0.04	Q	|	|	|	|
4+30	0.0118	0.05	Q	|	|	|	|
4+45	0.0129	0.05	Q	|	|	|	|
5+ 0	0.0141	0.06	Q	|	|	|	|
5+15	0.0151	0.04	Q	|	|	|	|
5+30	0.0161	0.05	QV	|	|	|	|
5+45	0.0174	0.06	QV	|	|	|	|
6+ 0	0.0186	0.06	QV	|	|	|	|
6+15	0.0200	0.07	QV	|	|	|	|
6+30	0.0214	0.07	QV	|	|	|	|
6+45	0.0229	0.07	QV	|	|	|	|
7+ 0	0.0244	0.07	QV	|	|	|	|
7+15	0.0260	0.07	QV	|	|	|	|
7+30	0.0277	0.08	QV	|	|	|	|
7+45	0.0295	0.09	QV	|	|	|	|
8+ 0	0.0315	0.10	QV	|	|	|	|
8+15	0.0359	0.21	Q V	|	|	|	|

```
 8+30       0.0404      0.22  Q V        |          |          |          |
 8+45       0.0468      0.31  |QV        |          |          |          |
 9+ 0       0.0550      0.40  |Q V       |          |          |          |
 9+15       0.0665      0.56  | Q V      |          |          |          |
 9+30       0.0798      0.64  | Q V      |          |          |          |
 9+45       0.0949      0.73  | Q  V     |          |          |          |
10+ 0       0.1118      0.82  |  Q  V    |          |          |          |
10+15       0.1182      0.31  |Q     V   |          |          |          |
10+30       0.1248      0.32  |Q     V   |          |          |          |
10+45       0.1393      0.70  | Q     V  |          |          |          |
11+ 0       0.1541      0.71  | Q      V|          |          |          |
11+15       0.1675      0.65  | Q       V          |          |          |
11+30       0.1812      0.66  | Q        V         |          |          |
11+45       0.1921      0.53  | Q        | V       |          |          |
12+ 0       0.2047      0.61  | Q        | V       |          |          |
12+15       0.2283      1.14  |   Q      |   V     |          |          |
12+30       0.2536      1.23  |   Q      |    V    |          |          |
12+45       0.2823      1.39  |    Q     |      V  |          |          |
13+ 0       0.3127      1.47  |    Q     |        V|          |          |
13+15       0.3510      1.85  |      Q   |         V          |          |
13+30       0.3895      1.86  |      Q   |          |   V     |          |
13+45       0.4114      1.06  |   Q      |          |    V    |          |
14+ 0       0.4334      1.07  |   Q      |          |      V  |          |
14+15       0.4618      1.37  |    Q     |          |       V |          |
14+30       0.4888      1.31  |    Q     |          |         V          |
14+45       0.5161      1.32  |    Q     |          |          | V       |
15+ 0       0.5420      1.25  |    Q     |          |          |  V      |
15+15       0.5665      1.19  |   Q      |          |          |    V    |
15+30       0.5897      1.12  |   Q      |          |          |     V   |
15+45       0.6069      0.83  |  Q       |          |          |      V  |
16+ 0       0.6244      0.84  |  Q       |          |          |       V|
16+15       0.6250      0.03  Q          |          |          |        V|
16+30       0.6256      0.03  Q          |          |          |        V|
16+45       0.6261      0.02  Q          |          |          |        V|
17+ 0       0.6265      0.02  Q          |          |          |        V|
17+15       0.6273      0.04  Q          |          |          |        V|
17+30       0.6281      0.04  Q          |          |          |        V|
17+45       0.6288      0.04  Q          |          |          |        V|
18+ 0       0.6294      0.03  Q          |          |          |        V|
18+15       0.6301      0.03  Q          |          |          |        V|
18+30       0.6307      0.03  Q          |          |          |        V|
18+45       0.6311      0.02  Q          |          |          |        V|
19+ 0       0.6314      0.01  Q          |          |          |        V|
19+15       0.6319      0.02  Q          |          |          |        V|
19+30       0.6325      0.03  Q          |          |          |        V|
19+45       0.6330      0.02  Q          |          |          |        V|
20+ 0       0.6333      0.01  Q          |          |          |        V|
20+15       0.6337      0.02  Q          |          |          |        V|
20+30       0.6342      0.02  Q          |          |          |        V|
20+45       0.6347      0.02  Q          |          |          |        V|
21+ 0       0.6350      0.01  Q          |          |          |        V|
21+15       0.6354      0.02  Q          |          |          |        V|
21+30       0.6357      0.01  Q          |          |          |        V|
21+45       0.6362      0.02  Q          |          |          |        V|
22+ 0       0.6365      0.01  Q          |          |          |        V|
22+15       0.6370      0.02  Q          |          |          |        V|
22+30       0.6373      0.01  Q          |          |          |        V|
22+45       0.6376      0.01  Q          |          |          |        V|
23+ 0       0.6379      0.01  Q          |          |          |        V|
23+15       0.6382      0.01  Q          |          |          |        V|
23+30       0.6385      0.01  Q          |          |          |        V|
23+45       0.6388      0.01  Q          |          |          |        V|
24+ 0       0.6391      0.01  Q          |          |          |         V
```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

------------------------------------------------------------------


Line A, Routed
Proposed Conditions
100 Yr. 3 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: LineAoffsite3100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    23
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =     1626.642 (CFS)
               Total volume =     221.321 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   2650.00 (Ft.)
Elevation difference =   50.00 (Ft.)
Slope of channel =  0.018868 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  2650.00(Ft.)     Elevation difference =  50.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    726.986(CFS)
Depth of flow =     2.700(Ft.)
Average velocity =    21.199(Ft/s)
Total flow rate =   726.986(CFS)
Channel flow top width =   15.400(Ft.)
Depth of flow in channel =   2.70(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   21.20(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  726.986(CFS)
Total capacity of improved channels =    726.986(CFS)
Critical Depth in Channel =    4.66(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1626.642(CFS)
```

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Depth of flow =     4.263(Ft.)
Average velocity =    26.753(Ft/s)
Total flow rate =  1626.642(CFS)
Channel flow top width =   18.526(Ft.)
Depth of flow in channel =   4.26(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   26.75(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1626.642(CFS)
Total capacity of improved channels =   1626.642(CFS)
Critical Depth in Channel =    7.31(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9403   Travel time =   1.65 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   6.7755
       dt(routing time-step) =   1.55 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0      406.7     813.3    1220.0    1626.6
 ----------------------------------------------------------------------
   0+15      16.3778     18.27  O         |         |         |         |
   0+30     119.1283    130.77  | OI      |         |         |         |
   0+45     267.2001    282.95  |     O   |         |         |         |
   1+ 0     367.8677    377.67  |        O|         |         |         |
   1+15     427.0040    432.70  |         O         |         |         |
   1+30     517.6166    527.42  |         | O       |         |         |
   1+45     634.8927    647.30  |         |    O    |         |         |
   2+ 0     746.3030    757.73  |         |       O |         |         |
   2+15     867.7470    880.45  |         |         |O        |         |
   2+30    1090.6163   1114.88  |         |         |     OI  |         |
   2+45    1451.4401   1490.29  |         |         |         |    OI   |
   3+ 0    1612.5317   1626.64  |         |         |         |        OI
   3+15    1211.6561   1163.75  |         |         |       IO|         |
   3+30     648.3106    588.81  |         |   IO    |         |         |
   3+45     338.1735    309.24  |      IO |         |         |         |
   4+ 0     185.8198    171.57  |   O     |         |         |         |
   4+15      96.8939     88.27  | O       |         |         |         |
   4+30      49.0017     44.47  |O        |         |         |         |
   4+45      28.9547     27.16  O         |         |         |         |
   5+ 0      18.8776     17.92  O         |         |         |         |
   5+15      10.6008      9.76  O         |         |         |         |
   5+30       4.0863      3.43  O         |         |         |         |
   5+45       0.7719      0.46  O         |         |         |         |
   6+ 0       0.0481      0.00  O         |         |         |         |
   6+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                  Number of intervals =    25
                  Time interval =   15.0 (Min.)
                  Maximum/Peak flow rate =     1612.532 (CFS)
                  Total volume =     221.321 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************
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---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: SketcherRT.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

      ---------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      433.9     867.9    1301.8    1735.8
 ---------------------------------------------------------------------
   0+15       3.3849     19.76  Q         |         |         |         |
   0+30      12.5919    131.72  q  Q      |         |         |         |
   0+45      23.7506    290.95  q     Q   |         |         |         |
   1+ 0      32.7971    400.66  q        Q|         |         |         |
   1+15      40.7688    467.77  q         Q         |         |         |
   1+30      50.0073    567.62  |q        |  Q      |         |         |
   1+45      60.2450    695.14  |q        |     Q   |         |         |
   2+ 0      70.6747    816.98  |q        |       Q |         |         |
   2+15      83.6690    951.42  |q        |         |Q        |         |
   2+30     103.0457   1193.66  | q       |         |      Q  |         |
   2+45     117.7360   1569.18  | q       |         |         |     Q   |
   3+ 0     123.2480   1735.78  | q       |         |         |         Q
   3+15     112.4906   1324.15  | q       |         |         Q         |
   3+30      89.3336    737.64  | q       |     Q   |         |         |
   3+45      59.1662    397.34  |q       Q|         |         |         |
   4+ 0      38.8972    224.72  q    Q    |         |         |         |
   4+15      25.5720    122.47  q Q       |         |         |         |
   4+30      16.8116     65.81  qQ        |         |         |         |
   4+45      11.0523     40.01  Q         |         |         |         |
   5+ 0       7.2661     26.14  Q         |         |         |         |
   5+15       4.7769     15.38  Q         |         |         |         |
   5+30       3.1404      7.23  Q         |         |         |         |
   5+45       2.0646      2.84  Q         |         |         |         |
   6+ 0       1.3573      1.41  Q         |         |         |         |
   6+15       0.8923      0.89  Q         |         |         |         |
   6+30       0.5866      0.59  Q         |         |         |         |
   6+45       0.3857      0.39  Q         |         |         |         |
   7+ 0       0.2535      0.25  Q         |         |         |         |
   7+15       0.1667      0.17  Q         |         |         |         |
   7+30       0.1096      0.11  Q         |         |         |         |
   7+45       0.0720      0.07  Q         |         |         |         |
   8+ 0       0.0474      0.05  Q         |         |         |         |
   8+15       0.0311      0.03  Q         |         |         |         |
   8+30       0.0205      0.02  Q         |         |         |         |
   8+45       0.0135      0.01  Q         |         |         |         |
   9+ 0       0.0088      0.01  Q         |         |         |         |
   9+15       0.0058      0.01  Q         |         |         |         |
   9+30       0.0038      0.00  Q         |         |         |         |
   9+45       0.0025      0.00  Q         |         |         |         |
  10+ 0       0.0017      0.00  Q         |         |         |         |
  10+15       0.0011      0.00  Q         |         |         |         |
  10+30       0.0010      0.00  Q         |         |         |         |
---------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                Number of intervals =    42
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =     1735.780 (CFS)
                Total volume =     243.975 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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**********************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   2650.00 (Ft.)
Elevation difference =   50.00 (Ft.)
Slope of channel =  0.018868 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  2650.00(Ft.)     Elevation difference =  50.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    781.907(CFS)
Depth of flow =     2.816(Ft.)
Average velocity =    21.665(Ft/s)
Total flow rate =   781.907(CFS)
Channel flow top width =   15.632(Ft.)
Depth of flow in channel =   2.82(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   21.67(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  781.907(CFS)
Total capacity of improved channels =    781.907(CFS)
Critical Depth in Channel =    4.88(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1735.780(CFS)
Depth of flow =     4.419(Ft.)
Average velocity =    27.240(Ft/s)
Total flow rate =  1735.780(CFS)
Channel flow top width =   18.839(Ft.)
Depth of flow in channel =   4.42(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   27.24(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1735.780(CFS)
Total capacity of improved channels =   1735.780(CFS)
Critical Depth in Channel =    7.56(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9413   Travel time =   1.62 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   6.8857
       dt(routing time-step) =   1.53 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                 P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)
```

```
      ----------------------------------------------------------------------
  Time(h+m) Out = O(CFS) In = I  0      433.9     867.9    1301.8    1735.8
  ----------------------------------------------------------------------
    0+15      17.7520     19.76  O         |         |         |         |
    0+30     120.3292    131.72  | OI      |         |         |         |
    0+45     274.7500    290.95  |     O   |         |         |         |
    1+ 0     389.5020    400.66  |       OI|         |         |         |
    1+15     460.9450    467.77  |         O         |         |         |
    1+30     557.4646    567.62  |         | OI      |         |         |
    1+45     682.1639    695.14  |         |    OI   |         |         |
    2+ 0     804.5811    816.98  |         |       O |         |         |
    2+15     937.7377    951.42  |         |         |O        |         |
    2+30    1169.0148   1193.66  |         |         |     OI  |         |
    2+45    1530.9698   1569.18  |         |         |         |    OI   |
    3+ 0    1718.8288   1735.78  |         |         |         |        OI
    3+15    1366.0279   1324.15  |         |         |         IO        |
    3+30     797.3174    737.64  |         |     I O |         |         |
    3+45     431.9636    397.34  |        O|         |         |         |
    4+ 0     242.2803    224.72  |    O    |         |         |         |
    4+15     132.8693    122.47  | IO      |         |         |         |
    4+30      71.5773     65.81  |O        |         |         |         |
    4+45      42.6327     40.01  O         |         |         |         |
    5+ 0      27.5542     26.14  O         |         |         |         |
    5+15      16.4730     15.38  O         |         |         |         |
    5+30       8.0561      7.23  O         |         |         |         |
    5+45       3.2832      2.84  O         |         |         |         |
    6+ 0       1.5510      1.41  O         |         |         |         |
    6+15       0.9445      0.89  O         |         |         |         |
    6+30       0.6177      0.59  O         |         |         |         |
    6+45       0.4061      0.39  O         |         |         |         |
    7+ 0       0.2670      0.25  O         |         |         |         |
    7+15       0.1755      0.17  O         |         |         |         |
    7+30       0.1154      0.11  O         |         |         |         |
    7+45       0.0759      0.07  O         |         |         |         |
    8+ 0       0.0499      0.05  O         |         |         |         |
    8+15       0.0328      0.03  O         |         |         |         |
    8+30       0.0216      0.02  O         |         |         |         |
    8+45       0.0142      0.01  O         |         |         |         |
    9+ 0       0.0093      0.01  O         |         |         |         |
    9+15       0.0061      0.01  O         |         |         |         |
    9+30       0.0040      0.00  O         |         |         |         |
    9+45       0.0026      0.00  O         |         |         |         |
   10+ 0       0.0017      0.00  O         |         |         |         |
   10+15       0.0011      0.00  O         |         |         |         |
   10+30       0.0010      0.00  O         |         |         |         |
   10+45       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    43
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =     1718.829 (CFS)
                    Total volume =     243.975 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION *********************

                    From study/file name: SUBA1RT.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
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R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0	438.0	876.1	1314.1	1752.2
0+15	0.5360	18.29	Q				
0+30	2.0510	122.38	q Q				
0+45	4.0636	278.81	q Q				
1+ 0	6.0308	395.53	q Q				
1+15	8.0728	469.02	q Q				
1+30	10.4733	567.94	q Q				
1+45	13.1767	695.34	q Q				
2+ 0	16.0791	820.66	q Q				
2+15	19.5564	957.29	q Q				
2+30	24.6368	1193.65	q Q				
2+45	30.5901	1561.56	q Q				
3+ 0	33.3585	1752.19	q Q				
3+15	32.3771	1398.40	q Q				
3+30	29.5410	826.86	q Q				
3+45	26.1221	458.09	q Q				
4+ 0	23.0718	265.35	q Q				
4+15	20.3777	153.25	q Q				
4+30	17.9981	89.58	q Q				
4+45	15.8965	58.53	qQ				
5+ 0	14.0402	41.59	Q				
5+15	12.4007	28.87	Q				
5+30	10.9526	19.01	Q				
5+45	9.6737	12.96	Q				
6+ 0	8.5441	10.10	Q				
6+15	7.5464	8.49	Q				
6+30	6.6652	7.28	Q				
6+45	5.8869	6.29	Q				
7+ 0	5.1994	5.47	Q				
7+15	4.5923	4.77	Q				
7+30	4.0560	4.17	Q				
7+45	3.5824	3.66	Q				
8+ 0	3.1641	3.21	Q				
8+15	2.7946	2.83	Q				
8+30	2.4683	2.49	Q				
8+45	2.1801	2.19	Q				
9+ 0	1.9255	1.93	Q				
9+15	1.7006	1.71	Q				
9+30	1.5021	1.51	Q				
9+45	1.3267	1.33	Q				
10+ 0	1.1717	1.17	Q				
10+15	1.0349	1.04	Q				
10+30	0.9141	0.92	Q				
10+45	0.8073	0.81	Q				
11+ 0	0.7131	0.71	Q				
11+15	0.6298	0.63	Q				
11+30	0.5562	0.56	Q				
11+45	0.4913	0.49	Q				
12+ 0	0.4339	0.43	Q				
12+15	0.3833	0.38	Q				
12+30	0.3385	0.34	Q				
12+45	0.2990	0.30	Q				
13+ 0	0.2641	0.26	Q				
13+15	0.2332	0.23	Q				
13+30	0.2060	0.21	Q				
13+45	0.1819	0.18	Q				
14+ 0	0.1607	0.16	Q				
14+15	0.1419	0.14	Q				
14+30	0.1254	0.13	Q				
14+45	0.1107	0.11	Q				
15+ 0	0.0978	0.10	Q				
15+15	0.0864	0.09	Q				
15+30	0.0763	0.08	Q				
15+45	0.0674	0.07	Q				
16+ 0	0.0595	0.06	Q				

```
  16+15       0.0526      0.05  Q         |         |         |         |
  16+30       0.0464      0.05  Q         |         |         |         |
  16+45       0.0410      0.04  Q         |         |         |         |
  17+ 0       0.0362      0.04  Q         |         |         |         |
  17+15       0.0320      0.03  Q         |         |         |         |
  17+30       0.0283      0.03  Q         |         |         |         |
  17+45       0.0250      0.02  Q         |         |         |         |
  18+ 0       0.0220      0.02  Q         |         |         |         |
  18+15       0.0195      0.02  Q         |         |         |         |
  18+30       0.0172      0.02  Q         |         |         |         |
  18+45       0.0152      0.02  Q         |         |         |         |
  19+ 0       0.0134      0.01  Q         |         |         |         |
  19+15       0.0118      0.01  Q         |         |         |         |
  19+30       0.0105      0.01  Q         |         |         |         |
  19+45       0.0092      0.01  Q         |         |         |         |
  20+ 0       0.0082      0.01  Q         |         |         |         |
  20+15       0.0072      0.01  Q         |         |         |         |
  20+30       0.0064      0.01  Q         |         |         |         |
  20+45       0.0056      0.01  Q         |         |         |         |
  21+ 0       0.0050      0.00  Q         |         |         |         |
  21+15       0.0044      0.00  Q         |         |         |         |
  21+30       0.0039      0.00  Q         |         |         |         |
  21+45       0.0034      0.00  Q         |         |         |         |
  22+ 0       0.0030      0.00  Q         |         |         |         |
  22+15       0.0027      0.00  Q         |         |         |         |
  22+30       0.0024      0.00  Q         |         |         |         |
  22+45       0.0021      0.00  Q         |         |         |         |
  23+ 0       0.0018      0.00  Q         |         |         |         |
  23+15       0.0016      0.00  Q         |         |         |         |
  23+30       0.0014      0.00  Q         |         |         |         |
  23+45       0.0013      0.00  Q         |         |         |         |
  24+ 0       0.0011      0.00  Q         |         |         |         |
  24+15       0.0010      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    97
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     1752.187 (CFS)
                      Total volume =     253.360 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       -----------------------------------------------------------------

       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        1.000 to Point/Station        2.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ___________________________________________________________________
       ********************* HYDROGRAPH INFORMATION **********************

                      From study/file name: SUBA2RT.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       -----------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -----------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      450.3     900.5    1350.8    1801.0
  -----------------------------------------------------------------------
    0+15       0.5034     18.79  Q         |         |         |         |
    0+30       1.9414    124.32  q Q       |         |         |         |
    0+45       3.9207    282.73  q     Q   |         |         |         |
    1+ 0       5.9575    401.49  q       Q |         |         |         |
    1+15       8.1552    477.17  q         Q         |         |         |
    1+30      10.7764    578.71  q         | Q       |         |         |
    1+45      13.7828    709.12  q         |    Q    |         |         |
```

```
 2+ 0      17.0875    837.75  q          |        Q |          |          |
 2+15      21.0440    978.34  q          |          |Q         |          |
 2+30      26.6325   1220.28  q          |          |      Q   |          |
 2+45      38.5144   1600.07  q          |          |          |    Q     |
 3+ 0      48.8525   1801.04  |q         |          |          |        Q
 3+15      47.8424   1446.25  |q         |          |          | Q        |
 3+30      41.7103    868.57  q          |         Q|          |          |
 3+45      35.4149    493.50  q         Q          |          |          |
 4+ 0      30.0081    295.36  q     Q    |          |          |          |
 4+15      28.1988    181.45  q   Q      |          |          |          |
 4+30      26.5032    116.08  q Q        |          |          |          |
 4+45      24.9096     83.44  qQ         |          |          |          |
 5+ 0      23.4118     65.01  qQ         |          |          |          |
 5+15      22.0040     50.88  qQ         |          |          |          |
 5+30      20.6809     39.69  Q          |          |          |          |
 5+45      19.4374     32.39  Q          |          |          |          |
 6+ 0      18.2686     28.36  Q          |          |          |          |
 6+15      17.1701     25.66  Q          |          |          |          |
 6+30      16.1377     23.42  Q          |          |          |          |
 6+45      15.1673     21.46  Q          |          |          |          |
 7+ 0      14.2553     19.72  Q          |          |          |          |
 7+15      13.3981     18.17  Q          |          |          |          |
 7+30      12.5925     16.76  Q          |          |          |          |
 7+45      11.8353     15.49  Q          |          |          |          |
 8+ 0      11.1237     14.34  Q          |          |          |          |
 8+15      10.4548     13.28  Q          |          |          |          |
 8+30       9.8261     12.32  Q          |          |          |          |
 8+45       9.2353     11.43  Q          |          |          |          |
 9+ 0       8.6800     10.61  Q          |          |          |          |
 9+15       8.1581      9.86  Q          |          |          |          |
 9+30       7.6675      9.17  Q          |          |          |          |
 9+45       7.2065      8.54  Q          |          |          |          |
10+ 0       6.7731      7.95  Q          |          |          |          |
10+15       6.3659      7.40  Q          |          |          |          |
10+30       5.9831      6.90  Q          |          |          |          |
10+45       5.6233      6.43  Q          |          |          |          |
11+ 0       5.2852      6.00  Q          |          |          |          |
11+15       4.9674      5.60  Q          |          |          |          |
11+30       4.6687      5.22  Q          |          |          |          |
11+45       4.3880      4.88  Q          |          |          |          |
12+ 0       4.1241      4.56  Q          |          |          |          |
12+15       3.8761      4.26  Q          |          |          |          |
12+30       3.6431      3.98  Q          |          |          |          |
12+45       3.4240      3.72  Q          |          |          |          |
13+ 0       3.2181      3.48  Q          |          |          |          |
13+15       3.0246      3.26  Q          |          |          |          |
13+30       2.8428      3.05  Q          |          |          |          |
13+45       2.6718      2.85  Q          |          |          |          |
14+ 0       2.5112      2.67  Q          |          |          |          |
14+15       2.3602      2.50  Q          |          |          |          |
14+30       2.2183      2.34  Q          |          |          |          |
14+45       2.0849      2.20  Q          |          |          |          |
15+ 0       1.9595      2.06  Q          |          |          |          |
15+15       1.8417      1.93  Q          |          |          |          |
15+30       1.7309      1.81  Q          |          |          |          |
15+45       1.6269      1.69  Q          |          |          |          |
16+ 0       1.5290      1.59  Q          |          |          |          |
16+15       1.4371      1.49  Q          |          |          |          |
16+30       1.3507      1.40  Q          |          |          |          |
16+45       1.2695      1.31  Q          |          |          |          |
17+ 0       1.1931      1.23  Q          |          |          |          |
17+15       1.1214      1.15  Q          |          |          |          |
17+30       1.0540      1.08  Q          |          |          |          |
17+45       0.9906      1.02  Q          |          |          |          |
18+ 0       0.9310      0.95  Q          |          |          |          |
18+15       0.8750      0.89  Q          |          |          |          |
18+30       0.8224      0.84  Q          |          |          |          |
18+45       0.7730      0.79  Q          |          |          |          |
19+ 0       0.7265      0.74  Q          |          |          |          |
19+15       0.6828      0.69  Q          |          |          |          |
19+30       0.6418      0.65  Q          |          |          |          |
```

19+45	0.6032	0.61	Q	|	|	|	|
20+ 0	0.5669	0.58	Q	|	|	|	|
20+15	0.5328	0.54	Q	|	|	|	|
20+30	0.5008	0.51	Q	|	|	|	|
20+45	0.4707	0.48	Q	|	|	|	|
21+ 0	0.4424	0.45	Q	|	|	|	|
21+15	0.4158	0.42	Q	|	|	|	|
21+30	0.3908	0.39	Q	|	|	|	|
21+45	0.3673	0.37	Q	|	|	|	|
22+ 0	0.3452	0.35	Q	|	|	|	|
22+15	0.3244	0.33	Q	|	|	|	|
22+30	0.3049	0.31	Q	|	|	|	|
22+45	0.2866	0.29	Q	|	|	|	|
23+ 0	0.2693	0.27	Q	|	|	|	|
23+15	0.2532	0.25	Q	|	|	|	|
23+30	0.2379	0.24	Q	|	|	|	|
23+45	0.2236	0.22	Q	|	|	|	|
24+ 0	0.2102	0.21	Q	|	|	|	|
24+15	0.1975	0.20	Q	|	|	|	|
24+30	0.1857	0.19	Q	|	|	|	|
24+45	0.1745	0.17	Q	|	|	|	|
25+ 0	0.1640	0.16	Q	|	|	|	|
25+15	0.1541	0.15	Q	|	|	|	|
25+30	0.1449	0.14	Q	|	|	|	|
25+45	0.1362	0.14	Q	|	|	|	|
26+ 0	0.1280	0.13	Q	|	|	|	|
26+15	0.1203	0.12	Q	|	|	|	|
26+30	0.1130	0.11	Q	|	|	|	|
26+45	0.1063	0.11	Q	|	|	|	|
27+ 0	0.0999	0.10	Q	|	|	|	|
27+15	0.0939	0.09	Q	|	|	|	|
27+30	0.0882	0.09	Q	|	|	|	|
27+45	0.0829	0.08	Q	|	|	|	|
28+ 0	0.0779	0.08	Q	|	|	|	|
28+15	0.0732	0.07	Q	|	|	|	|
28+30	0.0688	0.07	Q	|	|	|	|
28+45	0.0647	0.06	Q	|	|	|	|
29+ 0	0.0608	0.06	Q	|	|	|	|
29+15	0.0571	0.06	Q	|	|	|	|
29+30	0.0537	0.05	Q	|	|	|	|
29+45	0.0505	0.05	Q	|	|	|	|
30+ 0	0.0474	0.05	Q	|	|	|	|
30+15	0.0446	0.04	Q	|	|	|	|
30+30	0.0419	0.04	Q	|	|	|	|
30+45	0.0394	0.04	Q	|	|	|	|
31+ 0	0.0370	0.04	Q	|	|	|	|
31+15	0.0348	0.03	Q	|	|	|	|
31+30	0.0327	0.03	Q	|	|	|	|
31+45	0.0307	0.03	Q	|	|	|	|
32+ 0	0.0289	0.03	Q	|	|	|	|
32+15	0.0272	0.03	Q	|	|	|	|
32+30	0.0255	0.03	Q	|	|	|	|
32+45	0.0240	0.02	Q	|	|	|	|
33+ 0	0.0225	0.02	Q	|	|	|	|
33+15	0.0212	0.02	Q	|	|	|	|
33+30	0.0199	0.02	Q	|	|	|	|
33+45	0.0187	0.02	Q	|	|	|	|
34+ 0	0.0176	0.02	Q	|	|	|	|
34+15	0.0165	0.02	Q	|	|	|	|
34+30	0.0155	0.02	Q	|	|	|	|
34+45	0.0146	0.01	Q	|	|	|	|
35+ 0	0.0137	0.01	Q	|	|	|	|
35+15	0.0129	0.01	Q	|	|	|	|
35+30	0.0121	0.01	Q	|	|	|	|
35+45	0.0114	0.01	Q	|	|	|	|
36+ 0	0.0107	0.01	Q	|	|	|	|
36+15	0.0101	0.01	Q	|	|	|	|
36+30	0.0095	0.01	Q	|	|	|	|
36+45	0.0089	0.01	Q	|	|	|	|
37+ 0	0.0084	0.01	Q	|	|	|	|
37+15	0.0079	0.01	Q	|	|	|	|

```
   37+30       0.0074      0.01  Q         |         |         |         |
   37+45       0.0069      0.01  Q         |         |         |         |
   38+ 0       0.0065      0.01  Q         |         |         |         |
   38+15       0.0061      0.01  Q         |         |         |         |
   38+30       0.0058      0.01  Q         |         |         |         |
   38+45       0.0054      0.01  Q         |         |         |         |
   39+ 0       0.0051      0.01  Q         |         |         |         |
   39+15       0.0048      0.00  Q         |         |         |         |
   39+30       0.0045      0.00  Q         |         |         |         |
   39+45       0.0042      0.00  Q         |         |         |         |
   40+ 0       0.0040      0.00  Q         |         |         |         |
   40+15       0.0037      0.00  Q         |         |         |         |
   40+30       0.0035      0.00  Q         |         |         |         |
   40+45       0.0033      0.00  Q         |         |         |         |
   41+ 0       0.0031      0.00  Q         |         |         |         |
   41+15       0.0029      0.00  Q         |         |         |         |
   41+30       0.0027      0.00  Q         |         |         |         |
   41+45       0.0026      0.00  Q         |         |         |         |
   42+ 0       0.0024      0.00  Q         |         |         |         |
   42+15       0.0023      0.00  Q         |         |         |         |
   42+30       0.0021      0.00  Q         |         |         |         |
   42+45       0.0020      0.00  Q         |         |         |         |
   43+ 0       0.0019      0.00  Q         |         |         |         |
   43+15       0.0018      0.00  Q         |         |         |         |
   43+30       0.0017      0.00  Q         |         |         |         |
   43+45       0.0016      0.00  Q         |         |         |         |
   44+ 0       0.0015      0.00  Q         |         |         |         |
   44+15       0.0014      0.00  Q         |         |         |         |
   44+30       0.0013      0.00  Q         |         |         |         |
   44+45       0.0012      0.00  Q         |         |         |         |
   45+ 0       0.0011      0.00  Q         |         |         |         |
   45+15       0.0011      0.00  Q         |         |         |         |
   45+30       0.0010      0.00  Q         |         |         |         |
   45+45       0.0010      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   183
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     1801.040 (CFS)
                      Total volume =     270.324 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       _____________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   1600.00 (Ft.)
       Elevation difference =   32.00 (Ft.)
       Slope of channel =  0.020000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  1600.00(Ft.)     Elevation difference =  32.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =   10.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =   10.000(Ft.)
       Flow(q) thru subarea =    805.852(CFS)
       Depth of flow =     2.818(Ft.)
       Average velocity =    22.313(Ft/s)
```

```
Total flow rate =   805.852(CFS)
Channel flow top width =   15.635(Ft.)
Depth of flow in channel =   2.82(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   22.31(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  805.852(CFS)
Total capacity of improved channels =    805.852(CFS)
Critical Depth in Channel =    4.94(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1801.040(CFS)
Depth of flow =     4.438(Ft.)
Average velocity =    28.105(Ft/s)
Total flow rate =  1801.040(CFS)
Channel flow top width =   18.877(Ft.)
Depth of flow in channel =   4.44(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   28.11(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1801.040(CFS)
Total capacity of improved channels =   1801.040(CFS)
Critical Depth in Channel =    7.75(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9430   Travel time =   0.95 (min.)
        dt*(unit time interval) =  15.00(min.),  e=  11.5104
        dt(routing time-step) =   0.89 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      450.3     900.5    1350.8    1801.0
----------------------------------------------------------------------
  0+15      17.6706     18.79  O         |         |         |         |
  0+30     118.0272    124.32  | O       |         |         |         |
  0+45     273.2856    282.73  |     O   |         |         |         |
  1+ 0     394.4070    401.49  |       O |         |         |         |
  1+15     472.6589    477.17  |         O         |         |         |
  1+30     572.6578    578.71  |         | O       |         |         |
  1+45     701.3450    709.12  |         |    O    |         |         |
  2+ 0     830.0758    837.75  |         |       O |         |         |
  2+15     969.9524    978.34  |         |         |O        |         |
  2+30    1205.8530   1220.28  |         |         |     OI  |         |
  2+45    1577.4213   1600.07  |         |         |         |    O    |
  3+ 0    1789.0529   1801.04  |         |         |         |        OI
  3+15    1467.4093   1446.25  |         |         |         | O       |
  3+30     903.0249    868.57  |         |        IO         |         |
  3+45     515.8721    493.50  |         IO        |         |         |
  4+ 0     307.1785    295.36  |     O   |         |         |         |
  4+15     188.2403    181.45  |   O     |         |         |         |
  4+30     119.9776    116.08  | O       |         |         |         |
  4+45      85.3856     83.44  |O        |         |         |         |
  5+ 0      66.1056     65.01  |O        |         |         |         |
  5+15      51.7205     50.88  |O        |         |         |         |
  5+30      40.3569     39.69  O         |         |         |         |
  5+45      32.8294     32.39  O         |         |         |         |
```

6+ 0	28.6041	28.36	O	|	|	|	|
6+15	25.8222	25.66	O	|	|	|	|
6+30	23.5542	23.42	O	|	|	|	|
6+45	21.5772	21.46	O	|	|	|	|
7+ 0	19.8254	19.72	O	|	|	|	|
7+15	18.2587	18.17	O	|	|	|	|
7+30	16.8476	16.76	O	|	|	|	|
7+45	15.5694	15.49	O	|	|	|	|
8+ 0	14.4066	14.34	O	|	|	|	|
8+15	13.3451	13.28	O	|	|	|	|
8+30	12.3736	12.32	O	|	|	|	|
8+45	11.4824	11.43	O	|	|	|	|
9+ 0	10.6634	10.61	O	|	|	|	|
9+15	9.9096	9.86	O	|	|	|	|
9+30	9.2148	9.17	O	|	|	|	|
9+45	8.5738	8.54	O	|	|	|	|
10+ 0	7.9818	7.95	O	|	|	|	|
10+15	7.4344	7.40	O	|	|	|	|
10+30	6.9282	6.90	O	|	|	|	|
10+45	6.4585	6.43	O	|	|	|	|
11+ 0	6.0240	6.00	O	|	|	|	|
11+15	5.6211	5.60	O	|	|	|	|
11+30	5.2472	5.22	O	|	|	|	|
11+45	4.8999	4.88	O	|	|	|	|
12+ 0	4.5772	4.56	O	|	|	|	|
12+15	4.2772	4.26	O	|	|	|	|
12+30	3.9981	3.98	O	|	|	|	|
12+45	3.7384	3.72	O	|	|	|	|
13+ 0	3.4966	3.48	O	|	|	|	|
13+15	3.2712	3.26	O	|	|	|	|
13+30	3.0612	3.05	O	|	|	|	|
13+45	2.8654	2.85	O	|	|	|	|
14+ 0	2.6827	2.67	O	|	|	|	|
14+15	2.5122	2.50	O	|	|	|	|
14+30	2.3531	2.34	O	|	|	|	|
14+45	2.2044	2.20	O	|	|	|	|
15+ 0	2.0655	2.06	O	|	|	|	|
15+15	1.9358	1.93	O	|	|	|	|
15+30	1.8144	1.81	O	|	|	|	|
15+45	1.7010	1.69	O	|	|	|	|
16+ 0	1.5948	1.59	O	|	|	|	|
16+15	1.4956	1.49	O	|	|	|	|
16+30	1.4026	1.40	O	|	|	|	|
16+45	1.3156	1.31	O	|	|	|	|
17+ 0	1.2342	1.23	O	|	|	|	|
17+15	1.1579	1.15	O	|	|	|	|
17+30	1.0865	1.08	O	|	|	|	|
17+45	1.0195	1.02	O	|	|	|	|
18+ 0	0.9568	0.95	O	|	|	|	|
18+15	0.8980	0.89	O	|	|	|	|
18+30	0.8429	0.84	O	|	|	|	|
18+45	0.7912	0.79	O	|	|	|	|
19+ 0	0.7428	0.74	O	|	|	|	|
19+15	0.6974	0.69	O	|	|	|	|
19+30	0.6547	0.65	O	|	|	|	|
19+45	0.6148	0.61	O	|	|	|	|
20+ 0	0.5773	0.58	O	|	|	|	|
20+15	0.5421	0.54	O	|	|	|	|
20+30	0.5091	0.51	O	|	|	|	|
20+45	0.4781	0.48	O	|	|	|	|
21+ 0	0.4491	0.45	O	|	|	|	|
21+15	0.4218	0.42	O	|	|	|	|
21+30	0.3962	0.39	O	|	|	|	|
21+45	0.3721	0.37	O	|	|	|	|
22+ 0	0.3495	0.35	O	|	|	|	|
22+15	0.3284	0.33	O	|	|	|	|
22+30	0.3085	0.31	O	|	|	|	|
22+45	0.2898	0.29	O	|	|	|	|
23+ 0	0.2722	0.27	O	|	|	|	|
23+15	0.2558	0.25	O	|	|	|	|
23+30	0.2403	0.24	O	|	|	|	|

23+45	0.2258	0.22	O	|	|	|	|
24+ 0	0.2121	0.21	O	|	|	|	|
24+15	0.1993	0.20	O	|	|	|	|
24+30	0.1864	0.19	O	|	|	|	|
24+45	0.1752	0.17	O	|	|	|	|
25+ 0	0.1646	0.16	O	|	|	|	|
25+15	0.1547	0.15	O	|	|	|	|
25+30	0.1454	0.14	O	|	|	|	|
25+45	0.1367	0.14	O	|	|	|	|
26+ 0	0.1285	0.13	O	|	|	|	|
26+15	0.1207	0.12	O	|	|	|	|
26+30	0.1135	0.11	O	|	|	|	|
26+45	0.1067	0.11	O	|	|	|	|
27+ 0	0.1002	0.10	O	|	|	|	|
27+15	0.0942	0.09	O	|	|	|	|
27+30	0.0886	0.09	O	|	|	|	|
27+45	0.0832	0.08	O	|	|	|	|
28+ 0	0.0782	0.08	O	|	|	|	|
28+15	0.0735	0.07	O	|	|	|	|
28+30	0.0691	0.07	O	|	|	|	|
28+45	0.0649	0.06	O	|	|	|	|
29+ 0	0.0610	0.06	O	|	|	|	|
29+15	0.0574	0.06	O	|	|	|	|
29+30	0.0539	0.05	O	|	|	|	|
29+45	0.0507	0.05	O	|	|	|	|
30+ 0	0.0476	0.05	O	|	|	|	|
30+15	0.0448	0.04	O	|	|	|	|
30+30	0.0421	0.04	O	|	|	|	|
30+45	0.0395	0.04	O	|	|	|	|
31+ 0	0.0372	0.04	O	|	|	|	|
31+15	0.0349	0.03	O	|	|	|	|
31+30	0.0328	0.03	O	|	|	|	|
31+45	0.0309	0.03	O	|	|	|	|
32+ 0	0.0290	0.03	O	|	|	|	|
32+15	0.0273	0.03	O	|	|	|	|
32+30	0.0256	0.03	O	|	|	|	|
32+45	0.0241	0.02	O	|	|	|	|
33+ 0	0.0226	0.02	O	|	|	|	|
33+15	0.0213	0.02	O	|	|	|	|
33+30	0.0200	0.02	O	|	|	|	|
33+45	0.0188	0.02	O	|	|	|	|
34+ 0	0.0177	0.02	O	|	|	|	|
34+15	0.0166	0.02	O	|	|	|	|
34+30	0.0156	0.02	O	|	|	|	|
34+45	0.0147	0.01	O	|	|	|	|
35+ 0	0.0138	0.01	O	|	|	|	|
35+15	0.0130	0.01	O	|	|	|	|
35+30	0.0122	0.01	O	|	|	|	|
35+45	0.0114	0.01	O	|	|	|	|
36+ 0	0.0108	0.01	O	|	|	|	|
36+15	0.0101	0.01	O	|	|	|	|
36+30	0.0095	0.01	O	|	|	|	|
36+45	0.0089	0.01	O	|	|	|	|
37+ 0	0.0084	0.01	O	|	|	|	|
37+15	0.0079	0.01	O	|	|	|	|
37+30	0.0074	0.01	O	|	|	|	|
37+45	0.0070	0.01	O	|	|	|	|
38+ 0	0.0065	0.01	O	|	|	|	|
38+15	0.0062	0.01	O	|	|	|	|
38+30	0.0058	0.01	O	|	|	|	|
38+45	0.0054	0.01	O	|	|	|	|
39+ 0	0.0051	0.01	O	|	|	|	|
39+15	0.0048	0.00	O	|	|	|	|
39+30	0.0045	0.00	O	|	|	|	|
39+45	0.0042	0.00	O	|	|	|	|
40+ 0	0.0040	0.00	O	|	|	|	|
40+15	0.0037	0.00	O	|	|	|	|
40+30	0.0035	0.00	O	|	|	|	|
40+45	0.0033	0.00	O	|	|	|	|
41+ 0	0.0031	0.00	O	|	|	|	|
41+15	0.0029	0.00	O	|	|	|	|

```
  41+30       0.0027      0.00  O         |         |         |         |
  41+45       0.0026      0.00  O         |         |         |         |
  42+ 0       0.0024      0.00  O         |         |         |         |
  42+15       0.0023      0.00  O         |         |         |         |
  42+30       0.0021      0.00  O         |         |         |         |
  42+45       0.0020      0.00  O         |         |         |         |
  43+ 0       0.0019      0.00  O         |         |         |         |
  43+15       0.0018      0.00  O         |         |         |         |
  43+30       0.0017      0.00  O         |         |         |         |
  43+45       0.0016      0.00  O         |         |         |         |
  44+ 0       0.0015      0.00  O         |         |         |         |
  44+15       0.0014      0.00  O         |         |         |         |
  44+30       0.0013      0.00  O         |         |         |         |
  44+45       0.0012      0.00  O         |         |         |         |
  45+ 0       0.0012      0.00  O         |         |         |         |
  45+15       0.0011      0.00  O         |         |         |         |
  45+30       0.0010      0.00  O         |         |         |         |
  45+45       0.0010      0.00  O         |         |         |         |
  46+ 0       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =   184
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =     1789.053 (CFS)
                    Total volume =     270.324 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ---------------------------------------------------------------------


      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ____________________________________________________________________
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA3RT.rte
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      -------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      -------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      454.5     908.9    1363.4    1817.9
 ----------------------------------------------------------------------
   0+15       0.3831     18.05  Q         |         |         |         |
   0+30       1.4807    119.51  q Q       |         |         |         |
   0+45       2.9913    276.28  q     Q   |         |         |         |
   1+ 0       4.5457    398.95  q       Q |         |         |         |
   1+15       6.2231    478.88  q         Q         |         |         |
   1+30       8.2236    580.88  q         | Q       |         |         |
   1+45      10.5180    711.86  q         |    Q    |         |         |
   2+ 0      13.0401    843.12  q         |       Q |         |         |
   2+15      16.0596    986.01  q         |         |Q        |         |
   2+30      20.3246   1226.18  q         |         |     Q   |         |
   2+45      25.4538   1602.88  q         |         |         |    Q    |
   3+ 0      28.7980   1817.85  q         |         |         |         Q
   3+15      29.0046   1496.41  q         |         |         | Q       |
   3+30      27.6129    930.64  q         |         Q         |         |
   3+45      25.9744    541.85  q         |Q        |         |         |
   4+ 0      24.4125    331.59  q      Q  |         |         |         |
   4+15      22.9446    211.18  q   Q     |         |         |         |
   4+30      21.5649    141.54  q  Q      |         |         |         |
   4+45      20.2682    105.65  q Q       |         |         |         |
   5+ 0      19.0495     85.16  qQ        |         |         |         |
   5+15      17.9041     69.62  qQ        |         |         |         |
```

5+30	16.8275	57.18	qQ	|	|	|	|
5+45	15.8157	48.65	qQ	|	|	|	|
6+ 0	14.8647	43.47	Q	|	|	|	|
6+15	13.9709	39.79	Q	|	|	|	|
6+30	13.1308	36.68	Q	|	|	|	|
6+45	12.3412	33.92	Q	|	|	|	|
7+ 0	11.5992	31.42	Q	|	|	|	|
7+15	10.9017	29.16	Q	|	|	|	|
7+30	10.2462	27.09	Q	|	|	|	|
7+45	9.6301	25.20	Q	|	|	|	|
8+ 0	9.0510	23.46	Q	|	|	|	|
8+15	8.5068	21.85	Q	|	|	|	|
8+30	7.9953	20.37	Q	|	|	|	|
8+45	7.5145	19.00	Q	|	|	|	|
9+ 0	7.0627	17.73	Q	|	|	|	|
9+15	6.6380	16.55	Q	|	|	|	|
9+30	6.2388	15.45	Q	|	|	|	|
9+45	5.8637	14.44	Q	|	|	|	|
10+ 0	5.5111	13.49	Q	|	|	|	|
10+15	5.1797	12.61	Q	|	|	|	|
10+30	4.8683	11.80	Q	|	|	|	|
10+45	4.5756	11.03	Q	|	|	|	|
11+ 0	4.3004	10.32	Q	|	|	|	|
11+15	4.0418	9.66	Q	|	|	|	|
11+30	3.7988	9.05	Q	|	|	|	|
11+45	3.5704	8.47	Q	|	|	|	|
12+ 0	3.3557	7.93	Q	|	|	|	|
12+15	3.1539	7.43	Q	|	|	|	|
12+30	2.9643	6.96	Q	|	|	|	|
12+45	2.7860	6.52	Q	|	|	|	|
13+ 0	2.6185	6.12	Q	|	|	|	|
13+15	2.4611	5.73	Q	|	|	|	|
13+30	2.3131	5.37	Q	|	|	|	|
13+45	2.1740	5.04	Q	|	|	|	|
14+ 0	2.0433	4.73	Q	|	|	|	|
14+15	1.9204	4.43	Q	|	|	|	|
14+30	1.8049	4.16	Q	|	|	|	|
14+45	1.6964	3.90	Q	|	|	|	|
15+ 0	1.5944	3.66	Q	|	|	|	|
15+15	1.4985	3.43	Q	|	|	|	|
15+30	1.4084	3.22	Q	|	|	|	|
15+45	1.3237	3.02	Q	|	|	|	|
16+ 0	1.2441	2.84	Q	|	|	|	|
16+15	1.1693	2.66	Q	|	|	|	|
16+30	1.0990	2.50	Q	|	|	|	|
16+45	1.0329	2.35	Q	|	|	|	|
17+ 0	0.9708	2.21	Q	|	|	|	|
17+15	0.9124	2.07	Q	|	|	|	|
17+30	0.8576	1.94	Q	|	|	|	|
17+45	0.8060	1.83	Q	|	|	|	|
18+ 0	0.7575	1.71	Q	|	|	|	|
18+15	0.7120	1.61	Q	|	|	|	|
18+30	0.6692	1.51	Q	|	|	|	|
18+45	0.6289	1.42	Q	|	|	|	|
19+ 0	0.5911	1.33	Q	|	|	|	|
19+15	0.5556	1.25	Q	|	|	|	|
19+30	0.5222	1.18	Q	|	|	|	|
19+45	0.4908	1.11	Q	|	|	|	|
20+ 0	0.4613	1.04	Q	|	|	|	|
20+15	0.4335	0.98	Q	|	|	|	|
20+30	0.4075	0.92	Q	|	|	|	|
20+45	0.3830	0.86	Q	|	|	|	|
21+ 0	0.3599	0.81	Q	|	|	|	|
21+15	0.3383	0.76	Q	|	|	|	|
21+30	0.3180	0.71	Q	|	|	|	|
21+45	0.2988	0.67	Q	|	|	|	|
22+ 0	0.2809	0.63	Q	|	|	|	|
22+15	0.2640	0.59	Q	|	|	|	|
22+30	0.2481	0.56	Q	|	|	|	|
22+45	0.2332	0.52	Q	|	|	|	|
23+ 0	0.2192	0.49	Q	|	|	|	|

23+15	0.2060	0.46	Q	|	|	|	|
23+30	0.1936	0.43	Q	|	|	|	|
23+45	0.1820	0.41	Q	|	|	|	|
24+ 0	0.1710	0.38	Q	|	|	|	|
24+15	0.1607	0.36	Q	|	|	|	|
24+30	0.1511	0.34	Q	|	|	|	|
24+45	0.1420	0.32	Q	|	|	|	|
25+ 0	0.1334	0.30	Q	|	|	|	|
25+15	0.1254	0.28	Q	|	|	|	|
25+30	0.1179	0.26	Q	|	|	|	|
25+45	0.1108	0.25	Q	|	|	|	|
26+ 0	0.1041	0.23	Q	|	|	|	|
26+15	0.0979	0.22	Q	|	|	|	|
26+30	0.0920	0.21	Q	|	|	|	|
26+45	0.0865	0.19	Q	|	|	|	|
27+ 0	0.0813	0.18	Q	|	|	|	|
27+15	0.0764	0.17	Q	|	|	|	|
27+30	0.0718	0.16	Q	|	|	|	|
27+45	0.0675	0.15	Q	|	|	|	|
28+ 0	0.0634	0.14	Q	|	|	|	|
28+15	0.0596	0.13	Q	|	|	|	|
28+30	0.0560	0.13	Q	|	|	|	|
28+45	0.0526	0.12	Q	|	|	|	|
29+ 0	0.0495	0.11	Q	|	|	|	|
29+15	0.0465	0.10	Q	|	|	|	|
29+30	0.0437	0.10	Q	|	|	|	|
29+45	0.0411	0.09	Q	|	|	|	|
30+ 0	0.0386	0.09	Q	|	|	|	|
30+15	0.0363	0.08	Q	|	|	|	|
30+30	0.0341	0.08	Q	|	|	|	|
30+45	0.0321	0.07	Q	|	|	|	|
31+ 0	0.0301	0.07	Q	|	|	|	|
31+15	0.0283	0.06	Q	|	|	|	|
31+30	0.0266	0.06	Q	|	|	|	|
31+45	0.0250	0.06	Q	|	|	|	|
32+ 0	0.0235	0.05	Q	|	|	|	|
32+15	0.0221	0.05	Q	|	|	|	|
32+30	0.0208	0.05	Q	|	|	|	|
32+45	0.0195	0.04	Q	|	|	|	|
33+ 0	0.0183	0.04	Q	|	|	|	|
33+15	0.0172	0.04	Q	|	|	|	|
33+30	0.0162	0.04	Q	|	|	|	|
33+45	0.0152	0.03	Q	|	|	|	|
34+ 0	0.0143	0.03	Q	|	|	|	|
34+15	0.0135	0.03	Q	|	|	|	|
34+30	0.0126	0.03	Q	|	|	|	|
34+45	0.0119	0.03	Q	|	|	|	|
35+ 0	0.0112	0.02	Q	|	|	|	|
35+15	0.0105	0.02	Q	|	|	|	|
35+30	0.0099	0.02	Q	|	|	|	|
35+45	0.0093	0.02	Q	|	|	|	|
36+ 0	0.0087	0.02	Q	|	|	|	|
36+15	0.0082	0.02	Q	|	|	|	|
36+30	0.0077	0.02	Q	|	|	|	|
36+45	0.0072	0.02	Q	|	|	|	|
37+ 0	0.0068	0.02	Q	|	|	|	|
37+15	0.0064	0.01	Q	|	|	|	|
37+30	0.0060	0.01	Q	|	|	|	|
37+45	0.0056	0.01	Q	|	|	|	|
38+ 0	0.0053	0.01	Q	|	|	|	|
38+15	0.0050	0.01	Q	|	|	|	|
38+30	0.0047	0.01	Q	|	|	|	|
38+45	0.0044	0.01	Q	|	|	|	|
39+ 0	0.0041	0.01	Q	|	|	|	|
39+15	0.0039	0.01	Q	|	|	|	|
39+30	0.0037	0.01	Q	|	|	|	|
39+45	0.0034	0.01	Q	|	|	|	|
40+ 0	0.0032	0.01	Q	|	|	|	|
40+15	0.0030	0.01	Q	|	|	|	|
40+30	0.0029	0.01	Q	|	|	|	|
40+45	0.0027	0.01	Q	|	|	|	|

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  41+ 0       0.0025      0.01  Q         |         |         |         |
  41+15       0.0024      0.01  Q         |         |         |         |
  41+30       0.0022      0.00  Q         |         |         |         |
  41+45       0.0021      0.00  Q         |         |         |         |
  42+ 0       0.0020      0.00  Q         |         |         |         |
  42+15       0.0018      0.00  Q         |         |         |         |
  42+30       0.0017      0.00  Q         |         |         |         |
  42+45       0.0016      0.00  Q         |         |         |         |
  43+ 0       0.0015      0.00  Q         |         |         |         |
  43+15       0.0014      0.00  Q         |         |         |         |
  43+30       0.0014      0.00  Q         |         |         |         |
  43+45       0.0013      0.00  Q         |         |         |         |
  44+ 0       0.0012      0.00  Q         |         |         |         |
  44+15       0.0011      0.00  Q         |         |         |         |
  44+30       0.0011      0.00  Q         |         |         |         |
  44+45       0.0010      0.00  Q         |         |         |         |
  45+ 0       0.0000      0.00  Q         |         |         |         |
  45+15       0.0000      0.00  Q         |         |         |         |
  45+30       0.0000      0.00  Q         |         |         |         |
  45+45       0.0000      0.00  Q         |         |         |         |
  46+ 0       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =   184
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =     1817.851 (CFS)
                    Total volume =     283.271 (Ac.Ft)
             Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION *********************

                    From study/file name: SUBA4RT.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

      ----------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      473.8     947.7    1421.5    1895.4
 ----------------------------------------------------------------------
   0+15       0.9924     19.05  Q         |         |         |         |
   0+30       3.8074    123.32  q Q       |         |         |         |
   0+45       7.6591    283.94  q    Q    |         |         |         |
   1+ 0      11.5887    410.54  q       Q |         |         |         |
   1+15      15.8010    494.68  q         Q         |         |         |
   1+30      20.8106    601.69  q         | Q       |         |         |
   1+45      26.5370    738.40  q         |    Q    |         |         |
   2+ 0      32.8049    875.92  q         |       Q |         |         |
   2+15      40.3062   1026.32  q         |         |Q        |         |
   2+30      50.9576   1277.14  |q        |         |     Q   |         |
   2+45      63.7503   1666.63  |q        |         |         |    Q    |
   3+ 0      77.5156   1895.37  |q        |         |         |         Q
   3+15      75.8037   1572.22  |q        |         |         |  Q      |
   3+30      67.0439    997.68  |q        |         |Q        |         |
   3+45      62.4207    604.27  |q        | Q       |         |         |
   4+ 0      58.0639    389.65  |q      Q |         |         |         |
   4+15      54.0113    265.20  |q   Q    |         |         |         |
   4+30      50.2415    191.78  |q  Q     |         |         |         |
   4+45      46.7348    152.39  q  Q      |         |         |         |
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5+ 0	43.4729	128.63	q Q	|	|	|	|
5+15	40.4386	110.06	q Q	|	|	|	|
5+30	37.6162	94.80	q Q	|	|	|	|
5+45	34.9907	83.64	qQ	|	|	|	|
6+ 0	32.5485	76.02	qQ	|	|	|	|
6+15	30.2767	70.07	qQ	|	|	|	|
6+30	28.1635	64.85	qQ	|	|	|	|
6+45	26.1978	60.12	qQ	|	|	|	|
7+ 0	24.3693	55.79	qQ	|	|	|	|
7+15	22.6684	51.83	qQ	|	|	|	|
7+30	21.0862	48.18	qQ	|	|	|	|
7+45	19.6145	44.81	Q	|	|	|	|
8+ 0	18.2455	41.70	Q	|	|	|	|
8+15	16.9720	38.82	Q	|	|	|	|
8+30	15.7874	36.16	Q	|	|	|	|
8+45	14.6855	33.68	Q	|	|	|	|
9+ 0	13.6605	31.39	Q	|	|	|	|
9+15	12.7071	29.25	Q	|	|	|	|
9+30	11.8201	27.27	Q	|	|	|	|
9+45	10.9951	25.43	Q	|	|	|	|
10+ 0	10.2277	23.72	Q	|	|	|	|
10+15	9.5139	22.13	Q	|	|	|	|
10+30	8.8498	20.65	Q	|	|	|	|
10+45	8.2321	19.27	Q	|	|	|	|
11+ 0	7.6576	17.98	Q	|	|	|	|
11+15	7.1231	16.79	Q	|	|	|	|
11+30	6.6259	15.67	Q	|	|	|	|
11+45	6.1635	14.63	Q	|	|	|	|
12+ 0	5.7333	13.67	Q	|	|	|	|
12+15	5.3331	12.76	Q	|	|	|	|
12+30	4.9609	11.92	Q	|	|	|	|
12+45	4.6146	11.14	Q	|	|	|	|
13+ 0	4.2925	10.41	Q	|	|	|	|
13+15	3.9929	9.73	Q	|	|	|	|
13+30	3.7142	9.09	Q	|	|	|	|
13+45	3.4550	8.49	Q	|	|	|	|
14+ 0	3.2139	7.94	Q	|	|	|	|
14+15	2.9895	7.42	Q	|	|	|	|
14+30	2.7809	6.94	Q	|	|	|	|
14+45	2.5868	6.49	Q	|	|	|	|
15+ 0	2.4062	6.07	Q	|	|	|	|
15+15	2.2383	5.67	Q	|	|	|	|
15+30	2.0821	5.30	Q	|	|	|	|
15+45	1.9367	4.96	Q	|	|	|	|
16+ 0	1.8016	4.64	Q	|	|	|	|
16+15	1.6758	4.34	Q	|	|	|	|
16+30	1.5589	4.06	Q	|	|	|	|
16+45	1.4501	3.80	Q	|	|	|	|
17+ 0	1.3488	3.55	Q	|	|	|	|
17+15	1.2547	3.33	Q	|	|	|	|
17+30	1.1671	3.11	Q	|	|	|	|
17+45	1.0857	2.91	Q	|	|	|	|
18+ 0	1.0099	2.72	Q	|	|	|	|
18+15	0.9394	2.55	Q	|	|	|	|
18+30	0.8738	2.39	Q	|	|	|	|
18+45	0.8128	2.23	Q	|	|	|	|
19+ 0	0.7561	2.09	Q	|	|	|	|
19+15	0.7033	1.96	Q	|	|	|	|
19+30	0.6542	1.83	Q	|	|	|	|
19+45	0.6086	1.71	Q	|	|	|	|
20+ 0	0.5661	1.60	Q	|	|	|	|
20+15	0.5266	1.50	Q	|	|	|	|
20+30	0.4898	1.41	Q	|	|	|	|
20+45	0.4557	1.32	Q	|	|	|	|
21+ 0	0.4238	1.23	Q	|	|	|	|
21+15	0.3943	1.15	Q	|	|	|	|
21+30	0.3667	1.08	Q	|	|	|	|
21+45	0.3412	1.01	Q	|	|	|	|
22+ 0	0.3173	0.95	Q	|	|	|	|
22+15	0.2952	0.89	Q	|	|	|	|
22+30	0.2746	0.83	Q	|	|	|	|

22+45	0.2554	0.78	Q				
23+ 0	0.2376	0.73	Q				
23+15	0.2210	0.68	Q				
23+30	0.2056	0.64	Q				
23+45	0.1912	0.60	Q				
24+ 0	0.1779	0.56	Q				
24+15	0.1655	0.53	Q				
24+30	0.1539	0.49	Q				
24+45	0.1432	0.46	Q				
25+ 0	0.1332	0.43	Q				
25+15	0.1239	0.40	Q				
25+30	0.1152	0.38	Q				
25+45	0.1072	0.35	Q				
26+ 0	0.0997	0.33	Q				
26+15	0.0928	0.31	Q				
26+30	0.0863	0.29	Q				
26+45	0.0803	0.27	Q				
27+ 0	0.0747	0.26	Q				
27+15	0.0694	0.24	Q				
27+30	0.0646	0.22	Q				
27+45	0.0601	0.21	Q				
28+ 0	0.0559	0.20	Q				
28+15	0.0520	0.19	Q				
28+30	0.0484	0.17	Q				
28+45	0.0450	0.16	Q				
29+ 0	0.0419	0.15	Q				
29+15	0.0389	0.14	Q				
29+30	0.0362	0.13	Q				
29+45	0.0337	0.13	Q				
30+ 0	0.0313	0.12	Q				
30+15	0.0291	0.11	Q				
30+30	0.0271	0.10	Q				
30+45	0.0252	0.10	Q				
31+ 0	0.0235	0.09	Q				
31+15	0.0218	0.09	Q				
31+30	0.0203	0.08	Q				
31+45	0.0189	0.07	Q				
32+ 0	0.0176	0.07	Q				
32+15	0.0163	0.07	Q				
32+30	0.0152	0.06	Q				
32+45	0.0141	0.06	Q				
33+ 0	0.0132	0.05	Q				
33+15	0.0122	0.05	Q				
33+30	0.0114	0.05	Q				
33+45	0.0106	0.04	Q				
34+ 0	0.0098	0.04	Q				
34+15	0.0092	0.04	Q				
34+30	0.0085	0.04	Q				
34+45	0.0079	0.03	Q				
35+ 0	0.0074	0.03	Q				
35+15	0.0069	0.03	Q				
35+30	0.0064	0.03	Q				
35+45	0.0059	0.03	Q				
36+ 0	0.0055	0.02	Q				
36+15	0.0051	0.02	Q				
36+30	0.0048	0.02	Q				
36+45	0.0044	0.02	Q				
37+ 0	0.0041	0.02	Q				
37+15	0.0038	0.02	Q				
37+30	0.0036	0.02	Q				
37+45	0.0033	0.02	Q				
38+ 0	0.0031	0.01	Q				
38+15	0.0029	0.01	Q				
38+30	0.0027	0.01	Q				
38+45	0.0025	0.01	Q				
39+ 0	0.0023	0.01	Q				
39+15	0.0022	0.01	Q				
39+30	0.0020	0.01	Q				
39+45	0.0019	0.01	Q				
40+ 0	0.0017	0.01	Q				
40+15	0.0016	0.01	Q				

```
   40+30       0.0015      0.01  Q         |         |         |         |
   40+45       0.0014      0.01  Q         |         |         |         |
   41+ 0       0.0013      0.01  Q         |         |         |         |
   41+15       0.0012      0.01  Q         |         |         |         |
   41+30       0.0011      0.01  Q         |         |         |         |
   41+45       0.0010      0.01  Q         |         |         |         |
   42+ 0       0.0010      0.01  Q         |         |         |         |
   42+15       0.0000      0.00  Q         |         |         |         |
   42+30       0.0000      0.00  Q         |         |         |         |
   42+45       0.0000      0.00  Q         |         |         |         |
   43+ 0       0.0000      0.00  Q         |         |         |         |
   43+15       0.0000      0.00  Q         |         |         |         |
   43+30       0.0000      0.00  Q         |         |         |         |
   43+45       0.0000      0.00  Q         |         |         |         |
   44+ 0       0.0000      0.00  Q         |         |         |         |
   44+15       0.0000      0.00  Q         |         |         |         |
   44+30       0.0000      0.00  Q         |         |         |         |
   44+45       0.0000      0.00  Q         |         |         |         |
   45+ 0       0.0000      0.00  Q         |         |         |         |
   45+15       0.0000      0.00  Q         |         |         |         |
   45+30       0.0000      0.00  Q         |         |         |         |
   45+45       0.0000      0.00  Q         |         |         |         |
   46+ 0       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   184
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     1895.367 (CFS)
                      Total volume =     311.984 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        3.000 to Point/Station        4.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ______________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   1600.00 (Ft.)
       Elevation difference =   30.00 (Ft.)
       Slope of channel =  0.018750 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  1600.00(Ft.)     Elevation difference =  30.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =   10.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =   10.000(Ft.)
       Flow(q) thru subarea =    855.920(CFS)
       Depth of flow =     2.972(Ft.)
       Average velocity =    22.205(Ft/s)
       Total flow rate =   855.920(CFS)
       Channel flow top width =   15.943(Ft.)
       Depth of flow in channel =   2.97(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   22.21(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =  855.920(CFS)
       Total capacity of improved channels =    855.920(CFS)
       Critical Depth in Channel =    5.13(Ft.)
```

```
Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1895.367(CFS)
Depth of flow =     4.647(Ft.)
Average velocity =    27.846(Ft/s)
Total flow rate =  1895.367(CFS)
Channel flow top width =   19.294(Ft.)
Depth of flow in channel =   4.65(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   27.85(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1895.367(CFS)
Total capacity of improved channels =   1895.367(CFS)
Critical Depth in Channel =    7.94(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9425   Travel time =   0.96 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  11.4130
       dt(routing time-step) =   0.90 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      473.8     947.7    1421.5    1895.4
----------------------------------------------------------------------
  0+15      17.9001     19.05  O         |         |         |         |
  0+30     117.0414    123.32  | O       |         |         |         |
  0+45     274.2714    283.94  |    O    |         |         |         |
  1+ 0     402.9235    410.54  |       O |         |         |         |
  1+15     489.6201    494.68  |         O         |         |         |
  1+30     595.2532    601.69  |         | O       |         |         |
  1+45     730.1741    738.40  |         |    O    |         |         |
  2+ 0     867.6461    875.92  |         |       O |         |         |
  2+15    1017.2688   1026.32  |         |         |O        |         |
  2+30    1262.0435   1277.14  |         |         |     O   |         |
  2+45    1643.1896   1666.63  |         |         |         |   OI    |
  3+ 0    1881.6031   1895.37  |         |         |         |        OI
  3+15    1591.6616   1572.22  |         |         |         |  O      |
  3+30    1032.2518    997.68  |         |         |O        |         |
  3+45     627.9390    604.27  |         | IO      |         |         |
  4+ 0     402.5683    389.65  |       O |         |         |         |
  4+15     272.6849    265.20  |    O    |         |         |         |
  4+30     196.2012    191.78  |   O     |         |         |         |
  4+45     154.7591    152.39  |  O      |         |         |         |
  5+ 0     130.0577    128.63  | O       |         |         |         |
  5+15     111.1802    110.06  | O       |         |         |         |
  5+30      95.7190     94.80  | O       |         |         |         |
  5+45      84.3075     83.64  |O        |         |         |         |
  6+ 0      76.4756     76.02  |O        |         |         |         |
  6+15      70.4276     70.07  |O        |         |         |         |
  6+30      65.1627     64.85  |O        |         |         |         |
  6+45      60.4010     60.12  |O        |         |         |         |
  7+ 0      56.0539     55.79  |O        |         |         |         |
  7+15      52.0674     51.83  |O        |         |         |         |
  7+30      48.3995     48.18  |O        |         |         |         |
  7+45      45.0164     44.81  O         |         |         |         |
  8+ 0      41.8902     41.70  O         |         |         |         |
  8+15      38.9971     38.82  O         |         |         |         |
  8+30      36.3168     36.16  O         |         |         |         |
```

8+45	33.8313	33.68	O	|	|	|	|
9+ 0	31.5247	31.39	O	|	|	|	|
9+15	29.3829	29.25	O	|	|	|	|
9+30	27.3930	27.27	O	|	|	|	|
9+45	25.5434	25.43	O	|	|	|	|
10+ 0	23.8236	23.72	O	|	|	|	|
10+15	22.2238	22.13	O	|	|	|	|
10+30	20.7355	20.65	O	|	|	|	|
10+45	19.3493	19.27	O	|	|	|	|
11+ 0	18.0593	17.98	O	|	|	|	|
11+15	16.8580	16.79	O	|	|	|	|
11+30	15.7389	15.67	O	|	|	|	|
11+45	14.6962	14.63	O	|	|	|	|
12+ 0	13.7244	13.67	O	|	|	|	|
12+15	12.8185	12.76	O	|	|	|	|
12+30	11.9739	11.92	O	|	|	|	|
12+45	11.1863	11.14	O	|	|	|	|
13+ 0	10.4516	10.41	O	|	|	|	|
13+15	9.7663	9.73	O	|	|	|	|
13+30	9.1269	9.09	O	|	|	|	|
13+45	8.5301	8.49	O	|	|	|	|
14+ 0	7.9732	7.94	O	|	|	|	|
14+15	7.4533	7.42	O	|	|	|	|
14+30	6.9680	6.94	O	|	|	|	|
14+45	6.5148	6.49	O	|	|	|	|
15+ 0	6.0915	6.07	O	|	|	|	|
15+15	5.6963	5.67	O	|	|	|	|
15+30	5.3270	5.30	O	|	|	|	|
15+45	4.9821	4.96	O	|	|	|	|
16+ 0	4.6599	4.64	O	|	|	|	|
16+15	4.3587	4.34	O	|	|	|	|
16+30	4.0774	4.06	O	|	|	|	|
16+45	3.8144	3.80	O	|	|	|	|
17+ 0	3.5686	3.55	O	|	|	|	|
17+15	3.3388	3.33	O	|	|	|	|
17+30	3.1240	3.11	O	|	|	|	|
17+45	2.9232	2.91	O	|	|	|	|
18+ 0	2.7355	2.72	O	|	|	|	|
18+15	2.5599	2.55	O	|	|	|	|
18+30	2.3957	2.39	O	|	|	|	|
18+45	2.2422	2.23	O	|	|	|	|
19+ 0	2.0986	2.09	O	|	|	|	|
19+15	1.9643	1.96	O	|	|	|	|
19+30	1.8387	1.83	O	|	|	|	|
19+45	1.7212	1.71	O	|	|	|	|
20+ 0	1.6112	1.60	O	|	|	|	|
20+15	1.5084	1.50	O	|	|	|	|
20+30	1.4122	1.41	O	|	|	|	|
20+45	1.3221	1.32	O	|	|	|	|
21+ 0	1.2379	1.23	O	|	|	|	|
21+15	1.1590	1.15	O	|	|	|	|
21+30	1.0853	1.08	O	|	|	|	|
21+45	1.0162	1.01	O	|	|	|	|
22+ 0	0.9516	0.95	O	|	|	|	|
22+15	0.8911	0.89	O	|	|	|	|
22+30	0.8345	0.83	O	|	|	|	|
22+45	0.7816	0.78	O	|	|	|	|
23+ 0	0.7320	0.73	O	|	|	|	|
23+15	0.6855	0.68	O	|	|	|	|
23+30	0.6421	0.64	O	|	|	|	|
23+45	0.6014	0.60	O	|	|	|	|
24+ 0	0.5633	0.56	O	|	|	|	|
24+15	0.5276	0.53	O	|	|	|	|
24+30	0.4935	0.49	O	|	|	|	|
24+45	0.4622	0.46	O	|	|	|	|
25+ 0	0.4330	0.43	O	|	|	|	|
25+15	0.4057	0.40	O	|	|	|	|
25+30	0.3801	0.38	O	|	|	|	|
25+45	0.3561	0.35	O	|	|	|	|
26+ 0	0.3337	0.33	O	|	|	|	|
26+15	0.3126	0.31	O	|	|	|	|

26+30	0.2929	0.29	O	|	|	|	|
26+45	0.2745	0.27	O	|	|	|	|
27+ 0	0.2572	0.26	O	|	|	|	|
27+15	0.2410	0.24	O	|	|	|	|
27+30	0.2258	0.22	O	|	|	|	|
27+45	0.2116	0.21	O	|	|	|	|
28+ 0	0.1983	0.20	O	|	|	|	|
28+15	0.1859	0.19	O	|	|	|	|
28+30	0.1742	0.17	O	|	|	|	|
28+45	0.1632	0.16	O	|	|	|	|
29+ 0	0.1530	0.15	O	|	|	|	|
29+15	0.1434	0.14	O	|	|	|	|
29+30	0.1344	0.13	O	|	|	|	|
29+45	0.1259	0.13	O	|	|	|	|
30+ 0	0.1180	0.12	O	|	|	|	|
30+15	0.1106	0.11	O	|	|	|	|
30+30	0.1037	0.10	O	|	|	|	|
30+45	0.0972	0.10	O	|	|	|	|
31+ 0	0.0911	0.09	O	|	|	|	|
31+15	0.0854	0.09	O	|	|	|	|
31+30	0.0801	0.08	O	|	|	|	|
31+45	0.0751	0.07	O	|	|	|	|
32+ 0	0.0704	0.07	O	|	|	|	|
32+15	0.0660	0.07	O	|	|	|	|
32+30	0.0618	0.06	O	|	|	|	|
32+45	0.0580	0.06	O	|	|	|	|
33+ 0	0.0543	0.05	O	|	|	|	|
33+15	0.0509	0.05	O	|	|	|	|
33+30	0.0478	0.05	O	|	|	|	|
33+45	0.0448	0.04	O	|	|	|	|
34+ 0	0.0420	0.04	O	|	|	|	|
34+15	0.0394	0.04	O	|	|	|	|
34+30	0.0369	0.04	O	|	|	|	|
34+45	0.0346	0.03	O	|	|	|	|
35+ 0	0.0324	0.03	O	|	|	|	|
35+15	0.0304	0.03	O	|	|	|	|
35+30	0.0285	0.03	O	|	|	|	|
35+45	0.0268	0.03	O	|	|	|	|
36+ 0	0.0251	0.02	O	|	|	|	|
36+15	0.0235	0.02	O	|	|	|	|
36+30	0.0221	0.02	O	|	|	|	|
36+45	0.0207	0.02	O	|	|	|	|
37+ 0	0.0194	0.02	O	|	|	|	|
37+15	0.0182	0.02	O	|	|	|	|
37+30	0.0171	0.02	O	|	|	|	|
37+45	0.0160	0.02	O	|	|	|	|
38+ 0	0.0150	0.01	O	|	|	|	|
38+15	0.0141	0.01	O	|	|	|	|
38+30	0.0132	0.01	O	|	|	|	|
38+45	0.0124	0.01	O	|	|	|	|
39+ 0	0.0116	0.01	O	|	|	|	|
39+15	0.0109	0.01	O	|	|	|	|
39+30	0.0102	0.01	O	|	|	|	|
39+45	0.0096	0.01	O	|	|	|	|
40+ 0	0.0090	0.01	O	|	|	|	|
40+15	0.0084	0.01	O	|	|	|	|
40+30	0.0079	0.01	O	|	|	|	|
40+45	0.0074	0.01	O	|	|	|	|
41+ 0	0.0070	0.01	O	|	|	|	|
41+15	0.0065	0.01	O	|	|	|	|
41+30	0.0061	0.01	O	|	|	|	|
41+45	0.0057	0.01	O	|	|	|	|
42+ 0	0.0054	0.01	O	|	|	|	|
42+15	0.0042	0.00	O	|	|	|	|
42+30	0.0039	0.00	O	|	|	|	|
42+45	0.0037	0.00	O	|	|	|	|
43+ 0	0.0034	0.00	O	|	|	|	|
43+15	0.0032	0.00	O	|	|	|	|
43+30	0.0030	0.00	O	|	|	|	|
43+45	0.0029	0.00	O	|	|	|	|
44+ 0	0.0027	0.00	O	|	|	|	|

```
  44+15       0.0025      0.00  O         |         |         |         |
  44+30       0.0024      0.00  O         |         |         |         |
  44+45       0.0022      0.00  O         |         |         |         |
  45+ 0       0.0012      0.00  O         |         |         |         |
  45+15       0.0011      0.00  O         |         |         |         |
  45+30       0.0010      0.00  O         |         |         |         |
  45+45       0.0010      0.00  O         |         |         |         |
  46+ 0       0.0001      0.00  O         |         |         |         |
  46+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   185
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =     1881.603 (CFS)
                     Total volume =     311.984 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        3.000 to Point/Station        4.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION *********************

                     From study/file name: SUBA53100.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      ----------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      492.7     985.5    1478.2    1971.0
 ----------------------------------------------------------------------
   0+15      15.8963     33.80  Q         |         |         |         |
   0+30      33.0414    150.08  q  Q      |         |         |         |
   0+45      40.9857    315.26  q     Q   |         |         |         |
   1+ 0      41.8296    444.75  q        Q|         |         |         |
   1+15      50.5975    540.22  |q        Q         |         |         |
   1+30      60.8071    656.06  |q        |  Q      |         |         |
   1+45      70.7415    800.92  |q        |     Q   |         |         |
   2+ 0      78.7498    946.40  |q        |        Q|         |         |
   2+15      99.9297   1117.20  | q       |         | Q       |         |
   2+30     142.0628   1404.11  | q       |         |       Q |         |
   2+45     156.5261   1799.72  |  q      |         |         |     Q   |
   3+ 0      89.3520   1970.96  |q        |         |         |        Q
   3+15      24.0245   1615.69  q         |         |         | Q       |
   3+30       2.4428   1034.69  q         |         Q         |         |
   3+45       0.0000    627.94  q         | Q       |         |         |
   4+ 0       0.0000    402.57  q       Q |         |         |         |
   4+15       0.0000    272.68  q    Q    |         |         |         |
   4+30       0.0000    196.20  q  Q      |         |         |         |
   4+45       0.0000    154.76  q  Q      |         |         |         |
   5+ 0       0.0000    130.06  q Q       |         |         |         |
   5+15       0.0000    111.18  q Q       |         |         |         |
   5+30       0.0000     95.72  qQ        |         |         |         |
   5+45       0.0000     84.31  qQ        |         |         |         |
   6+ 0       0.0000     76.48  qQ        |         |         |         |
   6+15       0.0000     70.43  qQ        |         |         |         |
   6+30       0.0000     65.16  qQ        |         |         |         |
   6+45       0.0000     60.40  qQ        |         |         |         |
   7+ 0       0.0000     56.05  qQ        |         |         |         |
   7+15       0.0000     52.07  qQ        |         |         |         |
   7+30       0.0000     48.40  Q         |         |         |         |
   7+45       0.0000     45.02  Q         |         |         |         |
```

8+ 0	0.0000	41.89	Q				
8+15	0.0000	39.00	Q				
8+30	0.0000	36.32	Q				
8+45	0.0000	33.83	Q				
9+ 0	0.0000	31.52	Q				
9+15	0.0000	29.38	Q				
9+30	0.0000	27.39	Q				
9+45	0.0000	25.54	Q				
10+ 0	0.0000	23.82	Q				
10+15	0.0000	22.22	Q				
10+30	0.0000	20.74	Q				
10+45	0.0000	19.35	Q				
11+ 0	0.0000	18.06	Q				
11+15	0.0000	16.86	Q				
11+30	0.0000	15.74	Q				
11+45	0.0000	14.70	Q				
12+ 0	0.0000	13.72	Q				
12+15	0.0000	12.82	Q				
12+30	0.0000	11.97	Q				
12+45	0.0000	11.19	Q				
13+ 0	0.0000	10.45	Q				
13+15	0.0000	9.77	Q				
13+30	0.0000	9.13	Q				
13+45	0.0000	8.53	Q				
14+ 0	0.0000	7.97	Q				
14+15	0.0000	7.45	Q				
14+30	0.0000	6.97	Q				
14+45	0.0000	6.51	Q				
15+ 0	0.0000	6.09	Q				
15+15	0.0000	5.70	Q				
15+30	0.0000	5.33	Q				
15+45	0.0000	4.98	Q				
16+ 0	0.0000	4.66	Q				
16+15	0.0000	4.36	Q				
16+30	0.0000	4.08	Q				
16+45	0.0000	3.81	Q				
17+ 0	0.0000	3.57	Q				
17+15	0.0000	3.34	Q				
17+30	0.0000	3.12	Q				
17+45	0.0000	2.92	Q				
18+ 0	0.0000	2.74	Q				
18+15	0.0000	2.56	Q				
18+30	0.0000	2.40	Q				
18+45	0.0000	2.24	Q				
19+ 0	0.0000	2.10	Q				
19+15	0.0000	1.96	Q				
19+30	0.0000	1.84	Q				
19+45	0.0000	1.72	Q				
20+ 0	0.0000	1.61	Q				
20+15	0.0000	1.51	Q				
20+30	0.0000	1.41	Q				
20+45	0.0000	1.32	Q				
21+ 0	0.0000	1.24	Q				
21+15	0.0000	1.16	Q				
21+30	0.0000	1.09	Q				
21+45	0.0000	1.02	Q				
22+ 0	0.0000	0.95	Q				
22+15	0.0000	0.89	Q				
22+30	0.0000	0.83	Q				
22+45	0.0000	0.78	Q				
23+ 0	0.0000	0.73	Q				
23+15	0.0000	0.69	Q				
23+30	0.0000	0.64	Q				
23+45	0.0000	0.60	Q				
24+ 0	0.0000	0.56	Q				
24+15	0.0000	0.53	Q				
24+30	0.0000	0.49	Q				
24+45	0.0000	0.46	Q				
25+ 0	0.0000	0.43	Q				
25+15	0.0000	0.41	Q				
25+30	0.0000	0.38	Q				

25+45	0.0000	0.36	Q				
26+ 0	0.0000	0.33	Q				
26+15	0.0000	0.31	Q				
26+30	0.0000	0.29	Q				
26+45	0.0000	0.27	Q				
27+ 0	0.0000	0.26	Q				
27+15	0.0000	0.24	Q				
27+30	0.0000	0.23	Q				
27+45	0.0000	0.21	Q				
28+ 0	0.0000	0.20	Q				
28+15	0.0000	0.19	Q				
28+30	0.0000	0.17	Q				
28+45	0.0000	0.16	Q				
29+ 0	0.0000	0.15	Q				
29+15	0.0000	0.14	Q				
29+30	0.0000	0.13	Q				
29+45	0.0000	0.13	Q				
30+ 0	0.0000	0.12	Q				
30+15	0.0000	0.11	Q				
30+30	0.0000	0.10	Q				
30+45	0.0000	0.10	Q				
31+ 0	0.0000	0.09	Q				
31+15	0.0000	0.09	Q				
31+30	0.0000	0.08	Q				
31+45	0.0000	0.08	Q				
32+ 0	0.0000	0.07	Q				
32+15	0.0000	0.07	Q				
32+30	0.0000	0.06	Q				
32+45	0.0000	0.06	Q				
33+ 0	0.0000	0.05	Q				
33+15	0.0000	0.05	Q				
33+30	0.0000	0.05	Q				
33+45	0.0000	0.04	Q				
34+ 0	0.0000	0.04	Q				
34+15	0.0000	0.04	Q				
34+30	0.0000	0.04	Q				
34+45	0.0000	0.03	Q				
35+ 0	0.0000	0.03	Q				
35+15	0.0000	0.03	Q				
35+30	0.0000	0.03	Q				
35+45	0.0000	0.03	Q				
36+ 0	0.0000	0.03	Q				
36+15	0.0000	0.02	Q				
36+30	0.0000	0.02	Q				
36+45	0.0000	0.02	Q				
37+ 0	0.0000	0.02	Q				
37+15	0.0000	0.02	Q				
37+30	0.0000	0.02	Q				
37+45	0.0000	0.02	Q				
38+ 0	0.0000	0.02	Q				
38+15	0.0000	0.01	Q				
38+30	0.0000	0.01	Q				
38+45	0.0000	0.01	Q				
39+ 0	0.0000	0.01	Q				
39+15	0.0000	0.01	Q				
39+30	0.0000	0.01	Q				
39+45	0.0000	0.01	Q				
40+ 0	0.0000	0.01	Q				
40+15	0.0000	0.01	Q				
40+30	0.0000	0.01	Q				
40+45	0.0000	0.01	Q				
41+ 0	0.0000	0.01	Q				
41+15	0.0000	0.01	Q				
41+30	0.0000	0.01	Q				
41+45	0.0000	0.01	Q				
42+ 0	0.0000	0.01	Q				
42+15	0.0000	0.00	Q				
42+30	0.0000	0.00	Q				
42+45	0.0000	0.00	Q				
43+ 0	0.0000	0.00	Q				
43+15	0.0000	0.00	Q				

```
  43+30       0.0000      0.00  Q         |         |         |         |
  43+45       0.0000      0.00  Q         |         |         |         |
  44+ 0       0.0000      0.00  Q         |         |         |         |
  44+15       0.0000      0.00  Q         |         |         |         |
  44+30       0.0000      0.00  Q         |         |         |         |
  44+45       0.0000      0.00  Q         |         |         |         |
  45+ 0       0.0000      0.00  Q         |         |         |         |
  45+15       0.0000      0.00  Q         |         |         |         |
  45+30       0.0000      0.00  Q         |         |         |         |
  45+45       0.0000      0.00  Q         |         |         |         |
  46+ 0       0.0000      0.00  Q         |         |         |         |
  46+15       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =   185
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =     1970.955 (CFS)
                    Total volume =     330.723 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ---------------------------------------------------------------------


      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        3.000 to Point/Station        4.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      _____________________________________________________________________
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA63100.rte
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

      ---------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      547.4    1094.9    1642.3    2189.8
 ----------------------------------------------------------------------
   0+15      38.9228     72.72  qQ        |         |         |         |
   0+30      80.9066    230.99  |q  Q     |         |         |         |
   0+45     100.3620    415.62  |q     Q  |         |         |         |
   1+ 0     102.4288    547.18  |q       Q|         |         |         |
   1+15     123.9023    664.12  | q        | Q       |         |         |
   1+30     148.9066    804.97  | q        |   Q     |         |         |
   1+45     173.2371    974.15  |  q       |      Q  |         |         |
   2+ 0     192.8502   1139.25  |  q       |         Q         |         |
   2+15     244.7219   1361.92  |   q      |         |   Q     |         |
   2+30     347.9104   1752.02  |     q    |         |         | Q       |
   2+45     383.3324   2183.05  |      q   |         |         |        Q|
   3+ 0     218.8160   2189.77  |  q       |         |         |         Q
   3+15      58.8311   1674.52  |q         |         |         Q         |
   3+30       5.9815   1040.68  q          |        Q|         |         |
   3+45       0.0000    627.94  q         |Q        |         |         |
   4+ 0       0.0000    402.57  q      Q  |         |         |         |
   4+15       0.0000    272.68  q   Q     |         |         |         |
   4+30       0.0000    196.20  q  Q      |         |         |         |
   4+45       0.0000    154.76  q Q       |         |         |         |
   5+ 0       0.0000    130.06  q Q       |         |         |         |
   5+15       0.0000    111.18  q Q       |         |         |         |
   5+30       0.0000     95.72  qQ        |         |         |         |
   5+45       0.0000     84.31  qQ        |         |         |         |
   6+ 0       0.0000     76.48  qQ        |         |         |         |
   6+15       0.0000     70.43  qQ        |         |         |         |
   6+30       0.0000     65.16  qQ        |         |         |         |
   6+45       0.0000     60.40  qQ        |         |         |         |
   7+ 0       0.0000     56.05  qQ        |         |         |         |
```

7+15	0.0000	52.07	Q				
7+30	0.0000	48.40	Q				
7+45	0.0000	45.02	Q				
8+ 0	0.0000	41.89	Q				
8+15	0.0000	39.00	Q				
8+30	0.0000	36.32	Q				
8+45	0.0000	33.83	Q				
9+ 0	0.0000	31.52	Q				
9+15	0.0000	29.38	Q				
9+30	0.0000	27.39	Q				
9+45	0.0000	25.54	Q				
10+ 0	0.0000	23.82	Q				
10+15	0.0000	22.22	Q				
10+30	0.0000	20.74	Q				
10+45	0.0000	19.35	Q				
11+ 0	0.0000	18.06	Q				
11+15	0.0000	16.86	Q				
11+30	0.0000	15.74	Q				
11+45	0.0000	14.70	Q				
12+ 0	0.0000	13.72	Q				
12+15	0.0000	12.82	Q				
12+30	0.0000	11.97	Q				
12+45	0.0000	11.19	Q				
13+ 0	0.0000	10.45	Q				
13+15	0.0000	9.77	Q				
13+30	0.0000	9.13	Q				
13+45	0.0000	8.53	Q				
14+ 0	0.0000	7.97	Q				
14+15	0.0000	7.45	Q				
14+30	0.0000	6.97	Q				
14+45	0.0000	6.51	Q				
15+ 0	0.0000	6.09	Q				
15+15	0.0000	5.70	Q				
15+30	0.0000	5.33	Q				
15+45	0.0000	4.98	Q				
16+ 0	0.0000	4.66	Q				
16+15	0.0000	4.36	Q				
16+30	0.0000	4.08	Q				
16+45	0.0000	3.81	Q				
17+ 0	0.0000	3.57	Q				
17+15	0.0000	3.34	Q				
17+30	0.0000	3.12	Q				
17+45	0.0000	2.92	Q				
18+ 0	0.0000	2.74	Q				
18+15	0.0000	2.56	Q				
18+30	0.0000	2.40	Q				
18+45	0.0000	2.24	Q				
19+ 0	0.0000	2.10	Q				
19+15	0.0000	1.96	Q				
19+30	0.0000	1.84	Q				
19+45	0.0000	1.72	Q				
20+ 0	0.0000	1.61	Q				
20+15	0.0000	1.51	Q				
20+30	0.0000	1.41	Q				
20+45	0.0000	1.32	Q				
21+ 0	0.0000	1.24	Q				
21+15	0.0000	1.16	Q				
21+30	0.0000	1.09	Q				
21+45	0.0000	1.02	Q				
22+ 0	0.0000	0.95	Q				
22+15	0.0000	0.89	Q				
22+30	0.0000	0.83	Q				
22+45	0.0000	0.78	Q				
23+ 0	0.0000	0.73	Q				
23+15	0.0000	0.69	Q				
23+30	0.0000	0.64	Q				
23+45	0.0000	0.60	Q				
24+ 0	0.0000	0.56	Q				
24+15	0.0000	0.53	Q				
24+30	0.0000	0.49	Q				
24+45	0.0000	0.46	Q				

25+ 0	0.0000	0.43	Q				
25+15	0.0000	0.41	Q				
25+30	0.0000	0.38	Q				
25+45	0.0000	0.36	Q				
26+ 0	0.0000	0.33	Q				
26+15	0.0000	0.31	Q				
26+30	0.0000	0.29	Q				
26+45	0.0000	0.27	Q				
27+ 0	0.0000	0.26	Q				
27+15	0.0000	0.24	Q				
27+30	0.0000	0.23	Q				
27+45	0.0000	0.21	Q				
28+ 0	0.0000	0.20	Q				
28+15	0.0000	0.19	Q				
28+30	0.0000	0.17	Q				
28+45	0.0000	0.16	Q				
29+ 0	0.0000	0.15	Q				
29+15	0.0000	0.14	Q				
29+30	0.0000	0.13	Q				
29+45	0.0000	0.13	Q				
30+ 0	0.0000	0.12	Q				
30+15	0.0000	0.11	Q				
30+30	0.0000	0.10	Q				
30+45	0.0000	0.10	Q				
31+ 0	0.0000	0.09	Q				
31+15	0.0000	0.09	Q				
31+30	0.0000	0.08	Q				
31+45	0.0000	0.08	Q				
32+ 0	0.0000	0.07	Q				
32+15	0.0000	0.07	Q				
32+30	0.0000	0.06	Q				
32+45	0.0000	0.06	Q				
33+ 0	0.0000	0.05	Q				
33+15	0.0000	0.05	Q				
33+30	0.0000	0.05	Q				
33+45	0.0000	0.04	Q				
34+ 0	0.0000	0.04	Q				
34+15	0.0000	0.04	Q				
34+30	0.0000	0.04	Q				
34+45	0.0000	0.03	Q				
35+ 0	0.0000	0.03	Q				
35+15	0.0000	0.03	Q				
35+30	0.0000	0.03	Q				
35+45	0.0000	0.03	Q				
36+ 0	0.0000	0.03	Q				
36+15	0.0000	0.02	Q				
36+30	0.0000	0.02	Q				
36+45	0.0000	0.02	Q				
37+ 0	0.0000	0.02	Q				
37+15	0.0000	0.02	Q				
37+30	0.0000	0.02	Q				
37+45	0.0000	0.02	Q				
38+ 0	0.0000	0.02	Q				
38+15	0.0000	0.01	Q				
38+30	0.0000	0.01	Q				
38+45	0.0000	0.01	Q				
39+ 0	0.0000	0.01	Q				
39+15	0.0000	0.01	Q				
39+30	0.0000	0.01	Q				
39+45	0.0000	0.01	Q				
40+ 0	0.0000	0.01	Q				
40+15	0.0000	0.01	Q				
40+30	0.0000	0.01	Q				
40+45	0.0000	0.01	Q				
41+ 0	0.0000	0.01	Q				
41+15	0.0000	0.01	Q				
41+30	0.0000	0.01	Q				
41+45	0.0000	0.01	Q				
42+ 0	0.0000	0.01	Q				
42+15	0.0000	0.00	Q				
42+30	0.0000	0.00	Q				

```
   42+45       0.0000      0.00  Q         |         |         |         |
   43+ 0       0.0000      0.00  Q         |         |         |         |
   43+15       0.0000      0.00  Q         |         |         |         |
   43+30       0.0000      0.00  Q         |         |         |         |
   43+45       0.0000      0.00  Q         |         |         |         |
   44+ 0       0.0000      0.00  Q         |         |         |         |
   44+15       0.0000      0.00  Q         |         |         |         |
   44+30       0.0000      0.00  Q         |         |         |         |
   44+45       0.0000      0.00  Q         |         |         |         |
   45+ 0       0.0000      0.00  Q         |         |         |         |
   45+15       0.0000      0.00  Q         |         |         |         |
   45+30       0.0000      0.00  Q         |         |         |         |
   45+45       0.0000      0.00  Q         |         |         |         |
   46+ 0       0.0000      0.00  Q         |         |         |         |
   46+15       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                       Number of intervals =   185
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =     2189.771 (CFS)
                       Total volume =     376.614 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        3.000 to Point/Station        4.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file LineA3hr.rte
        ****************************HYDROGRAPH DATA****************************
                       Number of intervals =     0
                       Time interval =    0.0 (Min.)
                       Maximum/Peak flow rate =        0.000 (CFS)
                       Total volume =       0.000 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------
```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                          Study date: 02/01/12

      ---------------------------------------------------------------------

      Line A, Sketcher Site, routed thru basins
      100 yr 3 hr


      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: Sketcher3100.rte
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      189.497 (CFS)
                    Total volume =      22.656 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        1.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.00(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.00 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000      5.000    100.000      3.967        6.033
         4.000     10.000    150.000      8.450       11.550
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      47.4   94.75  142.12  189.50 (Ft.)
 0.250   19.95    3.38      0.171  O  I    |       |       |       |     2.03
 0.500   40.57   12.59      0.631  | O   I |       |       |       |     2.13
 0.750   49.76   23.75      1.189  |   O   I       |       |       |     2.24
```

```
 1.000   50.56   32.80      1.641  |    O  I       |       |       |     2.33
 1.250   61.58   40.77      2.040  |     O | I     |       |       |     2.41
 1.500   73.90   50.01      2.501  |       O   I   |       |       |     2.50
 1.750   85.89   60.25      3.013  |       | O   I |       |       |     2.60
 2.000   95.49   70.67      3.534  |       |  O    I       |       |     2.71
 2.250  121.72   83.67      4.184  |       |     O |   I   |       |     2.84
 2.500  173.49  103.05      5.305  |       |       |O      |    I  |     3.06
 2.750  189.50  117.74      6.774  |       |       |  O    |       I     3.35
 3.000  104.84  123.25      7.325  |       |       |I  O   |       |     3.46
 3.250   26.76  112.49      6.249  |   I   |       | O     |       |     3.25
 3.500    2.55   89.33      4.467  I       |      O|       |       |     2.89
 3.750    0.00   59.17      2.959  I       |O      |       |       |     2.59
 4.000    0.00   38.90      1.946  I     O |       |       |       |     2.39
 4.250    0.00   25.57      1.280  I   O   |       |       |       |     2.26
 4.500    0.00   16.81      0.842  I O     |       |       |       |     2.17
 4.750    0.00   11.05      0.554  IO      |       |       |       |     2.11
 5.000    0.00    7.27      0.365  IO      |       |       |       |     2.07
 5.250    0.00    4.78      0.241  O       |       |       |       |     2.05
 5.500    0.00    3.14      0.159  O       |       |       |       |     2.03
 5.750    0.00    2.06      0.105  O       |       |       |       |     2.02
 6.000    0.00    1.36      0.070  O       |       |       |       |     2.01
 6.250    0.00    0.89      0.047  O       |       |       |       |     2.01
 6.500    0.00    0.59      0.031  O       |       |       |       |     2.01
 6.750    0.00    0.39      0.021  O       |       |       |       |     2.00
 7.000    0.00    0.25      0.015  O       |       |       |       |     2.00
 7.250    0.00    0.17      0.010  O       |       |       |       |     2.00
 7.500    0.00    0.11      0.007  O       |       |       |       |     2.00
 7.750    0.00    0.07      0.006  O       |       |       |       |     2.00
 8.000    0.00    0.05      0.004  O       |       |       |       |     2.00
 8.250    0.00    0.03      0.004  O       |       |       |       |     2.00
 8.500    0.00    0.02      0.003  O       |       |       |       |     2.00
 8.750    0.00    0.01      0.003  O       |       |       |       |     2.00
 9.000    0.00    0.01      0.002  O       |       |       |       |     2.00
 9.250    0.00    0.01      0.002  O       |       |       |       |     2.00
 9.500    0.00    0.00      0.002  O       |       |       |       |     2.00
 9.750    0.00    0.00      0.002  O       |       |       |       |     2.00
10.000    0.00    0.00      0.002  O       |       |       |       |     2.00
10.250    0.00    0.00      0.002  O       |       |       |       |     2.00
10.500    0.00    0.00      0.002  O       |       |       |       |     1.98

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    42
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      123.248 (CFS)
                    Total volume =      22.654 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        1.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SketcherRT.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =     0
                    Time interval =    0.0 (Min.)
                    Maximum/Peak flow rate =        0.000 (CFS)
                    Total volume =       0.000 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
```

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        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ----------------------------------------------------------------------


      Subdrain Area A1 Routed through Basin A1
      Prop Condition
      100 Yr. 3 Hr

      ----------------------------------------------------------------------


      Program License Serial Number 6097

      ----------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA13100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       78.777 (CFS)
                    Total volume =       9.387 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000      5.000     30.000      4.690        5.310
        4.000      7.000     40.000      6.587        7.413
        6.000     12.000     50.000     11.483       12.517
      ----------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      19.7   39.39   59.08   78.78 (Ft.)
 0.250    9.35    0.54      0.091  O  I    |       |       |       |     2.02
```

0.500	17.67	2.05	0.344	O I	2.07
0.750	20.90	4.06	0.679	O I	2.14
1.000	20.92	6.03	1.007	O I	2.20
1.250	26.12	8.07	1.347	O I	2.27
1.500	31.14	10.47	1.747	O I	2.35
1.750	36.11	13.18	2.197	O I	2.44
2.000	39.96	16.08	2.681	O I	2.54
2.250	51.76	19.56	3.260	O I	2.65
2.500	74.37	24.64	4.106	O I	2.82
2.750	78.78	30.59	5.118	O I	3.06
3.000	38.77	33.36	5.672	O I	3.34
3.250	7.97	32.38	5.475	I O	3.24
3.500	0.53	29.54	4.924	I O	2.98
3.750	0.00	26.12	4.354	I O	2.87
4.000	0.00	23.07	3.846	I O	2.77
4.250	0.00	20.38	3.397	I O	2.68
4.500	0.00	18.00	3.000	I O	2.60
4.750	0.00	15.90	2.650	I O	2.53
5.000	0.00	14.04	2.341	I O	2.47
5.250	0.00	12.40	2.068	I O	2.41
5.500	0.00	10.95	1.827	I O	2.37
5.750	0.00	9.67	1.614	I O	2.32
6.000	0.00	8.54	1.425	I O	2.28
6.250	0.00	7.55	1.259	I O	2.25
6.500	0.00	6.67	1.112	I O	2.22
6.750	0.00	5.89	0.983	I O	2.20
7.000	0.00	5.20	0.868	I O	2.17
7.250	0.00	4.59	0.767	IO	2.15
7.500	0.00	4.06	0.678	IO	2.14
7.750	0.00	3.58	0.599	IO	2.12
8.000	0.00	3.16	0.529	IO	2.11
8.250	0.00	2.79	0.467	IO	2.09
8.500	0.00	2.47	0.413	IO	2.08
8.750	0.00	2.18	0.365	O	2.07
9.000	0.00	1.93	0.323	O	2.06
9.250	0.00	1.70	0.285	O	2.06
9.500	0.00	1.50	0.252	O	2.05
9.750	0.00	1.33	0.223	O	2.04
10.000	0.00	1.17	0.197	O	2.04
10.250	0.00	1.03	0.174	O	2.03
10.500	0.00	0.91	0.154	O	2.03
10.750	0.00	0.81	0.136	O	2.03
11.000	0.00	0.71	0.121	O	2.02
11.250	0.00	0.63	0.107	O	2.02
11.500	0.00	0.56	0.095	O	2.02
11.750	0.00	0.49	0.084	O	2.02
12.000	0.00	0.43	0.074	O	2.01
12.250	0.00	0.38	0.066	O	2.01
12.500	0.00	0.34	0.058	O	2.01
12.750	0.00	0.30	0.052	O	2.01
13.000	0.00	0.26	0.046	O	2.01
13.250	0.00	0.23	0.041	O	2.01
13.500	0.00	0.21	0.036	O	2.01
13.750	0.00	0.18	0.032	O	2.01
14.000	0.00	0.16	0.029	O	2.01
14.250	0.00	0.14	0.025	O	2.00
14.500	0.00	0.13	0.023	O	2.00
14.750	0.00	0.11	0.020	O	2.00
15.000	0.00	0.10	0.018	O	2.00
15.250	0.00	0.09	0.016	O	2.00
15.500	0.00	0.08	0.015	O	2.00
15.750	0.00	0.07	0.013	O	2.00
16.000	0.00	0.06	0.012	O	2.00
16.250	0.00	0.05	0.011	O	2.00
16.500	0.00	0.05	0.010	O	2.00
16.750	0.00	0.04	0.009	O	2.00
17.000	0.00	0.04	0.008	O	2.00
17.250	0.00	0.03	0.007	O	2.00
17.500	0.00	0.03	0.007	O	2.00
17.750	0.00	0.02	0.006	O	2.00
18.000	0.00	0.02	0.006	O	2.00

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18.250    0.00    0.02      0.005  O       |       |       |       |     2.00
18.500    0.00    0.02      0.005  O       |       |       |       |     2.00
18.750    0.00    0.02      0.004  O       |       |       |       |     2.00
19.000    0.00    0.01      0.004  O       |       |       |       |     2.00
19.250    0.00    0.01      0.004  O       |       |       |       |     2.00
19.500    0.00    0.01      0.004  O       |       |       |       |     2.00
19.750    0.00    0.01      0.003  O       |       |       |       |     2.00
20.000    0.00    0.01      0.003  O       |       |       |       |     2.00
20.250    0.00    0.01      0.003  O       |       |       |       |     2.00
20.500    0.00    0.01      0.003  O       |       |       |       |     2.00
20.750    0.00    0.01      0.003  O       |       |       |       |     2.00
21.000    0.00    0.00      0.003  O       |       |       |       |     2.00
21.250    0.00    0.00      0.003  O       |       |       |       |     2.00
21.500    0.00    0.00      0.002  O       |       |       |       |     2.00
21.750    0.00    0.00      0.002  O       |       |       |       |     2.00
22.000    0.00    0.00      0.002  O       |       |       |       |     2.00
22.250    0.00    0.00      0.002  O       |       |       |       |     2.00
22.500    0.00    0.00      0.002  O       |       |       |       |     2.00
22.750    0.00    0.00      0.002  O       |       |       |       |     2.00
23.000    0.00    0.00      0.002  O       |       |       |       |     2.00
23.250    0.00    0.00      0.002  O       |       |       |       |     2.00
23.500    0.00    0.00      0.002  O       |       |       |       |     2.00
23.750    0.00    0.00      0.002  O       |       |       |       |     2.00
24.000    0.00    0.00      0.002  O       |       |       |       |     2.00
24.250    0.00    0.00      0.002  O       |       |       |       |     2.00

Remaining water in basin =    0.00 (Ac.Ft)

****************************HYDROGRAPH DATA****************************
               Number of intervals =    97
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       33.358 (CFS)
               Total volume =       9.385 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************

-------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBF1RT.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ---------------------------------------------------------------------


      Subdrain Area A2 Routed Through Basin A2
      Proposed Condition
      100 Yr. 3 Hr.

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA23100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      142.388 (CFS)
                    Total volume =      16.967 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000     10.000     30.000      9.690       10.310
         4.000     15.000     70.000     14.277       15.723
         6.000     22.000    120.000     20.760       23.240
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      35.6   71.19  106.79  142.39 (Ft.)
 0.250   16.90    0.50      0.169  O  I    |       |       |       |     2.02
```

0.500	31.94	1.94	0.649	O I	2.06
0.750	37.78	3.92	1.308	O I	2.13
1.000	37.81	5.96	1.987	|O I	2.20
1.250	47.20	8.16	2.720	|O I	2.27
1.500	56.29	10.78	3.593	| O I	2.36
1.750	65.26	13.78	4.595	| O I	2.46
2.000	72.23	17.09	5.697	| O I	2.57
2.250	93.55	21.04	7.015	| O I	2.70
2.500	134.42	26.63	8.878	| O I	2.89
2.750	142.39	38.51	11.064	| O I	3.21
3.000	70.07	48.85	12.357	| O I	3.47
3.250	14.40	47.84	12.230	| I O	3.45
3.500	0.95	41.71	11.464	I |O	3.29
3.750	0.00	35.41	10.677	I O|	3.14
4.000	0.00	30.01	10.001	I O |	3.00
4.250	0.00	28.20	9.400	I O |	2.94
4.500	0.00	26.50	8.835	I O |	2.88
4.750	0.00	24.91	8.303	I O |	2.83
5.000	0.00	23.41	7.804	I O |	2.78
5.250	0.00	22.00	7.335	I O |	2.73
5.500	0.00	20.68	6.894	I O |	2.69
5.750	0.00	19.44	6.480	I O |	2.65
6.000	0.00	18.27	6.090	I O |	2.61
6.250	0.00	17.17	5.724	I O |	2.57
6.500	0.00	16.14	5.380	I O |	2.54
6.750	0.00	15.17	5.057	I O |	2.51
7.000	0.00	14.26	4.753	I O |	2.48
7.250	0.00	13.40	4.467	I O |	2.45
7.500	0.00	12.59	4.198	I O |	2.42
7.750	0.00	11.84	3.946	I O |	2.39
8.000	0.00	11.12	3.709	I O |	2.37
8.250	0.00	10.45	3.486	I O |	2.35
8.500	0.00	9.83	3.277	I O |	2.33
8.750	0.00	9.24	3.080	I O |	2.31
9.000	0.00	8.68	2.895	IO |	2.29
9.250	0.00	8.16	2.721	IO |	2.27
9.500	0.00	7.67	2.557	IO |	2.26
9.750	0.00	7.21	2.403	IO |	2.24
10.000	0.00	6.77	2.259	IO |	2.23
10.250	0.00	6.37	2.123	IO |	2.21
10.500	0.00	5.98	1.996	IO |	2.20
10.750	0.00	5.62	1.876	IO |	2.19
11.000	0.00	5.29	1.763	IO |	2.18
11.250	0.00	4.97	1.657	IO |	2.17
11.500	0.00	4.67	1.558	IO |	2.16
11.750	0.00	4.39	1.464	O |	2.15
12.000	0.00	4.12	1.376	O |	2.14
12.250	0.00	3.88	1.294	O |	2.13
12.500	0.00	3.64	1.216	O |	2.12
12.750	0.00	3.42	1.143	O |	2.11
13.000	0.00	3.22	1.074	O |	2.11
13.250	0.00	3.02	1.010	O |	2.10
13.500	0.00	2.84	0.949	O |	2.09
13.750	0.00	2.67	0.892	O |	2.09
14.000	0.00	2.51	0.839	O |	2.08
14.250	0.00	2.36	0.788	O |	2.08
14.500	0.00	2.22	0.741	O |	2.07
14.750	0.00	2.08	0.697	O |	2.07
15.000	0.00	1.96	0.655	O |	2.07
15.250	0.00	1.84	0.615	O |	2.06
15.500	0.00	1.73	0.579	O |	2.06
15.750	0.00	1.63	0.544	O |	2.05
16.000	0.00	1.53	0.511	O |	2.05
16.250	0.00	1.44	0.481	O |	2.05
16.500	0.00	1.35	0.452	O |	2.04
16.750	0.00	1.27	0.425	O |	2.04
17.000	0.00	1.19	0.399	O |	2.04
17.250	0.00	1.12	0.375	O |	2.04
17.500	0.00	1.05	0.353	O |	2.04
17.750	0.00	0.99	0.332	O |	2.03
18.000	0.00	0.93	0.312	O |	2.03

18.250	0.00	0.88	0.293	O	|	|	|	|	2.03
18.500	0.00	0.82	0.276	O	|	|	|	|	2.03
18.750	0.00	0.77	0.259	O	|	|	|	|	2.03
19.000	0.00	0.73	0.244	O	|	|	|	|	2.02
19.250	0.00	0.68	0.229	O	|	|	|	|	2.02
19.500	0.00	0.64	0.216	O	|	|	|	|	2.02
19.750	0.00	0.60	0.203	O	|	|	|	|	2.02
20.000	0.00	0.57	0.191	O	|	|	|	|	2.02
20.250	0.00	0.53	0.179	O	|	|	|	|	2.02
20.500	0.00	0.50	0.169	O	|	|	|	|	2.02
20.750	0.00	0.47	0.159	O	|	|	|	|	2.02
21.000	0.00	0.44	0.149	O	|	|	|	|	2.01
21.250	0.00	0.42	0.140	O	|	|	|	|	2.01
21.500	0.00	0.39	0.132	O	|	|	|	|	2.01
21.750	0.00	0.37	0.124	O	|	|	|	|	2.01
22.000	0.00	0.35	0.117	O	|	|	|	|	2.01
22.250	0.00	0.32	0.110	O	|	|	|	|	2.01
22.500	0.00	0.30	0.103	O	|	|	|	|	2.01
22.750	0.00	0.29	0.097	O	|	|	|	|	2.01
23.000	0.00	0.27	0.091	O	|	|	|	|	2.01
23.250	0.00	0.25	0.086	O	|	|	|	|	2.01
23.500	0.00	0.24	0.081	O	|	|	|	|	2.01
23.750	0.00	0.22	0.076	O	|	|	|	|	2.01
24.000	0.00	0.21	0.072	O	|	|	|	|	2.01
24.250	0.00	0.20	0.068	O	|	|	|	|	2.01
24.500	0.00	0.19	0.064	O	|	|	|	|	2.01
24.750	0.00	0.17	0.060	O	|	|	|	|	2.01
25.000	0.00	0.16	0.056	O	|	|	|	|	2.01
25.250	0.00	0.15	0.053	O	|	|	|	|	2.01
25.500	0.00	0.14	0.050	O	|	|	|	|	2.00
25.750	0.00	0.14	0.047	O	|	|	|	|	2.00
26.000	0.00	0.13	0.044	O	|	|	|	|	2.00
26.250	0.00	0.12	0.042	O	|	|	|	|	2.00
26.500	0.00	0.11	0.039	O	|	|	|	|	2.00
26.750	0.00	0.11	0.037	O	|	|	|	|	2.00
27.000	0.00	0.10	0.035	O	|	|	|	|	2.00
27.250	0.00	0.09	0.033	O	|	|	|	|	2.00
27.500	0.00	0.09	0.031	O	|	|	|	|	2.00
27.750	0.00	0.08	0.029	O	|	|	|	|	2.00
28.000	0.00	0.08	0.028	O	|	|	|	|	2.00
28.250	0.00	0.07	0.026	O	|	|	|	|	2.00
28.500	0.00	0.07	0.025	O	|	|	|	|	2.00
28.750	0.00	0.06	0.023	O	|	|	|	|	2.00
29.000	0.00	0.06	0.022	O	|	|	|	|	2.00
29.250	0.00	0.06	0.021	O	|	|	|	|	2.00
29.500	0.00	0.05	0.020	O	|	|	|	|	2.00
29.750	0.00	0.05	0.018	O	|	|	|	|	2.00
30.000	0.00	0.05	0.017	O	|	|	|	|	2.00
30.250	0.00	0.04	0.017	O	|	|	|	|	2.00
30.500	0.00	0.04	0.016	O	|	|	|	|	2.00
30.750	0.00	0.04	0.015	O	|	|	|	|	2.00
31.000	0.00	0.04	0.014	O	|	|	|	|	2.00
31.250	0.00	0.03	0.013	O	|	|	|	|	2.00
31.500	0.00	0.03	0.013	O	|	|	|	|	2.00
31.750	0.00	0.03	0.012	O	|	|	|	|	2.00
32.000	0.00	0.03	0.011	O	|	|	|	|	2.00
32.250	0.00	0.03	0.011	O	|	|	|	|	2.00
32.500	0.00	0.03	0.010	O	|	|	|	|	2.00
32.750	0.00	0.02	0.010	O	|	|	|	|	2.00
33.000	0.00	0.02	0.009	O	|	|	|	|	2.00
33.250	0.00	0.02	0.009	O	|	|	|	|	2.00
33.500	0.00	0.02	0.008	O	|	|	|	|	2.00
33.750	0.00	0.02	0.008	O	|	|	|	|	2.00
34.000	0.00	0.02	0.008	O	|	|	|	|	2.00
34.250	0.00	0.02	0.007	O	|	|	|	|	2.00
34.500	0.00	0.02	0.007	O	|	|	|	|	2.00
34.750	0.00	0.01	0.007	O	|	|	|	|	2.00
35.000	0.00	0.01	0.006	O	|	|	|	|	2.00
35.250	0.00	0.01	0.006	O	|	|	|	|	2.00
35.500	0.00	0.01	0.006	O	|	|	|	|	2.00
35.750	0.00	0.01	0.005	O	|	|	|	|	2.00

```
36.000    0.00    0.01      0.005  O       |       |       |       |     2.00
36.250    0.00    0.01      0.005  O       |       |       |       |     2.00
36.500    0.00    0.01      0.005  O       |       |       |       |     2.00
36.750    0.00    0.01      0.005  O       |       |       |       |     2.00
37.000    0.00    0.01      0.004  O       |       |       |       |     2.00
37.250    0.00    0.01      0.004  O       |       |       |       |     2.00
37.500    0.00    0.01      0.004  O       |       |       |       |     2.00
37.750    0.00    0.01      0.004  O       |       |       |       |     2.00
38.000    0.00    0.01      0.004  O       |       |       |       |     2.00
38.250    0.00    0.01      0.004  O       |       |       |       |     2.00
38.500    0.00    0.01      0.004  O       |       |       |       |     2.00
38.750    0.00    0.01      0.003  O       |       |       |       |     2.00
39.000    0.00    0.01      0.003  O       |       |       |       |     2.00
39.250    0.00    0.00      0.003  O       |       |       |       |     2.00
39.500    0.00    0.00      0.003  O       |       |       |       |     2.00
39.750    0.00    0.00      0.003  O       |       |       |       |     2.00
40.000    0.00    0.00      0.003  O       |       |       |       |     2.00
40.250    0.00    0.00      0.003  O       |       |       |       |     2.00
40.500    0.00    0.00      0.003  O       |       |       |       |     2.00
40.750    0.00    0.00      0.003  O       |       |       |       |     2.00
41.000    0.00    0.00      0.003  O       |       |       |       |     2.00
41.250    0.00    0.00      0.003  O       |       |       |       |     2.00
41.500    0.00    0.00      0.003  O       |       |       |       |     2.00
41.750    0.00    0.00      0.003  O       |       |       |       |     2.00
42.000    0.00    0.00      0.002  O       |       |       |       |     2.00
42.250    0.00    0.00      0.002  O       |       |       |       |     2.00
42.500    0.00    0.00      0.002  O       |       |       |       |     2.00
42.750    0.00    0.00      0.002  O       |       |       |       |     2.00
43.000    0.00    0.00      0.002  O       |       |       |       |     2.00
43.250    0.00    0.00      0.002  O       |       |       |       |     2.00
43.500    0.00    0.00      0.002  O       |       |       |       |     2.00
43.750    0.00    0.00      0.002  O       |       |       |       |     2.00
44.000    0.00    0.00      0.002  O       |       |       |       |     2.00
44.250    0.00    0.00      0.002  O       |       |       |       |     2.00
44.500    0.00    0.00      0.002  O       |       |       |       |     2.00
44.750    0.00    0.00      0.002  O       |       |       |       |     2.00
45.000    0.00    0.00      0.002  O       |       |       |       |     2.00
45.250    0.00    0.00      0.002  O       |       |       |       |     2.00
45.500    0.00    0.00      0.002  O       |       |       |       |     2.00
45.750    0.00    0.00      0.002  O       |       |       |       |     1.98

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =   183
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       48.852 (CFS)
                    Total volume =      16.965 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SUBF2RT.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =     0
                    Time interval =    0.0 (Min.)
                    Maximum/Peak flow rate =        0.000 (CFS)
                    Total volume =       0.000 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
```

```
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------
```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ----------------------------------------------------------------


      Subdrain Area A3 Routed Through Basin A3
      Proposed Condition
      100 Yr. 3 Hr.

      ----------------------------------------------------------------


      Program License Serial Number 6097

      -------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA33100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      108.666 (CFS)
                    Total volume =      12.948 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      *********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      -------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      -------------------------------------------------------------------
      -------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      -------------------------------------------------------------------
      -------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      -------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000     10.000     30.000      9.690       10.310
         4.000     15.000     50.000     14.483       15.517
         6.000     20.900     60.000     20.280       21.520
      -------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      -------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      -------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      27.2   54.33   81.50  108.67 (Ft.)
 0.250   12.90    0.38      0.129  O  I    |       |       |       |     2.01
```

0.500	24.38	1.48	0.495	O I| | | |	2.05
0.750	28.83	2.99	0.999	O I | | |	2.10
1.000	28.86	4.55	1.517	|O I | | |	2.15
1.250	36.03	6.22	2.076	|O | I | | |	2.21
1.500	42.96	8.22	2.742	| O | I | | |	2.27
1.750	49.80	10.52	3.507	| O | I | | |	2.35
2.000	55.12	13.04	4.348	| O | I | |	2.43
2.250	71.39	16.06	5.354	| O | | I | |	2.54
2.500	102.59	20.32	6.775	| O | | | I |	2.68
2.750	108.67	25.45	8.485	| O| | | I|	2.85
3.000	53.47	28.80	9.599	| O I| | |	2.96
3.250	10.99	29.00	9.668	| I O | | |	2.97
3.500	0.73	27.61	9.204	I O | | |	2.92
3.750	0.00	25.97	8.658	I O| | | |	2.87
4.000	0.00	24.41	8.138	I O| | | |	2.81
4.250	0.00	22.94	7.649	I O | | | |	2.76
4.500	0.00	21.56	7.189	I O | | | |	2.72
4.750	0.00	20.27	6.757	I O | | | |	2.68
5.000	0.00	19.05	6.350	I O | | | |	2.63
5.250	0.00	17.90	5.969	I O | | | |	2.60
5.500	0.00	16.83	5.610	I O | | | |	2.56
5.750	0.00	15.82	5.273	I O | | | |	2.53
6.000	0.00	14.86	4.956	I O | | | |	2.50
6.250	0.00	13.97	4.658	I O | | | |	2.47
6.500	0.00	13.13	4.378	I O | | | |	2.44
6.750	0.00	12.34	4.115	I O | | | |	2.41
7.000	0.00	11.60	3.867	I O | | | |	2.39
7.250	0.00	10.90	3.635	I O | | | |	2.36
7.500	0.00	10.25	3.416	I O | | | |	2.34
7.750	0.00	9.63	3.211	I O | | | |	2.32
8.000	0.00	9.05	3.018	I O | | | |	2.30
8.250	0.00	8.51	2.837	I O | | | |	2.28
8.500	0.00	8.00	2.666	I O | | | |	2.27
8.750	0.00	7.51	2.506	I O | | | |	2.25
9.000	0.00	7.06	2.355	I O | | | |	2.24
9.250	0.00	6.64	2.214	IO | | | |	2.22
9.500	0.00	6.24	2.081	IO | | | |	2.21
9.750	0.00	5.86	1.956	IO | | | |	2.20
10.000	0.00	5.51	1.838	IO | | | |	2.18
10.250	0.00	5.18	1.728	IO | | | |	2.17
10.500	0.00	4.87	1.624	IO | | | |	2.16
10.750	0.00	4.58	1.527	IO | | | |	2.15
11.000	0.00	4.30	1.435	IO | | | |	2.14
11.250	0.00	4.04	1.349	IO | | | |	2.13
11.500	0.00	3.80	1.268	IO | | | |	2.13
11.750	0.00	3.57	1.192	IO | | | |	2.12
12.000	0.00	3.36	1.120	O | | | |	2.11
12.250	0.00	3.15	1.053	O | | | |	2.11
12.500	0.00	2.96	0.990	O | | | |	2.10
12.750	0.00	2.79	0.930	O | | | |	2.09
13.000	0.00	2.62	0.874	O | | | |	2.09
13.250	0.00	2.46	0.822	O | | | |	2.08
13.500	0.00	2.31	0.773	O | | | |	2.08
13.750	0.00	2.17	0.726	O | | | |	2.07
14.000	0.00	2.04	0.683	O | | | |	2.07
14.250	0.00	1.92	0.642	O | | | |	2.06
14.500	0.00	1.80	0.603	O | | | |	2.06
14.750	0.00	1.70	0.567	O | | | |	2.06
15.000	0.00	1.59	0.533	O | | | |	2.05
15.250	0.00	1.50	0.501	O | | | |	2.05
15.500	0.00	1.41	0.471	O | | | |	2.05
15.750	0.00	1.32	0.443	O | | | |	2.04
16.000	0.00	1.24	0.416	O | | | |	2.04
16.250	0.00	1.17	0.391	O | | | |	2.04
16.500	0.00	1.10	0.368	O | | | |	2.04
16.750	0.00	1.03	0.346	O | | | |	2.03
17.000	0.00	0.97	0.325	O | | | |	2.03
17.250	0.00	0.91	0.306	O | | | |	2.03
17.500	0.00	0.86	0.287	O | | | |	2.03
17.750	0.00	0.81	0.270	O | | | |	2.03
18.000	0.00	0.76	0.254	O | | | |	2.03

18.250	0.00	0.71	0.239	O	|	|	|	|	2.02
18.500	0.00	0.67	0.225	O	|	|	|	|	2.02
18.750	0.00	0.63	0.211	O	|	|	|	|	2.02
19.000	0.00	0.59	0.199	O	|	|	|	|	2.02
19.250	0.00	0.56	0.187	O	|	|	|	|	2.02
19.500	0.00	0.52	0.176	O	|	|	|	|	2.02
19.750	0.00	0.49	0.165	O	|	|	|	|	2.02
20.000	0.00	0.46	0.155	O	|	|	|	|	2.02
20.250	0.00	0.43	0.146	O	|	|	|	|	2.01
20.500	0.00	0.41	0.137	O	|	|	|	|	2.01
20.750	0.00	0.38	0.129	O	|	|	|	|	2.01
21.000	0.00	0.36	0.122	O	|	|	|	|	2.01
21.250	0.00	0.34	0.114	O	|	|	|	|	2.01
21.500	0.00	0.32	0.108	O	|	|	|	|	2.01
21.750	0.00	0.30	0.101	O	|	|	|	|	2.01
22.000	0.00	0.28	0.095	O	|	|	|	|	2.01
22.250	0.00	0.26	0.090	O	|	|	|	|	2.01
22.500	0.00	0.25	0.084	O	|	|	|	|	2.01
22.750	0.00	0.23	0.079	O	|	|	|	|	2.01
23.000	0.00	0.22	0.075	O	|	|	|	|	2.01
23.250	0.00	0.21	0.070	O	|	|	|	|	2.01
23.500	0.00	0.19	0.066	O	|	|	|	|	2.01
23.750	0.00	0.18	0.062	O	|	|	|	|	2.01
24.000	0.00	0.17	0.059	O	|	|	|	|	2.01
24.250	0.00	0.16	0.055	O	|	|	|	|	2.01
24.500	0.00	0.15	0.052	O	|	|	|	|	2.01
24.750	0.00	0.14	0.049	O	|	|	|	|	2.00
25.000	0.00	0.13	0.046	O	|	|	|	|	2.00
25.250	0.00	0.13	0.043	O	|	|	|	|	2.00
25.500	0.00	0.12	0.041	O	|	|	|	|	2.00
25.750	0.00	0.11	0.039	O	|	|	|	|	2.00
26.000	0.00	0.10	0.036	O	|	|	|	|	2.00
26.250	0.00	0.10	0.034	O	|	|	|	|	2.00
26.500	0.00	0.09	0.032	O	|	|	|	|	2.00
26.750	0.00	0.09	0.030	O	|	|	|	|	2.00
27.000	0.00	0.08	0.029	O	|	|	|	|	2.00
27.250	0.00	0.08	0.027	O	|	|	|	|	2.00
27.500	0.00	0.07	0.026	O	|	|	|	|	2.00
27.750	0.00	0.07	0.024	O	|	|	|	|	2.00
28.000	0.00	0.06	0.023	O	|	|	|	|	2.00
28.250	0.00	0.06	0.022	O	|	|	|	|	2.00
28.500	0.00	0.06	0.020	O	|	|	|	|	2.00
28.750	0.00	0.05	0.019	O	|	|	|	|	2.00
29.000	0.00	0.05	0.018	O	|	|	|	|	2.00
29.250	0.00	0.05	0.017	O	|	|	|	|	2.00
29.500	0.00	0.04	0.016	O	|	|	|	|	2.00
29.750	0.00	0.04	0.015	O	|	|	|	|	2.00
30.000	0.00	0.04	0.015	O	|	|	|	|	2.00
30.250	0.00	0.04	0.014	O	|	|	|	|	2.00
30.500	0.00	0.03	0.013	O	|	|	|	|	2.00
30.750	0.00	0.03	0.012	O	|	|	|	|	2.00
31.000	0.00	0.03	0.012	O	|	|	|	|	2.00
31.250	0.00	0.03	0.011	O	|	|	|	|	2.00
31.500	0.00	0.03	0.011	O	|	|	|	|	2.00
31.750	0.00	0.03	0.010	O	|	|	|	|	2.00
32.000	0.00	0.02	0.010	O	|	|	|	|	2.00
32.250	0.00	0.02	0.009	O	|	|	|	|	2.00
32.500	0.00	0.02	0.009	O	|	|	|	|	2.00
32.750	0.00	0.02	0.008	O	|	|	|	|	2.00
33.000	0.00	0.02	0.008	O	|	|	|	|	2.00
33.250	0.00	0.02	0.007	O	|	|	|	|	2.00
33.500	0.00	0.02	0.007	O	|	|	|	|	2.00
33.750	0.00	0.02	0.007	O	|	|	|	|	2.00
34.000	0.00	0.01	0.006	O	|	|	|	|	2.00
34.250	0.00	0.01	0.006	O	|	|	|	|	2.00
34.500	0.00	0.01	0.006	O	|	|	|	|	2.00
34.750	0.00	0.01	0.006	O	|	|	|	|	2.00
35.000	0.00	0.01	0.005	O	|	|	|	|	2.00
35.250	0.00	0.01	0.005	O	|	|	|	|	2.00
35.500	0.00	0.01	0.005	O	|	|	|	|	2.00
35.750	0.00	0.01	0.005	O	|	|	|	|	2.00

```
36.000    0.00    0.01      0.005  O       |       |       |       |     2.00
36.250    0.00    0.01      0.004  O       |       |       |       |     2.00
36.500    0.00    0.01      0.004  O       |       |       |       |     2.00
36.750    0.00    0.01      0.004  O       |       |       |       |     2.00
37.000    0.00    0.01      0.004  O       |       |       |       |     2.00
37.250    0.00    0.01      0.004  O       |       |       |       |     2.00
37.500    0.00    0.01      0.004  O       |       |       |       |     2.00
37.750    0.00    0.01      0.004  O       |       |       |       |     2.00
38.000    0.00    0.01      0.003  O       |       |       |       |     2.00
38.250    0.00    0.00      0.003  O       |       |       |       |     2.00
38.500    0.00    0.00      0.003  O       |       |       |       |     2.00
38.750    0.00    0.00      0.003  O       |       |       |       |     2.00
39.000    0.00    0.00      0.003  O       |       |       |       |     2.00
39.250    0.00    0.00      0.003  O       |       |       |       |     2.00
39.500    0.00    0.00      0.003  O       |       |       |       |     2.00
39.750    0.00    0.00      0.003  O       |       |       |       |     2.00
40.000    0.00    0.00      0.003  O       |       |       |       |     2.00
40.250    0.00    0.00      0.003  O       |       |       |       |     2.00
40.500    0.00    0.00      0.003  O       |       |       |       |     2.00
40.750    0.00    0.00      0.003  O       |       |       |       |     2.00
41.000    0.00    0.00      0.003  O       |       |       |       |     2.00
41.250    0.00    0.00      0.002  O       |       |       |       |     2.00
41.500    0.00    0.00      0.002  O       |       |       |       |     2.00
41.750    0.00    0.00      0.002  O       |       |       |       |     2.00
42.000    0.00    0.00      0.002  O       |       |       |       |     2.00
42.250    0.00    0.00      0.002  O       |       |       |       |     2.00
42.500    0.00    0.00      0.002  O       |       |       |       |     2.00
42.750    0.00    0.00      0.002  O       |       |       |       |     2.00
43.000    0.00    0.00      0.002  O       |       |       |       |     2.00
43.250    0.00    0.00      0.002  O       |       |       |       |     2.00
43.500    0.00    0.00      0.002  O       |       |       |       |     2.00
43.750    0.00    0.00      0.002  O       |       |       |       |     2.00
44.000    0.00    0.00      0.002  O       |       |       |       |     2.00
44.250    0.00    0.00      0.002  O       |       |       |       |     2.00
44.500    0.00    0.00      0.002  O       |       |       |       |     2.00
44.750    0.00    0.00      0.002  O       |       |       |       |     2.00

Remaining water in basin =    0.00 (Ac.Ft)

****************************HYDROGRAPH DATA****************************
               Number of intervals =   179
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       29.005 (CFS)
               Total volume =      12.947 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBF3RT.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ---------------------------------------------------------------------


      Subdrain Area A4 Routed Through Basin A4
      Proposed Condition
      100 Yr. 3 Hr.

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA43100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      240.984 (CFS)
                    Total volume =      28.714 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000     20.000     70.000     19.277       20.723
        4.000     25.000    150.000     23.450       26.550
        6.000     38.800    200.000     36.734       40.866
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      60.2  120.49  180.74  240.98 (Ft.)
 0.250   28.59    0.99      0.285  O  I    |       |       |       |     2.01
```

0.500	54.05	3.81	1.089	O I| | | |	2.05
0.750	63.93	7.66	2.190	|O I | | |	2.11
1.000	63.99	11.59	3.312	|O I | | |	2.17
1.250	79.89	15.80	4.516	| O | I | | |	2.23
1.500	95.26	20.81	5.947	| O | I | | |	2.30
1.750	110.44	26.54	7.583	| O | I | | |	2.38
2.000	122.24	32.80	9.374	| O | I | |	2.47
2.250	158.32	40.31	11.517	| O | | I | |	2.58
2.500	227.50	50.96	14.560	| O | | | I |	2.73
2.750	240.98	63.75	18.215	| O | | I	2.91
3.000	118.59	77.52	20.470	| | O I| | |	3.09
3.250	24.38	75.80	20.363	| I | O | | |	3.07
3.500	1.61	67.04	19.155	I O | | |	2.96
3.750	0.00	62.42	17.835	I O | | |	2.89
4.000	0.00	58.06	16.590	I O| | | |	2.83
4.250	0.00	54.01	15.432	I O| | | |	2.77
4.500	0.00	50.24	14.355	I O | | | |	2.72
4.750	0.00	46.73	13.353	I O | | | |	2.67
5.000	0.00	43.47	12.421	I O | | | |	2.62
5.250	0.00	40.44	11.555	I O | | | |	2.58
5.500	0.00	37.62	10.748	I O | | | |	2.54
5.750	0.00	34.99	9.998	I O | | | |	2.50
6.000	0.00	32.55	9.300	I O | | | |	2.46
6.250	0.00	30.28	8.651	I O | | | |	2.43
6.500	0.00	28.16	8.048	I O | | | |	2.40
6.750	0.00	26.20	7.486	I O | | | |	2.37
7.000	0.00	24.37	6.964	I O | | | |	2.35
7.250	0.00	22.67	6.478	I O | | | |	2.32
7.500	0.00	21.09	6.026	I O | | | |	2.30
7.750	0.00	19.61	5.605	I O | | | |	2.28
8.000	0.00	18.25	5.214	I O | | | |	2.26
8.250	0.00	16.97	4.850	I O | | | |	2.24
8.500	0.00	15.79	4.512	I O | | | |	2.23
8.750	0.00	14.69	4.197	IO | | | |	2.21
9.000	0.00	13.66	3.904	IO | | | |	2.20
9.250	0.00	12.71	3.632	IO | | | |	2.18
9.500	0.00	11.82	3.379	IO | | | |	2.17
9.750	0.00	11.00	3.143	IO | | | |	2.16
10.000	0.00	10.23	2.924	IO | | | |	2.15
10.250	0.00	9.51	2.720	IO | | | |	2.14
10.500	0.00	8.85	2.530	IO | | | |	2.13
10.750	0.00	8.23	2.354	IO | | | |	2.12
11.000	0.00	7.66	2.189	IO | | | |	2.11
11.250	0.00	7.12	2.037	O | | | |	2.10
11.500	0.00	6.63	1.895	O | | | |	2.09
11.750	0.00	6.16	1.763	O | | | |	2.09
12.000	0.00	5.73	1.640	O | | | |	2.08
12.250	0.00	5.33	1.525	O | | | |	2.08
12.500	0.00	4.96	1.419	O | | | |	2.07
12.750	0.00	4.61	1.320	O | | | |	2.07
13.000	0.00	4.29	1.228	O | | | |	2.06
13.250	0.00	3.99	1.142	O | | | |	2.06
13.500	0.00	3.71	1.063	O | | | |	2.05
13.750	0.00	3.46	0.989	O | | | |	2.05
14.000	0.00	3.21	0.920	O | | | |	2.05
14.250	0.00	2.99	0.856	O | | | |	2.04
14.500	0.00	2.78	0.796	O | | | |	2.04
14.750	0.00	2.59	0.741	O | | | |	2.04
15.000	0.00	2.41	0.689	O | | | |	2.03
15.250	0.00	2.24	0.641	O | | | |	2.03
15.500	0.00	2.08	0.597	O | | | |	2.03
15.750	0.00	1.94	0.555	O | | | |	2.03
16.000	0.00	1.80	0.516	O | | | |	2.03
16.250	0.00	1.68	0.480	O | | | |	2.02
16.500	0.00	1.56	0.447	O | | | |	2.02
16.750	0.00	1.45	0.416	O | | | |	2.02
17.000	0.00	1.35	0.387	O | | | |	2.02
17.250	0.00	1.25	0.360	O | | | |	2.02
17.500	0.00	1.17	0.335	O | | | |	2.02
17.750	0.00	1.09	0.312	O | | | |	2.02
18.000	0.00	1.01	0.290	O | | | |	2.01

18.250	0.00	0.94	0.270	O	|	|	|	|	2.01
18.500	0.00	0.87	0.251	O	|	|	|	|	2.01
18.750	0.00	0.81	0.234	O	|	|	|	|	2.01
19.000	0.00	0.76	0.218	O	|	|	|	|	2.01
19.250	0.00	0.70	0.203	O	|	|	|	|	2.01
19.500	0.00	0.65	0.189	O	|	|	|	|	2.01
19.750	0.00	0.61	0.176	O	|	|	|	|	2.01
20.000	0.00	0.57	0.163	O	|	|	|	|	2.01
20.250	0.00	0.53	0.152	O	|	|	|	|	2.01
20.500	0.00	0.49	0.142	O	|	|	|	|	2.01
20.750	0.00	0.46	0.132	O	|	|	|	|	2.01
21.000	0.00	0.42	0.123	O	|	|	|	|	2.01
21.250	0.00	0.39	0.114	O	|	|	|	|	2.01
21.500	0.00	0.37	0.106	O	|	|	|	|	2.01
21.750	0.00	0.34	0.099	O	|	|	|	|	2.00
22.000	0.00	0.32	0.092	O	|	|	|	|	2.00
22.250	0.00	0.30	0.086	O	|	|	|	|	2.00
22.500	0.00	0.27	0.080	O	|	|	|	|	2.00
22.750	0.00	0.26	0.075	O	|	|	|	|	2.00
23.000	0.00	0.24	0.070	O	|	|	|	|	2.00
23.250	0.00	0.22	0.065	O	|	|	|	|	2.00
23.500	0.00	0.21	0.060	O	|	|	|	|	2.00
23.750	0.00	0.19	0.056	O	|	|	|	|	2.00
24.000	0.00	0.18	0.053	O	|	|	|	|	2.00
24.250	0.00	0.17	0.049	O	|	|	|	|	2.00
24.500	0.00	0.15	0.046	O	|	|	|	|	2.00
24.750	0.00	0.14	0.043	O	|	|	|	|	2.00
25.000	0.00	0.13	0.040	O	|	|	|	|	2.00
25.250	0.00	0.12	0.037	O	|	|	|	|	2.00
25.500	0.00	0.12	0.035	O	|	|	|	|	2.00
25.750	0.00	0.11	0.032	O	|	|	|	|	2.00
26.000	0.00	0.10	0.030	O	|	|	|	|	2.00
26.250	0.00	0.09	0.028	O	|	|	|	|	2.00
26.500	0.00	0.09	0.026	O	|	|	|	|	2.00
26.750	0.00	0.08	0.025	O	|	|	|	|	2.00
27.000	0.00	0.07	0.023	O	|	|	|	|	2.00
27.250	0.00	0.07	0.022	O	|	|	|	|	2.00
27.500	0.00	0.06	0.020	O	|	|	|	|	2.00
27.750	0.00	0.06	0.019	O	|	|	|	|	2.00
28.000	0.00	0.06	0.018	O	|	|	|	|	2.00
28.250	0.00	0.05	0.017	O	|	|	|	|	2.00
28.500	0.00	0.05	0.016	O	|	|	|	|	2.00
28.750	0.00	0.04	0.015	O	|	|	|	|	2.00
29.000	0.00	0.04	0.014	O	|	|	|	|	2.00
29.250	0.00	0.04	0.013	O	|	|	|	|	2.00
29.500	0.00	0.04	0.012	O	|	|	|	|	2.00
29.750	0.00	0.03	0.011	O	|	|	|	|	2.00
30.000	0.00	0.03	0.011	O	|	|	|	|	2.00
30.250	0.00	0.03	0.010	O	|	|	|	|	2.00
30.500	0.00	0.03	0.009	O	|	|	|	|	2.00
30.750	0.00	0.03	0.009	O	|	|	|	|	2.00
31.000	0.00	0.02	0.008	O	|	|	|	|	2.00
31.250	0.00	0.02	0.008	O	|	|	|	|	2.00
31.500	0.00	0.02	0.008	O	|	|	|	|	2.00
31.750	0.00	0.02	0.007	O	|	|	|	|	2.00
32.000	0.00	0.02	0.007	O	|	|	|	|	2.00
32.250	0.00	0.02	0.006	O	|	|	|	|	2.00
32.500	0.00	0.02	0.006	O	|	|	|	|	2.00
32.750	0.00	0.01	0.006	O	|	|	|	|	2.00
33.000	0.00	0.01	0.005	O	|	|	|	|	2.00
33.250	0.00	0.01	0.005	O	|	|	|	|	2.00
33.500	0.00	0.01	0.005	O	|	|	|	|	2.00
33.750	0.00	0.01	0.005	O	|	|	|	|	2.00
34.000	0.00	0.01	0.005	O	|	|	|	|	2.00
34.250	0.00	0.01	0.004	O	|	|	|	|	2.00
34.500	0.00	0.01	0.004	O	|	|	|	|	2.00
34.750	0.00	0.01	0.004	O	|	|	|	|	2.00
35.000	0.00	0.01	0.004	O	|	|	|	|	2.00
35.250	0.00	0.01	0.004	O	|	|	|	|	2.00
35.500	0.00	0.01	0.004	O	|	|	|	|	2.00
35.750	0.00	0.01	0.003	O	|	|	|	|	2.00

```
36.000    0.00    0.01      0.003  O       |       |       |       |     2.00
36.250    0.00    0.01      0.003  O       |       |       |       |     2.00
36.500    0.00    0.00      0.003  O       |       |       |       |     2.00
36.750    0.00    0.00      0.003  O       |       |       |       |     2.00
37.000    0.00    0.00      0.003  O       |       |       |       |     2.00
37.250    0.00    0.00      0.003  O       |       |       |       |     2.00
37.500    0.00    0.00      0.003  O       |       |       |       |     2.00
37.750    0.00    0.00      0.003  O       |       |       |       |     2.00
38.000    0.00    0.00      0.003  O       |       |       |       |     2.00
38.250    0.00    0.00      0.003  O       |       |       |       |     2.00
38.500    0.00    0.00      0.002  O       |       |       |       |     2.00
38.750    0.00    0.00      0.002  O       |       |       |       |     2.00
39.000    0.00    0.00      0.002  O       |       |       |       |     2.00
39.250    0.00    0.00      0.002  O       |       |       |       |     2.00
39.500    0.00    0.00      0.002  O       |       |       |       |     2.00
39.750    0.00    0.00      0.002  O       |       |       |       |     2.00
40.000    0.00    0.00      0.002  O       |       |       |       |     2.00
40.250    0.00    0.00      0.002  O       |       |       |       |     2.00
40.500    0.00    0.00      0.002  O       |       |       |       |     2.00
40.750    0.00    0.00      0.002  O       |       |       |       |     2.00
41.000    0.00    0.00      0.002  O       |       |       |       |     2.00
41.250    0.00    0.00      0.002  O       |       |       |       |     2.00
41.500    0.00    0.00      0.002  O       |       |       |       |     2.00
41.750    0.00    0.00      0.002  O       |       |       |       |     2.00
42.000    0.00    0.00      0.002  O       |       |       |       |     1.99

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =   168
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       77.516 (CFS)
                     Total volume =      28.713 (Ac.Ft)
             Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SUBF4RT.rte
      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =     0
                     Time interval =    0.0 (Min.)
                     Maximum/Peak flow rate =        0.000 (CFS)
                     Total volume =       0.000 (Ac.Ft)
             Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/26/12 File: LineAoffsite3100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Line A Offsite, Routed
100 Yr. 3 Hr.


--------------------------------------------------------------------
Drainage Area =    1643.00(Ac.)  =      2.567 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =    1643.00(Ac.)  =      2.567 Sq. Mi.
Length along longest watercourse =   20000.00(Ft.)
Length along longest watercourse measured to centroid =   10000.00(Ft.)
Length along longest watercourse =      3.788 Mi.
Length along longest watercourse measured to centroid =      1.894 Mi.
Difference in elevation =    4000.00(Ft.)
Slope along watercourse =   1056.0000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.406 Hr.
Lag time =    24.33 Min.
25% of lag time =     6.08 Min.
40% of lag time =     9.73 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1643.00           0.85                1396.55

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1643.00           1.90                3121.70

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.28 %
Adjusted average point rain =    1.886(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
  1643.000           92.00         0.150
 Total Area Entered =   1643.00(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	92.0	0.104	0.150	0.090	1.000	0.090
					Sum (F) =	0.090

Area averaged mean soil loss (F) (In/Hr) = 0.090
Minimum soil loss rate ((In/Hr)) = 0.045
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.780

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	61.647	5.828	96.496
2	0.500	123.295	33.332	551.928
3	0.750	184.942	33.227	550.184
4	1.000	246.589	12.119	200.671
5	1.250	308.236	6.971	115.433
6	1.500	369.884	4.136	68.478
7	1.750	431.531	2.175	36.022
8	2.000	493.178	0.830	13.740
9	2.250	554.826	0.525	8.691
10	2.500	616.473	0.434	7.178
11	2.750	678.120	0.300	4.967
12	3.000	739.768	0.124	2.047
			Sum = 100.000	Sum= 1655.836

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.279	0.090	(0.218)	0.189
2	0.50	4.80	0.362	0.090	(0.282)	0.272
3	0.75	5.10	0.385	0.090	(0.300)	0.295
4	1.00	4.90	0.370	0.090	(0.288)	0.280
5	1.25	6.60	0.498	0.090	(0.388)	0.408
6	1.50	7.30	0.551	0.090	(0.430)	0.461
7	1.75	8.40	0.634	0.090	(0.494)	0.544
8	2.00	9.00	0.679	0.090	(0.530)	0.589
9	2.25	12.30	0.928	0.090	(0.724)	0.838
10	2.50	17.60	1.328	0.090	(1.036)	1.238
11	2.75	16.10	1.215	0.090	(0.948)	1.125
12	3.00	4.20	0.317	0.090	(0.247)	0.227
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	6.5

Flood volume = Effective rainfall 1.62(In)
times area 1643.0(Ac.)/[(In)/(Ft.)] = 221.3(Ac.Ft)
Total soil loss = 0.27(In)
Total soil loss = 36.951(Ac.Ft)
Total rainfall = 1.89(In)
Flood volume = 9640728.2 Cubic Feet
Total soil loss = 1609588.6 Cubic Feet

Peak flow rate of this hydrograph = 1626.642(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
      ----------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0      425.0     850.0    1275.0    1700.0
  ----------------------------------------------------------------------
    0+15       0.3774     18.27  Q         |         |         |         |
    0+30       3.0793    130.77  V  Q      |         |         |         |
    0+45       8.9254    282.95   V    Q   |         |         |         |
    1+ 0      16.7285    377.67  |  V    Q |         |         |         |
    1+15      25.6685    432.70  |   V     Q         |         |         |
    1+30      36.5656    527.42  |     V   | Q       |         |         |
    1+45      49.9395    647.30  |        V|    Q    |         |         |
    2+ 0      65.5951    757.73  |          V     Q  |         |         |
    2+15      83.7862    880.45  |         |    V    Q         |         |
    2+30     106.8208   1114.88  |         |        V|     Q   |         |
    2+45     137.6119   1490.29  |         |         |   V     |    Q    |
    3+ 0     171.2202   1626.64  |         |         |         V       Q |
    3+15     195.2647   1163.75  |         |         |      Q  |    V    |
    3+30     207.4303    588.81  |         |  Q      |         |      V  |
    3+45     213.8196    309.24  |      Q  |         |         |       V |
    4+ 0     217.3645    171.57  |   Q     |         |         |        V|
    4+15     219.1883     88.27  | Q       |         |         |        V|
    4+30     220.1071     44.47  |Q        |         |         |        V|
    4+45     220.6683     27.16  Q         |         |         |        V|
    5+ 0     221.0386     17.92  Q         |         |         |        V|
    5+15     221.2402      9.76  Q         |         |         |        V|
    5+30     221.3111      3.43  Q         |         |         |        V|
    5+45     221.3207      0.46  Q         |         |         |         V
----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Line A, offsite Sketcher Site
100 yr 3 hr


--------------------------------------------------------------------
Drainage Area =     158.40(Ac.)  =      0.248 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     158.40(Ac.)  =      0.248 Sq. Mi.
Length along longest watercourse =    1400.00(Ft.)
Length along longest watercourse measured to centroid =     700.00(Ft.)
Length along longest watercourse =      0.265 Mi.
Length along longest watercourse measured to centroid =      0.133 Mi.
Difference in elevation =      28.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.083 Hr.
Lag time =     4.99 Min.
25% of lag time =     1.25 Min.
40% of lag time =     2.00 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.40           0.85                134.64

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.40           1.90                300.96

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.93 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   158.400           85.00         0.750
 Total Area Entered =    158.40(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        300.358         56.717             90.541
    2   0.500        600.716         37.109             59.239
    3   0.750        901.075          6.175              9.857
                                Sum = 100.000   Sum=     159.637
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.365	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.327
4 1.00	4.90	0.372	0.061	(0.112)	0.311
5 1.25	6.60	0.501	0.061	(0.150)	0.440
6 1.50	7.30	0.554	0.061	(0.166)	0.494
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.684	0.061	(0.205)	0.623
9 2.25	12.30	0.934	0.061	(0.280)	0.873
10 2.50	17.60	1.337	0.061	(0.401)	1.276
11 2.75	16.10	1.223	0.061	(0.367)	1.162
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     158.4(Ac.)/[(In)/(Ft.)] =      22.7(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     2.407(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      986892.3 Cubic Feet
Total soil loss =      104835.4 Cubic Feet
--------------------------------------------------------------------
 Peak flow rate of this hydrograph =    189.497(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
--------------------------------------------------------------------
  0+15       0.4122     19.95  V  Q      |         |         |         |
  0+30       1.2504     40.57  | V     Q |         |         |         |
  0+45       2.2785     49.76  |   V    Q|         |         |         |
  1+ 0       3.3231     50.56  |    V    Q         |         |         |
  1+15       4.5953     61.58  |       V | Q       |         |         |
  1+30       6.1221     73.90  |         V   Q     |         |         |
```

```
    1+45       7.8966     85.89  |         |  V   Q  |         |         |
    2+ 0       9.8696     95.49  |         |      V Q|         |         |
    2+15      12.3845    121.72  |         |          V  Q     |         |
    2+30      15.9689    173.49  |         |         |       V |   Q     |
    2+45      19.8842    189.50  |         |         |               V Q  |
    3+ 0      22.0504    104.84  |         |         Q         |       V |
    3+15      22.6033     26.76  |    Q    |         |         |        V|
    3+30      22.6559      2.55  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A1
100 Yr. 3 Hr.


--------------------------------------------------------------------
Drainage Area =      65.60(Ac.)  =      0.102 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      65.60(Ac.)  =      0.102 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       65.60           0.85                 55.76

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       65.60           1.90                124.64

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    65.600           85.00         0.750
 Total Area Entered =     65.60(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        386.627         64.140             42.405
    2   0.500        773.254         32.781             21.672
    3   0.750       1159.882          3.079              2.036
                                 Sum = 100.000   Sum=      66.113
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.365	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.327
4 1.00	4.90	0.372	0.061	(0.112)	0.312
5 1.25	6.60	0.501	0.061	(0.150)	0.441
6 1.50	7.30	0.555	0.061	(0.166)	0.494
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.684	0.061	(0.205)	0.623
9 2.25	12.30	0.935	0.061	(0.280)	0.874
10 2.50	17.60	1.337	0.061	(0.401)	1.276
11 2.75	16.10	1.223	0.061	(0.367)	1.162
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area      65.6(Ac.)/[(In)/(Ft.)] =       9.4(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     0.997(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      408896.7 Cubic Feet
Total soil loss =       43416.7 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =     78.777(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       20.0      40.0      60.0      80.0
---------------------------------------------------------------------
  0+15       0.1931      9.35  V   Q     |         |         |         |
  0+30       0.5583     17.67  | V     Q |         |         |         |
  0+45       0.9901     20.90  |   V     Q         |         |         |
  1+ 0       1.4223     20.92  |     V   Q         |         |         |
  1+15       1.9619     26.12  |       V |  Q      |         |         |
  1+30       2.6054     31.14  |          V   Q    |         |         |
```

```
   1+45       3.3514     36.11  |         |   V   Q |         |         |
   2+ 0       4.1770     39.96  |         |      V Q|         |         |
   2+15       5.2463     51.76  |         |           V  Q    |         |
   2+30       6.7829     74.37  |         |         |       V |      Q  |
   2+45       8.4105     78.78  |         |         |         |    V   Q|
   3+ 0       9.2115     38.77  |         |        Q|         |        V|
   3+15       9.3761      7.97  |  Q      |         |         |        V|
   3+30       9.3870      0.53  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A2
Proposed Conditions
100 Yr. 3 Hr.

--------------------------------------------------------------------
Drainage Area =     118.60(Ac.)  =      0.185 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     118.60(Ac.)  =      0.185 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      118.60           0.85                100.81

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      118.60           1.90                225.34

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   118.600           85.00         0.750
 Total Area Entered =    118.60(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        386.627         64.140             76.664
    2   0.500        773.254         32.781             39.182
    3   0.750       1159.882          3.079              3.680
                                 Sum = 100.000   Sum=     119.527
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.061    (  0.084)        0.220
   2   0.50     4.80      0.365          0.061    (  0.109)        0.304
   3   0.75     5.10      0.387          0.061    (  0.116)        0.327
   4   1.00     4.90      0.372          0.061    (  0.112)        0.311
   5   1.25     6.60      0.501          0.061    (  0.150)        0.441
   6   1.50     7.30      0.555          0.061    (  0.166)        0.494
   7   1.75     8.40      0.638          0.061    (  0.191)        0.577
   8   2.00     9.00      0.684          0.061    (  0.205)        0.623
   9   2.25    12.30      0.934          0.061    (  0.280)        0.874
  10   2.50    17.60      1.337          0.061    (  0.401)        1.276
  11   2.75    16.10      1.223          0.061    (  0.367)        1.162
  12   3.00     4.20      0.319          0.061    (  0.096)        0.258
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     6.9
       Flood volume = Effective rainfall      1.72(In)
        times area     118.6(Ac.)/[(In)/(Ft.)] =      17.0(Ac.Ft)
       Total soil loss =      0.18(In)
       Total soil loss =     1.802(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      739065.6 Cubic Feet
       Total soil loss =       78494.2 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    142.388(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ----------------------------------------------------------------------
    0+15       0.3491     16.90  V  Q      |         |         |         |
    0+30       1.0090     31.94  | V   Q   |         |         |         |
    0+45       1.7895     37.78  |   V  Q  |         |         |         |
    1+ 0       2.5707     37.81  |     VQ  |         |         |         |
    1+15       3.5460     47.20  |       VQ|         |         |         |
    1+30       4.7090     56.29  |          Q        |         |         |
```

```
    1+45       6.0574     65.26  |         |  QV     |         |         |
    2+ 0       7.5496     72.23  |         |   Q  V  |         |         |
    2+15       9.4824     93.55  |         |       Q   V       |         |
    2+30      12.2598    134.42  |         |         |     Q V |         |
    2+45      15.2017    142.39  |         |         |       Q |    V    |
    3+ 0      16.6494     70.07  |         |   Q     |         |        V|
    3+15      16.9470     14.40  | Q       |         |         |        V|
    3+30      16.9666      0.95  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A3 Prop Condition
100 Yr. 3 Hr.


--------------------------------------------------------------------
Drainage Area =      90.50(Ac.)  =      0.141 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      90.50(Ac.)  =      0.141 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       90.50           0.85                 76.92

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       90.50           1.90                171.95

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    90.500           85.00         0.750
 Total Area Entered =     90.50(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        386.627         64.140             58.500
    2   0.500        773.254         32.781             29.898
    3   0.750       1159.882          3.079              2.808
                                 Sum = 100.000   Sum=      91.207
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.061    (  0.084)        0.220
   2   0.50     4.80      0.365          0.061    (  0.109)        0.304
   3   0.75     5.10      0.387          0.061    (  0.116)        0.327
   4   1.00     4.90      0.372          0.061    (  0.112)        0.311
   5   1.25     6.60      0.501          0.061    (  0.150)        0.441
   6   1.50     7.30      0.555          0.061    (  0.166)        0.494
   7   1.75     8.40      0.638          0.061    (  0.191)        0.577
   8   2.00     9.00      0.684          0.061    (  0.205)        0.623
   9   2.25    12.30      0.934          0.061    (  0.280)        0.874
  10   2.50    17.60      1.337          0.061    (  0.401)        1.276
  11   2.75    16.10      1.223          0.061    (  0.367)        1.162
  12   3.00     4.20      0.319          0.061    (  0.096)        0.258
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     6.9
       Flood volume = Effective rainfall      1.72(In)
        times area      90.5(Ac.)/[(In)/(Ft.)] =      12.9(Ac.Ft)
       Total soil loss =      0.18(In)
       Total soil loss =     1.375(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      564034.9 Cubic Feet
       Total soil loss =       59896.5 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    108.666(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ----------------------------------------------------------------------
    0+15       0.2664     12.90  V Q       |         |         |         |
    0+30       0.7701     24.38  | V Q     |         |         |         |
    0+45       1.3657     28.83  |   VQ    |         |         |         |
    1+ 0       1.9619     28.86  |    QV   |         |         |         |
    1+15       2.7063     36.03  |      QV |         |         |         |
    1+30       3.5938     42.96  |       Q  V        |         |         |
```

```
    1+45       4.6228     49.80  |        Q|   V     |         |         |
    2+ 0       5.7617     55.12  |         |Q     V  |         |         |
    2+15       7.2368     71.39  |         |   Q       V       |         |
    2+30       9.3563    102.59  |         |         Q       V |         |
    2+45      11.6015    108.67  |         |         |Q        |    V    |
    3+ 0      12.7063     53.47  |         Q         |         |        V|
    3+15      12.9335     10.99  | Q       |         |         |        V|
    3+30      12.9485      0.73  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A4
Proposed Condition
100 Yr. 3 Hr.

--------------------------------------------------------------------
Drainage Area =     200.80(Ac.)  =      0.314 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     200.80(Ac.)  =      0.314 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      200.80           0.85                170.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      200.80           1.90                381.52

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.91 %
Adjusted average point rain =    1.898(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   200.800           85.00         0.750
 Total Area Entered =    200.80(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        386.627         64.140            129.799
    2   0.500        773.254         32.781             66.338
    3   0.750       1159.882          3.079              6.231
                                Sum = 100.000   Sum=     202.369
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.061    (  0.084)        0.220
   2   0.50     4.80      0.364          0.061    (  0.109)        0.304
   3   0.75     5.10      0.387          0.061    (  0.116)        0.326
   4   1.00     4.90      0.372          0.061    (  0.112)        0.311
   5   1.25     6.60      0.501          0.061    (  0.150)        0.440
   6   1.50     7.30      0.554          0.061    (  0.166)        0.494
   7   1.75     8.40      0.638          0.061    (  0.191)        0.577
   8   2.00     9.00      0.683          0.061    (  0.205)        0.623
   9   2.25    12.30      0.934          0.061    (  0.280)        0.873
  10   2.50    17.60      1.336          0.061    (  0.401)        1.276
  11   2.75    16.10      1.223          0.061    (  0.367)        1.162
  12   3.00     4.20      0.319          0.061    (  0.096)        0.258
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     6.9
       Flood volume = Effective rainfall      1.72(In)
        times area     200.8(Ac.)/[(In)/(Ft.)] =      28.7(Ac.Ft)
       Total soil loss =      0.18(In)
       Total soil loss =     3.051(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =     1250803.5 Cubic Feet
       Total soil loss =      132897.4 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =    240.984(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       --------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
  ---------------------------------------------------------------------
    0+15       0.5908     28.59  V  Q      |         |         |         |
    0+30       1.7076     54.05  | V    Q  |         |         |         |
    0+45       3.0285     63.93  |   V   Q |         |         |         |
    1+ 0       4.3506     63.99  |     V Q |         |         |         |
    1+15       6.0012     79.89  |       V Q         |         |         |
    1+30       7.9694     95.26  |          VQ       |         |         |
```

```
    1+45      10.2513    110.44  |         |   Q     |         |         |
    2+ 0      12.7769    122.24  |         |     QV  |         |         |
    2+15      16.0480    158.32  |         |          QV       |         |
    2+30      20.7485    227.50  |         |         |       V Q         |
    2+45      25.7275    240.98  |         |         |         | Q  V    |
    3+ 0      28.1776    118.59  |         |    Q    |         |        V|
    3+15      28.6812     24.38  |  Q      |         |         |        V|
    3+30      28.7145      1.61  Q         |         |         |         V
-----------------------------------------------------------------------
```

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A5 Proposed  Condition
100 Yr. 3 Hr.


--------------------------------------------------------------------
Drainage Area =     131.00(Ac.)  =      0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     131.00(Ac.)  =      0.205 Sq. Mi.
Length along longest watercourse =    3200.00(Ft.)
Length along longest watercourse measured to centroid =    1600.00(Ft.)
Length along longest watercourse =      0.606 Mi.
Length along longest watercourse measured to centroid =      0.303 Mi.
Difference in elevation =      32.00(Ft.)
Slope along watercourse =     52.8000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.089 Hr.
Lag time =     5.34 Min.
25% of lag time =     1.33 Min.
40% of lag time =     2.14 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      131.00           0.85                111.35

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      131.00           1.90                248.90

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   131.000           85.00         0.750
 Total Area Entered =    131.00(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        280.942         54.636             72.132
    2   0.500        561.885         38.203             50.437
    3   0.750        842.827          7.161              9.454
                                Sum = 100.000   Sum=     132.023
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.365	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.327
4 1.00	4.90	0.372	0.061	(0.112)	0.311
5 1.25	6.60	0.501	0.061	(0.150)	0.441
6 1.50	7.30	0.554	0.061	(0.166)	0.494
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.684	0.061	(0.205)	0.623
9 2.25	12.30	0.934	0.061	(0.280)	0.873
10 2.50	17.60	1.337	0.061	(0.401)	1.276
11 2.75	16.10	1.223	0.061	(0.367)	1.162
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     131.0(Ac.)/[(In)/(Ft.)] =      18.7(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     1.990(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      816288.2 Cubic Feet
Total soil loss =       86701.0 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =    156.526(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
---------------------------------------------------------------------
  0+15       0.3284     15.90  V  Q      |         |         |         |
  0+30       1.0111     33.04  | V   Q   |         |         |         |
  0+45       1.8579     40.99  |  V    Q |         |         |         |
  1+ 0       2.7222     41.83  |    V  Q |         |         |         |
  1+15       3.7676     50.60  |       V Q         |         |         |
  1+30       5.0239     60.81  |         V Q       |         |         |
```

```
    1+45       6.4855     70.74  |         |  VQ     |         |         |
    2+ 0       8.1126     78.75  |         |    Q V  |         |         |
    2+15      10.1772     99.93  |         |        Q V        |         |
    2+30      13.1124    142.06  |         |         |      VQ |         |
    2+45      16.3464    156.53  |         |         |          Q  V     |
    3+ 0      18.1926     89.35  |         |      Q  |         |       V |
    3+15      18.6889     24.02  |   Q     |         |         |        V|
    3+30      18.7394      2.44  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Subdrain Area A6 Proposed Condition
100 Yr. 3 Hr.


-------------------------------------------------------------------
Drainage Area =     321.10(Ac.)  =      0.502 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     321.10(Ac.)  =      0.502 Sq. Mi.
Length along longest watercourse =    3200.00(Ft.)
Length along longest watercourse measured to centroid =    1600.00(Ft.)
Length along longest watercourse =      0.606 Mi.
Length along longest watercourse measured to centroid =      0.303 Mi.
Difference in elevation =      32.00(Ft.)
Slope along watercourse =     52.8000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.089 Hr.
Lag time =     5.34 Min.
25% of lag time =     1.33 Min.
40% of lag time =     2.14 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      321.10           0.85                272.94

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      321.10           1.90                610.09

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.86 %
Adjusted average point rain =    1.897(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   321.100           85.00         0.750
 Total Area Entered =    321.10(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
-------------------------------------------------------------------
               Unit Hydrograph Data
-------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
    1   0.250        280.942         54.636            176.806
    2   0.500        561.885         38.203            123.628
    3   0.750        842.827          7.161             23.174
                                Sum = 100.000   Sum=     323.609
-------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.364	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.326
4 1.00	4.90	0.372	0.061	(0.112)	0.311
5 1.25	6.60	0.501	0.061	(0.150)	0.440
6 1.50	7.30	0.554	0.061	(0.166)	0.493
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.683	0.061	(0.205)	0.622
9 2.25	12.30	0.933	0.061	(0.280)	0.873
10 2.50	17.60	1.336	0.061	(0.401)	1.275
11 2.75	16.10	1.222	0.061	(0.367)	1.161
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     321.1(Ac.)/[(In)/(Ft.)] =      45.9(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     4.879(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =     1998998.8 Cubic Feet
Total soil loss =      212516.7 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    383.332(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      100.0     200.0     300.0     400.0
-------------------------------------------------------------------
  0+15       0.8042     38.92  V  Q      |         |         |         |
  0+30       2.4758     80.91  | V     Q |         |         |         |
  0+45       4.5494    100.36  |  V      Q         |         |         |
  1+ 0       6.6657    102.43  |    V    Q         |         |         |
  1+15       9.2257    123.90  |       V | Q       |         |         |
  1+30      12.3023    148.91  |         V   Q     |         |         |
```

```
    1+45      15.8815    173.24  |         |  V   Q  |         |         |
    2+ 0      19.8660    192.85  |         |      V Q|         |         |
    2+15      24.9223    244.72  |         |          V  Q     |         |
    2+30      32.1105    347.91  |         |         |      V  |   Q     |
    2+45      40.0306    383.33  |         |         |             V   Q |
    3+ 0      44.5516    218.82  |         |         |Q        |       V |
    3+15      45.7671     58.83  |    Q    |         |         |        V|
    3+30      45.8907      5.98  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/07/12

------------------------------------------------------------------


Line B, Prop condition
100 yr 3 hr


-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: OffsiteB13100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    15
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       82.945 (CFS)
               Total volume =       6.835 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   5000.00 (Ft.)
Elevation difference =  100.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  5000.00(Ft.)     Elevation difference = 100.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     26.576(CFS)
Depth of flow =     0.370(Ft.)
Average velocity =     6.924(Ft/s)
Total flow rate =    26.576(CFS)
Channel flow top width =   10.740(Ft.)
Depth of flow in channel =   0.37(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.92(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   26.576(CFS)
Total capacity of improved channels =     26.576(CFS)
Critical Depth in Channel =    0.59(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     82.945(CFS)
```

```
Depth of flow =     0.734(Ft.)
Average velocity =    10.535(Ft/s)
Total flow rate =    82.945(CFS)
Channel flow top width =   11.467(Ft.)
Depth of flow in channel =   0.73(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   10.53(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   82.945(CFS)
Total capacity of improved channels =     82.945(CFS)
Critical Depth in Channel =    1.23(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8611   Travel time =   7.91 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   1.8015
       dt(routing time-step) =   6.81 (min.),   c* =   0.9714

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       20.7      41.5      62.2      82.9
 ----------------------------------------------------------------------
   0+15       0.5179      0.98  O         |         |         |         |
   0+30       1.8386      2.63  OI        |         |         |         |
   0+45       2.9819      3.34  |O        |         |         |         |
   1+ 0       3.4192      3.51  |O        |         |         |         |
   1+15       5.5030      7.27  | OI      |         |         |         |
   1+30      11.0075     14.41  |    OI   |         |         |         |
   1+45      17.6881     20.77  |       O I         |         |         |
   2+ 0      23.9932     27.01  |         |O I      |         |         |
   2+15      33.1186     38.69  |         |    O  I |         |         |
   2+30      52.6507     65.31  |         |         |    O    |I        |
   2+45      74.3024     82.94  |         |         |         |    O    I
   3+ 0      66.3116     52.05  |         |         |    I    |O        |
   3+15      30.2576     10.19  |   I     |   O     |         |         |
   3+30       6.2408      1.66  I  O      |         |         |         |
   3+45       0.9379      0.05  O         |         |         |         |
   4+ 0       0.0495      0.00  O         |         |         |         |
   4+15       0.0014      0.00  O         |         |         |         |
   4+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    18
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =       74.302 (CFS)
                Total volume =       6.835 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ************************************************************************

        ---------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        1.000 to Point/Station        2.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ____________________________________________________________________
```

```
********************* HYDROGRAPH INFORMATION **********************

                From study/file name: SubB1Bsn.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0       83.9     167.8     251.7     335.6
 ---------------------------------------------------------------------
   0+15       7.0057      7.52  Q         |         |         |         |
   0+30      26.6818     28.52  |  Q      |         |         |         |
   0+45      50.3579     53.34  |     Q   |         |         |         |
   1+ 0      68.4495     71.87  |       Q |         |         |         |
   1+15      83.3068     88.81  |        qQ         |         |         |
   1+30     100.6376    111.65  |         |q Q      |         |         |
   1+45     120.1094    137.80  |         |   q Q   |         |         |
   2+ 0     139.8039    163.80  |         |     q  Q|         |         |
   2+15     164.6535    197.77  |         |        q|  Q      |         |
   2+30     208.2343    260.89  |         |         |   q     |Q        |
   2+45     261.0907    335.39  |         |         |         |q       Q|
   3+ 0     269.2777    335.59  |         |         |         | q       Q
   3+15     211.1423    241.40  |         |         |    q  Q |         |
   3+30     134.3169    140.56  |         |     Q   |         |         |
   3+45      77.3031     78.24  |        Q|         |         |         |
   4+ 0      42.6338     42.68  |    Q    |         |         |         |
   4+15      23.2364     23.24  | Q       |         |         |         |
   4+30      12.6644     12.66  |Q        |         |         |         |
   4+45       6.9024      6.90  Q         |         |         |         |
   5+ 0       3.7619      3.76  Q         |         |         |         |
   5+15       2.0503      2.05  Q         |         |         |         |
   5+30       1.1175      1.12  Q         |         |         |         |
   5+45       0.6091      0.61  Q         |         |         |         |
   6+ 0       0.3319      0.33  Q         |         |         |         |
   6+15       0.1809      0.18  Q         |         |         |         |
   6+30       0.0986      0.10  Q         |         |         |         |
   6+45       0.0537      0.05  Q         |         |         |         |
   7+ 0       0.0293      0.03  Q         |         |         |         |
   7+15       0.0160      0.02  Q         |         |         |         |
   7+30       0.0087      0.01  Q         |         |         |         |
   7+45       0.0047      0.00  Q         |         |         |         |
   8+ 0       0.0026      0.00  Q         |         |         |         |
   8+15       0.0014      0.00  Q         |         |         |         |
   8+30       0.0010      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
*****************************HYDROGRAPH DATA***************************
                Number of intervals =    34
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      335.589 (CFS)
                Total volume =      48.490 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

--------------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** STREAM ROUTING SCS CONVEX METHOD ****
____________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   3000.00 (Ft.)
Elevation difference =   60.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel
```

```
Channel length =  3000.00(Ft.)     Elevation difference =  60.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    156.488(CFS)
Depth of flow =     1.073(Ft.)
Average velocity =    13.171(Ft/s)
Total flow rate =   156.488(CFS)
Channel flow top width =   12.146(Ft.)
Depth of flow in channel =   1.07(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   13.17(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  156.488(CFS)
Total capacity of improved channels =    156.488(CFS)
Critical Depth in Channel =    1.84(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    335.589(CFS)
Depth of flow =     1.689(Ft.)
Average velocity =    16.996(Ft/s)
Total flow rate =   335.589(CFS)
Channel flow top width =   13.378(Ft.)
Depth of flow in channel =   1.69(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.00(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  335.589(CFS)
Total capacity of improved channels =    335.589(CFS)
Critical Depth in Channel =    2.94(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9091   Travel time =   2.94 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   4.0725
       dt(routing time-step) =   2.67 (min.),   c* =   0.9999

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       83.9     167.8     251.7     335.6
----------------------------------------------------------------------
  0+15       6.1819      7.52  O         |         |         |         |
  0+30      24.7758     28.52  | OI      |         |         |         |
  0+45      48.9133     53.34  |    OI   |         |         |         |
  1+ 0      68.5640     71.87  |       O |         |         |         |
  1+15      85.7883     88.81  |         O         |         |         |
  1+30     107.5726    111.65  |         | OI      |         |         |
  1+45     133.1333    137.80  |         |    OI   |         |         |
  2+ 0     159.1600    163.80  |         |       OI|         |         |
  2+15     191.7128    197.77  |         |         | OI      |         |
  2+30     249.6293    260.89  |         |         |        O|I        |
  2+45     322.1047    335.39  |         |         |         |       OI|
```

```
  3+ 0     335.5535    335.59  |         |         |         |        OI
  3+15     258.1975    241.40  |         |         |       I O         |
  3+30     158.5427    140.56  |         |     I O |         |         |
  3+45      89.3555     78.24  |        IO         |         |         |
  4+ 0      49.0252     42.68  |    O    |         |         |         |
  4+15      26.7060     23.24  | IO      |         |         |         |
  4+30      14.5502     12.66  |O        |         |         |         |
  4+45       7.9301      6.90  O         |         |         |         |
  5+ 0       4.3221      3.76  O         |         |         |         |
  5+15       2.3556      2.05  O         |         |         |         |
  5+30       1.2839      1.12  O         |         |         |         |
  5+45       0.6997      0.61  O         |         |         |         |
  6+ 0       0.3814      0.33  O         |         |         |         |
  6+15       0.2079      0.18  O         |         |         |         |
  6+30       0.1133      0.10  O         |         |         |         |
  6+45       0.0617      0.05  O         |         |         |         |
  7+ 0       0.0337      0.03  O         |         |         |         |
  7+15       0.0183      0.02  O         |         |         |         |
  7+30       0.0100      0.01  O         |         |         |         |
  7+45       0.0054      0.00  O         |         |         |         |
  8+ 0       0.0030      0.00  O         |         |         |         |
  8+15       0.0016      0.00  O         |         |         |         |
  8+30       0.0011      0.00  O         |         |         |         |
  8+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    35
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      335.553 (CFS)
                    Total volume =      48.490 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ---------------------------------------------------------------------


      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ____________________________________________________________________
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubB2Bsn.rte
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

      ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      141.8     283.7     425.5     567.3
  ----------------------------------------------------------------------
  0+15       7.0704     13.25  Q         |         |         |         |
  0+30      25.1656     49.94  |q Q      |         |         |         |
  0+45      44.9898     93.90  |  q  Q   |         |         |         |
  1+ 0      58.6550    127.22  |   q   Q |         |         |         |
  1+15      69.8535    155.64  |   q     Q         |         |         |
  1+30      83.8887    191.46  |    q    |  Q      |         |         |
  1+45      99.7030    232.84  |      q  |     Q   |         |         |
  2+ 0     115.4615    274.62  |       q |        Q|         |         |
  2+15     145.1589    336.87  |         q         |  Q      |         |
  2+30     204.7459    454.38  |         |   q     |         | Q       |
  2+45     245.2321    567.34  |         |      q  |         |         Q
  3+ 0     223.8483    559.40  |         |    q    |         |        Q|
  3+15     121.2546    379.45  |       q |         |     Q   |         |
  3+30      72.3502    230.89  |    q    |     Q   |         |         |
  3+45      37.9117    127.27  | q     Q |         |         |         |
  4+ 0      19.4005     68.43  |q  Q     |         |         |         |
```

```
    4+15       9.9278     36.63  q Q       |         |         |         |
    4+30       5.0803     19.63  qQ        |         |         |         |
    4+45       2.5997     10.53  Q         |         |         |         |
    5+ 0       1.3304      5.65  Q         |         |         |         |
    5+15       0.6808      3.04  Q         |         |         |         |
    5+30       0.3484      1.63  Q         |         |         |         |
    5+45       0.1783      0.88  Q         |         |         |         |
    6+ 0       0.0912      0.47  Q         |         |         |         |
    6+15       0.0467      0.25  Q         |         |         |         |
    6+30       0.0239      0.14  Q         |         |         |         |
    6+45       0.0122      0.07  Q         |         |         |         |
    7+ 0       0.0063      0.04  Q         |         |         |         |
    7+15       0.0032      0.02  Q         |         |         |         |
    7+30       0.0016      0.01  Q         |         |         |         |
    7+45       0.0010      0.01  Q         |         |         |         |
    8+ 0       0.0000      0.00  Q         |         |         |         |
    8+15       0.0000      0.00  Q         |         |         |         |
    8+30       0.0000      0.00  Q         |         |         |         |
    8+45       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    35
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      567.337 (CFS)
                       Total volume =      81.445 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        3.000 to Point/Station        4.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   2000.00 (Ft.)
        Elevation difference =   40.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  2000.00(Ft.)     Elevation difference =  40.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =    264.332(CFS)
        Depth of flow =     1.466(Ft.)
        Average velocity =    15.720(Ft/s)
        Total flow rate =   264.332(CFS)
        Channel flow top width =   12.933(Ft.)
        Depth of flow in channel =   1.47(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   15.72(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  264.332(CFS)
        Total capacity of improved channels =    264.332(CFS)
        Critical Depth in Channel =    2.56(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Covered channel
        Flow(q) thru subarea =    567.337(CFS)
        Depth of flow =     2.299(Ft.)
```

```
Average velocity =    20.062(Ft/s)
Total flow rate =   567.337(CFS)
Channel flow top width =   14.599(Ft.)
Depth of flow in channel =   2.30(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   20.06(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  567.337(CFS)
Total capacity of improved channels =    567.337(CFS)
Critical Depth in Channel =    4.03(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9219   Travel time =   1.66 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   6.8619
       dt(routing time-step) =   1.53 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0      141.8     283.7     425.5     567.3
 ----------------------------------------------------------------------
   0+15      11.8990     13.25  O         |         |         |         |
   0+30      46.1949     49.94  |  O      |         |         |         |
   0+45      89.4140     93.90  |     O   |         |         |         |
   1+ 0     123.8170    127.22  |       O |         |         |         |
   1+15     152.7394    155.64  |         O         |         |         |
   1+30     187.8036    191.46  |         |  O      |         |         |
   1+45     228.6113    232.84  |         |     O   |         |         |
   2+ 0     270.3546    274.62  |         |        O|         |         |
   2+15     330.5150    336.87  |         |         |  O      |         |
   2+30     442.3762    454.38  |         |         |         |OI       |
   2+45     555.8018    567.34  |         |         |         |        OI
   3+ 0     560.2121    559.40  |         |         |         |        O|
   3+15     397.8276    379.45  |         |         |     I O |         |
   3+30     246.0630    230.89  |         |     IO  |         |         |
   3+45     137.8489    127.27  |       IO|         |         |         |
   4+ 0      74.4343     68.43  |   IO    |         |         |         |
   4+15      39.8802     36.63  | O       |         |         |         |
   4+30      21.3668     19.63  |O        |         |         |         |
   4+45      11.4591     10.53  O         |         |         |         |
   5+ 0       6.1505      5.65  O         |         |         |         |
   5+15       3.3035      3.04  O         |         |         |         |
   5+30       1.7756      1.63  O         |         |         |         |
   5+45       0.9550      0.88  O         |         |         |         |
   6+ 0       0.5140      0.47  O         |         |         |         |
   6+15       0.2768      0.25  O         |         |         |         |
   6+30       0.1492      0.14  O         |         |         |         |
   6+45       0.0804      0.07  O         |         |         |         |
   7+ 0       0.0434      0.04  O         |         |         |         |
   7+15       0.0234      0.02  O         |         |         |         |
   7+30       0.0126      0.01  O         |         |         |         |
   7+45       0.0070      0.01  O         |         |         |         |
   8+ 0       0.0033      0.00  O         |         |         |         |
   8+15       0.0018      0.00  O         |         |         |         |
   8+30       0.0011      0.00  O         |         |         |         |
   8+45       0.0001      0.00  O         |         |         |         |
   9+ 0       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
```

```
                Number of intervals =    36
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      560.212 (CFS)
                Total volume =      81.445 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
****************************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: Subb33100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      294.3     588.6     882.9    1177.2
 ---------------------------------------------------------------------
   0+15      35.7818     47.68  |Q        |         |         |         |
   0+30     107.9760    154.17  |  q Q    |         |         |         |
   0+45     148.7623    238.18  |    q  Q |         |         |         |
   1+ 0     164.5717    288.39  |    q   Q|         |         |         |
   1+15     189.1282    341.87  |     q   |Q        |         |         |
   1+30     235.8161    423.62  |       q |   Q     |         |         |
   1+45     273.1772    501.79  |        q|      Q  |         |         |
   2+ 0     310.3001    580.65  |         q        Q|         |         |
   2+15     372.3114    702.83  |         | q       |  Q      |         |
   2+30     512.4663    954.84  |         |      q  |         | Q       |
   2+45     621.3847   1177.19  |         |         |q        |         Q
   3+ 0     480.5111   1040.72  |         |     q   |         |    Q    |
   3+15     206.8831    604.71  |      q  |         Q         |         |
   3+30      83.3997    329.46  | q       |Q        |         |         |
   3+45      41.9790    179.83  |q    Q   |         |         |         |
   4+ 0      18.1898     92.62  q  Q      |         |         |         |
   4+15       3.1080     42.99  qQ        |         |         |         |
   4+30       0.0000     21.37  Q         |         |         |         |
   4+45       0.0000     11.46  Q         |         |         |         |
   5+ 0       0.0000      6.15  Q         |         |         |         |
   5+15       0.0000      3.30  Q         |         |         |         |
   5+30       0.0000      1.78  Q         |         |         |         |
   5+45       0.0000      0.96  Q         |         |         |         |
   6+ 0       0.0000      0.51  Q         |         |         |         |
   6+15       0.0000      0.28  Q         |         |         |         |
   6+30       0.0000      0.15  Q         |         |         |         |
   6+45       0.0000      0.08  Q         |         |         |         |
   7+ 0       0.0000      0.04  Q         |         |         |         |
   7+15       0.0000      0.02  Q         |         |         |         |
   7+30       0.0000      0.01  Q         |         |         |         |
   7+45       0.0000      0.01  Q         |         |         |         |
   8+ 0       0.0000      0.00  Q         |         |         |         |
   8+15       0.0000      0.00  Q         |         |         |         |
   8+30       0.0000      0.00  Q         |         |         |         |
   8+45       0.0000      0.00  Q         |         |         |         |
   9+ 0       0.0000      0.00  Q         |         |         |         |
---------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =    36
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =     1177.186 (CFS)
                Total volume =     160.076 (Ac.Ft)
```

```
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*****************************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        4.000
**** RETARDING BASIN ROUTING ****
______________________________________________________________________

User entry of depth-outflow-storage data
---------------------------------------------------------------------
Total number of inflow hydrograph intervals = 36
Hydrograph time unit = 15.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
---------------------------------------------------------------------
---------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
---------------------------------------------------------------------
---------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
---------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   1.000     20.000    200.000     17.934       22.066
   2.000     30.000    400.000     25.868       34.132
   3.000     40.000   1000.000     29.669       50.331
---------------------------------------------------------------------
                Hydrograph Detention Basin Routing
---------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0     294.3  588.59  882.89 1177.19 (Ft.)
 0.250   47.68    4.46      0.446  OI      |       |       |       |     0.02
 0.500  154.17   22.53      2.253  O   I   |       |       |       |     0.11
 0.750  238.18   55.05      5.505  |O    I |       |       |       |     0.28
 1.000  288.39   94.04      9.404  | O    I|       |       |       |     0.47
 1.250  341.87  135.44     13.544  |  O    |I      |       |       |     0.68
 1.500  423.62  181.75     18.175  |   O   |  I    |       |       |     0.91
 1.750  501.79  262.85     23.142  |      O|    I  |       |       |     1.31
 2.000  580.65  358.18     27.909  |       |O     I|       |       |     1.79
 2.250  702.83  523.56     32.059  |       |     O |  I    |       |     2.21
 2.500  954.84  757.19     35.953  |       |       |   O   |I      |     2.60
 2.750 1177.19  993.53     39.892  |       |       |       |  O    I     2.99
      Warning: Basin depth limit exceeded, the data here is an estimation
 3.000 1040.72 1081.87     41.364  |       |       |       |   IO  |     3.14
 3.250  604.71  883.54     38.059  |       |       I       O       |     2.81
 3.500  329.46  564.83     32.747  |       I      O|       |       |     2.27
 3.750  179.83  367.53     28.377  |   I   |O      |       |       |     1.84
 4.000   92.62  288.32     24.416  | I    O|       |       |       |     1.44
 4.250   42.99  212.80     20.640  |I   O  |       |       |       |     1.06
 4.500   21.37  173.17     17.317  I   O   |       |       |       |     0.87
 4.750   11.46  143.82     14.382  I  O    |       |       |       |     0.72
 5.000    6.15  118.54     11.854  I  O    |       |       |       |     0.59
 5.250    3.30   97.22      9.722  I O     |       |       |       |     0.49
 5.500    1.78   79.49      7.949  I O     |       |       |       |     0.40
 5.750    0.96   64.86      6.486  IO      |       |       |       |     0.32
 6.000    0.51   52.85      5.285  IO      |       |       |       |     0.26
 6.250    0.28   43.03      4.303  IO      |       |       |       |     0.22
 6.500    0.15   35.01      3.501  O       |       |       |       |     0.18
 6.750    0.08   28.48      2.848  O       |       |       |       |     0.14
 7.000    0.04   23.16      2.316  O       |       |       |       |     0.12
```

```
 7.250    0.02   18.83      1.883  O       |       |       |       |     0.09
 7.500    0.01   15.30      1.530  O       |       |       |       |     0.08
 7.750    0.01   12.44      1.244  O       |       |       |       |     0.06
 8.000    0.00   10.11      1.011  O       |       |       |       |     0.05
 8.250    0.00    8.22      0.822  O       |       |       |       |     0.04
 8.500    0.00    6.68      0.668  O       |       |       |       |     0.03
 8.750    0.00    5.43      0.543  O       |       |       |       |     0.03
 9.000    0.00    4.41      0.441  O       |       |       |       |     0.02
 9.250    0.00    3.59      0.359  O       |       |       |       |     0.02
 9.500    0.00    2.91      0.291  O       |       |       |       |     0.01
 9.750    0.00    2.37      0.237  O       |       |       |       |     0.01
10.000    0.00    1.92      0.192  O       |       |       |       |     0.01
10.250    0.00    1.56      0.156  O       |       |       |       |     0.01
10.500    0.00    1.27      0.127  O       |       |       |       |     0.01
10.750    0.00    1.03      0.103  O       |       |       |       |     0.01
11.000    0.00    0.84      0.084  O       |       |       |       |     0.00
11.250    0.00    0.68      0.068  O       |       |       |       |     0.00
11.500    0.00    0.55      0.055  O       |       |       |       |     0.00
11.750    0.00    0.45      0.045  O       |       |       |       |     0.00
12.000    0.00    0.37      0.037  O       |       |       |       |     0.00
12.250    0.00    0.30      0.030  O       |       |       |       |     0.00
12.500    0.00    0.24      0.024  O       |       |       |       |     0.00
12.750    0.00    0.20      0.020  O       |       |       |       |     0.00

      Remaining water in basin =    0.02 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =    51
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =     1081.866 (CFS)
                     Total volume =     160.058 (Ac.Ft)
             Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        4.000 to Point/Station        4.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file LineB3hr.rte
      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =     0
                     Time interval =    0.0 (Min.)
                     Maximum/Peak flow rate =        0.000 (CFS)
                     Total volume =       0.000 (Ac.Ft)
             Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/30/12

      ---------------------------------------------------------------------


      Watershed B, Basin B1
      Proposed Condition
      100-year, 3-hour

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubB13100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    15
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      343.936 (CFS)
                    Total volume =      41.656 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 15
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000     10.000    285.000      7.056       12.944
         4.000     15.000    400.000     10.868       19.132
         6.000     18.700    535.000     13.173       24.227
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      86.0  171.97  257.95  343.94 (Ft.)
 0.250   30.98    7.01      0.248  O I     |       |       |       |     2.02
```

```
0.500   69.53   26.68      0.938  | O   I |       |       |       |     2.09
0.750   87.91   50.36      1.769  |   O   I       |       |       |     2.18
1.000   92.33   68.45      2.403  |     O I       |       |       |     2.24
1.250  109.88   83.31      2.924  |      O| I     |       |       |     2.29
1.500  132.92  100.64      3.532  |       |O  I   |       |       |     2.35
1.750  153.95  120.11      4.216  |       |  O  I |       |       |     2.42
2.000  172.84  139.80      4.906  |       |    O  I       |       |     2.49
2.250  216.00  164.65      5.778  |       |      O|   I   |       |     2.58
2.500  304.88  208.23      7.307  |       |       |  O    |   I   |     2.73
2.750  343.94  261.09      9.161  |       |       |       O       I     2.92
3.000  214.23  269.28      9.448  |       |       |  I    |O      |     2.94
3.250   68.77  211.14      7.409  |     I |       |  O    |       |     2.74
3.500   15.80  134.32      4.714  |I      |   O   |       |       |     2.47
3.750    2.21   77.30      2.714  I      O|       |       |       |     2.27
4.000    0.00   42.63      1.498  I  O    |       |       |       |     2.15
4.250    0.00   23.24      0.817  I O     |       |       |       |     2.08
4.500    0.00   12.66      0.446  IO      |       |       |       |     2.04
4.750    0.00    6.90      0.244  O       |       |       |       |     2.02
5.000    0.00    3.76      0.134  O       |       |       |       |     2.01
5.250    0.00    2.05      0.074  O       |       |       |       |     2.01
5.500    0.00    1.12      0.041  O       |       |       |       |     2.00
5.750    0.00    0.61      0.023  O       |       |       |       |     2.00
6.000    0.00    0.33      0.014  O       |       |       |       |     2.00
6.250    0.00    0.18      0.008  O       |       |       |       |     2.00
6.500    0.00    0.10      0.005  O       |       |       |       |     2.00
6.750    0.00    0.05      0.004  O       |       |       |       |     2.00
7.000    0.00    0.03      0.003  O       |       |       |       |     2.00
7.250    0.00    0.02      0.003  O       |       |       |       |     2.00
7.500    0.00    0.01      0.002  O       |       |       |       |     2.00
7.750    0.00    0.00      0.002  O       |       |       |       |     2.00
8.000    0.00    0.00      0.002  O       |       |       |       |     2.00
8.250    0.00    0.00      0.002  O       |       |       |       |     2.00
8.500    0.00    0.00      0.002  O       |       |       |       |     1.99
```

Remaining water in basin = 0.00 (Ac.Ft)

```
****************************HYDROGRAPH DATA****************************
               Number of intervals =    34
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      269.278 (CFS)
               Total volume =      41.654 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

-----------------------------------------------------------------

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
_____________________________________________________________________
Current stream hydrograph saved in file SubB1Bsn.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

-----------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/04/12

      ---------------------------------------------------------------------


      Watershed B, Basin B2

      Proposed Conditions
      100 Yr. 24 Hr.
      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubB23100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      275.700 (CFS)
                    Total volume =      32.957 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000      4.000    125.000      2.709        5.291
        4.000      5.000    200.000      2.934        7.066
        6.000      6.000    250.000      3.417        8.583
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      68.9  137.85  206.78  275.70 (Ft.)
 0.250   29.14    7.07      0.228  O  I    |       |       |       |     2.06
```

```
0.500   59.12   25.17      0.807  | O   I |       |       |       |     2.20
0.750   72.41   44.99      1.441  |    O  I       |       |       |     2.36
1.000   73.54   58.66      1.878  |     O I       |       |       |     2.47
1.250   89.64   69.85      2.236  |       O I     |       |       |     2.56
1.500  107.56   83.89      2.685  |       |O  I   |       |       |     2.67
1.750  125.00   99.70      3.191  |       |  O  I |       |       |     2.80
2.000  138.96  115.46      3.695  |       |    O  I       |       |     2.92
2.250  177.21  145.16      4.269  |       |       O   I   |       |     3.27
2.500  252.66  204.75      5.095  |       |       |      O|    I  |     4.19
2.750  275.70  245.23      5.905  |       |       |       |   O   I     5.81
3.000  151.98  223.85      5.477  |       |       |I      |O      |     4.95
3.250   38.56  121.25      3.880  |   I   |     O |       |       |     2.97
3.500    3.64   72.35      2.316  I       O       |       |       |     2.58
3.750    0.00   37.91      1.215  I   O   |       |       |       |     2.30
4.000    0.00   19.40      0.622  I O     |       |       |       |     2.16
4.250    0.00    9.93      0.319  IO      |       |       |       |     2.08
4.500    0.00    5.08      0.164  O       |       |       |       |     2.04
4.750    0.00    2.60      0.085  O       |       |       |       |     2.02
5.000    0.00    1.33      0.045  O       |       |       |       |     2.01
5.250    0.00    0.68      0.024  O       |       |       |       |     2.01
5.500    0.00    0.35      0.013  O       |       |       |       |     2.00
5.750    0.00    0.18      0.008  O       |       |       |       |     2.00
6.000    0.00    0.09      0.005  O       |       |       |       |     2.00
6.250    0.00    0.05      0.003  O       |       |       |       |     2.00
6.500    0.00    0.02      0.003  O       |       |       |       |     2.00
6.750    0.00    0.01      0.002  O       |       |       |       |     2.00
7.000    0.00    0.01      0.002  O       |       |       |       |     2.00
7.250    0.00    0.00      0.002  O       |       |       |       |     2.00
7.500    0.00    0.00      0.002  O       |       |       |       |     2.00
7.750    0.00    0.00      0.002  O       |       |       |       |     1.99

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =    31
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      245.232 (CFS)
                     Total volume =      32.955 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SubB2Bsn.rte
      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =     0
                     Time interval =    0.0 (Min.)
                     Maximum/Peak flow rate =        0.000 (CFS)
                     Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Offsite B1
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      92.10(Ac.)  =      0.144 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      92.10(Ac.)  =      0.144 Sq. Mi.
Length along longest watercourse =    3800.00(Ft.)
Length along longest watercourse measured to centroid =    1780.00(Ft.)
Length along longest watercourse =      0.720 Mi.
Length along longest watercourse measured to centroid =      0.337 Mi.
Difference in elevation =     226.00(Ft.)
Slope along watercourse =    314.0211 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.141 Hr.
Lag time =     8.46 Min.
25% of lag time =     2.11 Min.
40% of lag time =     3.38 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           0.85                 78.28

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           1.90                174.99

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.000           46.00         0.000
    28.000           66.00         0.000
```

3.500	77.00	0.000
41.600	83.00	0.000

Total Area Entered = 92.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.206	0.126
66.0	66.0	0.405	0.000	0.405	0.304	0.123
77.0	77.0	0.279	0.000	0.279	0.038	0.011
83.0	83.0	0.210	0.000	0.210	0.452	0.095
					Sum (F) =	0.355

Area averaged mean soil loss (F) (In/Hr) = 0.355
Minimum soil loss rate ((In/Hr)) = 0.177
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	177.319	37.414	34.727
2	0.500	354.637	52.090	48.350
3	0.750	531.956	8.760	8.131
4	1.000	709.274	1.737	1.612
			Sum = 100.000	Sum= 92.820

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time	(Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.355)	0.253	0.028
2	0.50	4.80	0.365	(0.355)	0.328	0.036
3	0.75	5.10	0.387	(0.355)	0.349	0.039
4	1.00	4.90	0.372	(0.355)	0.335	0.037
5	1.25	6.60	0.501	0.355	(0.451)	0.147
6	1.50	7.30	0.555	0.355	(0.499)	0.200
7	1.75	8.40	0.638	0.355	(0.574)	0.283
8	2.00	9.00	0.684	0.355	(0.615)	0.329
9	2.25	12.30	0.934	0.355	(0.841)	0.580
10	2.50	17.60	1.337	0.355	(1.203)	0.982
11	2.75	16.10	1.223	0.355	(1.101)	0.868
12	3.00	4.20	0.319	(0.355)	0.287	0.032
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	3.6

Flood volume = Effective rainfall 0.89(In)
times area 92.1(Ac.)/[(In)/(Ft.)] = 6.8(Ac.Ft)
Total soil loss = 1.01(In)
Total soil loss = 7.742(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 297737.9 Cubic Feet
Total soil loss = 337219.8 Cubic Feet

Peak flow rate of this hydrograph = 82.945(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0

```
  ---------------------------------------------------------------------
    0+15       0.0202      0.98  Q         |         |         |         |
    0+30       0.0744      2.63  VQ        |         |         |         |
    0+45       0.1434      3.34  VQ        |         |         |         |
    1+ 0       0.2159      3.51   Q        |         |         |         |
    1+15       0.3662      7.27  | VQ      |         |         |         |
    1+30       0.6639     14.41  |  V  Q   |         |         |         |
    1+45       1.0932     20.77  |     V  Q|         |         |         |
    2+ 0       1.6512     27.01  |        V| Q       |         |         |
    2+15       2.4506     38.69  |         |   V  Q  |         |         |
    2+30       3.8001     65.31  |         |         | V      Q|         |
    2+45       5.5138     82.94  |         |         |         | V   Q   |
    3+ 0       6.5892     52.05  |         |         |  Q      |       V |
    3+15       6.7998     10.19  |   Q     |         |         |        V|
    3+30       6.8341      1.66  Q         |         |         |        V|
    3+45       6.8351      0.05  Q         |         |         |        V|
---------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Onsite B1
Proposed Condition
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =     291.43(Ac.)  =      0.455 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     291.43(Ac.)  =      0.455 Sq. Mi.
Length along longest watercourse =    5000.00(Ft.)
Length along longest watercourse measured to centroid =    2500.00(Ft.)
Length along longest watercourse =      0.947 Mi.
Length along longest watercourse measured to centroid =      0.473 Mi.
Difference in elevation =     100.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.110 Hr.
Lag time =     6.57 Min.
25% of lag time =     1.64 Min.
40% of lag time =     2.63 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      291.43           0.85                 247.72

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      291.43           1.90                 553.72

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.87 %
Adjusted average point rain =    1.898(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   291.430           85.00         0.750
 Total Area Entered =    291.43(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
-------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        228.302         47.900            140.687
    2   0.500        456.604         41.440            121.713
    3   0.750        684.906          7.750             22.761
    4   1.000        913.208          2.910              8.546
                                 Sum = 100.000   Sum=     293.707
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.061	(0.084)	0.220
2	0.50	4.80	0.364	0.061	(0.109)	0.304
3	0.75	5.10	0.387	0.061	(0.116)	0.326
4	1.00	4.90	0.372	0.061	(0.112)	0.311
5	1.25	6.60	0.501	0.061	(0.150)	0.440
6	1.50	7.30	0.554	0.061	(0.166)	0.493
7	1.75	8.40	0.638	0.061	(0.191)	0.577
8	2.00	9.00	0.683	0.061	(0.205)	0.622
9	2.25	12.30	0.934	0.061	(0.280)	0.873
10	2.50	17.60	1.336	0.061	(0.401)	1.275
11	2.75	16.10	1.222	0.061	(0.367)	1.161
12	3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     291.4(Ac.)/[(In)/(Ft.)] =      41.7(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     4.428(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =     1814550.0 Cubic Feet
Total soil loss =      192880.0 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    343.936(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      100.0     200.0     300.0     400.0
-------------------------------------------------------------------
  0+15       0.6400     30.98  V  Q      |         |         |         |
  0+30       2.0765     69.53  |V    Q   |         |         |         |
  0+45       3.8929     87.91  |  V    Q |         |         |         |
  1+ 0       5.8006     92.33  |    V   Q|         |         |         |
  1+15       8.0708    109.88  |      V  Q         |         |         |
```

```
   1+30      10.8170    132.92  |         V  Q      |         |         |
   1+45      13.9978    153.95  |         |  V Q    |         |         |
   2+ 0      17.5689    172.84  |         |     VQ  |         |         |
   2+15      22.0318    216.00  |         |         |Q        |         |
   2+30      28.3309    304.88  |         |         |      V  Q         |
   2+45      35.4370    343.94  |         |         |         |   Q     |
   3+ 0      39.8634    214.23  |         |         |Q        |       V |
   3+15      41.2842     68.77  |     Q   |         |         |        V|
   3+30      41.6108     15.80  |Q        |         |         |        V|
   3+45      41.6563      2.21  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Onsite B2
Proposed Condition
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =     230.50(Ac.)  =      0.360 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     230.50(Ac.)  =      0.360 Sq. Mi.
Length along longest watercourse =    3500.00(Ft.)
Length along longest watercourse measured to centroid =    1700.00(Ft.)
Length along longest watercourse =      0.663 Mi.
Length along longest watercourse measured to centroid =      0.322 Mi.
Difference in elevation =      70.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.083 Hr.
Lag time =     4.96 Min.
25% of lag time =     1.24 Min.
40% of lag time =     1.98 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      230.50           0.85                 195.92

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      230.50           1.90                 437.95

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.90 %
Adjusted average point rain =    1.898(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   230.500           85.00         0.750
 Total Area Entered =    230.50(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        302.705         56.956            132.309
    2   0.500        605.409         36.980             85.905
    3   0.750        908.114          6.064             14.087
                                Sum = 100.000   Sum=     232.301
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.364	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.326
4 1.00	4.90	0.372	0.061	(0.112)	0.311
5 1.25	6.60	0.501	0.061	(0.150)	0.440
6 1.50	7.30	0.554	0.061	(0.166)	0.493
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.683	0.061	(0.205)	0.623
9 2.25	12.30	0.934	0.061	(0.280)	0.873
10 2.50	17.60	1.336	0.061	(0.401)	1.275
11 2.75	16.10	1.222	0.061	(0.367)	1.162
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     230.5(Ac.)/[(In)/(Ft.)] =      33.0(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     3.502(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =     1435601.3 Cubic Feet
Total soil loss =      152554.1 Cubic Feet
--------------------------------------------------------------------
 Peak flow rate of this hydrograph =    275.700(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
--------------------------------------------------------------------
  0+15       0.6021     29.14  V  Q      |         |         |         |
  0+30       1.8236     59.12  | V    Q  |         |         |         |
  0+45       3.3197     72.41  |   V    Q|         |         |         |
  1+ 0       4.8391     73.54  |    V   Q|         |         |         |
  1+15       6.6912     89.64  |       V |Q        |         |         |
  1+30       8.9134    107.56  |         V   Q     |         |         |
```

```
    1+45      11.4960    125.00  |         |  V  Q   |         |         |
    2+ 0      14.3670    138.96  |         |      VQ |         |         |
    2+15      18.0285    177.21  |         |          V Q      |         |
    2+30      23.2487    252.66  |         |         |       V |  Q      |
    2+45      28.9450    275.70  |         |         |               VQ   |
    3+ 0      32.0851    151.98  |         |         Q         |       V |
    3+15      32.8817     38.56  |    Q    |         |         |        V|
    3+30      32.9569      3.64  Q         |         |         |         V
-----------------------------------------------------------------------
```

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Onsite B3
Proposed Condition
100 Yr. 3 Hr.

-------------------------------------------------------------------
Drainage Area =     550.80(Ac.)  =      0.861 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     550.80(Ac.)  =      0.861 Sq. Mi.
Length along longest watercourse =   10000.00(Ft.)
Length along longest watercourse measured to centroid =    5000.00(Ft.)
Length along longest watercourse =      1.894 Mi.
Length along longest watercourse measured to centroid =      0.947 Mi.
Difference in elevation =     200.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.185 Hr.
Lag time =    11.13 Min.
25% of lag time =     2.78 Min.
40% of lag time =     4.45 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      550.80           0.85                468.18

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      550.80           1.90               1046.52

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.76 %
Adjusted average point rain =    1.895(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   550.800           85.00         0.750
 Total Area Entered =    550.80(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	134.811	29.318	162.748
2	0.500	269.623	48.027	266.597
3	0.750	404.434	12.157	67.485
4	1.000	539.246	5.392	29.930
5	1.250	674.057	2.934	16.286
6	1.500	808.869	2.172	12.056
		Sum = 100.000	Sum=	555.103

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.061	(0.084)	0.220
2	0.50	4.80	0.364	0.061	(0.109)	0.303
3	0.75	5.10	0.387	0.061	(0.116)	0.326
4	1.00	4.90	0.372	0.061	(0.111)	0.311
5	1.25	6.60	0.500	0.061	(0.150)	0.440
6	1.50	7.30	0.553	0.061	(0.166)	0.493
7	1.75	8.40	0.637	0.061	(0.191)	0.576
8	2.00	9.00	0.682	0.061	(0.205)	0.622
9	2.25	12.30	0.933	0.061	(0.280)	0.872
10	2.50	17.60	1.334	0.061	(0.400)	1.274
11	2.75	16.10	1.221	0.061	(0.366)	1.160
12	3.00	4.20	0.318	0.061	(0.096)	0.258
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	6.9

Flood volume = Effective rainfall 1.71(In)
times area 550.8(Ac.)/[(In)/(Ft.)] = 78.6(Ac.Ft)
Total soil loss = 0.18(In)
Total soil loss = 8.369(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 3425171.9 Cubic Feet
Total soil loss = 364541.3 Cubic Feet

Peak flow rate of this hydrograph = 621.385(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0      175.0     350.0     525.0     700.0
 ----------------------------------------------------------------------
   0+15       0.7393     35.78  V Q       |         |         |         |
   0+30       2.9702    107.98   V    Q   |         |         |         |
   0+45       6.0438    148.76  |  V    Q |         |         |         |
```

```
   1+ 0       9.4440    164.57  |   V    Q|         |         |         |
   1+15      13.3517    189.13  |     V   Q         |         |         |
   1+30      18.2239    235.82  |        V|  Q      |         |         |
   1+45      23.8680    273.18  |           V  Q    |         |         |
   2+ 0      30.2792    310.30  |          |    V Q |         |         |
   2+15      37.9716    372.31  |          |        V|Q        |         |
   2+30      48.5597    512.47  |          |         |   V    Q|         |
   2+45      61.3983    621.38  |          |         |         |V   Q    |
   3+ 0      71.3262    480.51  |          |         |      Q  |     V   |
   3+15      75.6006    206.88  |          |Q        |         |       V |
   3+30      77.3238     83.40  |   Q      |         |         |        V|
   3+45      78.1911     41.98  | Q        |         |         |        V|
   4+ 0      78.5669     18.19  |Q         |         |         |        V|
   4+15      78.6311      3.11  Q          |         |         |        V|
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                          Study date: 05/04/12

     ---------------------------------------------------------------------


     Line C Routed Through Basins
     Proposed Condition
     100 Yr. 3 Hr

     ---------------------------------------------------------------------


     Program License Serial Number 6097

     ---------------------------------------------------------------------
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: SUBC13100.rte
     ****************************HYDROGRAPH DATA****************************
                   Number of intervals =    14
                   Time interval =   15.0 (Min.)
                   Maximum/Peak flow rate =      125.816 (CFS)
                   Total volume =      15.022 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     **********************************************************************



     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station        1.000 to Point/Station        2.000
     **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
     ______________________________________________________________________
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: CoffsiteRT1.rte
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

     ---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      162.7     325.4     488.1     650.8
-----------------------------------------------------------------------
  0+15       4.7930     18.58  qQ        |         |         |         |
  0+30      27.3502     54.72  |q Q      |         |         |         |
  0+45      59.7908     92.94  |  q Q    |         |         |         |
  1+ 0      78.9278    112.44  |   q Q   |         |         |         |
  1+15      95.0089    136.15  |    q  Q |         |         |         |
  1+30     136.4920    185.77  |       q |Q        |         |         |
  1+45     176.4627    233.68  |         q   Q     |         |         |
  2+ 0     217.4588    280.99  |         |  q   Q  |         |         |
  2+15     269.3536    350.75  |         |     q   |Q        |         |
  2+30     386.2478    502.59  |         |         |  q      Q         |
  2+45     524.9408    650.76  |         |         |         | q       Q
  3+ 0     483.6777    550.76  |         |         |        q|  Q      |
  3+15     241.8438    257.89  |         |   qQ    |         |         |
  3+30     100.4114    101.80  |     Q   |         |         |         |
  3+45      42.1872     42.19  | Q       |         |         |         |
  4+ 0      17.0320     17.03  |Q        |         |         |         |
  4+15       7.8126      7.81  Q         |         |         |         |
  4+30       4.0765      4.08  Q         |         |         |         |
  4+45       1.5975      1.60  Q         |         |         |         |
  5+ 0       0.2830      0.28  Q         |         |         |         |
```

```
   5+15       0.0162      0.02  Q         |         |         |         |
   5+30       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    22
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      650.757 (CFS)
                      Total volume =      74.439 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *********************************************************************

       -------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        1.000 to Point/Station        2.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ___________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: CoffsiteRT2.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      181.5     362.9     544.4     725.9
  ----------------------------------------------------------------------
   0+15       1.2570     19.84  qQ        |         |         |         |
   0+30       5.4194     60.14  q  Q      |         |         |         |
   0+45       8.9875    101.93  q    Q    |         |         |         |
   1+ 0       9.4088    121.85  q     Q   |         |         |         |
   1+15      14.1841    150.33  q       Q |         |         |         |
   1+30      20.2727    206.05  |q        |Q        |         |         |
   1+45      25.7444    259.43  |q        |   Q     |         |         |
   2+ 0      30.3840    311.37  |q        |      Q  |         |         |
   2+15      42.1227    392.87  | q       |         |Q        |         |
   2+30      66.1688    568.76  |  q      |         |         |Q        |
   2+45      75.1132    725.87  |   q     |         |         |         Q
   3+ 0      37.0701    587.83  | q       |         |         | Q       |
   3+15       5.9485    263.84  q         |   Q     |         |         |
   3+30       0.4151    102.22  q    Q    |         |         |         |
   3+45       0.0128     42.20  q Q       |         |         |         |
   4+ 0       0.0001     17.03  Q         |         |         |         |
   4+15       0.0000      7.81  Q         |         |         |         |
   4+30       0.0000      4.08  Q         |         |         |         |
   4+45       0.0000      1.60  Q         |         |         |         |
   5+ 0       0.0000      0.28  Q         |         |         |         |
   5+15       0.0000      0.02  Q         |         |         |         |
   5+30       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    22
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      725.870 (CFS)
                      Total volume =      81.515 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *********************************************************************

       -------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station        2.000 to Point/Station        3.000
**** STREAM ROUTING SCS CONVEX METHOD ****
____________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   4000.00 (Ft.)
Elevation difference =   80.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  4000.00(Ft.)     Elevation difference =  80.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    292.188(CFS)
Depth of flow =     2.256(Ft.)
Average velocity =    17.851(Ft/s)
Total flow rate =   292.188(CFS)
Channel flow top width =    9.512(Ft.)
Depth of flow in channel =   2.26(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.85(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  292.188(CFS)
Total capacity of improved channels =    292.188(CFS)
Critical Depth in Channel =    3.69(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    725.870(CFS)
Depth of flow =     3.676(Ft.)
Average velocity =    22.764(Ft/s)
Total flow rate =   725.870(CFS)
Channel flow top width =   12.351(Ft.)
Depth of flow in channel =   3.68(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   22.76(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  725.870(CFS)
Total capacity of improved channels =    725.870(CFS)
Critical Depth in Channel =    5.84(Ft.)


********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9305   Travel time =   2.93 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   4.0029
        dt(routing time-step) =   2.73 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      181.5     362.9     544.4     725.9
----------------------------------------------------------------------
  0+15      16.2347     19.84  OI        |         |         |         |
  0+30      52.8149     60.14  | OI      |         |         |         |
```

```
  0+45      94.3325    101.93  |    O    |         |         |         |
  1+ 0     118.2269    121.85  |     O   |         |         |         |
  1+15     145.1576    150.33  |      OI |         |         |         |
  1+30     195.9226    206.05  |         OI        |         |         |
  1+45     249.7292    259.43  |         |  OI     |         |         |
  2+ 0     301.9328    311.37  |         |     OI  |         |         |
  2+15     378.0643    392.87  |         |         OI        |         |
  2+30     536.8015    568.76  |         |         |        O|I        |
  2+45     697.3237    725.87  |         |         |         |       O I
  3+ 0     612.9118    587.83  |         |         |         | IO      |
  3+15     322.7097    263.84  |         |   I  O  |         |         |
  3+30     131.5858    102.22  |    I O  |         |         |         |
  3+45      53.1056     42.20  | O       |         |         |         |
  4+ 0      21.6052     17.03  IO        |         |         |         |
  4+15       9.4878      7.81  O         |         |         |         |
  4+30       4.7554      4.08  O         |         |         |         |
  4+45       2.0479      1.60  O         |         |         |         |
  5+ 0       0.5218      0.28  O         |         |         |         |
  5+15       0.0647      0.02  O         |         |         |         |
  5+30       0.0029      0.00  O         |         |         |         |
  5+45       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    23
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      697.324 (CFS)
                    Total volume =      81.515 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ************************************************************************

      ------------------------------------------------------------------

      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION *********************

                    From study/file name: SUBC2RT.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

      ------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      231.1     462.1     693.2     924.2
 -------------------------------------------------------------------------
  0+15       3.3489     19.58  Q         |         |         |         |
  0+30      13.1705     65.99  q Q       |         |         |         |
  0+45      26.6362    120.97  |q   Q    |         |         |         |
  1+ 0      39.5490    157.78  |q    Q   |         |         |         |
  1+15      52.1038    197.26  | q     Q |         |         |         |
  1+30      66.3733    262.30  | q       |Q        |         |         |
  1+45      82.3343    332.06  |  q      |   Q     |         |         |
  2+ 0      99.1998    401.13  |   q     |      Q  |         |         |
  2+15     135.0479    513.11  |    q    |         | Q       |         |
  2+30     184.0632    720.86  |      q  |         |         |Q        |
  2+45     226.9138    924.24  |        q|         |         |         Q
  3+ 0     240.8830    853.79  |         q         |         |     Q   |
  3+15     215.5124    538.22  |        q|         |  Q      |         |
  3+30     159.5570    291.14  |     q   | Q       |         |         |
  3+45     105.9603    159.07  |   q Q   |         |         |         |
  4+ 0      83.4137    105.02  |  qQ     |         |         |         |
  4+15      67.7906     77.28  | qQ      |         |         |         |
  4+30      55.0937     59.85  | Q       |         |         |         |
  4+45      44.7748     46.82  |qQ       |         |         |         |
```

5+ 0	36.3887	36.91	|Q	|	|	|	|
5+15	29.5732	29.64	|Q	|	|	|	|
5+30	24.0342	24.04	|Q	|	|	|	|
5+45	19.5327	19.53	Q	|	|	|	|
6+ 0	15.8743	15.87	Q	|	|	|	|
6+15	12.9011	12.90	Q	|	|	|	|
6+30	10.4848	10.48	Q	|	|	|	|
6+45	8.5210	8.52	Q	|	|	|	|
7+ 0	6.9251	6.93	Q	|	|	|	|
7+15	5.6280	5.63	Q	|	|	|	|
7+30	4.5739	4.57	Q	|	|	|	|
7+45	3.7172	3.72	Q	|	|	|	|
8+ 0	3.0210	3.02	Q	|	|	|	|
8+15	2.4552	2.46	Q	|	|	|	|
8+30	1.9953	2.00	Q	|	|	|	|
8+45	1.6216	1.62	Q	|	|	|	|
9+ 0	1.3179	1.32	Q	|	|	|	|
9+15	1.0711	1.07	Q	|	|	|	|
9+30	0.8705	0.87	Q	|	|	|	|
9+45	0.7074	0.71	Q	|	|	|	|
10+ 0	0.5749	0.57	Q	|	|	|	|
10+15	0.4672	0.47	Q	|	|	|	|
10+30	0.3797	0.38	Q	|	|	|	|
10+45	0.3086	0.31	Q	|	|	|	|
11+ 0	0.2508	0.25	Q	|	|	|	|
11+15	0.2038	0.20	Q	|	|	|	|
11+30	0.1657	0.17	Q	|	|	|	|
11+45	0.1346	0.13	Q	|	|	|	|
12+ 0	0.1094	0.11	Q	|	|	|	|
12+15	0.0889	0.09	Q	|	|	|	|
12+30	0.0723	0.07	Q	|	|	|	|
12+45	0.0587	0.06	Q	|	|	|	|
13+ 0	0.0477	0.05	Q	|	|	|	|
13+15	0.0388	0.04	Q	|	|	|	|
13+30	0.0315	0.03	Q	|	|	|	|
13+45	0.0256	0.03	Q	|	|	|	|
14+ 0	0.0208	0.02	Q	|	|	|	|
14+15	0.0169	0.02	Q	|	|	|	|
14+30	0.0138	0.01	Q	|	|	|	|
14+45	0.0112	0.01	Q	|	|	|	|
15+ 0	0.0091	0.01	Q	|	|	|	|
15+15	0.0074	0.01	Q	|	|	|	|
15+30	0.0060	0.01	Q	|	|	|	|
15+45	0.0049	0.00	Q	|	|	|	|
16+ 0	0.0040	0.00	Q	|	|	|	|
16+15	0.0032	0.00	Q	|	|	|	|
16+30	0.0026	0.00	Q	|	|	|	|
16+45	0.0021	0.00	Q	|	|	|	|
17+ 0	0.0020	0.00	Q	|	|	|	|
17+15	0.0019	0.00	Q	|	|	|	|
17+30	0.0019	0.00	Q	|	|	|	|
17+45	0.0019	0.00	Q	|	|	|	|
18+ 0	0.0018	0.00	Q	|	|	|	|
18+15	0.0018	0.00	Q	|	|	|	|
18+30	0.0017	0.00	Q	|	|	|	|
18+45	0.0017	0.00	Q	|	|	|	|
19+ 0	0.0017	0.00	Q	|	|	|	|
19+15	0.0016	0.00	Q	|	|	|	|
19+30	0.0016	0.00	Q	|	|	|	|
19+45	0.0016	0.00	Q	|	|	|	|
20+ 0	0.0015	0.00	Q	|	|	|	|
20+15	0.0015	0.00	Q	|	|	|	|
20+30	0.0015	0.00	Q	|	|	|	|
20+45	0.0014	0.00	Q	|	|	|	|
21+ 0	0.0014	0.00	Q	|	|	|	|
21+15	0.0014	0.00	Q	|	|	|	|
21+30	0.0014	0.00	Q	|	|	|	|
21+45	0.0013	0.00	Q	|	|	|	|
22+ 0	0.0013	0.00	Q	|	|	|	|
22+15	0.0013	0.00	Q	|	|	|	|
22+30	0.0013	0.00	Q	|	|	|	|

```
   22+45       0.0012      0.00  Q         |         |         |         |
   23+ 0       0.0012      0.00  Q         |         |         |         |
   23+15       0.0012      0.00  Q         |         |         |         |
   23+30       0.0012      0.00  Q         |         |         |         |
   23+45       0.0011      0.00  Q         |         |         |         |
   24+ 0       0.0011      0.00  Q         |         |         |         |
   24+15       0.0011      0.00  Q         |         |         |         |
   24+30       0.0011      0.00  Q         |         |         |         |
   24+45       0.0010      0.00  Q         |         |         |         |
   25+ 0       0.0010      0.00  Q         |         |         |         |
   25+15       0.0010      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   101
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      924.237 (CFS)
                       Total volume =     124.822 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        3.000 to Point/Station        4.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   3000.00 (Ft.)
        Elevation difference =   50.00 (Ft.)
        Slope of channel =  0.016667 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  3000.00(Ft.)     Elevation difference =  50.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =    5.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =    392.869(CFS)
        Depth of flow =     2.787(Ft.)
        Average velocity =    18.106(Ft/s)
        Total flow rate =   392.869(CFS)
        Channel flow top width =   10.573(Ft.)
        Depth of flow in channel =   2.79(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   18.11(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  392.869(CFS)
        Total capacity of improved channels =    392.869(CFS)
        Critical Depth in Channel =    4.31(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Covered channel
        Flow(q) thru subarea =    924.237(CFS)
        Depth of flow =     4.361(Ft.)
        Average velocity =    22.639(Ft/s)
        Total flow rate =   924.237(CFS)
        Channel flow top width =   13.722(Ft.)
        Depth of flow in channel =   4.36(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   22.64(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  924.237(CFS)
```

```
Total capacity of improved channels =    924.237(CFS)
Critical Depth in Channel =    6.56(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9302   Travel time =   2.21 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   5.2011
        dt(routing time-step) =   2.05 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      231.1     462.1     693.2     924.2
----------------------------------------------------------------------
  0+15      16.9015     19.58  O         |         |         |         |
  0+30      59.6304     65.99  | O       |         |         |         |
  0+45     113.4383    120.97  |   OI    |         |         |         |
  1+ 0     152.7349    157.78  |     O   |         |         |         |
  1+15     191.8536    197.26  |       O |         |         |         |
  1+30     253.3890    262.30  |         OI        |         |         |
  1+45     322.5084    332.06  |         |  OI     |         |         |
  2+ 0     391.6732    401.13  |         |     OI  |         |         |
  2+15     497.7758    513.11  |         |         |OI       |         |
  2+30     692.4117    720.86  |         |         |        O|I        |
  2+45     896.3842    924.24  |         |         |         |       O I
  3+ 0     863.4424    853.79  |         |         |         |     IO  |
  3+15     581.4418    538.22  |         |         |  I O    |         |
  3+30     324.9819    291.14  |         | I O     |         |         |
  3+45     177.1547    159.07  |     IO  |         |         |         |
  4+ 0     112.4210    105.02  |   O     |         |         |         |
  4+15      81.0777     77.28  |  O      |         |         |         |
  4+30      62.2361     59.85  | O       |         |         |         |
  4+45      48.6068     46.82  | O       |         |         |         |
  5+ 0      38.2681     36.91  |O        |         |         |         |
  5+15      30.6339     29.64  |O        |         |         |         |
  5+30      24.8042     24.04  |O        |         |         |         |
  5+45      20.1496     19.53  O         |         |         |         |
  6+ 0      16.3753     15.87  O         |         |         |         |
  6+15      13.3083     12.90  O         |         |         |         |
  6+30      10.8157     10.48  O         |         |         |         |
  6+45       8.7900      8.52  O         |         |         |         |
  7+ 0       7.1436      6.93  O         |         |         |         |
  7+15       5.8057      5.63  O         |         |         |         |
  7+30       4.7183      4.57  O         |         |         |         |
  7+45       3.8346      3.72  O         |         |         |         |
  8+ 0       3.1164      3.02  O         |         |         |         |
  8+15       2.5327      2.46  O         |         |         |         |
  8+30       2.0583      2.00  O         |         |         |         |
  8+45       1.6728      1.62  O         |         |         |         |
  9+ 0       1.3595      1.32  O         |         |         |         |
  9+15       1.1049      1.07  O         |         |         |         |
  9+30       0.8979      0.87  O         |         |         |         |
  9+45       0.7297      0.71  O         |         |         |         |
 10+ 0       0.5931      0.57  O         |         |         |         |
 10+15       0.4820      0.47  O         |         |         |         |
 10+30       0.3917      0.38  O         |         |         |         |
 10+45       0.3183      0.31  O         |         |         |         |
 11+ 0       0.2587      0.25  O         |         |         |         |
 11+15       0.2103      0.20  O         |         |         |         |
 11+30       0.1709      0.17  O         |         |         |         |
```

```
   11+45       0.1389      0.13  O         |         |         |         |
   12+ 0       0.1129      0.11  O         |         |         |         |
   12+15       0.0917      0.09  O         |         |         |         |
   12+30       0.0745      0.07  O         |         |         |         |
   12+45       0.0606      0.06  O         |         |         |         |
   13+ 0       0.0492      0.05  O         |         |         |         |
   13+15       0.0400      0.04  O         |         |         |         |
   13+30       0.0325      0.03  O         |         |         |         |
   13+45       0.0264      0.03  O         |         |         |         |
   14+ 0       0.0215      0.02  O         |         |         |         |
   14+15       0.0175      0.02  O         |         |         |         |
   14+30       0.0142      0.01  O         |         |         |         |
   14+45       0.0115      0.01  O         |         |         |         |
   15+ 0       0.0094      0.01  O         |         |         |         |
   15+15       0.0076      0.01  O         |         |         |         |
   15+30       0.0062      0.01  O         |         |         |         |
   15+45       0.0050      0.00  O         |         |         |         |
   16+ 0       0.0041      0.00  O         |         |         |         |
   16+15       0.0033      0.00  O         |         |         |         |
   16+30       0.0027      0.00  O         |         |         |         |
   16+45       0.0022      0.00  O         |         |         |         |
   17+ 0       0.0020      0.00  O         |         |         |         |
   17+15       0.0019      0.00  O         |         |         |         |
   17+30       0.0019      0.00  O         |         |         |         |
   17+45       0.0019      0.00  O         |         |         |         |
   18+ 0       0.0018      0.00  O         |         |         |         |
   18+15       0.0018      0.00  O         |         |         |         |
   18+30       0.0017      0.00  O         |         |         |         |
   18+45       0.0017      0.00  O         |         |         |         |
   19+ 0       0.0017      0.00  O         |         |         |         |
   19+15       0.0016      0.00  O         |         |         |         |
   19+30       0.0016      0.00  O         |         |         |         |
   19+45       0.0016      0.00  O         |         |         |         |
   20+ 0       0.0015      0.00  O         |         |         |         |
   20+15       0.0015      0.00  O         |         |         |         |
   20+30       0.0015      0.00  O         |         |         |         |
   20+45       0.0014      0.00  O         |         |         |         |
   21+ 0       0.0014      0.00  O         |         |         |         |
   21+15       0.0014      0.00  O         |         |         |         |
   21+30       0.0014      0.00  O         |         |         |         |
   21+45       0.0013      0.00  O         |         |         |         |
   22+ 0       0.0013      0.00  O         |         |         |         |
   22+15       0.0013      0.00  O         |         |         |         |
   22+30       0.0013      0.00  O         |         |         |         |
   22+45       0.0012      0.00  O         |         |         |         |
   23+ 0       0.0012      0.00  O         |         |         |         |
   23+15       0.0012      0.00  O         |         |         |         |
   23+30       0.0012      0.00  O         |         |         |         |
   23+45       0.0011      0.00  O         |         |         |         |
   24+ 0       0.0011      0.00  O         |         |         |         |
   24+15       0.0011      0.00  O         |         |         |         |
   24+30       0.0011      0.00  O         |         |         |         |
   24+45       0.0010      0.00  O         |         |         |         |
   25+ 0       0.0010      0.00  O         |         |         |         |
   25+15       0.0010      0.00  O         |         |         |         |
   25+30       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   102
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      896.384 (CFS)
                      Total volume =     124.822 (Ac.Ft)
              Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------
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++
Process from Point/Station 3.000 to Point/Station 4.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****

********** HYDROGRAPH INFORMATION **********

From study/file name: SUBC33100.rte

++

P R I N T O F S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0 249.2 498.3 747.5 996.7
0+15	10.9934	27.89	qQ
0+30	21.8179	81.45	q Q
0+45	26.4259	139.86	|q Q
1+ 0	26.7152	179.45	|q Q |
1+15	32.7985	224.65	|q Q|
1+30	39.2877	292.68	|q |Q
1+45	45.6187	368.13	|q | Q
2+ 0	50.6458	442.32	| q | Q |
2+15	64.8912	562.67	| q | | Q
2+30	92.7506	785.16	| q | | |Q
2+45	100.3034	996.69	| q | | | Q
3+ 0	53.4811	916.92	| q | | | Q |
3+15	12.7959	594.24	q | | Q |
3+30	1.1098	326.09	q | Q |
3+45	0.0000	177.15	q Q | |
4+ 0	0.0000	112.42	q Q | |
4+15	0.0000	81.08	q Q | |
4+30	0.0000	62.24	q Q | |
4+45	0.0000	48.61	qQ | |
5+ 0	0.0000	38.27	qQ | |
5+15	0.0000	30.63	qQ | |
5+30	0.0000	24.80	Q | |
5+45	0.0000	20.15	Q | |
6+ 0	0.0000	16.38	Q | |
6+15	0.0000	13.31	Q | |
6+30	0.0000	10.82	Q | |
6+45	0.0000	8.79	Q | |
7+ 0	0.0000	7.14	Q | |
7+15	0.0000	5.81	Q | |
7+30	0.0000	4.72	Q | |
7+45	0.0000	3.83	Q | |
8+ 0	0.0000	3.12	Q | |
8+15	0.0000	2.53	Q | |
8+30	0.0000	2.06	Q | |
8+45	0.0000	1.67	Q | |
9+ 0	0.0000	1.36	Q | |
9+15	0.0000	1.10	Q | |
9+30	0.0000	0.90	Q | |
9+45	0.0000	0.73	Q | |
10+ 0	0.0000	0.59	Q | |
10+15	0.0000	0.48	Q | |
10+30	0.0000	0.39	Q | |
10+45	0.0000	0.32	Q | |
11+ 0	0.0000	0.26	Q | |
11+15	0.0000	0.21	Q | |
11+30	0.0000	0.17	Q | |
11+45	0.0000	0.14	Q | |
12+ 0	0.0000	0.11	Q | |
12+15	0.0000	0.09	Q | |
12+30	0.0000	0.07	Q | |
12+45	0.0000	0.06	Q | |
13+ 0	0.0000	0.05	Q | |
13+15	0.0000	0.04	Q | |
13+30	0.0000	0.03	Q | |
13+45	0.0000	0.03	Q | |

```
  14+ 0       0.0000      0.02  Q         |         |         |         |
  14+15       0.0000      0.02  Q         |         |         |         |
  14+30       0.0000      0.01  Q         |         |         |         |
  14+45       0.0000      0.01  Q         |         |         |         |
  15+ 0       0.0000      0.01  Q         |         |         |         |
  15+15       0.0000      0.01  Q         |         |         |         |
  15+30       0.0000      0.01  Q         |         |         |         |
  15+45       0.0000      0.01  Q         |         |         |         |
  16+ 0       0.0000      0.00  Q         |         |         |         |
  16+15       0.0000      0.00  Q         |         |         |         |
  16+30       0.0000      0.00  Q         |         |         |         |
  16+45       0.0000      0.00  Q         |         |         |         |
  17+ 0       0.0000      0.00  Q         |         |         |         |
  17+15       0.0000      0.00  Q         |         |         |         |
  17+30       0.0000      0.00  Q         |         |         |         |
  17+45       0.0000      0.00  Q         |         |         |         |
  18+ 0       0.0000      0.00  Q         |         |         |         |
  18+15       0.0000      0.00  Q         |         |         |         |
  18+30       0.0000      0.00  Q         |         |         |         |
  18+45       0.0000      0.00  Q         |         |         |         |
  19+ 0       0.0000      0.00  Q         |         |         |         |
  19+15       0.0000      0.00  Q         |         |         |         |
  19+30       0.0000      0.00  Q         |         |         |         |
  19+45       0.0000      0.00  Q         |         |         |         |
  20+ 0       0.0000      0.00  Q         |         |         |         |
  20+15       0.0000      0.00  Q         |         |         |         |
  20+30       0.0000      0.00  Q         |         |         |         |
  20+45       0.0000      0.00  Q         |         |         |         |
  21+ 0       0.0000      0.00  Q         |         |         |         |
  21+15       0.0000      0.00  Q         |         |         |         |
  21+30       0.0000      0.00  Q         |         |         |         |
  21+45       0.0000      0.00  Q         |         |         |         |
  22+ 0       0.0000      0.00  Q         |         |         |         |
  22+15       0.0000      0.00  Q         |         |         |         |
  22+30       0.0000      0.00  Q         |         |         |         |
  22+45       0.0000      0.00  Q         |         |         |         |
  23+ 0       0.0000      0.00  Q         |         |         |         |
  23+15       0.0000      0.00  Q         |         |         |         |
  23+30       0.0000      0.00  Q         |         |         |         |
  23+45       0.0000      0.00  Q         |         |         |         |
  24+ 0       0.0000      0.00  Q         |         |         |         |
  24+15       0.0000      0.00  Q         |         |         |         |
  24+30       0.0000      0.00  Q         |         |         |         |
  24+45       0.0000      0.00  Q         |         |         |         |
  25+ 0       0.0000      0.00  Q         |         |         |         |
  25+15       0.0000      0.00  Q         |         |         |         |
  25+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   102
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      996.688 (CFS)
                       Total volume =     136.798 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        4.000 to Point/Station        5.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1300.00 (Ft.)
        Elevation difference =   30.00 (Ft.)
        Slope of channel =  0.023077 (Vert/Horiz)
        Channel type - Improved Channel
```

```
Channel length =  1300.00(Ft.)     Elevation difference =  30.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    431.701(CFS)
Depth of flow =     2.685(Ft.)
Average velocity =    20.917(Ft/s)
Total flow rate =   431.701(CFS)
Channel flow top width =   10.371(Ft.)
Depth of flow in channel =   2.69(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   20.92(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  431.701(CFS)
Total capacity of improved channels =    431.701(CFS)
Critical Depth in Channel =    4.56(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    996.688(CFS)
Depth of flow =     4.172(Ft.)
Average velocity =    26.051(Ft/s)
Total flow rate =   996.688(CFS)
Channel flow top width =   13.343(Ft.)
Depth of flow in channel =   4.17(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   26.05(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  996.688(CFS)
Total capacity of improved channels =    996.688(CFS)
Critical Depth in Channel =    6.81(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9387   Travel time =   0.83 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  13.1414
       dt(routing time-step) =   0.78 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      249.2     498.3     747.5     996.7
----------------------------------------------------------------------
  0+15      26.4429     27.89  |O        |         |         |         |
  0+30      78.6608     81.45  |  O      |         |         |         |
  0+45     136.8236    139.86  |    O    |         |         |         |
  1+ 0     177.3896    179.45  |      O  |         |         |         |
  1+15     222.2993    224.65  |       OI|         |         |         |
  1+30     289.1360    292.68  |         |O        |         |         |
  1+45     364.1999    368.13  |         |   O     |         |         |
  2+ 0     438.4572    442.32  |         |      O  |         |         |
  2+15     556.4029    562.67  |         |         | O       |         |
  2+30     773.5813    785.16  |         |         |         |O        |
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```
 2+45     985.6777    996.69  |         |         |         |        OI
 3+ 0     921.0752    916.92  |         |         |         |     O   |
 3+15     611.0337    594.24  |         |         |  IO     |         |
 3+30     340.0488    326.09  |         |  O      |         |         |
 3+45     184.9070    177.15  |      O  |         |         |         |
 4+ 0     115.7905    112.42  |   O     |         |         |         |
 4+15      82.7092     81.08  |  O      |         |         |         |
 4+30      63.2168     62.24  | O       |         |         |         |
 4+45      49.3162     48.61  |O        |         |         |         |
 5+ 0      38.8062     38.27  |O        |         |         |         |
 5+15      31.0313     30.63  |O        |         |         |         |
 5+30      25.1077     24.80  IO        |         |         |         |
 5+45      20.3919     20.15  O         |         |         |         |
 6+ 0      16.5718     16.38  O         |         |         |         |
 6+15      13.4679     13.31  O         |         |         |         |
 6+30      10.9454     10.82  O         |         |         |         |
 6+45       8.8954      8.79  O         |         |         |         |
 7+ 0       7.2293      7.14  O         |         |         |         |
 7+15       5.8753      5.81  O         |         |         |         |
 7+30       4.7749      4.72  O         |         |         |         |
 7+45       3.8806      3.83  O         |         |         |         |
 8+ 0       3.1537      3.12  O         |         |         |         |
 8+15       2.5631      2.53  O         |         |         |         |
 8+30       2.0830      2.06  O         |         |         |         |
 8+45       1.6929      1.67  O         |         |         |         |
 9+ 0       1.3758      1.36  O         |         |         |         |
 9+15       1.1181      1.10  O         |         |         |         |
 9+30       0.9087      0.90  O         |         |         |         |
 9+45       0.7385      0.73  O         |         |         |         |
10+ 0       0.6002      0.59  O         |         |         |         |
10+15       0.4878      0.48  O         |         |         |         |
10+30       0.3964      0.39  O         |         |         |         |
10+45       0.3222      0.32  O         |         |         |         |
11+ 0       0.2618      0.26  O         |         |         |         |
11+15       0.2128      0.21  O         |         |         |         |
11+30       0.1729      0.17  O         |         |         |         |
11+45       0.1405      0.14  O         |         |         |         |
12+ 0       0.1142      0.11  O         |         |         |         |
12+15       0.0928      0.09  O         |         |         |         |
12+30       0.0754      0.07  O         |         |         |         |
12+45       0.0613      0.06  O         |         |         |         |
13+ 0       0.0498      0.05  O         |         |         |         |
13+15       0.0405      0.04  O         |         |         |         |
13+30       0.0329      0.03  O         |         |         |         |
13+45       0.0267      0.03  O         |         |         |         |
14+ 0       0.0217      0.02  O         |         |         |         |
14+15       0.0177      0.02  O         |         |         |         |
14+30       0.0144      0.01  O         |         |         |         |
14+45       0.0117      0.01  O         |         |         |         |
15+ 0       0.0095      0.01  O         |         |         |         |
15+15       0.0077      0.01  O         |         |         |         |
15+30       0.0063      0.01  O         |         |         |         |
15+45       0.0051      0.01  O         |         |         |         |
16+ 0       0.0041      0.00  O         |         |         |         |
16+15       0.0034      0.00  O         |         |         |         |
16+30       0.0027      0.00  O         |         |         |         |
16+45       0.0022      0.00  O         |         |         |         |
17+ 0       0.0020      0.00  O         |         |         |         |
17+15       0.0019      0.00  O         |         |         |         |
17+30       0.0019      0.00  O         |         |         |         |
17+45       0.0019      0.00  O         |         |         |         |
18+ 0       0.0018      0.00  O         |         |         |         |
18+15       0.0018      0.00  O         |         |         |         |
18+30       0.0017      0.00  O         |         |         |         |
18+45       0.0017      0.00  O         |         |         |         |
19+ 0       0.0017      0.00  O         |         |         |         |
19+15       0.0016      0.00  O         |         |         |         |
19+30       0.0016      0.00  O         |         |         |         |
19+45       0.0016      0.00  O         |         |         |         |
20+ 0       0.0015      0.00  O         |         |         |         |
20+15       0.0015      0.00  O         |         |         |         |
```

```
  20+30       0.0015      0.00  O         |         |         |         |
  20+45       0.0015      0.00  O         |         |         |         |
  21+ 0       0.0014      0.00  O         |         |         |         |
  21+15       0.0014      0.00  O         |         |         |         |
  21+30       0.0014      0.00  O         |         |         |         |
  21+45       0.0013      0.00  O         |         |         |         |
  22+ 0       0.0013      0.00  O         |         |         |         |
  22+15       0.0013      0.00  O         |         |         |         |
  22+30       0.0013      0.00  O         |         |         |         |
  22+45       0.0012      0.00  O         |         |         |         |
  23+ 0       0.0012      0.00  O         |         |         |         |
  23+15       0.0012      0.00  O         |         |         |         |
  23+30       0.0012      0.00  O         |         |         |         |
  23+45       0.0011      0.00  O         |         |         |         |
  24+ 0       0.0011      0.00  O         |         |         |         |
  24+15       0.0011      0.00  O         |         |         |         |
  24+30       0.0011      0.00  O         |         |         |         |
  24+45       0.0010      0.00  O         |         |         |         |
  25+ 0       0.0010      0.00  O         |         |         |         |
  25+15       0.0010      0.00  O         |         |         |         |
  25+30       0.0001      0.00  O         |         |         |         |
  25+45       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   103
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      985.678 (CFS)
                      Total volume =     136.798 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        4.000 to Point/Station        5.000
       **** RETARDING BASIN ROUTING ****
       _____________________________________________________________________

       User entry of depth-outflow-storage data
       ---------------------------------------------------------------------
       Total number of inflow hydrograph intervals = 103
       Hydrograph time unit = 15.000 (Min.)
       Initial depth in storage basin =   0.10(Ft.)
       ---------------------------------------------------------------------
       ---------------------------------------------------------------------
       Initial basin depth =   0.10 (Ft.)
       Initial basin storage =      3.00 (Ac.Ft)
       Initial basin outflow =  20.00 (CFS)
       ---------------------------------------------------------------------
       ---------------------------------------------------------------------
       Depth vs. Storage and Depth vs. Discharge data:
        Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
            (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
       ---------------------------------------------------------------------
          0.000      0.000      0.000      0.000        0.000
          1.000     30.000    200.000     27.934       32.066
          2.000     45.000    400.000     40.868       49.132
          4.000     55.000    900.000     45.702       64.298
       ---------------------------------------------------------------------
                      Hydrograph Detention Basin Routing
       ---------------------------------------------------------------------

       Graph values: 'I'= unit inflow; 'O'=outflow at time shown
       ---------------------------------------------------------------------
  Time   Inflow  Outflow    Storage                                      Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0     246.4  492.84  739.26  985.68 (Ft.)
  0.250   26.44   17.84      2.676  O       |       |       |       |     0.09
```

0.500	78.66	22.31	3.347	O I	0.11
0.750	136.82	33.32	4.998	O I	0.17
1.000	177.39	49.27	7.391	O I	0.25
1.250	222.30	68.68	10.301	O I	0.34
1.500	289.14	92.78	13.917	O I	0.46
1.750	364.20	122.92	18.438	O I	0.61
2.000	438.46	158.80	23.820	O I	0.79
2.250	556.40	204.58	30.343	O I	1.02
2.500	773.58	316.06	38.704	O I	1.58
2.750	985.68	547.74	47.955	O I	2.59
3.000	921.08	824.06	53.481	O I	3.70
3.250	611.03	784.55	52.691	O I	3.54
3.500	340.05	574.05	48.481	O I	2.70
3.750	184.91	386.42	43.982	O I	1.93
4.000	115.79	329.26	39.695	O I	1.65
4.250	82.71	273.57	35.518	O I	1.37
4.500	63.22	225.00	31.875	O I	1.12
4.750	49.32	191.56	28.734	O I	0.96
5.000	38.81	172.55	25.883	O I	0.86
5.250	31.03	154.82	23.222	O I	0.77
5.500	25.11	138.48	20.772	O I	0.69
5.750	20.39	123.57	18.535	O I	0.62
6.000	16.57	110.03	16.504	O I	0.55
6.250	13.47	97.78	14.668	O I	0.49
6.500	10.95	86.76	13.013	O I	0.43
6.750	8.90	76.85	11.528	O I	0.38
7.000	7.23	67.99	10.198	O I	0.34
7.250	5.88	60.07	9.011	O I	0.30
7.500	4.77	53.02	7.953	O I	0.27
7.750	3.88	46.74	7.011	O I	0.23
8.000	3.15	41.17	6.176	O I	0.21
8.250	2.56	36.24	5.435	O I	0.18
8.500	2.08	31.86	4.780	O I	0.16
8.750	1.69	28.00	4.200	O	0.14
9.000	1.38	24.59	3.689	O	0.12
9.250	1.12	21.58	3.237	O	0.11
9.500	0.91	18.93	2.840	O	0.09
9.750	0.74	16.60	2.490	O	0.08
10.000	0.60	14.55	2.182	O	0.07
10.250	0.49	12.74	1.911	O	0.06
10.500	0.40	11.16	1.673	O	0.06
10.750	0.32	9.77	1.465	O	0.05
11.000	0.26	8.54	1.282	O	0.04
11.250	0.21	7.47	1.121	O	0.04
11.500	0.17	6.54	0.980	O	0.03
11.750	0.14	5.71	0.857	O	0.03
12.000	0.11	4.99	0.749	O	0.02
12.250	0.09	4.36	0.655	O	0.02
12.500	0.08	3.81	0.572	O	0.02
12.750	0.06	3.33	0.499	O	0.02
13.000	0.05	2.91	0.436	O	0.01
13.250	0.04	2.54	0.381	O	0.01
13.500	0.03	2.22	0.332	O	0.01
13.750	0.03	1.93	0.290	O	0.01
14.000	0.02	1.69	0.253	O	0.01
14.250	0.02	1.47	0.221	O	0.01
14.500	0.01	1.29	0.193	O	0.01
14.750	0.01	1.12	0.168	O	0.01
15.000	0.01	0.98	0.147	O	0.00
15.250	0.01	0.85	0.128	O	0.00
15.500	0.01	0.74	0.112	O	0.00
15.750	0.01	0.65	0.097	O	0.00
16.000	0.00	0.57	0.085	O	0.00
16.250	0.00	0.49	0.074	O	0.00
16.500	0.00	0.43	0.065	O	0.00
16.750	0.00	0.38	0.056	O	0.00
17.000	0.00	0.33	0.049	O	0.00
17.250	0.00	0.29	0.043	O	0.00
17.500	0.00	0.25	0.037	O	0.00
17.750	0.00	0.22	0.033	O	0.00
18.000	0.00	0.19	0.028	O	0.00

```
18.250    0.00    0.17      0.025  O       |       |       |       |     0.00
18.500    0.00    0.14      0.022  O       |       |       |       |     0.00
18.750    0.00    0.13      0.019  O       |       |       |       |     0.00
19.000    0.00    0.11      0.016  O       |       |       |       |     0.00
19.250    0.00    0.10      0.014  O       |       |       |       |     0.00
19.500    0.00    0.08      0.013  O       |       |       |       |     0.00
19.750    0.00    0.07      0.011  O       |       |       |       |     0.00
20.000    0.00    0.06      0.010  O       |       |       |       |     0.00
20.250    0.00    0.06      0.008  O       |       |       |       |     0.00
20.500    0.00    0.05      0.007  O       |       |       |       |     0.00
20.750    0.00    0.04      0.006  O       |       |       |       |     0.00
21.000    0.00    0.04      0.006  O       |       |       |       |     0.00
21.250    0.00    0.03      0.005  O       |       |       |       |     0.00
21.500    0.00    0.03      0.004  O       |       |       |       |     0.00
21.750    0.00    0.03      0.004  O       |       |       |       |     0.00
22.000    0.00    0.02      0.003  O       |       |       |       |     0.00
22.250    0.00    0.02      0.003  O       |       |       |       |     0.00
22.500    0.00    0.02      0.003  O       |       |       |       |     0.00
22.750    0.00    0.02      0.002  O       |       |       |       |     0.00
23.000    0.00    0.01      0.002  O       |       |       |       |     0.00
23.250    0.00    0.01      0.002  O       |       |       |       |     0.00
23.500    0.00    0.01      0.002  O       |       |       |       |     0.00
23.750    0.00    0.01      0.001  O       |       |       |       |     0.00
24.000    0.00    0.01      0.001  O       |       |       |       |     0.00
24.250    0.00    0.01      0.001  O       |       |       |       |     0.00
24.500    0.00    0.01      0.001  O       |       |       |       |     0.00
24.750    0.00    0.01      0.001  O       |       |       |       |     0.00
25.000    0.00    0.01      0.001  O       |       |       |       |     0.00
25.250    0.00    0.00      0.001  O       |       |       |       |     0.00
25.500    0.00    0.00      0.001  O       |       |       |       |     0.00
25.750    0.00    0.00      0.001  O       |       |       |       |     0.00
26.000    0.00    0.00      0.000  O       |       |       |       |     0.00

****************************HYDROGRAPH DATA****************************
               Number of intervals =   104
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      824.060 (CFS)
               Total volume =     139.384 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file LineC3hr.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/04/12

------------------------------------------------------------------


Line C, Offsite subdrain Area C1 and C21
Routed
100 Yr. 3 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: OffsiteSUBC13100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    20
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      360.479 (CFS)
               Total volume =      41.223 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   3000.00 (Ft.)
Elevation difference =   50.00 (Ft.)
Slope of channel =  0.016667 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  3000.00(Ft.)     Elevation difference =  50.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    140.469(CFS)
Depth of flow =     1.573(Ft.)
Average velocity =    13.582(Ft/s)
Total flow rate =   140.469(CFS)
Channel flow top width =    8.147(Ft.)
Depth of flow in channel =   1.57(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   13.58(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  140.469(CFS)
Total capacity of improved channels =    140.469(CFS)
Critical Depth in Channel =    2.44(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    360.479(CFS)
```

```
Depth of flow =     2.660(Ft.)
Average velocity =    17.692(Ft/s)
Total flow rate =   360.479(CFS)
Channel flow top width =   10.320(Ft.)
Depth of flow in channel =   2.66(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.69(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  360.479(CFS)
Total capacity of improved channels =    360.479(CFS)
Critical Depth in Channel =    4.13(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9123   Travel time =   2.83 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   4.2117
       dt(routing time-step) =   2.58 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       90.1     180.2     270.4     360.5
 ----------------------------------------------------------------------
   0+15       1.8418      2.22  O         |         |         |         |
   0+30      14.5408     17.10  |O        |         |         |         |
   0+45      36.3745     40.38  |   O     |         |         |         |
   1+ 0      52.1491     54.59  |    OI   |         |         |         |
   1+15      61.5254     62.96  |     O   |         |         |         |
   1+30      87.4078     92.48  |        OI         |         |         |
   1+45     114.7350    119.36  |         | OI      |         |         |
   2+ 0     143.3035    148.28  |         |    OI   |         |         |
   2+15     174.3831    179.80  |         |        O|         |         |
   2+30     242.4964    255.51  |         |         |     O I |         |
   2+45     342.4322    360.48  |         |         |         |      O  I
   3+ 0     353.8363    352.46  |         |         |         |        O|
   3+15     206.3617    176.03  |         |        I| O       |         |
   3+30      92.7497     75.46  |       I O         |         |         |
   3+45      40.3501     33.06  |  IO     |         |         |         |
   4+ 0      16.8993     13.54  |O        |         |         |         |
   4+15       7.8126      6.62  O         |         |         |         |
   4+30       4.0765      3.55  O         |         |         |         |
   4+45       1.5975      1.19  O         |         |         |         |
   5+ 0       0.2830      0.09  O         |         |         |         |
   5+15       0.0162      0.00  O         |         |         |         |
   5+30       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =    22
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      353.836 (CFS)
                     Total volume =      41.223 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ---------------------------------------------------------------------
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: OffsiteSUBC213100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      131.2     262.5     393.7     524.9
 ---------------------------------------------------------------------
   0+15       2.9512      4.79  Q         |         |         |         |
   0+30      12.8095     27.35  q Q       |         |         |         |
   0+45      23.4163     59.79  |q  Q     |         |         |         |
   1+ 0      26.7787     78.93  | q   Q   |         |         |         |
   1+15      33.4835     95.01  | q    Q  |         |         |         |
   1+30      49.0842    136.49  |  q      Q         |         |         |
   1+45      61.7277    176.46  |   q     |  Q      |         |         |
   2+ 0      74.1553    217.46  |    q    |     Q   |         |         |
   2+15      94.9705    269.35  |      q  |         Q         |         |
   2+30     143.7514    386.25  |         q         |         Q         |
   2+45     182.5086    524.94  |         |  q      |         |         Q
   3+ 0     129.8414    483.68  |        q|         |         |     Q   |
   3+15      35.4821    241.84  | q       |       Q |         |         |
   3+30       7.6617    100.41  q      Q  |         |         |         |
   3+45       1.8371     42.19  q  Q      |         |         |         |
   4+ 0       0.1327     17.03  qQ        |         |         |         |
   4+15       0.0000      7.81  Q         |         |         |         |
   4+30       0.0000      4.08  Q         |         |         |         |
   4+45       0.0000      1.60  Q         |         |         |         |
   5+ 0       0.0000      0.28  Q         |         |         |         |
   5+15       0.0000      0.02  Q         |         |         |         |
   5+30       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
******************************HYDROGRAPH DATA****************************
                Number of intervals =    22
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      524.941 (CFS)
                Total volume =      59.417 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file CoffsiteRT1.rte
******************************HYDROGRAPH DATA****************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/04/12

------------------------------------------------------------------


Line C, Offsite Subdrain Areas C21 and C51
Routed
100 Yr. 3 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: OffsiteSUBC413100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    14
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       63.042 (CFS)
               Total volume =       5.923 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    400.00 (Ft.)
Elevation difference =   10.00 (Ft.)
Slope of channel =  0.025000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   400.00(Ft.)     Elevation difference =  10.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     22.848(CFS)
Depth of flow =     0.480(Ft.)
Average velocity =     8.693(Ft/s)
Total flow rate =    22.848(CFS)
Channel flow top width =    5.959(Ft.)
Depth of flow in channel =   0.48(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.69(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   22.848(CFS)
Total capacity of improved channels =     22.848(CFS)
Critical Depth in Channel =    0.81(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     63.042(CFS)
```

```
Depth of flow =     0.878(Ft.)
Average velocity =    12.223(Ft/s)
Total flow rate =    63.042(CFS)
Channel flow top width =    6.755(Ft.)
Depth of flow in channel =   0.88(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   12.22(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   63.042(CFS)
Total capacity of improved channels =     63.042(CFS)
Critical Depth in Channel =    1.53(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8779   Travel time =   0.55 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  21.2180
       dt(routing time-step) =   0.48 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       15.8      31.5      47.3      63.0
 ----------------------------------------------------------------------
   0+15       1.0308      1.06  O         |         |         |         |
   0+30       4.5717      4.69  | O       |         |         |         |
   0+45       7.6834      7.78  |   O     |         |         |         |
   1+ 0       8.0737      8.08  |    O    |         |         |         |
   1+15      11.8196     11.94  |      O  |         |         |         |
   1+30      17.0081     17.18  |         O         |         |         |
   1+45      21.4911     21.63  |         |  O      |         |         |
   2+ 0      25.3936     25.52  |         |     O   |         |         |
   2+15      34.8341     35.14  |         |         | O       |         |
   2+30      54.6119     55.25  |         |         |         |   OI    |
   2+45      62.7929     63.04  |         |         |         |        OI
   3+ 0      32.2161     31.20  |         |        IO         |         |
   3+15       4.8507      3.98  | IO      |         |         |         |
   3+30       0.2712      0.15  O         |         |         |         |
   3+45       0.0048      0.00  O         |         |         |         |
   4+ 0       0.0000      0.00  O         |         |         |         |
---------------------------------------------------------------------
********************************HYDROGRAPH DATA***************************
               Number of intervals =    16
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       62.793 (CFS)
               Total volume =       5.923 (Ac.Ft)
       Status of hydrographs being held in storage
                 Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************
```

```
                    From study/file name: OffsiteSUBC513100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       18.8      37.7      56.5      75.4
 ---------------------------------------------------------------------
    0+15       0.2655      1.30  Q         |         |         |         |
    0+30       0.9768      5.55  q Q       |         |         |         |
    0+45       1.4118      9.10  q   Q     |         |         |         |
    1+ 0       1.3450      9.42  q   Q     |         |         |         |
    1+15       2.5137     14.33  |q     Q  |         |         |         |
    1+30       3.4505     20.46  |q        Q         |         |         |
    1+45       4.4188     25.91  | q       |  Q      |         |         |
    2+ 0       5.1305     30.52  | q       |     Q   |         |         |
    2+15       7.6518     42.49  |   q     |         | Q       |         |
    2+30      12.2984     66.91  |     q   |         |         |    Q    |
    2+45      12.5770     75.37  |     q   |         |         |         Q
    3+ 0       3.6549     35.87  |q        |        Q|         |         |
    3+15       0.1609      5.01  q Q       |         |         |         |
    3+30       0.0000      0.27  Q         |         |         |         |
    3+45       0.0000      0.00  Q         |         |         |         |
    4+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    16
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       75.370 (CFS)
                    Total volume =       7.077 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ---------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        1.000 to Point/Station        2.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ____________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =    400.00 (Ft.)
       Elevation difference =   10.00 (Ft.)
       Slope of channel =  0.025000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =   400.00(Ft.)     Elevation difference =  10.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =    5.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =    5.000(Ft.)
       Flow(q) thru subarea =     27.396(CFS)
       Depth of flow =     0.535(Ft.)
       Average velocity =     9.258(Ft/s)
       Total flow rate =    27.396(CFS)
       Channel flow top width =    6.069(Ft.)
       Depth of flow in channel =   0.53(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =    9.26(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =   27.396(CFS)
       Total capacity of improved channels =     27.396(CFS)
```

```
Critical Depth in Channel =    0.92(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     75.370(CFS)
Depth of flow =     0.975(Ft.)
Average velocity =    12.940(Ft/s)
Total flow rate =    75.370(CFS)
Channel flow top width =    6.950(Ft.)
Depth of flow in channel =   0.97(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   12.94(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   75.370(CFS)
Total capacity of improved channels =     75.370(CFS)
Critical Depth in Channel =    1.70(Ft.)


********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8839   Travel time =   0.52 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  22.2933
       dt(routing time-step) =   0.46 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0       18.8      37.7      56.5      75.4
 ----------------------------------------------------------------------
   0+15       1.2570      1.30  O         |         |         |         |
   0+30       5.4194      5.55  | O       |         |         |         |
   0+45       8.9875      9.10  |   O     |         |         |         |
   1+ 0       9.4088      9.42  |   O     |         |         |         |
   1+15      14.1841     14.33  |      O  |         |         |         |
   1+30      20.2727     20.46  |         O         |         |         |
   1+45      25.7444     25.91  |         |  O      |         |         |
   2+ 0      30.3840     30.52  |         |     O   |         |         |
   2+15      42.1227     42.49  |         |         | O       |         |
   2+30      66.1688     66.91  |         |         |         |    O    |
   2+45      75.1132     75.37  |         |         |         |        OI
   3+ 0      37.0701     35.87  |         |        O|         |         |
   3+15       5.9485      5.01  | IO      |         |         |         |
   3+30       0.4151      0.27  O         |         |         |         |
   3+45       0.0128      0.00  O         |         |         |         |
   4+ 0       0.0001      0.00  O         |         |         |         |
   4+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
*****************************HYDROGRAPH DATA***************************
               Number of intervals =    17
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       75.113 (CFS)
               Total volume =       7.077 (Ac.Ft)
       Status of hydrographs being held in storage
                 Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

---------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file CoffsiteRT2.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/01/12

      ----------------------------------------------------------------


      Watershed C, Subdrain Area C2
      Routed Through Basin
      100 Yr. 3 Hr.

      ----------------------------------------------------------------


      Program License Serial Number 6097

      ------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBC23100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    14
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      361.448 (CFS)
                    Total volume =      43.308 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------
      Total number of inflow hydrograph intervals = 14
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.002      0.002        0.002
         3.000     10.000    100.000      8.967       11.033
         4.000     15.000    200.000     12.934       17.066
         6.000     38.000    500.000     32.835       43.165
      ----------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      90.4  180.72  271.09  361.45 (Ft.)
 0.250   35.93    3.35      0.337  O  I    |       |       |       |     2.03
```

0.500	75.65	13.17	1.319		O I				2.13
0.750	94.48	26.64	2.665		O I				2.27
1.000	96.68	39.55	3.956		O I				2.40
1.250	116.48	52.10	5.211		O	I			2.52
1.500	140.10	66.37	6.638		O	I			2.66
1.750	163.08	82.33	8.234		O	I			2.82
2.000	181.68	99.20	9.920		O I		2.99
2.250	229.95	135.05	11.752			O	I		3.35
2.500	326.40	184.06	14.203			O	I	3.84
2.750	361.45	226.91	17.063				O	I	4.18
3.000	210.02	240.88	18.134				I O		4.27
3.250	58.09	215.51	16.189		I		O		4.10
3.500	6.11	159.56	12.978	I	O			3.60
3.750	0.00	105.96	10.298	I	O			3.06
4.000	0.00	83.41	8.342	I O				2.83
4.250	0.00	67.79	6.780	I O				2.68
4.500	0.00	55.09	5.510	I O				2.55
4.750	0.00	44.77	4.478	I O				2.45
5.000	0.00	36.39	3.640	I O				2.36
5.250	0.00	29.57	2.959	I O				2.30
5.500	0.00	24.03	2.405	I O				2.24
5.750	0.00	19.53	1.955	IO				2.20
6.000	0.00	15.87	1.589	IO				2.16
6.250	0.00	12.90	1.292	IO				2.13
6.500	0.00	10.48	1.050	O				2.10
6.750	0.00	8.52	0.854	O				2.09
7.000	0.00	6.93	0.694	O				2.07
7.250	0.00	5.63	0.565	O				2.06
7.500	0.00	4.57	0.459	O				2.05
7.750	0.00	3.72	0.373	O				2.04
8.000	0.00	3.02	0.304	O				2.03
8.250	0.00	2.46	0.247	O				2.02
8.500	0.00	2.00	0.201	O				2.02
8.750	0.00	1.62	0.164	O				2.02
9.000	0.00	1.32	0.134	O				2.01
9.250	0.00	1.07	0.109	O				2.01
9.500	0.00	0.87	0.089	O				2.01
9.750	0.00	0.71	0.073	O				2.01
10.000	0.00	0.57	0.059	O				2.01
10.250	0.00	0.47	0.049	O				2.00
10.500	0.00	0.38	0.040	O				2.00
10.750	0.00	0.31	0.033	O				2.00
11.000	0.00	0.25	0.027	O				2.00
11.250	0.00	0.20	0.022	O				2.00
11.500	0.00	0.17	0.018	O				2.00
11.750	0.00	0.13	0.015	O				2.00
12.000	0.00	0.11	0.013	O				2.00
12.250	0.00	0.09	0.011	O				2.00
12.500	0.00	0.07	0.009	O				2.00
12.750	0.00	0.06	0.008	O				2.00
13.000	0.00	0.05	0.007	O				2.00
13.250	0.00	0.04	0.006	O				2.00
13.500	0.00	0.03	0.005	O				2.00
13.750	0.00	0.03	0.004	O				2.00
14.000	0.00	0.02	0.004	O				2.00
14.250	0.00	0.02	0.003	O				2.00
14.500	0.00	0.01	0.003	O				2.00
14.750	0.00	0.01	0.003	O				2.00
15.000	0.00	0.01	0.003	O				2.00
15.250	0.00	0.01	0.003	O				2.00
15.500	0.00	0.01	0.002	O				2.00
15.750	0.00	0.00	0.002	O				2.00
16.000	0.00	0.00	0.002	O				2.00
16.250	0.00	0.00	0.002	O				2.00
16.500	0.00	0.00	0.002	O				2.00
16.750	0.00	0.00	0.002	O				2.00
17.000	0.00	0.00	0.002	O				1.97
17.250	0.00	0.00	0.002	O				1.93
17.500	0.00	0.00	0.002	O				1.89
17.750	0.00	0.00	0.002	O				1.85
18.000	0.00	0.00	0.002	O				1.81

```
18.250    0.00    0.00      0.002  O       |       |       |       |     1.78
18.500    0.00    0.00      0.002  O       |       |       |       |     1.74
18.750    0.00    0.00      0.002  O       |       |       |       |     1.71
19.000    0.00    0.00      0.002  O       |       |       |       |     1.67
19.250    0.00    0.00      0.002  O       |       |       |       |     1.64
19.500    0.00    0.00      0.002  O       |       |       |       |     1.60
19.750    0.00    0.00      0.002  O       |       |       |       |     1.57
20.000    0.00    0.00      0.002  O       |       |       |       |     1.54
20.250    0.00    0.00      0.002  O       |       |       |       |     1.51
20.500    0.00    0.00      0.001  O       |       |       |       |     1.48
20.750    0.00    0.00      0.001  O       |       |       |       |     1.45
21.000    0.00    0.00      0.001  O       |       |       |       |     1.42
21.250    0.00    0.00      0.001  O       |       |       |       |     1.39
21.500    0.00    0.00      0.001  O       |       |       |       |     1.36
21.750    0.00    0.00      0.001  O       |       |       |       |     1.33
22.000    0.00    0.00      0.001  O       |       |       |       |     1.30
22.250    0.00    0.00      0.001  O       |       |       |       |     1.28
22.500    0.00    0.00      0.001  O       |       |       |       |     1.25
22.750    0.00    0.00      0.001  O       |       |       |       |     1.23
23.000    0.00    0.00      0.001  O       |       |       |       |     1.20
23.250    0.00    0.00      0.001  O       |       |       |       |     1.18
23.500    0.00    0.00      0.001  O       |       |       |       |     1.15
23.750    0.00    0.00      0.001  O       |       |       |       |     1.13
24.000    0.00    0.00      0.001  O       |       |       |       |     1.10
24.250    0.00    0.00      0.001  O       |       |       |       |     1.08
24.500    0.00    0.00      0.001  O       |       |       |       |     1.06
24.750    0.00    0.00      0.001  O       |       |       |       |     1.04
25.000    0.00    0.00      0.001  O       |       |       |       |     1.02
25.250    0.00    0.00      0.001  O       |       |       |       |     1.00

      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =   101
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      240.883 (CFS)
                    Total volume =      43.307 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SUBC2RT.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =     0
                    Time interval =    0.0 (Min.)
                    Maximum/Peak flow rate =        0.000 (CFS)
                    Total volume =       0.000 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------
```

```
           U n i t   H y d r o g r a p h   A n a l y s i s

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                 Study date  04/25/12 File: SubC13100.out


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      ----------------------------------------------------------------------
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      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6097

      ----------------------------------------------------------------------
--
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
--
      Watershed C, Offsite C1
      Proposed Condition
      100-year, 3-hour

      ----------------------------------------------------------------------
-
      Drainage Area =     403.10(Ac.)  =      0.630 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =     403.10(Ac.)  =
0.630 Sq. Mi.
      Length along longest watercourse =    9900.00(Ft.)
      Length along longest watercourse measured to centroid =
5600.00(Ft.)
      Length along longest watercourse =      1.875 Mi.
      Length along longest watercourse measured to centroid =      1.061
Mi.
      Difference in elevation =     700.00(Ft.)
      Slope along watercourse =    373.3333 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.303 Hr.
      Lag time =    18.21 Min.
      25% of lag time =     4.55 Min.
      40% of lag time =     7.28 Min.
      Unit time =    15.00 Min.
      Duration of storm = 3 Hour(s)
      User Entered Base Flow =     0.00(CFS)
```

```
2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10             0.85                 342.63

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10             1.90                 765.89

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.82 %
Adjusted average point rain =    1.897(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.500           46.00         0.000
     5.400           66.00         0.000
    13.200           77.00         0.000
   376.000           83.00         0.000
 Total Area Entered =    403.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)
(In/Hr)
46.0  46.0      0.611     0.000        0.611       0.021      0.013
66.0  66.0      0.405     0.000        0.405       0.013      0.005
77.0  77.0      0.279     0.000        0.279       0.033      0.009
83.0  83.0      0.210     0.000        0.210       0.933      0.196
                                                     Sum (F) =
0.223
Area averaged mean soil loss (F) (In/Hr) =  0.223
Minimum soil loss rate ((In/Hr)) =  0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------
--

            U n i t  H y d r o g r a p h
                  FOOTHILL S-Curve
-----------------------------------------------------------------
-
            Unit Hydrograph Data
-----------------------------------------------------------------
--
Unit time period   Time % of lag   Distribution   Unit Hydrograph
```

	(hrs)		Graph %	(CFS)
1	0.250	82.386	9.509	38.632
2	0.500	164.773	49.802	202.320
3	0.750	247.159	23.542	95.638
4	1.000	329.545	9.452	38.397
5	1.250	411.931	4.591	18.651
6	1.500	494.318	1.618	6.571
7	1.750	576.704	0.707	2.873
8	2.000	659.090	0.536	2.179
9	2.250	741.476	0.243	0.986
			Sum = 100.000	Sum= 406.249

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.223	(0.253)	0.058
2	0.50	4.80	0.364	0.223	(0.328)	0.141
3	0.75	5.10	0.387	0.223	(0.348)	0.164
4	1.00	4.90	0.372	0.223	(0.335)	0.149
5	1.25	6.60	0.501	0.223	(0.451)	0.278
6	1.50	7.30	0.554	0.223	(0.498)	0.331
7	1.75	8.40	0.637	0.223	(0.574)	0.414
8	2.00	9.00	0.683	0.223	(0.615)	0.460
9	2.25	12.30	0.933	0.223	(0.840)	0.710
10	2.50	17.60	1.335	0.223	(1.202)	1.112
11	2.75	16.10	1.221	0.223	(1.099)	0.998
12	3.00	4.20	0.319	0.223	(0.287)	0.095
		(Loss Rate Not Used)				
	Sum =	100.0			Sum =	4.9

Flood volume = Effective rainfall 1.23(In)
times area 403.1(Ac.)/[(In)/(Ft.)] = 41.2(Ac.Ft)
Total soil loss = 0.67(In)
Total soil loss = 22.489(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 1795655.1 Cubic Feet
Total soil loss = 979622.6 Cubic Feet

Peak flow rate of this hydrograph = 360.479(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

```
     ----------------------------------------------------------------
-
                  Hydrograph in  15   Minute intervals ((CFS))

     ----------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0      100.0     200.0     300.0
400.0
  ---------------------------------------------------------------------
    0+15       0.0460      2.22  Q         |         |         |
|
    0+30       0.3992     17.10  VQ        |         |         |
|
    0+45       1.2334     40.38   V  Q     |         |         |
|
    1+ 0       2.3614     54.59  | V  Q    |         |         |
|
    1+15       3.6623     62.96  |  V  Q   |         |         |
|
    1+30       5.5731     92.48  |    V   Q|         |         |
|
    1+45       8.0391    119.36  |      V  |Q        |         |
|
    2+ 0      11.1027    148.28  |         V   Q     |         |
|
    2+15      14.8176    179.80  |         |   V  Q  |         |
|
    2+30      20.0968    255.51  |         |        V|    Q    |
|
    2+45      27.5447    360.48  |         |         |     V   |     Q
|
    3+ 0      34.8269    352.46  |         |         |         |  V Q
|
    3+15      38.4639    176.03  |         |      Q  |         |      V
|
    3+30      40.0230     75.46  |      Q  |         |         |       V
|
    3+45      40.7060     33.06  |  Q      |         |         |
V|
    4+ 0      40.9859     13.54  |Q        |         |         |
V|
    4+15      41.1227      6.62  Q         |         |         |
V|
    4+30      41.1960      3.55  Q         |         |         |
V|
    4+45      41.2206      1.19  Q         |         |         |
V|
    5+ 0      41.2226      0.09  Q         |         |         |
V|
---------------------------------------------------------------------
```

```
           U n i t   H y d r o g r a p h   A n a l y s i s

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      ----------------------------------------------------------------------
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      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6097

      ----------------------------------------------------------------------
--
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
--
      Watershed C, Offsite C2
      Proposed Condition
      100-year, 3-hour

      ----------------------------------------------------------------------
-
      Drainage Area =     180.10(Ac.)  =      0.281 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =     180.10(Ac.)  =
0.281 Sq. Mi.
      Length along longest watercourse =    5800.00(Ft.)
      Length along longest watercourse measured to centroid =
2200.00(Ft.)
      Length along longest watercourse =      1.098 Mi.
      Length along longest watercourse measured to centroid =      0.417
Mi.
      Difference in elevation =     547.00(Ft.)
      Slope along watercourse =    497.9586 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.164 Hr.
      Lag time =     9.86 Min.
      25% of lag time =     2.47 Min.
      40% of lag time =     3.95 Min.
      Unit time =    15.00 Min.
      Duration of storm = 3 Hour(s)
      User Entered Base Flow =     0.00(CFS)
```

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
180.10	0.85	153.08

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
180.10	1.90	342.19

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.92 %
Adjusted average point rain = 1.899(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
17.000	66.00	0.000
1.300	77.00	0.000
161.800	83.00	0.000

Total Area Entered = 180.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.094	0.038
77.0	77.0	0.279	0.000	0.279	0.007	0.002
83.0	83.0	0.210	0.000	0.210	0.898	0.188
					Sum (F) =	0.229

Area averaged mean soil loss (F) (In/Hr) = 0.229
Minimum soil loss rate ((In/Hr)) = 0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)

```
     ------------------------------------------------------------------
--
         1   0.250        152.073         31.114             56.474
         2   0.500        304.146         54.171             98.324
         3   0.750        456.220         11.618             21.087
         4   1.000        608.293          2.287              4.152
         5   1.250        760.366          0.810              1.471
                                   Sum = 100.000   Sum=     181.507
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.229	(0.253)	0.052
2	0.50	4.80	0.365	0.229	(0.328)	0.136
3	0.75	5.10	0.387	0.229	(0.349)	0.159
4	1.00	4.90	0.372	0.229	(0.335)	0.143
5	1.25	6.60	0.501	0.229	(0.451)	0.272
6	1.50	7.30	0.554	0.229	(0.499)	0.326
7	1.75	8.40	0.638	0.229	(0.574)	0.409
8	2.00	9.00	0.683	0.229	(0.615)	0.455
9	2.25	12.30	0.934	0.229	(0.841)	0.705
10	2.50	17.60	1.337	0.229	(1.203)	1.108
11	2.75	16.10	1.223	0.229	(1.100)	0.994
12	3.00	4.20	0.319	0.229	(0.287)	0.090

```
            (Loss Rate Not Used)
     Sum =     100.0                                    Sum =     4.8
      Flood volume = Effective rainfall      1.21(In)
       times area     180.1(Ac.)/[(In)/(Ft.)] =      18.2(Ac.Ft)
      Total soil loss =      0.69(In)
      Total soil loss =    10.299(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =      792532.8 Cubic Feet
      Total soil loss =      448638.2 Cubic Feet
     ------------------------------------------------------------------
-
       Peak flow rate of this hydrograph =    182.509(CFS)
     ------------------------------------------------------------------
-
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                         3 - H O U R    S T O R M
                    R u n o f f     H y d r o g r a p h
     ------------------------------------------------------------------
-
                   Hydrograph in  15   Minute intervals ((CFS))

     ------------------------------------------------------------------
-
```

```
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0
200.0
  ---------------------------------------------------------------------
    0+15       0.0610      2.95  Q         |         |         |
|
    0+30       0.3256     12.81  V Q       |         |         |
|
    0+45       0.8094     23.42  |V  Q     |         |         |
|
    1+ 0       1.3627     26.78  | V  Q    |         |         |
|
    1+15       2.0545     33.48  |   V Q   |         |         |
|
    1+30       3.0687     49.08  |     V  Q|         |         |
|
    1+45       4.3440     61.73  |        V| Q       |         |
|
    2+ 0       5.8762     74.16  |           V Q     |         |
|
    2+15       7.8384     94.97  |         |      VQ |         |
|
    2+30      10.8084    143.75  |         |         |  V    Q |
|
    2+45      14.5793    182.51  |         |         |         | V   Q
|
    3+ 0      17.2620    129.84  |         |         |    Q    |      V
|
    3+15      17.9951     35.48  |      Q  |         |         |
V|
    3+30      18.1534      7.66  |Q        |         |         |
V|
    3+45      18.1913      1.84  Q         |         |         |
V|
    4+ 0      18.1940      0.13  Q         |         |         |
V
---------------------------------------------------------------------
```

```
           U n i t   H y d r o g r a p h   A n a l y s i s

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                 Study date  04/25/12 File: SubC413100.out


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      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6097

      ----------------------------------------------------------------------
--
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
--
      Watershed C, Offsite C3
      Proposed Condition
      100-year, 3-hour

      ----------------------------------------------------------------------
-
      Drainage Area =      61.60(Ac.)  =      0.096 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =      61.60(Ac.)  =
0.096 Sq. Mi.
      Length along longest watercourse =    2300.00(Ft.)
      Length along longest watercourse measured to centroid =
1340.00(Ft.)
      Length along longest watercourse =      0.436 Mi.
      Length along longest watercourse measured to centroid =      0.254
Mi.
      Difference in elevation =     219.00(Ft.)
      Slope along watercourse =    502.7478 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.096 Hr.
      Lag time =     5.74 Min.
      25% of lag time =     1.43 Min.
      40% of lag time =     2.30 Min.
      Unit time =    15.00 Min.
      Duration of storm = 3 Hour(s)
      User Entered Base Flow =     0.00(CFS)
```

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
61.60	0.85	52.36

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
61.60	1.90	117.04

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.899(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
8.200	66.00	0.000
11.300	77.00	0.000
42.100	83.00	0.000

Total Area Entered = 61.60(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.133	0.054
77.0	77.0	0.279	0.000	0.279	0.183	0.051
83.0	83.0	0.210	0.000	0.210	0.683	0.143
					Sum (F) =	0.249

Area averaged mean soil loss (F) (In/Hr) = 0.249
Minimum soil loss rate ((In/Hr)) = 0.124
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)

```
     ------------------------------------------------------------------
--
         1   0.250        261.402         52.675             32.701
         2   0.500        522.805         43.927             27.270
         3   0.750        784.207          3.398              2.110
                                   Sum = 100.000   Sum=      62.081
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.249	(0.253)	0.033
2 0.50	4.80	0.365	0.249	(0.328)	0.116
3 0.75	5.10	0.387	0.249	(0.349)	0.139
4 1.00	4.90	0.372	0.249	(0.335)	0.124
5 1.25	6.60	0.501	0.249	(0.451)	0.253
6 1.50	7.30	0.555	0.249	(0.499)	0.306
7 1.75	8.40	0.638	0.249	(0.574)	0.390
8 2.00	9.00	0.684	0.249	(0.615)	0.435
9 2.25	12.30	0.935	0.249	(0.841)	0.686
10 2.50	17.60	1.337	0.249	(1.204)	1.089
11 2.75	16.10	1.223	0.249	(1.101)	0.975
12 3.00	4.20	0.319	0.249	(0.287)	0.071

```
            (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.6
      Flood volume = Effective rainfall      1.15(In)
       times area      61.6(Ac.)/[(In)/(Ft.)] =       5.9(Ac.Ft)
      Total soil loss =      0.75(In)
      Total soil loss =     3.828(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =      257988.2 Cubic Feet
      Total soil loss =      166752.5 Cubic Feet
      ------------------------------------------------------------------
-
       Peak flow rate of this hydrograph =     63.042(CFS)
      ------------------------------------------------------------------
-
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                         3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
-
                    Hydrograph in  15   Minute intervals ((CFS))

      ------------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5
70.0
```

```
  ----------------------------------------------------------------------
    0+15       0.0220      1.06  Q         |         |         |
|
    0+30       0.1188      4.69  V Q       |         |         |
|
    0+45       0.2796      7.78  |V  Q     |         |         |
|
    1+ 0       0.4466      8.08  |  VQ     |         |         |
|
    1+15       0.6934     11.94  |   V Q   |         |         |
|
    1+30       1.0483     17.18  |      V Q|         |         |
|
    1+45       1.4952     21.63  |         V Q       |         |
|
    2+ 0       2.0224     25.52  |         |  VQ     |         |
|
    2+15       2.7485     35.14  |         |       V Q         |
|
    2+30       3.8901     55.25  |         |         |     V   |Q
|
    2+45       5.1926     63.04  |         |         |         |    VQ
|
    3+ 0       5.8372     31.20  |         |      Q  |         |
V|
    3+15       5.9195      3.98  | Q       |         |         |
V|
    3+30       5.9226      0.15  Q         |         |         |
V|
---------------------------------------------------------------------
```

```
          U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/25/12 File: SubC513100.out


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     Riverside County Synthetic Unit Hydrology Method
     RCFC & WCD Manual date - April 1978


     Program License Serial Number 6097

     ----------------------------------------------------------------------
--
      English (in-lb) Input Units Used
      English Rainfall Data (Inches) Input Values Used

      English Units used in output format



     ----------------------------------------------------------------------
--
     Watershed C, Offsite C4
     Proposed Condition
     100-year, 3-hour

     ----------------------------------------------------------------------
-
     Drainage Area =      12.70(Ac.)  =      0.020 Sq. Mi.
     Drainage Area for Depth-Area Areal Adjustment =      12.70(Ac.)  =
0.020 Sq. Mi.
     Length along longest watercourse =    1160.00(Ft.)
     Length along longest watercourse measured to centroid =
510.00(Ft.)
     Length along longest watercourse =      0.220 Mi.
     Length along longest watercourse measured to centroid =      0.097
Mi.
     Difference in elevation =     129.00(Ft.)
     Slope along watercourse =    587.1724 Ft./Mi.
     Average Manning's 'N' = 0.030
     Lag time =    0.050 Hr.
     Lag time =     2.98 Min.
     25% of lag time =     0.74 Min.
     40% of lag time =     1.19 Min.
     Unit time =    15.00 Min.
     Duration of storm = 3 Hour(s)
     User Entered Base Flow =     0.00(CFS)
```

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	0.85	10.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	1.90	24.13

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
4.000	66.00	0.000
8.700	83.00	0.000

Total Area Entered = 12.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.315	0.128
83.0	83.0	0.210	0.000	0.210	0.685	0.144
					Sum (F) =	0.271

Area averaged mean soil loss (F) (In/Hr) = 0.271
Minimum soil loss rate ((In/Hr)) = 0.136
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	504.085	73.731	9.437

```
          2   0.500       1008.171         26.269              3.362
                                     Sum = 100.000   Sum=      12.799
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum
calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective
Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281       (  0.271)       0.253        0.028
   2   0.50     4.80      0.365          0.271    (  0.328)        0.093
   3   0.75     5.10      0.388          0.271    (  0.349)        0.116
   4   1.00     4.90      0.372          0.271    (  0.335)        0.101
   5   1.25     6.60      0.502          0.271    (  0.451)        0.230
   6   1.50     7.30      0.555          0.271    (  0.499)        0.283
   7   1.75     8.40      0.638          0.271    (  0.575)        0.367
   8   2.00     9.00      0.684          0.271    (  0.616)        0.413
   9   2.25    12.30      0.935          0.271    (  0.841)        0.663
  10   2.50    17.60      1.338          0.271    (  1.204)        1.066
  11   2.75    16.10      1.224          0.271    (  1.101)        0.952
  12   3.00     4.20      0.319          0.271    (  0.287)        0.048
            (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.4
      Flood volume = Effective rainfall      1.09(In)
       times area      12.7(Ac.)/[(In)/(Ft.)] =       1.2(Ac.Ft)
      Total soil loss =      0.81(In)
      Total soil loss =     0.857(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =       50270.1 Cubic Feet
      Total soil loss =       37316.9 Cubic Feet
      ---------------------------------------------------------------
-
       Peak flow rate of this hydrograph =     12.577(CFS)
      ---------------------------------------------------------------
-
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                         3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------
-
                   Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0
20.0
  ---------------------------------------------------------------------
    0+15       0.0055      0.27  Q         |         |         |
|
```

```
    0+30       0.0257      0.98  VQ        |         |         |
|
    0+45       0.0548      1.41  |VQ       |         |         |
|
    1+ 0       0.0826      1.34  | Q       |         |         |
|
    1+15       0.1346      2.51  |   VQ    |         |         |
|
    1+30       0.2059      3.45  |     QV  |         |         |
|
    1+45       0.2972      4.42  |       Q V         |         |
|
    2+ 0       0.4032      5.13  |         Q  V      |         |
|
    2+15       0.5612      7.65  |         |    Q   V|         |
|
    2+30       0.8153     12.30  |         |         |   Q   V |
|
    2+45       1.0752     12.58  |         |         |    Q    |      V
|
    3+ 0       1.1507      3.65  |      Q  |         |         |
V|
    3+15       1.1540      0.16  Q         |         |         |
V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/01/12 File: SUBC13100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Subdrain Area C1
Proposed Condition
100 Yr, 3 Hr.

--------------------------------------------------------------------
Drainage Area =     105.00(Ac.)  =      0.164 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     105.00(Ac.)  =      0.164 Sq. Mi.
Length along longest watercourse =    3000.00(Ft.)
Length along longest watercourse measured to centroid =    1500.00(Ft.)
Length along longest watercourse =      0.568 Mi.
Length along longest watercourse measured to centroid =      0.284 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =     88.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.077 Hr.
Lag time =     4.61 Min.
25% of lag time =     1.15 Min.
40% of lag time =     1.85 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.00           0.85                 89.25

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.00           1.90                199.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   105.000           85.00         0.750
 Total Area Entered =    105.00(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        325.140         59.121             62.562
    2   0.500        650.280         35.788             37.871
    3   0.750        975.420          5.091              5.387
                                Sum = 100.000   Sum=     105.820
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.365	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.327
4 1.00	4.90	0.372	0.061	(0.112)	0.311
5 1.25	6.60	0.501	0.061	(0.150)	0.441
6 1.50	7.30	0.555	0.061	(0.166)	0.494
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.684	0.061	(0.205)	0.623
9 2.25	12.30	0.934	0.061	(0.280)	0.874
10 2.50	17.60	1.337	0.061	(0.401)	1.276
11 2.75	16.10	1.223	0.061	(0.367)	1.162
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     105.0(Ac.)/[(In)/(Ft.)] =      15.0(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     1.595(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      654359.2 Cubic Feet
Total soil loss =       69493.2 Cubic Feet
--------------------------------------------------------------------
 Peak flow rate of this hydrograph =    125.816(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
---------------------------------------------------------------------
  0+15       0.2849     13.79  V Q       |         |         |         |
  0+30       0.8503     27.37  | V  Q    |         |         |         |
  0+45       1.5352     33.15  |   V Q   |         |         |         |
  1+ 0       2.2275     33.51  |    VQ   |         |         |         |
  1+15       3.0776     41.14  |       Q |         |         |         |
  1+30       4.0958     49.28  |        QV         |         |         |
```

```
   1+45       5.2780     57.22  |         |Q  V     |         |         |
   2+ 0       6.5906     63.53  |         | Q    V  |         |         |
   2+15       8.2723     81.40  |         |     Q     V       |         |
   2+30      10.6761    116.34  |         |         |  Q    V |         |
   2+45      13.2756    125.82  |         |         |    Q         V    |
   3+ 0      14.6616     67.08  |         |  Q      |         |        V|
   3+15      14.9933     16.05  |  Q      |         |         |        V|
   3+30      15.0220      1.39  Q         |         |         |        V|
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Subdrain Area C2
Proposed Conditions
100 Yr, 3 Hr.

--------------------------------------------------------------------
Drainage Area =     303.00(Ac.)  =      0.473 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     303.00(Ac.)  =      0.473 Sq. Mi.
Length along longest watercourse =    4000.00(Ft.)
Length along longest watercourse measured to centroid =    2000.00(Ft.)
Length along longest watercourse =      0.758 Mi.
Length along longest watercourse measured to centroid =      0.379 Mi.
Difference in elevation =      80.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.092 Hr.
Lag time =     5.55 Min.
25% of lag time =     1.39 Min.
40% of lag time =     2.22 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      303.00           0.85                 257.55

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      303.00           1.90                 575.70

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.87 %
Adjusted average point rain =    1.897(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   303.000           85.00         0.750
 Total Area Entered =    303.00(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        270.496         53.435            163.172
    2   0.500        540.992         38.815            118.527
    3   0.750        811.489          7.750             23.667
                                Sum = 100.000   Sum=     305.367
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.364	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.326
4 1.00	4.90	0.372	0.061	(0.112)	0.311
5 1.25	6.60	0.501	0.061	(0.150)	0.440
6 1.50	7.30	0.554	0.061	(0.166)	0.493
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.683	0.061	(0.205)	0.622
9 2.25	12.30	0.934	0.061	(0.280)	0.873
10 2.50	17.60	1.336	0.061	(0.401)	1.275
11 2.75	16.10	1.222	0.061	(0.367)	1.161
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     303.0(Ac.)/[(In)/(Ft.)] =      43.3(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     4.604(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =     1886483.3 Cubic Feet
Total soil loss =      200537.4 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =    361.448(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      100.0     200.0     300.0     400.0
---------------------------------------------------------------------
  0+15       0.7423     35.93  V  Q      |         |         |         |
  0+30       2.3053     75.65  | V    Q  |         |         |         |
  0+45       4.2573     94.48  |  V     Q|         |         |         |
  1+ 0       6.2548     96.68  |    V   Q|         |         |         |
  1+15       8.6615    116.48  |      V  |Q        |         |         |
  1+30      11.5561    140.10  |         V   Q     |         |         |
```

```
    1+45      14.9256    163.08  |         |  V  Q   |         |         |
    2+ 0      18.6793    181.68  |         |      VQ |         |         |
    2+15      23.4302    229.95  |         |          VQ       |         |
    2+30      30.1740    326.40  |         |         |      V  | Q       |
    2+45      37.6420    361.45  |         |         |             V Q   |
    3+ 0      41.9812    210.02  |         |         |Q        |       V |
    3+15      43.1815     58.09  |    Q    |         |         |        V|
    3+30      43.3077      6.11  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  05/01/12 File: SUBC33100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Subdrain Area C3
Proposed Conditions
100 Yr. 3 Hr.

-------------------------------------------------------------------
Drainage Area =      83.70(Ac.)  =      0.131 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      83.70(Ac.)  =      0.131 Sq. Mi.
Length along longest watercourse =    3000.00(Ft.)
Length along longest watercourse measured to centroid =    1500.00(Ft.)
Length along longest watercourse =      0.568 Mi.
Length along longest watercourse measured to centroid =      0.284 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =     88.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.077 Hr.
Lag time =     4.61 Min.
25% of lag time =     1.15 Min.
40% of lag time =     1.85 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       83.70           0.85                 71.14

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       83.70           1.90                159.03

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    83.700           85.00         0.750
 Total Area Entered =     83.70(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        325.140         59.121             49.871
    2   0.500        650.280         35.788             30.189
    3   0.750        975.420          5.091              4.294
                                 Sum = 100.000   Sum=      84.354
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	3.70	0.281	0.061	(0.084)	0.220
2 0.50	4.80	0.365	0.061	(0.109)	0.304
3 0.75	5.10	0.387	0.061	(0.116)	0.327
4 1.00	4.90	0.372	0.061	(0.112)	0.311
5 1.25	6.60	0.501	0.061	(0.150)	0.441
6 1.50	7.30	0.555	0.061	(0.166)	0.494
7 1.75	8.40	0.638	0.061	(0.191)	0.577
8 2.00	9.00	0.684	0.061	(0.205)	0.623
9 2.25	12.30	0.934	0.061	(0.280)	0.874
10 2.50	17.60	1.337	0.061	(0.401)	1.276
11 2.75	16.10	1.223	0.061	(0.367)	1.162
12 3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =	100.0			Sum =	6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area      83.7(Ac.)/[(In)/(Ft.)] =      12.0(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     1.272(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =      521671.5 Cubic Feet
Total soil loss =       55396.0 Cubic Feet
--------------------------------------------------------------------
 Peak flow rate of this hydrograph =    100.303(CFS)
--------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

--------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
---------------------------------------------------------------------
  0+15       0.2271     10.99  V Q       |         |         |         |
  0+30       0.6779     21.82  | V Q     |         |         |         |
  0+45       1.2239     26.43  |   VQ    |         |         |         |
  1+ 0       1.7759     26.72  |    Q    |         |         |         |
  1+15       2.4535     32.80  |     Q V |         |         |         |
  1+30       3.2653     39.29  |      Q  V         |         |         |
```

```
    1+45       4.2078     45.62  |        Q|   V     |         |         |
    2+ 0       5.2542     50.65  |         Q      V  |         |         |
    2+15       6.5949     64.89  |         | Q         V       |         |
    2+30       8.5113     92.75  |         |       Q |       V |         |
    2+45      10.5836    100.30  |         |         Q               V    |
    3+ 0      11.6886     53.48  |         Q         |         |        V|
    3+15      11.9530     12.80  | Q       |         |         |        V|
    3+30      11.9759      1.11  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
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                          Study date: 05/04/12

     ---------------------------------------------------------------------


     Watershed D, Line D
     Proposed Condition
     100 Yr. 3 Hr.

     ---------------------------------------------------------------------


     Program License Serial Number 6097

     ---------------------------------------------------------------------
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: OffsiteD13100.rte
     ****************************HYDROGRAPH DATA***************************
                   Number of intervals =    22
                   Time interval =   15.0 (Min.)
                   Maximum/Peak flow rate =      373.436 (CFS)
                   Total volume =      42.431 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     **********************************************************************



     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station        0.000 to Point/Station        1.000
     **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
     ______________________________________________________________________
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: OffsiteD23100.rte
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

     ---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      130.4     260.7     391.1     521.5
-----------------------------------------------------------------------
  0+15       1.7742      2.69  Q         |         |         |         |
  0+30       6.7907     15.43  qQ        |         |         |         |
  0+45      12.2708     40.00  q  Q      |         |         |         |
  1+ 0      14.3332     58.59  |q  Q     |         |         |         |
  1+15      21.5676     75.34  |q   Q    |         |         |         |
  1+30      37.4948    116.61  | q     Q |         |         |         |
  1+45      50.4496    160.23  |  q      | Q       |         |         |
  2+ 0      63.0103    202.76  |   q     |    Q    |         |         |
  2+15      85.2339    258.19  |     q   |        Q|         |         |
  2+30     136.5971    378.01  |         q         |       Q |         |
  2+45     174.1599    521.46  |         |  q      |         |         Q
  3+ 0     115.2907    488.73  |       q |         |         |      Q  |
  3+15      24.8564    257.39  |q        |        Q|         |         |
  3+30       4.7669    111.68  q       Q |         |         |         |
  3+45       1.0290     57.65  q   Q     |         |         |         |
  4+ 0       0.0319     29.08  q Q       |         |         |         |
  4+15       0.0000     13.67  qQ        |         |         |         |
  4+30       0.0000      7.29  Q         |         |         |         |
  4+45       0.0000      4.77  Q         |         |         |         |
  5+ 0       0.0000      2.79  Q         |         |         |         |
```

```
    5+15       0.0000      0.92  Q         |         |         |         |
    5+30       0.0000      0.06  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    22
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      521.460 (CFS)
                       Total volume =      57.920 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        1.000 to Point/Station        2.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ___________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1500.00 (Ft.)
        Elevation difference =   30.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  1500.00(Ft.)     Elevation difference =  30.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =    5.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =    193.170(CFS)
        Depth of flow =     1.790(Ft.)
        Average velocity =    15.891(Ft/s)
        Total flow rate =   193.170(CFS)
        Channel flow top width =    8.581(Ft.)
        Depth of flow in channel =   1.79(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   15.89(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  193.170(CFS)
        Total capacity of improved channels =    193.170(CFS)
        Critical Depth in Channel =    2.94(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Covered channel
        Flow(q) thru subarea =    521.460(CFS)
        Depth of flow =     3.088(Ft.)
        Average velocity =    20.875(Ft/s)
        Total flow rate =   521.460(CFS)
        Channel flow top width =   11.177(Ft.)
        Depth of flow in channel =   3.09(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   20.87(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  521.460(CFS)
        Total capacity of improved channels =    521.460(CFS)
        Critical Depth in Channel =    5.00(Ft.)


        ********************** SCS CONVEX CHANNEL ROUTING *********************
        Convex method of stream routing  data items:
        Using equation: Outflow =
        O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
                  where c* = 1 - (1-c)^e and dt = c(length)/velocity
```

```
          c(v/v+1.7) =   0.9247   Travel time =   1.20 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   9.3632
        dt(routing time-step) =   1.11 (min.),   c* =   1.0000

   Output hydrograph delayed by 0  unit time increments


   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                     P R I N T  O F  S T O R M
                  R u n o f f     H y d r o g r a p h
   ----------------------------------------------------------------------
               Hydrograph in  15   Minute intervals (CFS)

   ----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0      130.4     260.7     391.1     521.5
 ----------------------------------------------------------------------
   0+15       2.4898      2.69  O         |         |         |         |
   0+30      14.4906     15.43  |O        |         |         |         |
   0+45      38.1907     40.00  | OI      |         |         |         |
   1+ 0      57.2175     58.59  |   O     |         |         |         |
   1+15      74.1040     75.34  |    O    |         |         |         |
   1+30     113.5653    116.61  |       O |         |         |         |
   1+45     157.0079    160.23  |         | O       |         |         |
   2+ 0     199.6199    202.76  |         |    O    |         |         |
   2+15     254.1006    258.19  |         |        O|         |         |
   2+30     369.1609    378.01  |         |         |       O |         |
   2+45     510.8692    521.46  |         |         |         |        OI
   3+ 0     491.1430    488.73  |         |         |         |      O  |
   3+15     274.4674    257.39  |         |        I|O        |         |
   3+30     122.4392    111.68  |       IO|         |         |         |
   3+45      61.6395     57.65  |   O     |         |         |         |
   4+ 0      31.1896     29.08  | O       |         |         |         |
   4+15      14.8099     13.67  |O        |         |         |         |
   4+30       7.7602      7.29  O         |         |         |         |
   4+45       4.9533      4.77  O         |         |         |         |
   5+ 0       2.9343      2.79  O         |         |         |         |
   5+15       1.0615      0.92  O         |         |         |         |
   5+30       0.1209      0.06  O         |         |         |         |
   5+45       0.0042      0.00  O         |         |         |         |
   6+ 0       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
   ****************************HYDROGRAPH DATA***************************
                  Number of intervals =    24
                  Time interval =   15.0 (Min.)
                  Maximum/Peak flow rate =      510.869 (CFS)
                  Total volume =      57.920 (Ac.Ft)
          Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
   **********************************************************************

   ----------------------------------------------------------------------


   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
   Process from Point/Station        1.000 to Point/Station        2.000
   **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
   ______________________________________________________________________
   ******************** HYDROGRAPH INFORMATION **********************

                  From study/file name: SubD1Bsn.rte
   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                     P R I N T  O F  S T O R M
                  R u n o f f     H y d r o g r a p h
   ----------------------------------------------------------------------
               Hydrograph in  15   Minute intervals (CFS)

   ----------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      157.6     315.2     472.7     630.3
 ----------------------------------------------------------------------
```

```
   0+15       3.1785      5.67  Q          |          |          |          |
   0+30      11.1425     25.63  qQ         |          |          |          |
   0+45      20.2678     58.46  |q Q       |          |          |          |
   1+ 0      27.8344     85.05  |q   Q     |          |          |          |
   1+15      35.2626    109.37  | q   Q    |          |          |          |
   1+30      44.1198    157.69  | q        Q          |          |          |
   1+45      53.7455    210.75  |  q       |  Q       |          |          |
   2+ 0      63.6115    263.23  |   q      |     Q    |          |          |
   2+15      76.0486    330.15  |   q      |          Q          |          |
   2+30      96.4705    465.63  |     q    |          |          Q|         |
   2+45     119.4622    630.33  |      q   |          |          |         Q
   3+ 0     123.5671    614.71  |      q   |          |          |        Q|
   3+15     104.6188    379.09  |     q    |          |    Q     |         |
   3+30      80.5977    203.04  |    q     | Q        |          |         |
   3+45      61.0803    122.72  |  q   Q   |          |          |         |
   4+ 0      46.2892     77.48  | q Q      |          |          |         |
   4+15      35.0799     49.89  | qQ       |          |          |         |
   4+30      26.5850     34.35  |qQ        |          |          |         |
   4+45      20.1473     25.10  |Q         |          |          |         |
   5+ 0      15.2684     18.20  qQ         |          |          |         |
   5+15      11.5711     12.63  Q          |          |          |         |
   5+30       8.7690      8.89  Q          |          |          |         |
   5+45       6.6455      6.65  Q          |          |          |         |
   6+ 0       5.0363      5.04  Q          |          |          |         |
   6+15       3.8167      3.82  Q          |          |          |         |
   6+30       2.8925      2.89  Q          |          |          |         |
   6+45       2.1920      2.19  Q          |          |          |         |
   7+ 0       1.6612      1.66  Q          |          |          |         |
   7+15       1.2589      1.26  Q          |          |          |         |
   7+30       0.9541      0.95  Q          |          |          |         |
   7+45       0.7230      0.72  Q          |          |          |         |
   8+ 0       0.5479      0.55  Q          |          |          |         |
   8+15       0.4153      0.42  Q          |          |          |         |
   8+30       0.3147      0.31  Q          |          |          |         |
   8+45       0.2385      0.24  Q          |          |          |         |
   9+ 0       0.1807      0.18  Q          |          |          |         |
   9+15       0.1370      0.14  Q          |          |          |         |
   9+30       0.1038      0.10  Q          |          |          |         |
   9+45       0.0787      0.08  Q          |          |          |         |
  10+ 0       0.0596      0.06  Q          |          |          |         |
  10+15       0.0452      0.05  Q          |          |          |         |
  10+30       0.0342      0.03  Q          |          |          |         |
  10+45       0.0259      0.03  Q          |          |          |         |
  11+ 0       0.0197      0.02  Q          |          |          |         |
  11+15       0.0149      0.01  Q          |          |          |         |
  11+30       0.0113      0.01  Q          |          |          |         |
  11+45       0.0086      0.01  Q          |          |          |         |
  12+ 0       0.0065      0.01  Q          |          |          |         |
  12+15       0.0049      0.00  Q          |          |          |         |
  12+30       0.0037      0.00  Q          |          |          |         |
  12+45       0.0028      0.00  Q          |          |          |         |
  13+ 0       0.0021      0.00  Q          |          |          |         |
  13+15       0.0016      0.00  Q          |          |          |         |
  13+30       0.0012      0.00  Q          |          |          |         |
  13+45       0.0010      0.00  Q          |          |          |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =    55
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      630.331 (CFS)
                     Total volume =      80.899 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station        2.000 to Point/Station        3.000
**** STREAM ROUTING SCS CONVEX METHOD ****
____________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   5750.00 (Ft.)
Elevation difference =  115.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  5750.00(Ft.)     Elevation difference = 115.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    256.597(CFS)
Depth of flow =     2.099(Ft.)
Average velocity =    17.219(Ft/s)
Total flow rate =   256.597(CFS)
Channel flow top width =    9.198(Ft.)
Depth of flow in channel =   2.10(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.22(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  256.597(CFS)
Total capacity of improved channels =    256.597(CFS)
Critical Depth in Channel =    3.44(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    630.331(CFS)
Depth of flow =     3.414(Ft.)
Average velocity =    21.942(Ft/s)
Total flow rate =   630.331(CFS)
Channel flow top width =   11.828(Ft.)
Depth of flow in channel =   3.41(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   21.94(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  630.331(CFS)
Total capacity of improved channels =    630.331(CFS)
Critical Depth in Channel =    5.47(Ft.)


********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9281   Travel time =   4.37 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   2.8003
        dt(routing time-step) =   4.05 (min.),   c* =   0.9994

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      157.6     315.2     472.7     630.3
-----------------------------------------------------------------------
  0+15       4.1340      5.67  O         |         |         |         |
  0+30      20.2278     25.63  |O        |         |         |         |
```

```
  0+45      49.5695     58.46  |  O      |         |         |         |
  1+ 0      77.8477     85.05  |   OI    |         |         |         |
  1+15     102.7803    109.37  |     O   |         |         |         |
  1+30     144.6015    157.69  |        OI         |         |         |
  1+45     196.3800    210.75  |         | OI      |         |         |
  2+ 0     249.0169    263.23  |         |    OI   |         |         |
  2+15     312.0261    330.15  |         |        OI         |         |
  2+30     428.9460    465.63  |         |         |      O I|         |
  2+45     585.7254    630.33  |         |         |         |      O  I
  3+ 0     618.9106    614.71  |         |         |         |        O|
  3+15     442.8703    379.09  |         |         |   I   O |         |
  3+30     250.7321    203.04  |         | I  O    |         |         |
  3+45     144.4910    122.72  |      I O|         |         |         |
  4+ 0      89.7389     77.48  |   IO    |         |         |         |
  4+15      57.3657     49.89  |  O      |         |         |         |
  4+30      38.5578     34.35  | O       |         |         |         |
  4+45      27.6057     25.10  |O        |         |         |         |
  5+ 0      20.0715     18.20  |O        |         |         |         |
  5+15      14.1416     12.63  O         |         |         |         |
  5+30       9.9040      8.89  O         |         |         |         |
  5+45       7.2568      6.65  O         |         |         |         |
  6+ 0       5.4734      5.04  O         |         |         |         |
  6+15       4.1471      3.82  O         |         |         |         |
  6+30       3.1428      2.89  O         |         |         |         |
  6+45       2.3818      2.19  O         |         |         |         |
  7+ 0       1.8050      1.66  O         |         |         |         |
  7+15       1.3679      1.26  O         |         |         |         |
  7+30       1.0367      0.95  O         |         |         |         |
  7+45       0.7856      0.72  O         |         |         |         |
  8+ 0       0.5954      0.55  O         |         |         |         |
  8+15       0.4512      0.42  O         |         |         |         |
  8+30       0.3419      0.31  O         |         |         |         |
  8+45       0.2591      0.24  O         |         |         |         |
  9+ 0       0.1964      0.18  O         |         |         |         |
  9+15       0.1488      0.14  O         |         |         |         |
  9+30       0.1128      0.10  O         |         |         |         |
  9+45       0.0855      0.08  O         |         |         |         |
 10+ 0       0.0648      0.06  O         |         |         |         |
 10+15       0.0491      0.05  O         |         |         |         |
 10+30       0.0372      0.03  O         |         |         |         |
 10+45       0.0282      0.03  O         |         |         |         |
 11+ 0       0.0214      0.02  O         |         |         |         |
 11+15       0.0162      0.01  O         |         |         |         |
 11+30       0.0123      0.01  O         |         |         |         |
 11+45       0.0093      0.01  O         |         |         |         |
 12+ 0       0.0070      0.01  O         |         |         |         |
 12+15       0.0053      0.00  O         |         |         |         |
 12+30       0.0040      0.00  O         |         |         |         |
 12+45       0.0031      0.00  O         |         |         |         |
 13+ 0       0.0023      0.00  O         |         |         |         |
 13+15       0.0018      0.00  O         |         |         |         |
 13+30       0.0013      0.00  O         |         |         |         |
 13+45       0.0011      0.00  O         |         |         |         |
 14+ 0       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    56
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      618.911 (CFS)
                       Total volume =      80.899 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        2.000 to Point/Station        3.000
```

```
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
____________________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                 From study/file name: SUBD23100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T   O F   S T O R M
                 R u n o f f      H y d r o g r a p h
---------------------------------------------------------------------------
              Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      182.3     364.5     546.8     729.0
 ---------------------------------------------------------------------
   0+15      14.6449     18.78  qQ        |         |         |         |
   0+30      30.3266     50.55  |qQ       |         |         |         |
   0+45      37.5450     87.11  | q Q     |         |         |         |
   1+ 0      38.2889    116.14  | q   Q   |         |         |         |
   1+15      46.3684    149.15  | q     Q |         |         |         |
   1+30      55.7114    200.31  |  q      Q         |         |         |
   1+45      64.8026    261.18  |  q      |   Q     |         |         |
   2+ 0      72.1234    321.14  |  q      |      Q  |         |         |
   2+15      91.5904    403.62  |    q    |         | Q       |         |
   2+30     130.2650    559.21  |      q  |         |         Q         |
   2+45     143.3165    729.04  |      q  |         |         |         Q
   3+ 0      81.3855    700.30  |   q     |         |         |        Q |
   3+15      21.6973    464.57  |q        |         |    Q    |         |
   3+30       2.1832    252.92  q         |  Q      |         |         |
   3+45       0.0000    144.49  q      Q  |         |         |         |
   4+ 0       0.0000     89.74  q   Q     |         |         |         |
   4+15       0.0000     57.37  q  Q      |         |         |         |
   4+30       0.0000     38.56  q Q       |         |         |         |
   4+45       0.0000     27.61  qQ        |         |         |         |
   5+ 0       0.0000     20.07  qQ        |         |         |         |
   5+15       0.0000     14.14  Q         |         |         |         |
   5+30       0.0000      9.90  Q         |         |         |         |
   5+45       0.0000      7.26  Q         |         |         |         |
   6+ 0       0.0000      5.47  Q         |         |         |         |
   6+15       0.0000      4.15  Q         |         |         |         |
   6+30       0.0000      3.14  Q         |         |         |         |
   6+45       0.0000      2.38  Q         |         |         |         |
   7+ 0       0.0000      1.81  Q         |         |         |         |
   7+15       0.0000      1.37  Q         |         |         |         |
   7+30       0.0000      1.04  Q         |         |         |         |
   7+45       0.0000      0.79  Q         |         |         |         |
   8+ 0       0.0000      0.60  Q         |         |         |         |
   8+15       0.0000      0.45  Q         |         |         |         |
   8+30       0.0000      0.34  Q         |         |         |         |
   8+45       0.0000      0.26  Q         |         |         |         |
   9+ 0       0.0000      0.20  Q         |         |         |         |
   9+15       0.0000      0.15  Q         |         |         |         |
   9+30       0.0000      0.11  Q         |         |         |         |
   9+45       0.0000      0.09  Q         |         |         |         |
  10+ 0       0.0000      0.06  Q         |         |         |         |
  10+15       0.0000      0.05  Q         |         |         |         |
  10+30       0.0000      0.04  Q         |         |         |         |
  10+45       0.0000      0.03  Q         |         |         |         |
  11+ 0       0.0000      0.02  Q         |         |         |         |
  11+15       0.0000      0.02  Q         |         |         |         |
  11+30       0.0000      0.01  Q         |         |         |         |
  11+45       0.0000      0.01  Q         |         |         |         |
  12+ 0       0.0000      0.01  Q         |         |         |         |
  12+15       0.0000      0.01  Q         |         |         |         |
  12+30       0.0000      0.00  Q         |         |         |         |
  12+45       0.0000      0.00  Q         |         |         |         |
  13+ 0       0.0000      0.00  Q         |         |         |         |
  13+15       0.0000      0.00  Q         |         |         |         |
  13+30       0.0000      0.00  Q         |         |         |         |
  13+45       0.0000      0.00  Q         |         |         |         |
  14+ 0       0.0000      0.00  Q         |         |         |         |
---------------------------------------------------------------------
```

```
****************************HYDROGRAPH DATA***************************
                Number of intervals =    56
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      729.042 (CFS)
                Total volume =      98.053 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** RETARDING BASIN ROUTING ****
______________________________________________________________________

User entry of depth-outflow-storage data
---------------------------------------------------------------------
Total number of inflow hydrograph intervals = 56
Hydrograph time unit = 15.000 (Min.)
Initial depth in storage basin =   0.00(Ft.)
---------------------------------------------------------------------
---------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
---------------------------------------------------------------------
---------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
---------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   1.000     10.000    175.000      8.192       11.808
   2.000     15.000    250.000     12.417       17.583
   4.000     25.000    700.000     17.769       32.231
---------------------------------------------------------------------
                Hydrograph Detention Basin Routing
---------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                  Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0     182.3  364.52  546.78  729.04 (Ft.)
 0.250   18.78    2.88      0.164  O       |       |       |       |     0.02
 0.500   50.55   12.61      0.721  O I     |       |       |       |     0.07
 0.750   87.11   29.83      1.704  |O I    |       |       |       |     0.17
 1.000  116.14   51.81      2.961  | O  I  |       |       |       |     0.30
 1.250  149.15   76.56      4.375  |  O  I |       |       |       |     0.44
 1.500  200.31  106.62      6.093  |   O   I       |       |       |     0.61
 1.750  261.18  144.63      8.265  |     O |  I    |       |       |     0.83
 2.000  321.14  187.71     10.847  |       O     I |       |       |     1.17
 2.250  403.62  234.58     13.972  |       | O     |I      |       |     1.79
 2.500  559.21  370.19     17.671  |       |       O       I       |     2.53
 2.750  729.04  544.06     21.535  |       |       |      O|       I     3.31
 3.000  700.30  652.34     23.941  |       |       |       |   O I |     3.79
 3.250  464.57  607.97     22.955  |       |       |   I   | O     |     3.59
 3.500  252.92  449.79     19.440  |       |  I    |  O    |       |     2.89
 3.750  144.49  290.42     15.898  |     I |   O   |       |       |     2.18
 4.000   89.74  220.59     13.039  |  I    |O      |       |       |     1.61
 4.250   57.37  181.13     10.409  | I    O|       |       |       |     1.08
 4.500   38.56  141.22      8.070  |I    O |       |       |       |     0.81
 4.750   27.61  108.11      6.177  |I  O   |       |       |       |     0.62
 5.000   20.07   82.30      4.703  I  O    |       |       |       |     0.47
 5.250   14.14   62.34      3.562  I O     |       |       |       |     0.36
 5.500    9.90   46.93      2.682  I O     |       |       |       |     0.27
 5.750    7.26   35.19      2.011  IO      |       |       |       |     0.20
 6.000    5.47   26.36      1.506  IO      |       |       |       |     0.15
```

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 6.250    4.15   19.76      1.129  O       |       |       |       |     0.11
 6.500    3.14   14.83      0.847  O       |       |       |       |     0.08
 6.750    2.38   11.13      0.636  O       |       |       |       |     0.06
 7.000    1.81    8.36      0.478  O       |       |       |       |     0.05
 7.250    1.37    6.29      0.359  O       |       |       |       |     0.04
 7.500    1.04    4.73      0.270  O       |       |       |       |     0.03
 7.750    0.79    3.56      0.204  O       |       |       |       |     0.02
 8.000    0.60    2.68      0.153  O       |       |       |       |     0.02
 8.250    0.45    2.02      0.116  O       |       |       |       |     0.01
 8.500    0.34    1.52      0.087  O       |       |       |       |     0.01
 8.750    0.26    1.15      0.066  O       |       |       |       |     0.01
 9.000    0.20    0.87      0.050  O       |       |       |       |     0.00
 9.250    0.15    0.65      0.037  O       |       |       |       |     0.00
 9.500    0.11    0.49      0.028  O       |       |       |       |     0.00
 9.750    0.09    0.37      0.021  O       |       |       |       |     0.00
10.000    0.06    0.28      0.016  O       |       |       |       |     0.00
10.250    0.05    0.21      0.012  O       |       |       |       |     0.00
10.500    0.04    0.16      0.009  O       |       |       |       |     0.00
10.750    0.03    0.12      0.007  O       |       |       |       |     0.00
11.000    0.02    0.09      0.005  O       |       |       |       |     0.00
11.250    0.02    0.07      0.004  O       |       |       |       |     0.00
11.500    0.01    0.05      0.003  O       |       |       |       |     0.00
11.750    0.01    0.04      0.002  O       |       |       |       |     0.00
12.000    0.01    0.03      0.002  O       |       |       |       |     0.00
12.250    0.01    0.02      0.001  O       |       |       |       |     0.00
12.500    0.00    0.02      0.001  O       |       |       |       |     0.00
12.750    0.00    0.01      0.001  O       |       |       |       |     0.00
13.000    0.00    0.01      0.001  O       |       |       |       |     0.00
13.250    0.00    0.01      0.000  O       |       |       |       |     0.00
13.500    0.00    0.01      0.000  O       |       |       |       |     0.00
13.750    0.00    0.00      0.000  O       |       |       |       |     0.00
14.000    0.00    0.00      0.000  O       |       |       |       |     0.00
14.250    0.00    0.00      0.000  O       |       |       |       |     0.00

****************************HYDROGRAPH DATA****************************
               Number of intervals =    57
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      652.343 (CFS)
               Total volume =      98.053 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        3.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file LineD3hr.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/04/12

      ----------------------------------------------------------------


      Watershed D, Basin D1
      Proposed Condition
      100 Yr. 3 Hr.

      ----------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION *********************

                    From study/file name: SubD13100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    13
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      193.034 (CFS)
                    Total volume =      22.980 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      *********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------
      Total number of inflow hydrograph intervals = 13
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------
      ---------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------
      ---------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000     15.000    200.000     12.934       17.066
        4.000     20.000    500.000     14.835       25.165
        6.000     29.500   1000.000     19.169       39.831
      ---------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      48.3   96.52  144.78  193.03 (Ft.)
 0.250   26.43    3.18      0.240  O   I   |       |       |       |     2.02
```

0.500	45.70	11.14	0.838		O I				2.06
0.750	51.95	20.27	1.522		O I				2.10
1.000	51.08	27.83	2.089		O I				2.14
1.250	65.94	35.26	2.646		O	I			2.18
1.500	77.74	44.12	3.310		O	I			2.22
1.750	90.00	53.75	4.032		O I			2.27
2.000	98.98	63.61	4.772			O I		2.32
2.250	130.97	76.05	5.705			O	I		2.38
2.500	189.80	96.47	7.236			O		I	2.48
2.750	193.03	119.46	8.960				O	I 2.60
3.000	79.79	123.57	9.268			I	O		2.62
3.250	10.85	104.62	7.847		I		O		2.52
3.500	0.00	80.60	6.046	I	O			2.40
3.750	0.00	61.08	4.582	I	O			2.31
4.000	0.00	46.29	3.473	I O				2.23
4.250	0.00	35.08	2.633	I O				2.18
4.500	0.00	26.59	1.996	I O				2.13
4.750	0.00	20.15	1.513	I O				2.10
5.000	0.00	15.27	1.147	I O				2.08
5.250	0.00	11.57	0.870	IO				2.06
5.500	0.00	8.77	0.660	IO				2.04
5.750	0.00	6.65	0.500	IO				2.03
6.000	0.00	5.04	0.380	O				2.03
6.250	0.00	3.82	0.288	O				2.02
6.500	0.00	2.89	0.219	O				2.01
6.750	0.00	2.19	0.166	O				2.01
7.000	0.00	1.66	0.126	O				2.01
7.250	0.00	1.26	0.096	O				2.01
7.500	0.00	0.95	0.073	O				2.00
7.750	0.00	0.72	0.056	O				2.00
8.000	0.00	0.55	0.043	O				2.00
8.250	0.00	0.42	0.033	O				2.00
8.500	0.00	0.31	0.026	O				2.00
8.750	0.00	0.24	0.020	O				2.00
9.000	0.00	0.18	0.015	O				2.00
9.250	0.00	0.14	0.012	O				2.00
9.500	0.00	0.10	0.010	O				2.00
9.750	0.00	0.08	0.008	O				2.00
10.000	0.00	0.06	0.006	O				2.00
10.250	0.00	0.05	0.005	O				2.00
10.500	0.00	0.03	0.004	O				2.00
10.750	0.00	0.03	0.004	O				2.00
11.000	0.00	0.02	0.003	O				2.00
11.250	0.00	0.01	0.003	O				2.00
11.500	0.00	0.01	0.003	O				2.00
11.750	0.00	0.01	0.003	O				2.00
12.000	0.00	0.01	0.002	O				2.00
12.250	0.00	0.00	0.002	O				2.00
12.500	0.00	0.00	0.002	O				2.00
12.750	0.00	0.00	0.002	O				2.00
13.000	0.00	0.00	0.002	O				2.00
13.250	0.00	0.00	0.002	O				2.00
13.500	0.00	0.00	0.002	O				2.00
13.750	0.00	0.00	0.002	O				1.99

Remaining water in basin = 0.00 (Ac.Ft)

```
****************************HYDROGRAPH DATA****************************
               Number of intervals =    55
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      123.567 (CFS)
               Total volume =      22.978 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SubD1Bsn.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/07/12

      ---------------------------------------------------------------------


      Watershed D, Basin D3
      Proposed Condition
      100 Yr. 3 Hr.

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubD33100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    13
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      126.682 (CFS)
                    Total volume =      15.065 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 13
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000     10.000    150.000      8.450       11.550
        4.000     20.000    500.000     14.835       25.165
        6.000     28.800   1000.000     18.469       39.131
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      31.7   63.34   95.01  126.68 (Ft.)
 0.250   17.06    2.26      0.153  O   I   |       |       |       |     2.02
```

```
 0.500   29.86    7.95      0.532  | O    I|       |       |       |     2.05
 0.750   34.03   14.39      0.961  |  O    I       |       |       |     2.10
 1.000   33.51   19.59      1.308  |   O   I       |       |       |     2.13
 1.250   43.07   24.61      1.642  |     O | I     |       |       |     2.16
 1.500   50.90   30.61      2.042  |      O|   I   |       |       |     2.20
 1.750   58.90   37.13      2.477  |       |O    I |       |       |     2.25
 2.000   64.83   43.77      2.919  |       |  O    I       |       |     2.29
 2.250   85.55   52.20      3.481  |       |    O  |    I  |       |     2.35
 2.500  123.93   66.30      4.421  |       |       O       |      I|     2.44
 2.750  126.68   82.14      5.477  |       |       |   O   |       I     2.55
 3.000   53.42   84.26      5.618  |       |    I  |    O  |       |     2.56
 3.250    7.43   69.81      4.655  |I      |       |O      |       |     2.47
 3.500    0.00   52.07      3.473  I       |    O  |       |       |     2.35
 3.750    0.00   38.10      2.541  I       |O      |       |       |     2.25
 4.000    0.00   27.87      1.860  I      O|       |       |       |     2.19
 4.250    0.00   20.39      1.361  I    O  |       |       |       |     2.14
 4.500    0.00   14.92      0.996  I  O    |       |       |       |     2.10
 4.750    0.00   10.92      0.729  I O     |       |       |       |     2.07
 5.000    0.00    7.99      0.534  I O     |       |       |       |     2.05
 5.250    0.00    5.84      0.391  IO      |       |       |       |     2.04
 5.500    0.00    4.27      0.287  IO      |       |       |       |     2.03
 5.750    0.00    3.13      0.210  O       |       |       |       |     2.02
 6.000    0.00    2.29      0.154  O       |       |       |       |     2.02
 6.250    0.00    1.67      0.114  O       |       |       |       |     2.01
 6.500    0.00    1.22      0.084  O       |       |       |       |     2.01
 6.750    0.00    0.90      0.062  O       |       |       |       |     2.01
 7.000    0.00    0.66      0.046  O       |       |       |       |     2.00
 7.250    0.00    0.48      0.034  O       |       |       |       |     2.00
 7.500    0.00    0.35      0.025  O       |       |       |       |     2.00
 7.750    0.00    0.26      0.019  O       |       |       |       |     2.00
 8.000    0.00    0.19      0.014  O       |       |       |       |     2.00
 8.250    0.00    0.14      0.011  O       |       |       |       |     2.00
 8.500    0.00    0.10      0.009  O       |       |       |       |     2.00
 8.750    0.00    0.07      0.007  O       |       |       |       |     2.00
 9.000    0.00    0.05      0.006  O       |       |       |       |     2.00
 9.250    0.00    0.04      0.005  O       |       |       |       |     2.00
 9.500    0.00    0.03      0.004  O       |       |       |       |     2.00
 9.750    0.00    0.02      0.003  O       |       |       |       |     2.00
10.000    0.00    0.02      0.003  O       |       |       |       |     2.00
10.250    0.00    0.01      0.003  O       |       |       |       |     2.00
10.500    0.00    0.01      0.002  O       |       |       |       |     2.00
10.750    0.00    0.01      0.002  O       |       |       |       |     2.00
11.000    0.00    0.00      0.002  O       |       |       |       |     2.00
11.250    0.00    0.00      0.002  O       |       |       |       |     2.00
11.500    0.00    0.00      0.002  O       |       |       |       |     2.00
11.750    0.00    0.00      0.002  O       |       |       |       |     2.00
12.000    0.00    0.00      0.002  O       |       |       |       |     2.00
12.250    0.00    0.00      0.002  O       |       |       |       |     1.99

       Remaining water in basin =    0.00 (Ac.Ft)

       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =    49
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       84.260 (CFS)
                      Total volume =      15.063 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        1.000 to Point/Station        2.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ______________________________________________________________________
```

```
Current stream hydrograph saved in file SubD3Bsn.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

-----------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/27/12 File: OffsiteD13100.out


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----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed D, Offsite D1
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =     443.50(Ac.)  =      0.693 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     443.50(Ac.)  =      0.693 Sq. Mi.
Length along longest watercourse =   13900.00(Ft.)
Length along longest watercourse measured to centroid =    6600.00(Ft.)
Length along longest watercourse =      2.633 Mi.
Length along longest watercourse measured to centroid =      1.250 Mi.
Difference in elevation =     857.00(Ft.)
Slope along watercourse =    325.5367 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.377 Hr.
Lag time =    22.63 Min.
25% of lag time =     5.66 Min.
40% of lag time =     9.05 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      443.50           0.85                 376.97

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      443.50           1.90                 842.65

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.81 %
Adjusted average point rain =    1.896(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    35.200           46.00         0.000
    16.200           66.00         0.000
```

3.900	77.00	0.000
388.200	83.00	0.000

Total Area Entered = 443.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.079	0.049
66.0	66.0	0.405	0.000	0.405	0.037	0.015
77.0	77.0	0.279	0.000	0.279	0.009	0.002
83.0	83.0	0.210	0.000	0.210	0.875	0.184
					Sum (F) =	0.249

Area averaged mean soil loss (F) (In/Hr) = 0.249
Minimum soil loss rate ((In/Hr)) = 0.125
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	66.287	6.542	29.242
2	0.500	132.575	37.826	169.068
3	0.750	198.862	30.871	137.982
4	1.000	265.150	11.436	51.115
5	1.250	331.437	6.452	28.840
6	1.500	397.724	3.588	16.038
7	1.750	464.012	1.551	6.933
8	2.000	530.299	0.677	3.026
9	2.250	596.587	0.470	2.099
10	2.500	662.874	0.403	1.800
11	2.750	729.161	0.184	0.822
			Sum = 100.000	Sum= 446.965

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.249	(0.253)	0.031
2	0.50	4.80	0.364	0.249	(0.328)	0.115
3	0.75	5.10	0.387	0.249	(0.348)	0.137
4	1.00	4.90	0.372	0.249	(0.335)	0.122
5	1.25	6.60	0.501	0.249	(0.451)	0.251
6	1.50	7.30	0.554	0.249	(0.498)	0.304
7	1.75	8.40	0.637	0.249	(0.573)	0.388
8	2.00	9.00	0.683	0.249	(0.614)	0.433
9	2.25	12.30	0.933	0.249	(0.840)	0.684
10	2.50	17.60	1.335	0.249	(1.202)	1.086
11	2.75	16.10	1.221	0.249	(1.099)	0.972
12	3.00	4.20	0.319	0.249	(0.287)	0.069
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.6

Flood volume = Effective rainfall 1.15(In)
times area 443.5(Ac.)/[(In)/(Ft.)] = 42.4(Ac.Ft)
Total soil loss = 0.75(In)
Total soil loss = 27.653(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 1848314.3 Cubic Feet
Total soil loss = 1204570.1 Cubic Feet

Peak flow rate of this hydrograph = 373.436(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0      100.0     200.0     300.0     400.0
                                 |         |         |         |         |
  0+15       0.0189      0.91  Q         |         |         |         |
  0+30       0.1974      8.64  Q         |         |         |         |
  0+45       0.7704     27.73  V Q       |         |         |         |
  1+ 0       1.6848     44.26  |V  Q     |         |         |         |
  1+15       2.7958     53.77  | V  Q    |         |         |         |
  1+30       4.4305     79.12  |   V  Q  |         |         |         |
  1+45       6.6986    109.78  |     V   Q         |         |         |
  2+ 0       9.5860    139.75  |        V|  Q      |         |         |
  2+15      13.1596    172.96  |           V    Q  |         |         |
  2+30      18.1474    241.41  |         |      V  |   Q     |         |
  2+45      25.3230    347.30  |         |         |  V      |   Q     |
  3+ 0      33.0386    373.44  |         |         |         |V     Q  |
  3+15      37.8430    232.53  |         |         |  Q      |    V    |
  3+30      40.0520    106.91  |         Q         |         |      V  |
  3+45      41.2218     56.62  |    Q    |         |         |       V |
  4+ 0      41.8220     29.05  | Q       |         |         |        V|
  4+15      42.1045     13.67  |Q        |         |         |        V|
  4+30      42.2551      7.29  Q         |         |         |        V|
  4+45      42.3536      4.77  Q         |         |         |        V|
  5+ 0      42.4112      2.79  Q         |         |         |        V|
  5+15      42.4303      0.92  Q         |         |         |        V|
  5+30      42.4315      0.06  Q         |         |         |         V
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed D, Offsite D2
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =     183.80(Ac.)  =      0.287 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     183.80(Ac.)  =      0.287 Sq. Mi.
Length along longest watercourse =    4950.00(Ft.)
Length along longest watercourse measured to centroid =    2120.00(Ft.)
Length along longest watercourse =      0.938 Mi.
Length along longest watercourse measured to centroid =      0.402 Mi.
Difference in elevation =     461.00(Ft.)
Slope along watercourse =    491.7333 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.153 Hr.
Lag time =     9.18 Min.
25% of lag time =     2.29 Min.
40% of lag time =     3.67 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      183.80           0.85                156.23

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      183.80           1.90                349.22

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    1.898(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    22.800           46.00         0.000
    35.900           66.00         0.000
```

```
     8.300          77.00         0.000
   116.800          83.00         0.000
 Total Area Entered =    183.80(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
46.0  46.0      0.611     0.000        0.611       0.124      0.076
66.0  66.0      0.405     0.000        0.405       0.195      0.079
77.0  77.0      0.279     0.000        0.279       0.045      0.013
83.0  83.0      0.210     0.000        0.210       0.635      0.133
                                                  Sum (F) =   0.301
Area averaged mean soil loss (F) (In/Hr) =  0.301
Minimum soil loss rate ((In/Hr)) =  0.150
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
-----------------------------------------------------------------------
               Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.250        163.411         34.070             63.110
    2   0.500        326.821         53.280             98.693
    3   0.750        490.232         10.282             19.046
    4   1.000        653.643          1.829              3.388
    5   1.250        817.053          0.539              0.999
                                 Sum = 100.000   Sum=     185.236
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281       (  0.301)       0.253        0.028
   2   0.50     4.80      0.365          0.301    (  0.328)        0.064
   3   0.75     5.10      0.387          0.301    (  0.349)        0.086
   4   1.00     4.90      0.372          0.301    (  0.335)        0.071
   5   1.25     6.60      0.501          0.301    (  0.451)        0.200
   6   1.50     7.30      0.554          0.301    (  0.499)        0.253
   7   1.75     8.40      0.638          0.301    (  0.574)        0.337
   8   2.00     9.00      0.683          0.301    (  0.615)        0.383
   9   2.25    12.30      0.934          0.301    (  0.841)        0.633
  10   2.50    17.60      1.337          0.301    (  1.203)        1.036
  11   2.75    16.10      1.223          0.301    (  1.100)        0.922
  12   3.00     4.20      0.319       (  0.301)       0.287        0.032
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.0
       Flood volume = Effective rainfall      1.01(In)
        times area     183.8(Ac.)/[(In)/(Ft.)] =      15.5(Ac.Ft)
       Total soil loss =      0.89(In)
       Total soil loss =    13.589(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      674691.2 Cubic Feet
       Total soil loss =      591958.0 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    174.160(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
```

```
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ---------------------------------------------------------------------
    0+15       0.0367      1.77  Q         |         |         |         |
    0+30       0.1770      6.79  VQ        |         |         |         |
    0+45       0.4305     12.27   VQ       |         |         |         |
    1+ 0       0.7266     14.33  |VQ       |         |         |         |
    1+15       1.1722     21.57  |  VQ     |         |         |         |
    1+30       1.9469     37.49  |    V Q  |         |         |         |
    1+45       2.9893     50.45  |      V  Q         |         |         |
    2+ 0       4.2911     63.01  |         |VQ       |         |         |
    2+15       6.0522     85.23  |         |    V Q  |         |         |
    2+30       8.8744    136.60  |         |           V    Q  |         |
    2+45      12.4728    174.16  |         |         |         | V Q     |
    3+ 0      14.8548    115.29  |         |         |  Q      |       V |
    3+15      15.3684     24.86  |   Q     |         |         |        V|
    3+30      15.4669      4.77  Q         |         |         |        V|
    3+45      15.4881      1.03  Q         |         |         |        V|
    4+ 0      15.4888      0.03  Q         |         |         |         V
---------------------------------------------------------------------
```

```
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed D, Onsite D1
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =     160.67(Ac.)  =      0.251 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     160.67(Ac.)  =      0.251 Sq. Mi.
Length along longest watercourse =    1500.00(Ft.)
Length along longest watercourse measured to centroid =     750.00(Ft.)
Length along longest watercourse =      0.284 Mi.
Length along longest watercourse measured to centroid =      0.142 Mi.
Difference in elevation =      30.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.044 Hr.
Lag time =     2.63 Min.
25% of lag time =     0.66 Min.
40% of lag time =     1.05 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      160.67           0.85                136.57

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      160.67           1.90                305.27

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.93 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   160.670           85.00         0.750
 Total Area Entered =    160.67(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
---------------------------------------------------------------------
              Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        570.030         74.072            119.942
    2   0.500       1140.059         25.928             41.983
                                Sum = 100.000   Sum=     161.925
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.061	(0.084)	0.220
2	0.50	4.80	0.365	0.061	(0.109)	0.304
3	0.75	5.10	0.387	0.061	(0.116)	0.327
4	1.00	4.90	0.372	0.061	(0.112)	0.311
5	1.25	6.60	0.501	0.061	(0.150)	0.440
6	1.50	7.30	0.554	0.061	(0.166)	0.494
7	1.75	8.40	0.638	0.061	(0.191)	0.577
8	2.00	9.00	0.684	0.061	(0.205)	0.623
9	2.25	12.30	0.934	0.061	(0.280)	0.873
10	2.50	17.60	1.337	0.061	(0.401)	1.276
11	2.75	16.10	1.223	0.061	(0.367)	1.162
12	3.00	4.20	0.319	0.061	(0.096)	0.258
		(Loss Rate Not Used)			
Sum =		100.0			Sum = 6.9

```
Flood volume = Effective rainfall      1.72(In)
 times area     160.7(Ac.)/[(In)/(Ft.)] =      23.0(Ac.Ft)
Total soil loss =      0.18(In)
Total soil loss =     2.441(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =     1001024.3 Cubic Feet
Total soil loss =      106337.8 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =    193.034(CFS)
---------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - H O U R    S T O R M
              R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
---------------------------------------------------------------------
  0+15       0.5460     26.43  V    Q    |         |         |         |
  0+30       1.4903     45.70  | V      Q|         |         |         |
  0+45       2.5636     51.95  |   V     Q         |         |         |
  1+ 0       3.6190     51.08  |     V   Q         |         |         |
  1+15       4.9814     65.94  |       V |  Q      |         |         |
  1+30       6.5876     77.74  |          V   Q    |         |         |
  1+45       8.4470     90.00  |         |   V  Q  |         |         |
```

```
   2+ 0      10.4920     98.98  |         |       VQ|         |         |
   2+15      13.1979    130.97  |         |         | V   Q   |         |
   2+30      17.1193    189.80  |         |         |        V|      Q  |
   2+45      21.1076    193.03  |         |         |         |     V Q |
   3+ 0      22.7563     79.79  |         |    Q    |         |        V|
   3+15      22.9804     10.85  | Q       |         |         |         V
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed D, Onsite D2
Proposed Condition
100-year, 3-hour

-------------------------------------------------------------------
Drainage Area =     119.91(Ac.)  =      0.187 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     119.91(Ac.)  =      0.187 Sq. Mi.
Length along longest watercourse =    3750.00(Ft.)
Length along longest watercourse measured to centroid =    1875.00(Ft.)
Length along longest watercourse =      0.710 Mi.
Length along longest watercourse measured to centroid =      0.355 Mi.
Difference in elevation =      75.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.088 Hr.
Lag time =     5.28 Min.
25% of lag time =     1.32 Min.
40% of lag time =     2.11 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      119.91           0.85                101.92

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      119.91           1.90                227.83

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   119.910           85.00         0.750
 Total Area Entered =    119.91(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        284.095         54.987             66.450
    2   0.500        568.189         38.022             45.948
    3   0.750        852.284          6.992              8.449
                                Sum = 100.000   Sum=     120.847
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.061    (  0.084)        0.220
   2   0.50     4.80      0.365          0.061    (  0.109)        0.304
   3   0.75     5.10      0.387          0.061    (  0.116)        0.327
   4   1.00     4.90      0.372          0.061    (  0.112)        0.311
   5   1.25     6.60      0.501          0.061    (  0.150)        0.441
   6   1.50     7.30      0.555          0.061    (  0.166)        0.494
   7   1.75     8.40      0.638          0.061    (  0.191)        0.577
   8   2.00     9.00      0.684          0.061    (  0.205)        0.623
   9   2.25    12.30      0.934          0.061    (  0.280)        0.874
  10   2.50    17.60      1.337          0.061    (  0.401)        1.276
  11   2.75    16.10      1.223          0.061    (  0.367)        1.162
  12   3.00     4.20      0.319          0.061    (  0.096)        0.258
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     6.9
       Flood volume = Effective rainfall      1.72(In)
        times area     119.9(Ac.)/[(In)/(Ft.)] =      17.2(Ac.Ft)
       Total soil loss =      0.18(In)
       Total soil loss =     1.822(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      747224.2 Cubic Feet
       Total soil loss =       79361.2 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =    143.317(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       --------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ----------------------------------------------------------------------
    0+15       0.3026     14.64  V Q       |         |         |         |
    0+30       0.9292     30.33  | V   Q   |         |         |         |
    0+45       1.7049     37.54  |  V   Q  |         |         |         |
    1+ 0       2.4960     38.29  |    V Q  |         |         |         |
    1+15       3.4540     46.37  |       VQ|         |         |         |
    1+30       4.6051     55.71  |         VQ        |         |         |
```

```
    1+45       5.9440     64.80  |         | QV      |         |         |
    2+ 0       7.4341     72.12  |         |   Q  V  |         |         |
    2+15       9.3265     91.59  |         |       Q  V        |         |
    2+30      12.0179    130.26  |         |         |     Q V |         |
    2+45      14.9790    143.32  |         |         |       Q     V     |
    3+ 0      16.6605     81.39  |         |     Q   |         |       V |
    3+15      17.1088     21.70  |   Q     |         |         |        V|
    3+30      17.1539      2.18  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/07/12 File: SubD33100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed D, Onsite D3
Proposed Condition
100 Yr. 3 Hr.

-------------------------------------------------------------------
Drainage Area =     105.30(Ac.)  =      0.165 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     105.30(Ac.)  =      0.165 Sq. Mi.
Length along longest watercourse =    1600.00(Ft.)
Length along longest watercourse measured to centroid =     800.00(Ft.)
Length along longest watercourse =      0.303 Mi.
Length along longest watercourse measured to centroid =      0.152 Mi.
Difference in elevation =      32.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.046 Hr.
Lag time =     2.76 Min.
25% of lag time =     0.69 Min.
40% of lag time =     1.11 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.30           0.85                 89.50

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.30           1.90                200.07

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   105.300           85.00         0.750
 Total Area Entered =    105.30(Ac.)
```

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                  Sum (F) =   0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
-------------------------------------------------------------------
              Unit Hydrograph Data
-------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
    1   0.250        542.745         72.919             77.384
    2   0.500       1085.490         27.081             28.739
                                Sum = 100.000   Sum=     106.123
-------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.061    (  0.084)        0.220
   2   0.50     4.80      0.365          0.061    (  0.109)        0.304
   3   0.75     5.10      0.387          0.061    (  0.116)        0.327
   4   1.00     4.90      0.372          0.061    (  0.112)        0.311
   5   1.25     6.60      0.501          0.061    (  0.150)        0.441
   6   1.50     7.30      0.555          0.061    (  0.166)        0.494
   7   1.75     8.40      0.638          0.061    (  0.191)        0.577
   8   2.00     9.00      0.684          0.061    (  0.205)        0.623
   9   2.25    12.30      0.934          0.061    (  0.280)        0.874
  10   2.50    17.60      1.337          0.061    (  0.401)        1.276
  11   2.75    16.10      1.223          0.061    (  0.367)        1.162
  12   3.00     4.20      0.319          0.061    (  0.096)        0.258
                (Loss Rate Not Used)
     Sum =     100.0                                  Sum =     6.9
       Flood volume = Effective rainfall      1.72(In)
        times area     105.3(Ac.)/[(In)/(Ft.)] =      15.1(Ac.Ft)
       Total soil loss =      0.18(In)
       Total soil loss =     1.600(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      656227.8 Cubic Feet
       Total soil loss =       69691.7 Cubic Feet
       -------------------------------------------------------------------
        Peak flow rate of this hydrograph =    126.682(CFS)
       -------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       -------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       -------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ---------------------------------------------------------------------
    0+15       0.3524     17.06  V  Q      |         |         |         |
    0+30       0.9693     29.86  | V  Q    |         |         |         |
    0+45       1.6724     34.03  |   V Q   |         |         |         |
    1+ 0       2.3647     33.51  |     Q   |         |         |         |
    1+15       3.2545     43.07  |       Q |         |         |         |
    1+30       4.3061     50.90  |         QV        |         |         |
    1+45       5.5230     58.90  |         |Q  V     |         |         |
```

```
    2+ 0       6.8624     64.83  |         | Q     V |         |         |
    2+15       8.6299     85.55  |         |      Q  | V       |         |
    2+30      11.1904    123.93  |         |         |   Q    V|         |
    2+45      13.8078    126.68  |         |         |    Q    |     V   |
    3+ 0      14.9115     53.42  |         Q         |         |        V|
    3+15      15.0649      7.43  |Q        |         |         |         V
-------------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/07/12

------------------------------------------------------------------


Watershed E
Proposed Condition
100 Yr. 3 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubE13100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    24
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =     1355.820 (CFS)
               Total volume =     159.492 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       71.000 to Point/Station       72.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1070.00 (Ft.)
Elevation difference =   51.00 (Ft.)
Slope of channel =  0.047664 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1070.00(Ft.)     Elevation difference =  51.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    504.998(CFS)
Depth of flow =     1.620(Ft.)
Average velocity =    13.415(Ft/s)
Total flow rate =   504.998(CFS)
Channel flow top width =   26.479(Ft.)
Depth of flow in channel =   1.62(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   13.42(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  504.998(CFS)
Total capacity of improved channels =    504.998(CFS)
Critical Depth in Channel =    2.47(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =   1355.820(CFS)
Depth of flow =     2.851(Ft.)
Average velocity =    18.501(Ft/s)
```

```
Total flow rate =  1355.820(CFS)
Channel flow top width =   31.405(Ft.)
Depth of flow in channel =   2.85(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   18.50(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1355.820(CFS)
Total capacity of improved channels =   1355.820(CFS)
Critical Depth in Channel =    4.47(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9158   Travel time =   0.96 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  11.6607
       dt(routing time-step) =   0.88 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
              R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0      339.0     677.9    1016.9    1355.8
 ----------------------------------------------------------------------
   0+15       2.9246      3.11  O         |         |         |         |
   0+30      25.3138     26.70  O         |         |         |         |
   0+45      84.4960     88.11  | O       |         |         |         |
   1+ 0     151.1106    155.05  |   O     |         |         |         |
   1+15     193.1893    195.57  |    O    |         |         |         |
   1+30     262.5128    266.70  |      O  |         |         |         |
   1+45     375.4758    382.28  |         |O        |         |         |
   2+ 0     481.6486    487.86  |         |   O     |         |         |
   2+15     601.7301    608.85  |         |      O  |         |         |
   2+30     804.4456    816.68  |         |         |  OI     |         |
   2+45    1146.4785   1167.10  |         |         |         |  OI     |
   3+ 0    1344.7133   1355.82  |         |         |         |        OI
   3+15    1031.4273   1011.14  |         |         |        IO         |
   3+30     520.7342    490.07  |         |   IO    |         |         |
   3+45     292.8475    280.51  |       O |         |         |         |
   4+ 0     174.7917    168.18  |   IO    |         |         |         |
   4+15      99.1384     94.82  | O       |         |         |         |
   4+30      52.0453     49.37  |O        |         |         |         |
   4+45      28.9463     27.67  O         |         |         |         |
   5+ 0      19.9104     19.43  O         |         |         |         |
   5+15      14.1023     13.77  O         |         |         |         |
   5+30       8.0856      7.73  O         |         |         |         |
   5+45       3.0064      2.71  O         |         |         |         |
   6+ 0       0.3307      0.18  O         |         |         |         |
   6+15       0.0107      0.00  O         |         |         |         |
   6+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
********************************HYDROGRAPH DATA****************************
                Number of intervals =    26
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =     1344.713 (CFS)
                Total volume =     159.492 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

--------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       71.000 to Point/Station       72.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SUBE21RT.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0      497.7     995.4    1493.0    1990.7
 ---------------------------------------------------------------------
   0+15       1.4194      4.34  Q         |         |         |         |
   0+30      13.0466     38.36  Q         |         |         |         |
   0+45      42.7875    127.28  q Q       |         |         |         |
   1+ 0      73.4638    224.57  |q  Q     |         |         |         |
   1+15      92.7284    285.92  |q   Q    |         |         |         |
   1+30     129.9469    392.46  | q    Q  |         |         |         |
   1+45     182.8810    558.36  |  q      |Q        |         |         |
   2+ 0     234.7665    716.42  |   q     |   Q     |         |         |
   2+15     291.9259    893.66  |    q    |      Q  |         |         |
   2+30     396.4020   1200.85  |      q  |         |   Q     |         |
   2+45     566.7360   1713.21  |         |q        |         |   Q     |
   3+ 0     645.9907   1990.70  |         | q       |         |         Q
   3+15     466.8877   1498.32  |        q|         |         Q         |
   3+30     234.7546    755.49  |   q     |    Q    |         |         |
   3+45     125.7609    418.61  | q     Q |         |         |         |
   4+ 0      69.9666    244.76  |q  Q     |         |         |         |
   4+15      36.1816    135.32  q Q       |         |         |         |
   4+30      18.1267     70.17  qQ        |         |         |         |
   4+45      11.1218     40.07  Q         |         |         |         |
   5+ 0       7.4454     27.36  Q         |         |         |         |
   5+15       4.2337     18.34  Q         |         |         |         |
   5+30       1.5493      9.63  Q         |         |         |         |
   5+45       0.2113      3.22  Q         |         |         |         |
   6+ 0       0.0089      0.34  Q         |         |         |         |
   6+15       0.0000      0.01  Q         |         |         |         |
   6+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    26
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =     1990.704 (CFS)
                       Total volume =     234.871 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ---------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       72.000 to Point/Station       73.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   2900.00 (Ft.)
        Elevation difference =   53.00 (Ft.)
        Slope of channel =  0.018276 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  2900.00(Ft.)     Elevation difference =  53.00(Ft.)
```

```
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    741.881(CFS)
Depth of flow =     2.659(Ft.)
Average velocity =    11.020(Ft/s)
Total flow rate =   741.881(CFS)
Channel flow top width =   30.636(Ft.)
Depth of flow in channel =   2.66(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.02(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  741.881(CFS)
Total capacity of improved channels =    741.881(CFS)
Critical Depth in Channel =    3.13(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =   1990.704(CFS)
Depth of flow =     4.591(Ft.)
Average velocity =    14.859(Ft/s)
Total flow rate =  1990.704(CFS)
Channel flow top width =   38.364(Ft.)
Depth of flow in channel =   4.59(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   14.86(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1990.704(CFS)
Total capacity of improved channels =   1990.704(CFS)
Critical Depth in Channel =    5.56(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8973   Travel time =   3.25 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   3.7593
       dt(routing time-step) =   2.92 (min.),   c* =   0.9998

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      497.7     995.4    1493.0    1990.7
-------------------------------------------------------------------
  0+15       3.4980      4.34  O         |         |         |         |
  0+30      31.7357     38.36  O         |         |         |         |
  0+45     109.9648    127.28  | O       |         |         |         |
  1+ 0     205.6240    224.57  |   O     |         |         |         |
  1+15     273.9677    285.92  |    O    |         |         |         |
  1+30     371.7088    392.46  |      O  |         |         |         |
  1+45     526.0451    558.36  |         OI        |         |         |
  2+ 0     685.6276    716.42  |         |  OI     |         |         |
  2+15     859.1332    893.66  |         |      O  |         |         |
  2+30    1141.0167   1200.85  |         |         | O I     |         |
  2+45    1613.4217   1713.21  |         |         |         | O I     |
  3+ 0    1936.6449   1990.70  |         |         |         |       O I
  3+15    1594.1954   1498.32  |         |         |         I O       |
  3+30     900.1695    755.49  |         |    I  O |         |         |
  3+45     484.2423    418.61  |       IO|         |         |         |
```

```
  4+ 0     278.6275    244.76  |   IO    |         |         |         |
  4+15     156.6391    135.32  | IO      |         |         |         |
  4+30      82.8634     70.17  |O        |         |         |         |
  4+45      45.9332     40.07  O         |         |         |         |
  5+ 0      29.8326     27.36  O         |         |         |         |
  5+15      20.0930     18.34  O         |         |         |         |
  5+30      11.3297      9.63  O         |         |         |         |
  5+45       4.4677      3.22  O         |         |         |         |
  6+ 0       0.9004      0.34  O         |         |         |         |
  6+15       0.0749      0.01  O         |         |         |         |
  6+30       0.0021      0.00  O         |         |         |         |
  6+45       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    27
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =     1936.645 (CFS)
                    Total volume =     234.871 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ************************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station       72.000 to Point/Station       73.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubE33100.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                       P R I N T  O F  S T O R M
                    R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals (CFS)

      ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      487.5     975.0    1462.6    1950.1
  -----------------------------------------------------------------------
  0+15       1.0803      4.58  Q         |         |         |         |
  0+30       3.2330     34.97  Q         |         |         |         |
  0+45       4.2485    114.21  q Q       |         |         |         |
  1+ 0       4.5260    210.15  q   Q     |         |         |         |
  1+15       5.0014    278.97  q    Q    |         |         |         |
  1+30       6.0400    377.75  q      Q  |         |         |         |
  1+45       6.9066    532.95  q         Q         |         |         |
  2+ 0       7.8482    693.48  q         |   Q     |         |         |
  2+15       9.7972    868.93  q         |      Q  |         |         |
  2+30      14.4585   1155.48  q         |         |  Q      |         |
  2+45      18.0942   1631.52  q         |         |         |  Q      |
  3+ 0      13.4546   1950.10  q         |         |         |         Q
  3+15       4.6227   1598.82  q         |         |         | Q       |
  3+30       0.9687    901.14  q         |       Q |         |         |
  3+45       0.2157    484.46  q        Q|         |         |         |
  4+ 0       0.0285    278.66  q    Q    |         |         |         |
  4+15       0.0000    156.64  q  Q      |         |         |         |
  4+30       0.0000     82.86  qQ        |         |         |         |
  4+45       0.0000     45.93  Q         |         |         |         |
  5+ 0       0.0000     29.83  Q         |         |         |         |
  5+15       0.0000     20.09  Q         |         |         |         |
  5+30       0.0000     11.33  Q         |         |         |         |
  5+45       0.0000      4.47  Q         |         |         |         |
  6+ 0       0.0000      0.90  Q         |         |         |         |
  6+15       0.0000      0.07  Q         |         |         |         |
  6+30       0.0000      0.00  Q         |         |         |         |
  6+45       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
```

```
****************************HYDROGRAPH DATA****************************
               Number of intervals =    27
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =     1950.099 (CFS)
               Total volume =     236.948 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       72.000 to Point/Station       73.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file WSE3hr.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/07/12

------------------------------------------------------------------


Watershed E21, Routed to Node 72
Proposed Condition
100 Yr, 3 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubE213100.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =    23
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      653.411 (CFS)
               Total volume =      75.379 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      721.000 to Point/Station       72.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1390.00 (Ft.)
Elevation difference =   39.00 (Ft.)
Slope of channel =  0.028058 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1390.00(Ft.)     Elevation difference =  39.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    245.241(CFS)
Depth of flow =     1.240(Ft.)
Average velocity =     8.795(Ft/s)
Total flow rate =   245.241(CFS)
Channel flow top width =   24.961(Ft.)
Depth of flow in channel =   1.24(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.80(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  245.241(CFS)
Total capacity of improved channels =    245.241(CFS)
Critical Depth in Channel =    1.58(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    653.411(CFS)
Depth of flow =     2.190(Ft.)
Average velocity =    12.240(Ft/s)
```

```
Total flow rate =   653.411(CFS)
Channel flow top width =   28.759(Ft.)
Depth of flow in channel =   2.19(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   12.24(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  653.411(CFS)
Total capacity of improved channels =    653.411(CFS)
Critical Depth in Channel =    2.91(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8780   Travel time =   1.89 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   6.3506
       dt(routing time-step) =   1.66 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0      163.4     326.7     490.1     653.4
 ---------------------------------------------------------------------
   0+15       1.4194      1.60  O         |         |         |         |
   0+30      13.0466     14.47  O         |         |         |         |
   0+45      42.7875     46.32  | O       |         |         |         |
   1+ 0      73.4638     76.85  |   O     |         |         |         |
   1+15      92.7284     94.71  |    O    |         |         |         |
   1+30     129.9469    134.34  |      OI |         |         |         |
   1+45     182.8810    188.93  |         |O        |         |         |
   2+ 0     234.7665    240.48  |         |   O     |         |         |
   2+15     291.9259    298.34  |         |      OI |         |         |
   2+30     396.4020    408.62  |         |         |   OI    |         |
   2+45     566.7360    586.44  |         |         |         |   OI    |
   3+ 0     645.9907    653.41  |         |         |         |        OI
   3+15     466.8877    443.65  |         |         |      IO |         |
   3+30     234.7546    208.73  |         | I O     |         |         |
   3+45     125.7609    115.42  |      O  |         |         |         |
   4+ 0      69.9666     64.30  |  IO     |         |         |         |
   4+15      36.1816     32.68  | O       |         |         |         |
   4+30      18.1267     16.31  IO        |         |         |         |
   4+45      11.1218     10.47  O         |         |         |         |
   5+ 0       7.4454      7.07  O         |         |         |         |
   5+15       4.2337      3.88  O         |         |         |         |
   5+30       1.5493      1.26  O         |         |         |         |
   5+45       0.2113      0.08  O         |         |         |         |
   6+ 0       0.0089      0.00  O         |         |         |         |
   6+15       0.0000      0.00  O         |         |         |         |
---------------------------------------------------------------------
****************************HYDROGRAPH DATA***************************
                Number of intervals =    25
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      645.991 (CFS)
                Total volume =      75.379 (Ac.Ft)
        Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      721.000 to Point/Station       72.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBE21RT.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/25/12 File: SubE13100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed E, Subarea E1
Proposed Condition
100 Yr., 3 Hr.

-------------------------------------------------------------------
Drainage Area =    1648.50(Ac.)  =      2.576 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =    1648.50(Ac.)  =      2.576 Sq. Mi.
Length along longest watercourse =   14430.00(Ft.)
Length along longest watercourse measured to centroid =    9640.00(Ft.)
Length along longest watercourse =      2.733 Mi.
Length along longest watercourse measured to centroid =      1.826 Mi.
Difference in elevation =     815.00(Ft.)
Slope along watercourse =    298.2121 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.449 Hr.
Lag time =    26.95 Min.
25% of lag time =     6.74 Min.
40% of lag time =    10.78 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1648.50           0.85                1401.22

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1648.50           1.90                3132.15

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.28 %
Adjusted average point rain =    1.886(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   105.000           46.00         0.000
    47.400           66.00         0.000
```

18.500	77.00	0.000
1477.600	83.00	0.000

Total Area Entered = 1648.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.064	0.039
66.0	66.0	0.405	0.000	0.405	0.029	0.012
77.0	77.0	0.279	0.000	0.279	0.011	0.003
83.0	83.0	0.210	0.000	0.210	0.896	0.188
					Sum (F) =	0.242

Area averaged mean soil loss (F) (In/Hr) = 0.242
Minimum soil loss rate ((In/Hr)) = 0.121
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	55.654	4.998	83.034
2	0.500	111.309	26.859	446.222
3	0.750	166.963	36.143	600.478
4	1.000	222.617	13.228	219.760
5	1.250	278.271	7.651	127.110
6	1.500	333.926	4.833	80.291
7	1.750	389.580	2.918	48.473
8	2.000	445.234	1.465	24.333
9	2.250	500.889	0.637	10.581
10	2.500	556.543	0.443	7.358
11	2.750	612.197	0.397	6.588
12	3.000	667.851	0.285	4.731
13	3.250	723.506	0.146	2.419
			Sum = 100.000	Sum= 1661.379

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.279	0.242	(0.251)	0.037
2	0.50	4.80	0.362	0.242	(0.326)	0.120
3	0.75	5.10	0.385	0.242	(0.346)	0.143
4	1.00	4.90	0.370	0.242	(0.333)	0.128
5	1.25	6.60	0.498	0.242	(0.448)	0.256
6	1.50	7.30	0.551	0.242	(0.496)	0.309
7	1.75	8.40	0.634	0.242	(0.570)	0.392
8	2.00	9.00	0.679	0.242	(0.611)	0.437
9	2.25	12.30	0.928	0.242	(0.835)	0.686
10	2.50	17.60	1.328	0.242	(1.195)	1.086
11	2.75	16.10	1.215	0.242	(1.093)	0.973
12	3.00	4.20	0.317	0.242	(0.285)	0.075
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	4.6

Flood volume = Effective rainfall 1.16(In)
times area 1648.5(Ac.)/[(In)/(Ft.)] = 159.5(Ac.Ft)
Total soil loss = 0.73(In)
Total soil loss = 99.638(Ac.Ft)
Total rainfall = 1.89(In)
Flood volume = 6947474.3 Cubic Feet
Total soil loss = 4340229.8 Cubic Feet

Peak flow rate of this hydrograph = 1355.820(CFS)

```
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0      350.0     700.0    1050.0    1400.0
  ---------------------------------------------------------------------
    0+15       0.0642      3.11  Q         |         |         |         |
    0+30       0.6159     26.70  Q         |         |         |         |
    0+45       2.4364     88.11  V Q       |         |         |         |
    1+ 0       5.6399    155.05   V  Q     |         |         |         |
    1+15       9.6807    195.57  | V  Q    |         |         |         |
    1+30      15.1910    266.70  |  V   Q  |         |         |         |
    1+45      23.0893    382.28  |    V    Q         |         |         |
    2+ 0      33.1691    487.86  |       V |  Q      |         |         |
    2+15      45.7487    608.85  |          V     Q  |         |         |
    2+30      62.6222    816.68  |         |    V    |  Q      |         |
    2+45      86.7358   1167.10  |         |         |V        |  Q      |
    3+ 0     114.7487   1355.82  |         |         |       V |       Q |
    3+15     135.6400   1011.14  |         |         |       Q     V     |
    3+30     145.7654    490.07  |         |   Q     |         |     V   |
    3+45     151.5611    280.51  |       Q |         |         |       V |
    4+ 0     155.0359    168.18  |   Q     |         |         |       V |
    4+15     156.9950     94.82  | Q       |         |         |        V|
    4+30     158.0151     49.37  |Q        |         |         |        V|
    4+45     158.5867     27.67  Q         |         |         |        V|
    5+ 0     158.9881     19.43  Q         |         |         |        V|
    5+15     159.2726     13.77  Q         |         |         |        V|
    5+30     159.4323      7.73  Q         |         |         |        V|
    5+45     159.4883      2.71  Q         |         |         |        V|
    6+ 0     159.4921      0.18  Q         |         |         |        V|
---------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/25/12 File: SubE213100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed E, Subarea E21
Proposed Condition
100 Yr., 3 Hr.

--------------------------------------------------------------------
Drainage Area =     780.80(Ac.)  =      1.220 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     780.80(Ac.)  =      1.220 Sq. Mi.
Length along longest watercourse =   14080.00(Ft.)
Length along longest watercourse measured to centroid =    8100.00(Ft.)
Length along longest watercourse =      2.667 Mi.
Length along longest watercourse measured to centroid =      1.534 Mi.
Difference in elevation =     877.00(Ft.)
Slope along watercourse =    328.8750 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.409 Hr.
Lag time =    24.53 Min.
25% of lag time =     6.13 Min.
40% of lag time =     9.81 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      780.80           0.85                 663.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      780.80           1.90                1483.52

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.66 %
Adjusted average point rain =    1.894(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    62.200           46.00         0.000
    11.200           66.00         0.000
```

4.800	77.00	0.000
702.600	83.00	0.000

Total Area Entered = 780.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.080	0.049
66.0	66.0	0.405	0.000	0.405	0.014	0.006
77.0	77.0	0.279	0.000	0.279	0.006	0.002
83.0	83.0	0.210	0.000	0.210	0.900	0.189
					Sum (F) =	0.245

Area averaged mean soil loss (F) (In/Hr) = 0.245
Minimum soil loss rate ((In/Hr)) = 0.123
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	61.144	5.754	45.282
2	0.500	122.287	32.815	258.222
3	0.750	183.431	33.484	263.483
4	1.000	244.575	12.198	95.988
5	1.250	305.719	7.029	55.312
6	1.500	366.862	4.194	33.004
7	1.750	428.006	2.244	17.661
8	2.000	489.150	0.859	6.758
9	2.250	550.293	0.537	4.223
10	2.500	611.437	0.428	3.369
11	2.750	672.581	0.317	2.495
12	3.000	733.725	0.140	1.104
			Sum = 100.000	Sum= 786.900

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.280	0.245	(0.252)	0.035
2	0.50	4.80	0.364	0.245	(0.327)	0.119
3	0.75	5.10	0.386	0.245	(0.348)	0.141
4	1.00	4.90	0.371	0.245	(0.334)	0.126
5	1.25	6.60	0.500	0.245	(0.450)	0.255
6	1.50	7.30	0.553	0.245	(0.498)	0.308
7	1.75	8.40	0.636	0.245	(0.573)	0.391
8	2.00	9.00	0.682	0.245	(0.613)	0.437
9	2.25	12.30	0.932	0.245	(0.838)	0.687
10	2.50	17.60	1.333	0.245	(1.200)	1.088
11	2.75	16.10	1.219	0.245	(1.097)	0.974
12	3.00	4.20	0.318	0.245	(0.286)	0.073
			(Loss Rate Not Used)			
Sum =		100.0			Sum =	4.6

Flood volume = Effective rainfall 1.16(In)
times area 780.8(Ac.)/[(In)/(Ft.)] = 75.4(Ac.Ft)
Total soil loss = 0.74(In)
Total soil loss = 47.825(Ac.Ft)
Total rainfall = 1.89(In)
Flood volume = 3283508.7 Cubic Feet
Total soil loss = 2083273.1 Cubic Feet

Peak flow rate of this hydrograph = 653.411(CFS)

++

3 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 175.0 350.0 525.0 700.0
0+15	0.0330	1.60	Q
0+30	0.3320	14.47	Q
0+45	1.2889	46.32	V Q
1+ 0	2.8767	76.85	V Q
1+15	4.8334	94.71	| V Q
1+30	7.6090	134.34	| V Q |
1+45	11.5125	188.93	| V Q
2+ 0	16.4811	240.48	| V | Q
2+15	22.6450	298.34	| V Q |
2+30	31.0876	408.62	| V | Q
2+45	43.2041	586.44	| V | Q
3+ 0	56.7043	653.41	| V Q
3+15	65.8706	443.65	| Q | V
3+30	70.1831	208.73	|Q | V |
3+45	72.5679	115.42	| Q | V |
4+ 0	73.8965	64.30	| Q | V|
4+15	74.5716	32.68	|Q | V|
4+30	74.9087	16.31	Q | V|
4+45	75.1251	10.47	Q | V|
5+ 0	75.2711	7.07	Q | V|
5+15	75.3513	3.88	Q | V|
5+30	75.3773	1.26	Q | V|
5+45	75.3790	0.08	Q | V|

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  05/07/12 File: SUBE33100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed E, Subdrain Area E3
Proposed Condition
100 Yr. 3 Hr.

-------------------------------------------------------------------
Drainage Area =      17.10(Ac.)  =      0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      17.10(Ac.)  =      0.027 Sq. Mi.
Length along longest watercourse =    2900.00(Ft.)
Length along longest watercourse measured to centroid =    1850.00(Ft.)
Length along longest watercourse =      0.549 Mi.
Length along longest watercourse measured to centroid =      0.350 Mi.
Difference in elevation =      53.00(Ft.)
Slope along watercourse =     96.4966 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.162 Hr.
Lag time =     9.69 Min.
25% of lag time =     2.42 Min.
40% of lag time =     3.88 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.10           0.85                 14.54

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.10           1.90                 32.49

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    17.100           85.00         0.000
 Total Area Entered =     17.10(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	154.750	31.833	5.486
2	0.500	309.500	53.965	9.300
3	0.750	464.249	11.299	1.947
4	1.000	618.999	2.163	0.373
5	1.250	773.749	0.741	0.128
		Sum = 100.000	Sum=	17.234

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	(0.187)	0.084	0.197
2	0.50	4.80	0.365	(0.187)	0.109	0.255
3	0.75	5.10	0.388	(0.187)	0.116	0.271
4	1.00	4.90	0.372	(0.187)	0.112	0.261
5	1.25	6.60	0.502	(0.187)	0.150	0.351
6	1.50	7.30	0.555	(0.187)	0.166	0.388
7	1.75	8.40	0.638	0.187	(0.192)	0.451
8	2.00	9.00	0.684	0.187	(0.205)	0.497
9	2.25	12.30	0.935	0.187	(0.280)	0.748
10	2.50	17.60	1.337	0.187	(0.401)	1.150
11	2.75	16.10	1.224	0.187	(0.367)	1.037
12	3.00	4.20	0.319	(0.187)	0.096	0.223
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	5.8

Flood volume = Effective rainfall 1.46(In)
times area 17.1(Ac.)/[(In)/(Ft.)] = 2.1(Ac.Ft)
Total soil loss = 0.44(In)
Total soil loss = 0.630(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 90471.6 Cubic Feet
Total soil loss = 27458.3 Cubic Feet

Peak flow rate of this hydrograph = 18.094(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+15       0.0223      1.08  V Q       |         |         |         |
  0+30       0.0891      3.23   V    Q   |         |         |         |
  0+45       0.1769      4.25  |  V    Q |         |         |         |
  1+ 0       0.2704      4.53  |    V   Q|         |         |         |
```

```
    1+15       0.3737      5.00  |      V  Q         |         |         |
    1+30       0.4985      6.04  |        V| Q       |         |         |
    1+45       0.6412      6.91  |           VQ      |         |         |
    2+ 0       0.8034      7.85  |         |    Q    |         |         |
    2+15       1.0058      9.80  |         |        Q|         |         |
    2+30       1.3045     14.46  |         |         |    V  Q |         |
    2+45       1.6784     18.09  |         |         |         | V   Q   |
    3+ 0       1.9564     13.45  |         |         |     Q   |      V  |
    3+15       2.0519      4.62  |        Q|         |         |        V|
    3+30       2.0719      0.97  |Q        |         |         |        V|
    3+45       2.0764      0.22  Q         |         |         |        V|
    4+ 0       2.0769      0.03  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 10/29/12

------------------------------------------------------------------


Watershed F, Line F
Proposed Condition
100-year, 3-hour

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION *********************

               From study/file name: OffsiteF13100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    13
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       17.105 (CFS)
               Total volume =       1.507 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1200.00 (Ft.)
Elevation difference =   24.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1200.00(Ft.)     Elevation difference =  24.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      6.074(CFS)
Depth of flow =     0.232(Ft.)
Average velocity =     5.015(Ft/s)
Total flow rate =     6.074(CFS)
Channel flow top width =    5.463(Ft.)
Depth of flow in channel =   0.23(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.02(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    6.074(CFS)
Total capacity of improved channels =      6.074(CFS)
Critical Depth in Channel =    0.35(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     17.105(CFS)
```

```
Depth of flow =     0.431(Ft.)
Average velocity =     7.305(Ft/s)
Total flow rate =    17.105(CFS)
Channel flow top width =    5.862(Ft.)
Depth of flow in channel =   0.43(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.30(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   17.105(CFS)
Total capacity of improved channels =     17.105(CFS)
Critical Depth in Channel =    0.68(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8112   Travel time =   2.74 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   4.8358
       dt(routing time-step) =   2.22 (min.),   c* =   0.9997

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
 Time(h+m) Out = O(CFS) In = I  0        4.3       8.6      12.8      17.1
 ---------------------------------------------------------------------
   0+15       0.2799      0.33  O         |         |         |         |
   0+30       0.9095      1.01  | O       |         |         |         |
   0+45       1.4609      1.54  |  O      |         |         |         |
   1+ 0       1.5036      1.50  |  O      |         |         |         |
   1+15       2.7065      2.92  |     O   |         |         |         |
   1+30       4.1020      4.31  |        OI         |         |         |
   1+45       5.4104      5.60  |         | OI      |         |         |
   2+ 0       6.4804      6.63  |         |    O    |         |         |
   2+15       9.3613      9.84  |         |         |O I      |         |
   2+30      15.1184     16.04  |         |         |         |    O I  |
   2+45      16.9463     17.10  |         |         |         |        OI
   3+ 0       7.5767      5.92  |         |  I   O  |         |         |
   3+15       1.0402      0.19  I O       |         |         |         |
   3+30       0.0285      0.00  O         |         |         |         |
   3+45       0.0000      0.00  O         |         |         |         |
---------------------------------------------------------------------
********************************HYDROGRAPH DATA***************************
               Number of intervals =    15
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       16.946 (CFS)
               Total volume =       1.507 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: LineF3hrBsnF1.rte
```

++

P R I N T O F S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0 17.7 35.5 53.2 70.9
0+15	1.5913	1.87	qQ | | | |
0+30	5.5207	6.43	| Q | | | |
0+45	9.9624	11.42	| qQ | | | |
1+ 0	13.6651	15.17	| qQ | | | |
1+15	17.3699	20.08	| q|Q | | |
1+30	21.7981	25.90	| | q Q | | |
1+45	26.5933	32.00	| | q Q | | |
2+ 0	31.5211	38.00	| | q |Q | |
2+15	37.7576	47.12	| | | |q Q | |
2+30	47.9635	63.08	| | | q | Q |
2+45	53.9957	70.94	| | | q Q
3+ 0	55.3350	62.91	| | | |q Q |
3+15	51.9819	53.02	| | | Q| |
3+30	43.2604	43.29	| | Q | |
3+45	33.3613	33.36	| | Q | | |
4+ 0	25.7274	25.73	| Q | | |
4+15	19.8403	19.84	| |Q | | |
4+30	15.3004	15.30	| Q | | | |
4+45	11.7992	11.80	| Q | | | |
5+ 0	9.0993	9.10	| Q | | | |
5+15	7.0171	7.02	| Q | | | |
5+30	5.4114	5.41	| Q | | | |
5+45	4.1732	4.17	| Q | | | |
6+ 0	3.2182	3.22	|Q | | | |
6+15	2.4818	2.48	|Q | | | |
6+30	1.9139	1.91	|Q | | | |
6+45	1.4760	1.48	Q | | | |
7+ 0	1.1382	1.14	Q | | | |
7+15	0.8778	0.88	Q | | | |
7+30	0.6769	0.68	Q | | | |
7+45	0.5220	0.52	Q | | | |
8+ 0	0.4026	0.40	Q | | | |
8+15	0.3104	0.31	Q | | | |
8+30	0.2394	0.24	Q | | | |
8+45	0.1846	0.18	Q | | | |
9+ 0	0.1424	0.14	Q | | | |
9+15	0.1098	0.11	Q | | | |
9+30	0.0847	0.08	Q | | | |
9+45	0.0653	0.07	Q | | | |
10+ 0	0.0504	0.05	Q | | | |
10+15	0.0388	0.04	Q | | | |
10+30	0.0299	0.03	Q | | | |
10+45	0.0231	0.02	Q | | | |
11+ 0	0.0178	0.02	Q | | | |
11+15	0.0137	0.01	Q | | | |
11+30	0.0106	0.01	Q | | | |
11+45	0.0082	0.01	Q | | | |
12+ 0	0.0063	0.01	Q | | | |
12+15	0.0049	0.00	Q | | | |
12+30	0.0037	0.00	Q | | | |
12+45	0.0029	0.00	Q | | | |
13+ 0	0.0022	0.00	Q | | | |
13+15	0.0017	0.00	Q | | | |
13+30	0.0013	0.00	Q | | | |
13+45	0.0010	0.00	Q | | | |
14+ 0	0.0010	0.00	Q | | | |

**********HYDROGRAPH DATA**********

Number of intervals = 56

Time interval = 15.0 (Min.)

Maximum/Peak flow rate = 70.942 (CFS)

Total volume = 13.162 (Ac.Ft)

```
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------


+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
___________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: OffsiteF23100.rte
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       31.3      62.7      94.0     125.3
-------------------------------------------------------------------
  0+15       0.6969      2.57  Q         |         |         |         |
  0+30       3.0437      9.47  q  Q      |         |         |         |
  0+45       5.4193     16.84  |q   Q    |         |         |         |
  1+ 0       5.8643     21.03  |q    Q   |         |         |         |
  1+15       8.7572     28.83  | q      Q|         |         |         |
  1+30      13.5072     39.41  |   q     | Q       |         |         |
  1+45      17.3963     49.40  |    q    |    Q    |         |         |
  2+ 0      20.9918     58.99  |     q   |       Q |         |         |
  2+15      28.7117     75.83  |        q|         |   Q     |         |
  2+30      45.6035    108.69  |         |   q     |         |   Q     |
  2+45      54.3796    125.32  |         |      q  |         |         Q
  3+ 0      30.2550     93.17  |        q|         |        Q|         |
  3+15       4.6539     57.68  |q        |       Q |         |         |
  3+30       0.5737     43.86  q         |  Q      |         |         |
  3+45       0.0212     33.38  q         Q         |         |         |
  4+ 0       0.0000     25.73  q       Q |         |         |         |
  4+15       0.0000     19.84  q     Q   |         |         |         |
  4+30       0.0000     15.30  q   Q     |         |         |         |
  4+45       0.0000     11.80  q  Q      |         |         |         |
  5+ 0       0.0000      9.10  q Q       |         |         |         |
  5+15       0.0000      7.02  q Q       |         |         |         |
  5+30       0.0000      5.41  qQ        |         |         |         |
  5+45       0.0000      4.17  qQ        |         |         |         |
  6+ 0       0.0000      3.22  qQ        |         |         |         |
  6+15       0.0000      2.48  Q         |         |         |         |
  6+30       0.0000      1.91  Q         |         |         |         |
  6+45       0.0000      1.48  Q         |         |         |         |
  7+ 0       0.0000      1.14  Q         |         |         |         |
  7+15       0.0000      0.88  Q         |         |         |         |
  7+30       0.0000      0.68  Q         |         |         |         |
  7+45       0.0000      0.52  Q         |         |         |         |
  8+ 0       0.0000      0.40  Q         |         |         |         |
  8+15       0.0000      0.31  Q         |         |         |         |
  8+30       0.0000      0.24  Q         |         |         |         |
  8+45       0.0000      0.18  Q         |         |         |         |
  9+ 0       0.0000      0.14  Q         |         |         |         |
  9+15       0.0000      0.11  Q         |         |         |         |
  9+30       0.0000      0.08  Q         |         |         |         |
  9+45       0.0000      0.07  Q         |         |         |         |
 10+ 0       0.0000      0.05  Q         |         |         |         |
 10+15       0.0000      0.04  Q         |         |         |         |
 10+30       0.0000      0.03  Q         |         |         |         |
 10+45       0.0000      0.02  Q         |         |         |         |
 11+ 0       0.0000      0.02  Q         |         |         |         |
 11+15       0.0000      0.01  Q         |         |         |         |
 11+30       0.0000      0.01  Q         |         |         |         |
```

```
  11+45       0.0000      0.01  Q         |         |         |         |
  12+ 0       0.0000      0.01  Q         |         |         |         |
  12+15       0.0000      0.00  Q         |         |         |         |
  12+30       0.0000      0.00  Q         |         |         |         |
  12+45       0.0000      0.00  Q         |         |         |         |
  13+ 0       0.0000      0.00  Q         |         |         |         |
  13+15       0.0000      0.00  Q         |         |         |         |
  13+30       0.0000      0.00  Q         |         |         |         |
  13+45       0.0000      0.00  Q         |         |         |         |
  14+ 0       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    56
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      125.322 (CFS)
                      Total volume =      18.118 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ______________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   1200.00 (Ft.)
       Elevation difference =   24.00 (Ft.)
       Slope of channel =  0.020000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  1200.00(Ft.)     Elevation difference =  24.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =    5.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =    5.000(Ft.)
       Flow(q) thru subarea =     52.463(CFS)
       Depth of flow =     0.841(Ft.)
       Average velocity =    10.681(Ft/s)
       Total flow rate =    52.463(CFS)
       Channel flow top width =    6.682(Ft.)
       Depth of flow in channel =   0.84(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   10.68(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =   52.463(CFS)
       Total capacity of improved channels =     52.463(CFS)
       Critical Depth in Channel =    1.38(Ft.)


       Channel evaluation using maximum flow rate of hydrograph
       Covered channel
       Flow(q) thru subarea =    125.322(CFS)
       Depth of flow =     1.399(Ft.)
       Average velocity =    14.003(Ft/s)
       Total flow rate =   125.322(CFS)
       Channel flow top width =    7.797(Ft.)
       Depth of flow in channel =   1.40(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   14.00(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =  125.322(CFS)
       Total capacity of improved channels =    125.322(CFS)
```

```
Critical Depth in Channel =    2.28(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8917   Travel time =   1.43 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   8.1850
       dt(routing time-step) =   1.27 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       31.3      62.7      94.0     125.3
----------------------------------------------------------------------
  0+15       2.3501      2.57  O         |         |         |         |
  0+30       8.8875      9.47  | OI      |         |         |         |
  0+45      16.2169     16.84  |    O    |         |         |         |
  1+ 0      20.6772     21.03  |     O   |         |         |         |
  1+15      28.1712     28.83  |       OI|         |         |         |
  1+30      38.5094     39.41  |         | O       |         |         |
  1+45      48.5516     49.40  |         |    O    |         |         |
  2+ 0      58.1787     58.99  |         |       O |         |         |
  2+15      74.4010     75.83  |         |         |  OI     |         |
  2+30     105.8958    108.69  |         |         |         |  OI     |
  2+45     123.9091    125.32  |         |         |         |        OI
  3+ 0      95.8969     93.17  |         |         |        IO         |
  3+15      60.6894     57.68  |         |       IO|         |         |
  3+30      45.0354     43.86  |         |  IO     |         |         |
  3+45      34.2723     33.38  |         O         |         |         |
  4+ 0      26.3774     25.73  |       O |         |         |         |
  4+15      20.3402     19.84  |     O   |         |         |         |
  4+30      15.6858     15.30  |   IO    |         |         |         |
  4+45      12.0965     11.80  |  O      |         |         |         |
  5+ 0       9.3285      9.10  | O       |         |         |         |
  5+15       7.1939      7.02  | O       |         |         |         |
  5+30       5.5478      5.41  |O        |         |         |         |
  5+45       4.2783      4.17  |O        |         |         |         |
  6+ 0       3.2993      3.22  |O        |         |         |         |
  6+15       2.5443      2.48  O         |         |         |         |
  6+30       1.9621      1.91  O         |         |         |         |
  6+45       1.5131      1.48  O         |         |         |         |
  7+ 0       1.1669      1.14  O         |         |         |         |
  7+15       0.8999      0.88  O         |         |         |         |
  7+30       0.6940      0.68  O         |         |         |         |
  7+45       0.5352      0.52  O         |         |         |         |
  8+ 0       0.4127      0.40  O         |         |         |         |
  8+15       0.3183      0.31  O         |         |         |         |
  8+30       0.2454      0.24  O         |         |         |         |
  8+45       0.1893      0.18  O         |         |         |         |
  9+ 0       0.1460      0.14  O         |         |         |         |
  9+15       0.1126      0.11  O         |         |         |         |
  9+30       0.0868      0.08  O         |         |         |         |
  9+45       0.0669      0.07  O         |         |         |         |
 10+ 0       0.0516      0.05  O         |         |         |         |
 10+15       0.0398      0.04  O         |         |         |         |
 10+30       0.0307      0.03  O         |         |         |         |
 10+45       0.0237      0.02  O         |         |         |         |
 11+ 0       0.0183      0.02  O         |         |         |         |
 11+15       0.0141      0.01  O         |         |         |         |
 11+30       0.0109      0.01  O         |         |         |         |
 11+45       0.0084      0.01  O         |         |         |         |
```

```
  12+ 0       0.0065      0.01  O         |         |         |         |
  12+15       0.0050      0.00  O         |         |         |         |
  12+30       0.0038      0.00  O         |         |         |         |
  12+45       0.0030      0.00  O         |         |         |         |
  13+ 0       0.0023      0.00  O         |         |         |         |
  13+15       0.0018      0.00  O         |         |         |         |
  13+30       0.0014      0.00  O         |         |         |         |
  13+45       0.0010      0.00  O         |         |         |         |
  14+ 0       0.0010      0.00  O         |         |         |         |
  14+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    57
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      123.909 (CFS)
                      Total volume =      18.118 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ********************* HYDROGRAPH INFORMATION **********************

                      From study/file name: LineF3hrBsnF2.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       46.4      92.8     139.2     185.6
  ----------------------------------------------------------------------
  0+15       0.9775      3.33  Q         |         |         |         |
  0+30       3.4851     12.37  q Q       |         |         |         |
  0+45       6.5352     22.75  |q  Q     |         |         |         |
  1+ 0       9.3622     30.04  | q   Q   |         |         |         |
  1+15      12.3456     40.52  | q     Q |         |         |         |
  1+30      15.9081     54.42  |  q      |Q        |         |         |
  1+45      19.8579     68.41  |   q     |   Q     |         |         |
  2+ 0      25.8861     84.06  |    q    |       Q |         |         |
  2+15      33.0202    107.42  |      q  |         |  Q      |         |
  2+30      43.6259    149.52  |        q|         |         | Q       |
  2+45      61.7063    185.62  |         |  q      |         |        Q
  3+ 0      66.5973    162.49  |         |   q     |         |    Q    |
  3+15      49.4217    110.11  |         q         |  Q      |         |
  3+30      40.6465     85.68  |       q |       Q |         |         |
  3+45      33.0348     67.31  |      q  |   Q     |         |         |
  4+ 0      26.8485     53.23  |    q    |Q        |         |         |
  4+15      21.8207     42.16  |   q    Q|         |         |         |
  4+30      18.4400     34.13  |  q   Q  |         |         |         |
  4+45      16.0624     28.16  |  q  Q   |         |         |         |
  5+ 0      13.9913     23.32  |  q Q    |         |         |         |
  5+15      12.1872     19.38  | q Q     |         |         |         |
  5+30      10.6158     16.16  | qQ      |         |         |         |
  5+45       9.2470     13.53  |qQ       |         |         |         |
  6+ 0       8.0547     11.35  |qQ       |         |         |         |
  6+15       7.0161      9.56  |qQ       |         |         |         |
  6+30       6.1115      8.07  |Q        |         |         |         |
  6+45       5.3234      6.84  |Q        |         |         |         |
  7+ 0       4.6370      5.80  qQ        |         |         |         |
  7+15       4.0391      4.94  qQ        |         |         |         |
  7+30       3.5183      4.21  Q         |         |         |         |
```

7+45	3.0647	3.60	Q	|	|	|	|
8+ 0	2.6695	3.08	Q	|	|	|	|
8+15	2.3253	2.64	Q	|	|	|	|
8+30	2.0255	2.27	Q	|	|	|	|
8+45	1.7643	1.95	Q	|	|	|	|
9+ 0	1.5368	1.68	Q	|	|	|	|
9+15	1.3387	1.45	Q	|	|	|	|
9+30	1.1661	1.25	Q	|	|	|	|
9+45	1.0157	1.08	Q	|	|	|	|
10+ 0	0.8847	0.94	Q	|	|	|	|
10+15	0.7707	0.81	Q	|	|	|	|
10+30	0.6713	0.70	Q	|	|	|	|
10+45	0.5847	0.61	Q	|	|	|	|
11+ 0	0.5093	0.53	Q	|	|	|	|
11+15	0.4437	0.46	Q	|	|	|	|
11+30	0.3865	0.40	Q	|	|	|	|
11+45	0.3366	0.35	Q	|	|	|	|
12+ 0	0.2932	0.30	Q	|	|	|	|
12+15	0.2554	0.26	Q	|	|	|	|
12+30	0.2225	0.23	Q	|	|	|	|
12+45	0.1938	0.20	Q	|	|	|	|
13+ 0	0.1688	0.17	Q	|	|	|	|
13+15	0.1470	0.15	Q	|	|	|	|
13+30	0.1281	0.13	Q	|	|	|	|
13+45	0.1116	0.11	Q	|	|	|	|
14+ 0	0.0972	0.10	Q	|	|	|	|
14+15	0.0847	0.08	Q	|	|	|	|
14+30	0.0737	0.07	Q	|	|	|	|
14+45	0.0642	0.06	Q	|	|	|	|
15+ 0	0.0559	0.06	Q	|	|	|	|
15+15	0.0487	0.05	Q	|	|	|	|
15+30	0.0424	0.04	Q	|	|	|	|
15+45	0.0370	0.04	Q	|	|	|	|
16+ 0	0.0322	0.03	Q	|	|	|	|
16+15	0.0281	0.03	Q	|	|	|	|
16+30	0.0244	0.02	Q	|	|	|	|
16+45	0.0213	0.02	Q	|	|	|	|
17+ 0	0.0185	0.02	Q	|	|	|	|
17+15	0.0162	0.02	Q	|	|	|	|
17+30	0.0141	0.01	Q	|	|	|	|
17+45	0.0123	0.01	Q	|	|	|	|
18+ 0	0.0107	0.01	Q	|	|	|	|
18+15	0.0093	0.01	Q	|	|	|	|
18+30	0.0081	0.01	Q	|	|	|	|
18+45	0.0071	0.01	Q	|	|	|	|
19+ 0	0.0061	0.01	Q	|	|	|	|
19+15	0.0054	0.01	Q	|	|	|	|
19+30	0.0047	0.00	Q	|	|	|	|
19+45	0.0041	0.00	Q	|	|	|	|
20+ 0	0.0035	0.00	Q	|	|	|	|
20+15	0.0031	0.00	Q	|	|	|	|
20+30	0.0027	0.00	Q	|	|	|	|
20+45	0.0023	0.00	Q	|	|	|	|
21+ 0	0.0020	0.00	Q	|	|	|	|
21+15	0.0018	0.00	Q	|	|	|	|
21+30	0.0015	0.00	Q	|	|	|	|
21+45	0.0013	0.00	Q	|	|	|	|
22+ 0	0.0012	0.00	Q	|	|	|	|
22+15	0.0010	0.00	Q	|	|	|	|
22+30	0.0010	0.00	Q	|	|	|	|

**********HYDROGRAPH DATA**********

Number of intervals = 90
Time interval = 15.0 (Min.)
Maximum/Peak flow rate = 185.615 (CFS)
Total volume = 30.806 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

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---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: OffsiteF33100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       81.4     162.9     244.3     325.8
----------------------------------------------------------------------
  0+15       1.0253      4.35  Q         |         |         |         |
  0+30       5.8903     18.26  q Q       |         |         |         |
  0+45      13.0704     35.82  |q  Q     |         |         |         |
  1+ 0      16.0290     46.07  |q   Q    |         |         |         |
  1+15      20.4211     60.94  | q    Q  |         |         |         |
  1+30      32.9180     87.34  |   q     Q         |         |         |
  1+45      43.0541    111.46  |    q    |  Q      |         |         |
  2+ 0      53.4511    137.52  |     q   |     Q   |         |         |
  2+15      68.6023    176.02  |       q |         |Q        |         |
  2+30     105.5165    255.04  |         | q       |         |Q        |
  2+45     140.1782    325.79  |         |      q  |         |        Q
  3+ 0     107.9002    270.39  |         |  q      |         |  Q      |
  3+15      32.0037    142.11  |  q      |      Q  |         |         |
  3+30       8.7502     94.43  |q        |Q        |         |         |
  3+45       2.4819     69.79  q       Q |         |         |         |
  4+ 0       0.7152     53.94  q     Q   |         |         |         |
  4+15       0.0349     42.20  q    Q    |         |         |         |
  4+30       0.0000     34.13  q   Q     |         |         |         |
  4+45       0.0000     28.16  q  Q      |         |         |         |
  5+ 0       0.0000     23.32  q Q       |         |         |         |
  5+15       0.0000     19.38  q Q       |         |         |         |
  5+30       0.0000     16.16  qQ        |         |         |         |
  5+45       0.0000     13.53  qQ        |         |         |         |
  6+ 0       0.0000     11.35  qQ        |         |         |         |
  6+15       0.0000      9.56  qQ        |         |         |         |
  6+30       0.0000      8.07  Q         |         |         |         |
  6+45       0.0000      6.84  Q         |         |         |         |
  7+ 0       0.0000      5.80  Q         |         |         |         |
  7+15       0.0000      4.94  Q         |         |         |         |
  7+30       0.0000      4.21  Q         |         |         |         |
  7+45       0.0000      3.60  Q         |         |         |         |
  8+ 0       0.0000      3.08  Q         |         |         |         |
  8+15       0.0000      2.64  Q         |         |         |         |
  8+30       0.0000      2.27  Q         |         |         |         |
  8+45       0.0000      1.95  Q         |         |         |         |
  9+ 0       0.0000      1.68  Q         |         |         |         |
  9+15       0.0000      1.45  Q         |         |         |         |
  9+30       0.0000      1.25  Q         |         |         |         |
  9+45       0.0000      1.08  Q         |         |         |         |
 10+ 0       0.0000      0.94  Q         |         |         |         |
 10+15       0.0000      0.81  Q         |         |         |         |
 10+30       0.0000      0.70  Q         |         |         |         |
 10+45       0.0000      0.61  Q         |         |         |         |
 11+ 0       0.0000      0.53  Q         |         |         |         |
 11+15       0.0000      0.46  Q         |         |         |         |
 11+30       0.0000      0.40  Q         |         |         |         |
 11+45       0.0000      0.35  Q         |         |         |         |
 12+ 0       0.0000      0.30  Q         |         |         |         |
 12+15       0.0000      0.26  Q         |         |         |         |
 12+30       0.0000      0.23  Q         |         |         |         |
 12+45       0.0000      0.20  Q         |         |         |         |
```

```
  13+ 0       0.0000      0.17  Q         |         |         |         |
  13+15       0.0000      0.15  Q         |         |         |         |
  13+30       0.0000      0.13  Q         |         |         |         |
  13+45       0.0000      0.11  Q         |         |         |         |
  14+ 0       0.0000      0.10  Q         |         |         |         |
  14+15       0.0000      0.08  Q         |         |         |         |
  14+30       0.0000      0.07  Q         |         |         |         |
  14+45       0.0000      0.06  Q         |         |         |         |
  15+ 0       0.0000      0.06  Q         |         |         |         |
  15+15       0.0000      0.05  Q         |         |         |         |
  15+30       0.0000      0.04  Q         |         |         |         |
  15+45       0.0000      0.04  Q         |         |         |         |
  16+ 0       0.0000      0.03  Q         |         |         |         |
  16+15       0.0000      0.03  Q         |         |         |         |
  16+30       0.0000      0.02  Q         |         |         |         |
  16+45       0.0000      0.02  Q         |         |         |         |
  17+ 0       0.0000      0.02  Q         |         |         |         |
  17+15       0.0000      0.02  Q         |         |         |         |
  17+30       0.0000      0.01  Q         |         |         |         |
  17+45       0.0000      0.01  Q         |         |         |         |
  18+ 0       0.0000      0.01  Q         |         |         |         |
  18+15       0.0000      0.01  Q         |         |         |         |
  18+30       0.0000      0.01  Q         |         |         |         |
  18+45       0.0000      0.01  Q         |         |         |         |
  19+ 0       0.0000      0.01  Q         |         |         |         |
  19+15       0.0000      0.01  Q         |         |         |         |
  19+30       0.0000      0.00  Q         |         |         |         |
  19+45       0.0000      0.00  Q         |         |         |         |
  20+ 0       0.0000      0.00  Q         |         |         |         |
  20+15       0.0000      0.00  Q         |         |         |         |
  20+30       0.0000      0.00  Q         |         |         |         |
  20+45       0.0000      0.00  Q         |         |         |         |
  21+ 0       0.0000      0.00  Q         |         |         |         |
  21+15       0.0000      0.00  Q         |         |         |         |
  21+30       0.0000      0.00  Q         |         |         |         |
  21+45       0.0000      0.00  Q         |         |         |         |
  22+ 0       0.0000      0.00  Q         |         |         |         |
  22+15       0.0000      0.00  Q         |         |         |         |
  22+30       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    90
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      325.794 (CFS)
                      Total volume =      44.278 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       -----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: OffsiteF43100.rte
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ----------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       98.4     196.9     295.3     393.8
  ----------------------------------------------------------------------
    0+15       0.7716      5.12  Q         |         |         |         |
```

0+30	3.3201	21.58	q Q | | | |
0+45	6.1181	41.94	q Q | | | |
1+ 0	6.8633	52.93	q Q | | | |
1+15	10.0466	70.98	|q Q | | | |
1+30	16.0967	103.43	|q Q | | |
1+45	21.0112	132.47	| q | Q | | |
2+ 0	25.7029	163.22	| q | Q | | |
2+15	34.7483	210.77	| q | | Q | |
2+30	55.1717	310.21	| q | | | Q |
2+45	67.9917	393.79	| q | | | | Q
3+ 0	41.5773	311.97	| q | | | Q |
3+15	7.7414	149.86	q | Q | | |
3+30	1.1909	95.62	q Q| | | |
3+45	0.0399	69.83	q Q | | | |
4+ 0	0.0000	53.94	q Q | | | |
4+15	0.0000	42.20	q Q | | | |
4+30	0.0000	34.13	q Q | | | |
4+45	0.0000	28.16	q Q | | | |
5+ 0	0.0000	23.32	q Q | | | |
5+15	0.0000	19.38	qQ | | | |
5+30	0.0000	16.16	qQ | | | |
5+45	0.0000	13.53	qQ | | | |
6+ 0	0.0000	11.35	qQ | | | |
6+15	0.0000	9.56	Q | | | |
6+30	0.0000	8.07	Q | | | |
6+45	0.0000	6.84	Q | | | |
7+ 0	0.0000	5.80	Q | | | |
7+15	0.0000	4.94	Q | | | |
7+30	0.0000	4.21	Q | | | |
7+45	0.0000	3.60	Q | | | |
8+ 0	0.0000	3.08	Q | | | |
8+15	0.0000	2.64	Q | | | |
8+30	0.0000	2.27	Q | | | |
8+45	0.0000	1.95	Q | | | |
9+ 0	0.0000	1.68	Q | | | |
9+15	0.0000	1.45	Q | | | |
9+30	0.0000	1.25	Q | | | |
9+45	0.0000	1.08	Q | | | |
10+ 0	0.0000	0.94	Q | | | |
10+15	0.0000	0.81	Q | | | |
10+30	0.0000	0.70	Q | | | |
10+45	0.0000	0.61	Q | | | |
11+ 0	0.0000	0.53	Q | | | |
11+15	0.0000	0.46	Q | | | |
11+30	0.0000	0.40	Q | | | |
11+45	0.0000	0.35	Q | | | |
12+ 0	0.0000	0.30	Q | | | |
12+15	0.0000	0.26	Q | | | |
12+30	0.0000	0.23	Q | | | |
12+45	0.0000	0.20	Q | | | |
13+ 0	0.0000	0.17	Q | | | |
13+15	0.0000	0.15	Q | | | |
13+30	0.0000	0.13	Q | | | |
13+45	0.0000	0.11	Q | | | |
14+ 0	0.0000	0.10	Q | | | |
14+15	0.0000	0.08	Q | | | |
14+30	0.0000	0.07	Q | | | |
14+45	0.0000	0.06	Q | | | |
15+ 0	0.0000	0.06	Q | | | |
15+15	0.0000	0.05	Q | | | |
15+30	0.0000	0.04	Q | | | |
15+45	0.0000	0.04	Q | | | |
16+ 0	0.0000	0.03	Q | | | |
16+15	0.0000	0.03	Q | | | |
16+30	0.0000	0.02	Q | | | |
16+45	0.0000	0.02	Q | | | |
17+ 0	0.0000	0.02	Q | | | |
17+15	0.0000	0.02	Q | | | |
17+30	0.0000	0.01	Q | | | |
17+45	0.0000	0.01	Q | | | |
18+ 0	0.0000	0.01	Q | | | |

```
  18+15       0.0000      0.01  Q         |         |         |         |
  18+30       0.0000      0.01  Q         |         |         |         |
  18+45       0.0000      0.01  Q         |         |         |         |
  19+ 0       0.0000      0.01  Q         |         |         |         |
  19+15       0.0000      0.01  Q         |         |         |         |
  19+30       0.0000      0.00  Q         |         |         |         |
  19+45       0.0000      0.00  Q         |         |         |         |
  20+ 0       0.0000      0.00  Q         |         |         |         |
  20+15       0.0000      0.00  Q         |         |         |         |
  20+30       0.0000      0.00  Q         |         |         |         |
  20+45       0.0000      0.00  Q         |         |         |         |
  21+ 0       0.0000      0.00  Q         |         |         |         |
  21+15       0.0000      0.00  Q         |         |         |         |
  21+30       0.0000      0.00  Q         |         |         |         |
  21+45       0.0000      0.00  Q         |         |         |         |
  22+ 0       0.0000      0.00  Q         |         |         |         |
  22+15       0.0000      0.00  Q         |         |         |         |
  22+30       0.0000      0.00  Q         |         |         |         |
---------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                      Number of intervals =    90
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      393.785 (CFS)
                      Total volume =      50.443 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        1.000 to Point/Station        3.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ____________________________________________________________________
        Current stream hydrograph saved in file LineF3hr.rte
        ****************************HYDROGRAPH DATA***************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 10/29/12

      ----------------------------------------------------------------------


      Watershed F, Basin F1
      Proposed Condition
      100-year, 3 hour

      ----------------------------------------------------------------------


      Program License Serial Number 6097

      ----------------------------------------------------------------------
      ********************* HYDROGRAPH INFORMATION **********************

                    From study/file name: SubF13100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    13
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       97.566 (CFS)
                    Total volume =      11.657 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 13
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000      4.000     50.000      3.483        4.517
        5.000      6.000     60.000      5.380        6.620
        6.000      8.000    100.000      6.967        9.033
      ----------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      24.4   48.78   73.17   97.57 (Ft.)
 0.250   14.08    1.59      0.129  O   I   |       |       |       |     2.03
```

0.500	23.44	5.52	0.443		O I				2.11
0.750	26.42	9.96	0.799		O I				2.20
1.000	25.87	13.67	1.095		O I				2.27
1.250	33.85	17.37	1.391		O	I			2.35
1.500	39.60	21.80	1.745		O	I			2.44
1.750	45.91	26.59	2.128		O I			2.53
2.000	50.35	31.52	2.522			O I		2.63
2.250	67.20	37.76	3.021			O	I		2.76
2.500	97.51	47.96	3.837			O		I	2.96
2.750	97.57	54.00	4.799				O	I 3.80
3.000	37.69	55.33	5.067			I	O		4.07
3.250	4.71	51.98	4.396		I		O		3.40
3.500	0.00	43.26	3.461	I	O			2.87
3.750	0.00	33.36	2.670	I	O			2.67
4.000	0.00	25.73	2.059	I O				2.51
4.250	0.00	19.84	1.588	I O					2.40
4.500	0.00	15.30	1.225	I O					2.31
4.750	0.00	11.80	0.945	I O					2.24
5.000	0.00	9.10	0.730	I O					2.18
5.250	0.00	7.02	0.563	I O					2.14
5.500	0.00	5.41	0.435	IO					2.11
5.750	0.00	4.17	0.336	IO					2.08
6.000	0.00	3.22	0.259	IO					2.06
6.250	0.00	2.48	0.200	O					2.05
6.500	0.00	1.91	0.155	O					2.04
6.750	0.00	1.48	0.120	O					2.03
7.000	0.00	1.14	0.093	O					2.02
7.250	0.00	0.88	0.072	O					2.02
7.500	0.00	0.68	0.056	O					2.01
7.750	0.00	0.52	0.044	O					2.01
8.000	0.00	0.40	0.034	O					2.01
8.250	0.00	0.31	0.027	O					2.01
8.500	0.00	0.24	0.021	O					2.00
8.750	0.00	0.18	0.017	O					2.00
9.000	0.00	0.14	0.013	O					2.00
9.250	0.00	0.11	0.011	O					2.00
9.500	0.00	0.08	0.009	O					2.00
9.750	0.00	0.07	0.007	O					2.00
10.000	0.00	0.05	0.006	O					2.00
10.250	0.00	0.04	0.005	O					2.00
10.500	0.00	0.03	0.004	O					2.00
10.750	0.00	0.02	0.004	O					2.00
11.000	0.00	0.02	0.003	O					2.00
11.250	0.00	0.01	0.003	O					2.00
11.500	0.00	0.01	0.003	O					2.00
11.750	0.00	0.01	0.003	O					2.00
12.000	0.00	0.01	0.002	O					2.00
12.250	0.00	0.00	0.002	O					2.00
12.500	0.00	0.00	0.002	O					2.00
12.750	0.00	0.00	0.002	O					2.00
13.000	0.00	0.00	0.002	O					2.00
13.250	0.00	0.00	0.002	O					2.00
13.500	0.00	0.00	0.002	O					2.00
13.750	0.00	0.00	0.002	O					2.00
14.000	0.00	0.00	0.002	O					1.98

Remaining water in basin = 0.00 (Ac.Ft)

```
****************************HYDROGRAPH DATA****************************
                Number of intervals =    56
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =       55.335 (CFS)
                Total volume =      11.655 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************
```

```
----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file LineF3hrBsnF1.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 10/29/12

      ---------------------------------------------------------------------


      Watershed F, Basin F2
      Proposed Condition
      100-year, 3 hour

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ********************* HYDROGRAPH INFORMATION **********************

                    From study/file name: SubF23100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    13
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      106.208 (CFS)
                    Total volume =      12.690 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 13
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000      3.000     20.000      2.793        3.207
        5.000      6.000     50.000      5.483        6.517
        6.000      8.000    100.000      6.967        9.033
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      26.6   53.10   79.66  106.21 (Ft.)
 0.250   15.33    0.98      0.148  O   I   |       |       |       |     2.05
```

0.500	25.52	3.49	0.524		O I				2.17
0.750	28.76	6.54	0.982		O I				2.33
1.000	28.16	9.36	1.405		O I				2.47
1.250	36.84	12.35	1.853		O	I			2.62
1.500	43.11	15.91	2.387		O	I			2.80
1.750	49.98	19.86	2.979		O	I			2.99
2.000	54.81	25.89	3.589		O	I			3.39
2.250	73.16	33.02	4.302			O	I		3.87
2.500	106.15	43.63	5.363			O		I	4.58
2.750	106.21	61.71	6.468				O	I	5.23
3.000	41.03	66.60	6.664			I	O		5.33
3.250	5.12	49.42	5.942	I	O				4.96
3.500	0.00	40.65	5.065 I	O				4.38
3.750	0.00	33.03	4.303 I	O				3.87
4.000	0.00	26.85	3.685 I O				3.46
4.250	0.00	21.82	3.182 I O					3.12
4.500	0.00	18.44	2.766 I O					2.92
4.750	0.00	16.06	2.410 I O					2.80
5.000	0.00	13.99	2.099 I O					2.70
5.250	0.00	12.19	1.829 I O					2.61
5.500	0.00	10.62	1.593 I O					2.53
5.750	0.00	9.25	1.388 I O					2.46
6.000	0.00	8.05	1.209 I O					2.40
6.250	0.00	7.02	1.054 I O					2.35
6.500	0.00	6.11	0.918 IO					2.31
6.750	0.00	5.32	0.800 IO					2.27
7.000	0.00	4.64	0.697 IO					2.23
7.250	0.00	4.04	0.607 IO					2.20
7.500	0.00	3.52	0.529 IO					2.18
7.750	0.00	3.06	0.461 O					2.15
8.000	0.00	2.67	0.402 O					2.13
8.250	0.00	2.33	0.350 O					2.12
8.500	0.00	2.03	0.305 O					2.10
8.750	0.00	1.76	0.266 O					2.09
9.000	0.00	1.54	0.232 O					2.08
9.250	0.00	1.34	0.203 O					2.07
9.500	0.00	1.17	0.177 O					2.06
9.750	0.00	1.02	0.154 O					2.05
10.000	0.00	0.88	0.134 O					2.04
10.250	0.00	0.77	0.117 O					2.04
10.500	0.00	0.67	0.102 O					2.03
10.750	0.00	0.58	0.090 O					2.03
11.000	0.00	0.51	0.078 O					2.03
11.250	0.00	0.44	0.068 O					2.02
11.500	0.00	0.39	0.060 O					2.02
11.750	0.00	0.34	0.052 O					2.02
12.000	0.00	0.29	0.046 O					2.01
12.250	0.00	0.26	0.040 O					2.01
12.500	0.00	0.22	0.035 O					2.01
12.750	0.00	0.19	0.031 O					2.01
13.000	0.00	0.17	0.027 O					2.01
13.250	0.00	0.15	0.024 O					2.01
13.500	0.00	0.13	0.021 O					2.01
13.750	0.00	0.11	0.019 O					2.01
14.000	0.00	0.10	0.016 O					2.00
14.250	0.00	0.08	0.015 O					2.00
14.500	0.00	0.07	0.013 O					2.00
14.750	0.00	0.06	0.011 O					2.00
15.000	0.00	0.06	0.010 O					2.00
15.250	0.00	0.05	0.009 O					2.00
15.500	0.00	0.04	0.008 O					2.00
15.750	0.00	0.04	0.007 O					2.00
16.000	0.00	0.03	0.007 O					2.00
16.250	0.00	0.03	0.006 O					2.00
16.500	0.00	0.02	0.006 O					2.00
16.750	0.00	0.02	0.005 O					2.00
17.000	0.00	0.02	0.005 O					2.00
17.250	0.00	0.02	0.004 O					2.00
17.500	0.00	0.01	0.004 O					2.00
17.750	0.00	0.01	0.004 O					2.00
18.000	0.00	0.01	0.003 O					2.00

```
18.250    0.00    0.01      0.003  O       |       |       |       |     2.00
18.500    0.00    0.01      0.003  O       |       |       |       |     2.00
18.750    0.00    0.01      0.003  O       |       |       |       |     2.00
19.000    0.00    0.01      0.003  O       |       |       |       |     2.00
19.250    0.00    0.01      0.003  O       |       |       |       |     2.00
19.500    0.00    0.00      0.003  O       |       |       |       |     2.00
19.750    0.00    0.00      0.002  O       |       |       |       |     2.00
20.000    0.00    0.00      0.002  O       |       |       |       |     2.00
20.250    0.00    0.00      0.002  O       |       |       |       |     2.00
20.500    0.00    0.00      0.002  O       |       |       |       |     2.00
20.750    0.00    0.00      0.002  O       |       |       |       |     2.00
21.000    0.00    0.00      0.002  O       |       |       |       |     2.00
21.250    0.00    0.00      0.002  O       |       |       |       |     2.00
21.500    0.00    0.00      0.002  O       |       |       |       |     2.00
21.750    0.00    0.00      0.002  O       |       |       |       |     2.00
22.000    0.00    0.00      0.002  O       |       |       |       |     2.00
22.250    0.00    0.00      0.002  O       |       |       |       |     2.00
22.500    0.00    0.00      0.002  O       |       |       |       |     1.98

       Remaining water in basin =    0.00 (Ac.Ft)

       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =    90
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       66.597 (CFS)
                      Total volume =      12.688 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ______________________________________________________________________
       Current stream hydrograph saved in file LineF3hrBsnF2.rte
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/30/12


      ------------------------------------------------------------------
--


      Watershed F, Basin F3
      Proposed Condition
      100-year, 3-hour

      ------------------------------------------------------------------
-


      Program License Serial Number 6097

      ------------------------------------------------------------------
-
      ******************** HYDROGRAPH INFORMATION **********************

                 From study/file name: SubF33100.rte
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =    13
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =       46.922 (CFS)
                 Total volume =       5.580 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station        1.000 to Point/Station
2.000
      **** RETARDING BASIN ROUTING ****
      ____________________________________________________________________
___

      User entry of depth-outflow-storage data
      ------------------------------------------------------------------
-
      Total number of inflow hydrograph intervals = 13
      Hydrograph time unit = 15.000 (Min.)
```

```
      Initial depth in storage basin =   0.10(Ft.)
      ------------------------------------------------------------------
-
      ------------------------------------------------------------------
-
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ------------------------------------------------------------------
--
      ------------------------------------------------------------------
-
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ------------------------------------------------------------------
--
          0.000      0.000      0.000      0.000        0.000
          1.000      0.001      0.001      0.001        0.001
          2.000      0.002      0.001      0.002        0.002
          3.000      4.000     50.000      3.483        4.517
          5.000      6.500    100.000      5.467        7.533
          6.000      8.800    150.000      7.250       10.350
      ------------------------------------------------------------------
-
                  Hydrograph Detention Basin Routing
      ------------------------------------------------------------------
--

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ------------------------------------------------------------------
--
  Time   Inflow  Outflow    Storage
Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0      11.7   23.46   35.19   46.92
(Ft.)
  0.250    6.32    0.70      0.058  O   I   |       |       |       |
2.01
  0.500   11.06    2.53      0.204  |O     I|       |       |       |
2.05
  0.750   12.60    4.66      0.374  |  O    I       |       |       |
2.09
  1.000   12.41    6.45      0.518  |   O   I       |       |       |
2.13
  1.250   15.95    8.22      0.659  |    O  | I     |       |       |
2.16
  1.500   18.85   10.32      0.827  |      O|   I   |       |       |
2.21
  1.750   21.82   12.61      1.011  |       O     I |       |       |
2.25
  2.000   24.01   14.97      1.199  |       | O     I       |       |
2.30
  2.250   31.69   17.92      1.435  |       |   O   |    I  |       |
2.36
```

```
  2.500   45.90   22.69      1.817  |       |      O|       |      I|
2.45
  2.750   46.92   28.12      2.251  |       |       |  O    |       I
2.56
  3.000   19.79   29.32      2.346  |       |    I  |  O    |       |
2.59
  3.250    2.75   25.19      2.016  |I      |       |O      |       |
2.50
  3.500    0.00   19.74      1.580  I       |    O  |       |       |
2.39
  3.750    0.00   15.22      1.219  I       | O     |       |       |
2.30
  4.000    0.00   11.74      0.941  I       O       |       |       |
2.23
  4.250    0.00    9.05      0.726  I     O |       |       |       |
2.18
  4.500    0.00    6.98      0.560  I   O   |       |       |       |
2.14
  4.750    0.00    5.38      0.432  I  O    |       |       |       |
2.11
  5.000    0.00    4.15      0.334  I O     |       |       |       |
2.08
  5.250    0.00    3.20      0.258  I O     |       |       |       |
2.06
  5.500    0.00    2.47      0.199  IO      |       |       |       |
2.05
  5.750    0.00    1.90      0.154  IO      |       |       |       |
2.04
  6.000    0.00    1.47      0.119  IO      |       |       |       |
2.03
  6.250    0.00    1.13      0.092  O       |       |       |       |
2.02
  6.500    0.00    0.87      0.072  O       |       |       |       |
2.02
  6.750    0.00    0.67      0.056  O       |       |       |       |
2.01
  7.000    0.00    0.52      0.043  O       |       |       |       |
2.01
  7.250    0.00    0.40      0.034  O       |       |       |       |
2.01
  7.500    0.00    0.31      0.027  O       |       |       |       |
2.01
  7.750    0.00    0.24      0.021  O       |       |       |       |
2.00
  8.000    0.00    0.18      0.017  O       |       |       |       |
2.00
  8.250    0.00    0.14      0.013  O       |       |       |       |
2.00
  8.500    0.00    0.11      0.011  O       |       |       |       |
2.00
  8.750    0.00    0.08      0.009  O       |       |       |       |
2.00
  9.000    0.00    0.06      0.007  O       |       |       |       |
2.00
```

```
  9.250    0.00    0.05      0.006  O       |       |       |       |
2.00
  9.500    0.00    0.04      0.005  O       |       |       |       |
2.00
  9.750    0.00    0.03      0.004  O       |       |       |       |
2.00
 10.000    0.00    0.02      0.004  O       |       |       |       |
2.00
 10.250    0.00    0.02      0.003  O       |       |       |       |
2.00
 10.500    0.00    0.01      0.003  O       |       |       |       |
2.00
 10.750    0.00    0.01      0.003  O       |       |       |       |
2.00
 11.000    0.00    0.01      0.003  O       |       |       |       |
2.00
 11.250    0.00    0.01      0.002  O       |       |       |       |
2.00
 11.500    0.00    0.00      0.002  O       |       |       |       |
2.00
 11.750    0.00    0.00      0.002  O       |       |       |       |
2.00
 12.000    0.00    0.00      0.002  O       |       |       |       |
2.00
 12.250    0.00    0.00      0.002  O       |       |       |       |
2.00
 12.500    0.00    0.00      0.002  O       |       |       |       |
2.00
 12.750    0.00    0.00      0.002  O       |       |       |       |
2.00
 13.000    0.00    0.00      0.002  O       |       |       |       |
2.00
 13.250    0.00    0.00      0.002  O       |       |       |       |
1.98


      Remaining water in basin =    0.00 (Ac.Ft)


      ****************************HYDROGRAPH
DATA***************************
                 Number of intervals =    53
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =       29.319 (CFS)
                 Total volume =       5.578 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****
```

```
      ----------------------------------------------------------------
-

      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station        1.000 to Point/Station
2.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ________________________________________________________________
___
      Current stream hydrograph saved in file lineF3hrBsnF3.rte
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =     0
                 Time interval =    0.0 (Min.)
                 Maximum/Peak flow rate =        0.000 (CFS)
                 Total volume =       0.000 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ****************************************************************
****

      ----------------------------------------------------------------
-
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/27/12 File: OffsiteF13100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed F, Offsite F1
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      17.50(Ac.)  =      0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      17.50(Ac.)  =      0.027 Sq. Mi.
Length along longest watercourse =    1610.00(Ft.)
Length along longest watercourse measured to centroid =     650.00(Ft.)
Length along longest watercourse =      0.305 Mi.
Length along longest watercourse measured to centroid =      0.123 Mi.
Difference in elevation =     139.00(Ft.)
Slope along watercourse =    455.8509 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.50           0.85                 14.88

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.50           1.90                 33.25

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     2.200           46.00         0.000
     2.900           66.00         0.000
```

```
          12.400           83.00         0.000
       Total Area Entered =     17.50(Ac.)


      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      46.0  46.0      0.611     0.000        0.611       0.126      0.077
      66.0  66.0      0.405     0.000        0.405       0.166      0.067
      83.0  83.0      0.210     0.000        0.210       0.709      0.149
                                                        Sum (F) =   0.293
      Area averaged mean soil loss (F) (In/Hr) =  0.293
      Minimum soil loss rate ((In/Hr)) =  0.146
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ---------------------------------------------------------------------

                    U n i t  H y d r o g r a p h
                           FOOTHILL S-Curve
      ---------------------------------------------------------------------
                    Unit Hydrograph Data
      ---------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                           Graph %            (CFS)
      ---------------------------------------------------------------------
          1   0.250        386.798         66.248             11.684
          2   0.500        773.597         33.752              5.953
                                     Sum = 100.000   Sum=      17.637
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281       (  0.293)       0.253        0.028
   2   0.50     4.80      0.365          0.293    (  0.328)        0.072
   3   0.75     5.10      0.388          0.293    (  0.349)        0.095
   4   1.00     4.90      0.372          0.293    (  0.335)        0.080
   5   1.25     6.60      0.502          0.293    (  0.451)        0.209
   6   1.50     7.30      0.555          0.293    (  0.499)        0.262
   7   1.75     8.40      0.638          0.293    (  0.575)        0.346
   8   2.00     9.00      0.684          0.293    (  0.616)        0.391
   9   2.25    12.30      0.935          0.293    (  0.841)        0.642
  10   2.50    17.60      1.337          0.293    (  1.204)        1.045
  11   2.75    16.10      1.224          0.293    (  1.101)        0.931
  12   3.00     4.20      0.319       (  0.293)       0.287        0.032
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.1
       Flood volume = Effective rainfall      1.03(In)
        times area      17.5(Ac.)/[(In)/(Ft.)] =       1.5(Ac.Ft)
       Total soil loss =      0.87(In)
       Total soil loss =     1.264(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =       65632.1 Cubic Feet
       Total soil loss =       55056.2 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     17.105(CFS)
       ---------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ---------------------------------------------------------------------
    0+15       0.0068      0.33  Q         |         |         |         |
    0+30       0.0277      1.01  V Q       |         |         |         |
    0+45       0.0595      1.54  |V Q      |         |         |         |
```

```
   1+ 0       0.0904      1.50  | Q       |         |         |         |
   1+15       0.1507      2.92  |   VQ    |         |         |         |
   1+30       0.2397      4.31  |     V Q |         |         |         |
   1+45       0.3555      5.60  |        V|Q        |         |         |
   2+ 0       0.4925      6.63  |            Q      |         |         |
   2+15       0.6957      9.84  |         |       VQ|         |         |
   2+30       1.0271     16.04  |         |         |      V  | Q       |
   2+45       1.3805     17.10  |         |         |            Q V   |
   3+ 0       1.5028      5.92  |         |Q        |         |        V|
   3+15       1.5067      0.19  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed F, Offsite F2
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      54.70(Ac.)  =      0.085 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      54.70(Ac.)  =      0.085 Sq. Mi.
Length along longest watercourse =    3200.00(Ft.)
Length along longest watercourse measured to centroid =    1700.00(Ft.)
Length along longest watercourse =      0.606 Mi.
Length along longest watercourse measured to centroid =      0.322 Mi.
Difference in elevation =     330.00(Ft.)
Slope along watercourse =    544.5000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.117 Hr.
Lag time =     7.01 Min.
25% of lag time =     1.75 Min.
40% of lag time =     2.81 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       54.70           0.85                 46.50

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       54.70           1.90                103.93

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     4.000           46.00         0.000
     9.300           66.00         0.000
```

```
    41.400          83.00         0.000
 Total Area Entered =     54.70(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
46.0  46.0      0.611     0.000        0.611       0.073      0.045
66.0  66.0      0.405     0.000        0.405       0.170      0.069
83.0  83.0      0.210     0.000        0.210       0.757      0.159
                                                  Sum (F) =   0.272
Area averaged mean soil loss (F) (In/Hr) =  0.272
Minimum soil loss rate ((In/Hr)) =  0.136
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     FOOTHILL S-Curve
--------------------------------------------------------------------
              Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        213.856         44.943             24.776
    2   0.500        427.712         48.675             26.833
    3   0.750        641.568          5.562              3.066
    4   1.000        855.424          0.820              0.452
                                Sum = 100.000   Sum=      55.127
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281       (  0.272)       0.253        0.028
   2   0.50     4.80      0.365          0.272    (  0.328)        0.092
   3   0.75     5.10      0.388          0.272    (  0.349)        0.115
   4   1.00     4.90      0.372          0.272    (  0.335)        0.100
   5   1.25     6.60      0.501          0.272    (  0.451)        0.229
   6   1.50     7.30      0.555          0.272    (  0.499)        0.282
   7   1.75     8.40      0.638          0.272    (  0.574)        0.366
   8   2.00     9.00      0.684          0.272    (  0.615)        0.411
   9   2.25    12.30      0.935          0.272    (  0.841)        0.662
  10   2.50    17.60      1.337          0.272    (  1.204)        1.065
  11   2.75    16.10      1.223          0.272    (  1.101)        0.951
  12   3.00     4.20      0.319          0.272    (  0.287)        0.047
               (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.3
       Flood volume = Effective rainfall      1.09(In)
        times area      54.7(Ac.)/[(In)/(Ft.)] =       5.0(Ac.Ft)
       Total soil loss =      0.81(In)
       Total soil loss =     3.703(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      215887.6 Cubic Feet
       Total soil loss =      161288.0 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =     54.380(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
       --------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       --------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
  ----------------------------------------------------------------------
    0+15       0.0144      0.70  Q         |         |         |         |
```

```
    0+30       0.0773      3.04  V Q       |         |         |         |
    0+45       0.1893      5.42   V Q      |         |         |         |
    1+ 0       0.3104      5.86  | VQ      |         |         |         |
    1+15       0.4913      8.76  |  V Q    |         |         |         |
    1+30       0.7704     13.51  |     V  Q|         |         |         |
    1+45       1.1298     17.40  |        V|Q        |         |         |
    2+ 0       1.5636     20.99  |           VQ      |         |         |
    2+15       2.1568     28.71  |         |      V Q|         |         |
    2+30       3.0990     45.60  |         |         |    V    Q         |
    2+45       4.2225     54.38  |         |         |         |   V Q   |
    3+ 0       4.8477     30.26  |         |         Q         |        V|
    3+15       4.9438      4.65  |  Q      |         |         |        V|
    3+30       4.9557      0.57  Q         |         |         |        V|
    3+45       4.9561      0.02  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/27/12 File: OffsiteF33100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed F, Offsite F3
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =     146.60(Ac.)  =      0.229 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     146.60(Ac.)  =      0.229 Sq. Mi.
Length along longest watercourse =    5600.00(Ft.)
Length along longest watercourse measured to centroid =    3020.00(Ft.)
Length along longest watercourse =      1.061 Mi.
Length along longest watercourse measured to centroid =      0.572 Mi.
Difference in elevation =     408.00(Ft.)
Slope along watercourse =    384.6857 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.192 Hr.
Lag time =    11.53 Min.
25% of lag time =     2.88 Min.
40% of lag time =     4.61 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      146.60           0.85                 124.61

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      146.60           1.90                 278.54

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    15.100           46.00         0.000
    11.500           66.00         0.000
```

```
   120.000          83.00         0.000
 Total Area Entered =    146.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
46.0  46.0      0.611     0.000        0.611       0.103      0.063
66.0  66.0      0.405     0.000        0.405       0.078      0.032
83.0  83.0      0.210     0.000        0.210       0.819      0.172
                                                  Sum (F) =   0.266
Area averaged mean soil loss (F) (In/Hr) =  0.266
Minimum soil loss rate ((In/Hr)) =  0.133
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
--------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
--------------------------------------------------------------------
    1   0.250        130.096         24.683             36.468
    2   0.500        260.193         55.636             82.200
    3   0.750        390.289         14.262             21.072
    4   1.000        520.386          3.932              5.809
    5   1.250        650.482          1.037              1.532
    6   1.500        780.579          0.449              0.663
                                Sum = 100.000   Sum=     147.745
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281       (  0.266)       0.253        0.028
   2   0.50     4.80      0.365          0.266    (  0.328)        0.098
   3   0.75     5.10      0.387          0.266    (  0.349)        0.121
   4   1.00     4.90      0.372          0.266    (  0.335)        0.106
   5   1.25     6.60      0.501          0.266    (  0.451)        0.235
   6   1.50     7.30      0.554          0.266    (  0.499)        0.288
   7   1.75     8.40      0.638          0.266    (  0.574)        0.372
   8   2.00     9.00      0.684          0.266    (  0.615)        0.417
   9   2.25    12.30      0.934          0.266    (  0.841)        0.668
  10   2.50    17.60      1.337          0.266    (  1.203)        1.070
  11   2.75    16.10      1.223          0.266    (  1.101)        0.956
  12   3.00     4.20      0.319          0.266    (  0.287)        0.053
                (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.4
       Flood volume = Effective rainfall      1.10(In)
        times area     146.6(Ac.)/[(In)/(Ft.)] =      13.5(Ac.Ft)
       Total soil loss =      0.80(In)
       Total soil loss =     9.725(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      586838.1 Cubic Feet
       Total soil loss =      423613.6 Cubic Feet
       --------------------------------------------------------------------
        Peak flow rate of this hydrograph =    140.178(CFS)
       --------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
       --------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

       --------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
```

```
 ---------------------------------------------------------------------
  0+15       0.0212      1.03  Q         |         |         |         |
  0+30       0.1429      5.89  VQ        |         |         |         |
  0+45       0.4129     13.07   VQ       |         |         |         |
  1+ 0       0.7441     16.03  | VQ      |         |         |         |
  1+15       1.1660     20.42  |  VQ     |         |         |         |
  1+30       1.8462     32.92  |    VQ   |         |         |         |
  1+45       2.7357     43.05  |       Q |         |         |         |
  2+ 0       3.8401     53.45  |         QV        |         |         |
  2+15       5.2575     68.60  |         |  Q V    |         |         |
  2+30       7.4376    105.52  |         |         |QV       |         |
  2+45      10.3338    140.18  |         |         |       Q V         |
  3+ 0      12.5631    107.90  |         |         |Q        |      V  |
  3+15      13.2244     32.00  |     Q   |         |         |        V|
  3+30      13.4052      8.75  |Q        |         |         |        V|
  3+45      13.4565      2.48  Q         |         |         |        V|
  4+ 0      13.4712      0.72  Q         |         |         |        V|
  4+15      13.4719      0.03  Q         |         |         |         V
---------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed F, Offsite F4
Proposed Condition
100-year, 3-hour

--------------------------------------------------------------------
Drainage Area =      69.50(Ac.)  =      0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      69.50(Ac.)  =      0.109 Sq. Mi.
Length along longest watercourse =    3750.00(Ft.)
Length along longest watercourse measured to centroid =    1820.00(Ft.)
Length along longest watercourse =      0.710 Mi.
Length along longest watercourse measured to centroid =      0.345 Mi.
Difference in elevation =     285.00(Ft.)
Slope along watercourse =    401.2800 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.135 Hr.
Lag time =     8.10 Min.
25% of lag time =     2.03 Min.
40% of lag time =     3.24 Min.
Unit time =    15.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       69.50           0.85                 59.07

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       69.50           1.90                132.05

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     5.300           46.00         0.000
    14.300           66.00         0.000
```

```
    49.900          83.00         0.000
 Total Area Entered =     69.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
46.0  46.0      0.611     0.000        0.611       0.076      0.047
66.0  66.0      0.405     0.000        0.405       0.206      0.083
83.0  83.0      0.210     0.000        0.210       0.718      0.151
                                                  Sum (F) =   0.281
Area averaged mean soil loss (F) (In/Hr) =  0.281
Minimum soil loss rate ((In/Hr)) =  0.140
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        185.142         39.169             27.435
    2   0.500        370.284         51.389             35.994
    3   0.750        555.426          7.965              5.579
    4   1.000        740.569          1.478              1.035
                                Sum = 100.000   Sum=      70.043
-----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281       (  0.281)       0.253        0.028
   2   0.50     4.80      0.365          0.281    (  0.328)        0.084
   3   0.75     5.10      0.387          0.281    (  0.349)        0.107
   4   1.00     4.90      0.372          0.281    (  0.335)        0.092
   5   1.25     6.60      0.501          0.281    (  0.451)        0.221
   6   1.50     7.30      0.555          0.281    (  0.499)        0.274
   7   1.75     8.40      0.638          0.281    (  0.574)        0.358
   8   2.00     9.00      0.684          0.281    (  0.615)        0.403
   9   2.25    12.30      0.935          0.281    (  0.841)        0.654
  10   2.50    17.60      1.337          0.281    (  1.203)        1.057
  11   2.75    16.10      1.223          0.281    (  1.101)        0.943
  12   3.00     4.20      0.319          0.281    (  0.287)        0.038
               (Loss Rate Not Used)
     Sum =     100.0                                   Sum =     4.3
       Flood volume = Effective rainfall      1.06(In)
        times area      69.5(Ac.)/[(In)/(Ft.)] =       6.2(Ac.Ft)
       Total soil loss =      0.83(In)
       Total soil loss =     4.836(Ac.Ft)
       Total rainfall =      1.90(In)
       Flood volume =      268552.4 Cubic Feet
       Total soil loss =      210643.3 Cubic Feet
       ---------------------------------------------------------------
        Peak flow rate of this hydrograph =     67.992(CFS)
       ---------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------
                   Hydrograph in  15   Minute intervals ((CFS))

       ---------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
  ---------------------------------------------------------------------
    0+15       0.0159      0.77  Q         |         |         |         |
```

```
    0+30       0.0845      3.32  VQ        |         |         |         |
    0+45       0.2109      6.12   V Q      |         |         |         |
    1+ 0       0.3528      6.86  | VQ      |         |         |         |
    1+15       0.5603     10.05  |  V Q    |         |         |         |
    1+30       0.8929     16.10  |    V   Q|         |         |         |
    1+45       1.3270     21.01  |       V | Q       |         |         |
    2+ 0       1.8581     25.70  |           V Q     |         |         |
    2+15       2.5760     34.75  |         |     V  Q|         |         |
    2+30       3.7159     55.17  |         |         |   V     |Q        |
    2+45       5.1207     67.99  |         |         |           V    Q |
    3+ 0       5.9797     41.58  |         |         |  Q      |       V |
    3+15       6.1397      7.74  |   Q     |         |         |        V|
    3+30       6.1643      1.19  Q         |         |         |        V|
    3+45       6.1651      0.04  Q         |         |         |         V
-----------------------------------------------------------------------
```

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          U n i t   H y d r o g r a p h   A n a l y s i s

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     Riverside County Synthetic Unit Hydrology Method
     RCFC & WCD Manual date - April 1978


     Program License Serial Number 6097

     ----------------------------------------------------------------------
--
      English (in-lb) Input Units Used
      English Rainfall Data (Inches) Input Values Used

      English Units used in output format



     ----------------------------------------------------------------------
--
     Watershed F, Subarea F1
     Proposed Condition
     100-year, 3-hour

     ----------------------------------------------------------------------
-
     Drainage Area =      81.47(Ac.)  =      0.127 Sq. Mi.
     Drainage Area for Depth-Area Areal Adjustment =      81.47(Ac.)  =
0.127 Sq. Mi.
     Length along longest watercourse =    1200.00(Ft.)
     Length along longest watercourse measured to centroid =
600.00(Ft.)
     Length along longest watercourse =      0.227 Mi.
     Length along longest watercourse measured to centroid =      0.114
Mi.
     Difference in elevation =      24.00(Ft.)
     Slope along watercourse =    105.6000 Ft./Mi.
     Average Manning's 'N' = 0.015
     Lag time =    0.037 Hr.
     Lag time =     2.22 Min.
     25% of lag time =     0.56 Min.
     40% of lag time =     0.89 Min.
     Unit time =    15.00 Min.
     Duration of storm = 3 Hour(s)
     User Entered Base Flow =     0.00(CFS)
```

```
2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       81.47             0.85                  69.25

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       81.47             1.90                 154.79

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    81.470           85.00         0.750
 Total Area Entered =     81.47(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)
(In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                     Sum (F) =
0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-----------------------------------------------------------------
--

            U n i t  H y d r o g r a p h
                  VALLEY S-Curve
-----------------------------------------------------------------
-
            Unit Hydrograph Data
-----------------------------------------------------------------
--
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------
--
    1   0.250        675.381         77.819             63.894
    2   0.500       1350.763         22.181             18.212
                                Sum = 100.000   Sum=      82.106
```

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.061	(0.084)	0.220
2	0.50	4.80	0.365	0.061	(0.109)	0.304
3	0.75	5.10	0.387	0.061	(0.116)	0.327
4	1.00	4.90	0.372	0.061	(0.112)	0.311
5	1.25	6.60	0.501	0.061	(0.150)	0.441
6	1.50	7.30	0.555	0.061	(0.166)	0.494
7	1.75	8.40	0.638	0.061	(0.191)	0.577
8	2.00	9.00	0.684	0.061	(0.205)	0.623
9	2.25	12.30	0.934	0.061	(0.280)	0.874
10	2.50	17.60	1.337	0.061	(0.401)	1.276
11	2.75	16.10	1.223	0.061	(0.367)	1.162
12	3.00	4.20	0.319	0.061	(0.096)	0.258

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.9

Flood volume = Effective rainfall 1.72(In)
times area 81.5(Ac.)/[(In)/(Ft.)] = 11.7(Ac.Ft)
Total soil loss = 0.18(In)
Total soil loss = 1.238(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 507778.2 Cubic Feet
Total soil loss = 53920.1 Cubic Feet

Peak flow rate of this hydrograph = 97.566(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       25.0      50.0      75.0
100.0
  ----------------------------------------------------------------------
    0+15       0.2910     14.08  V    Q    |         |         |
|
    0+30       0.7753     23.44  | V      Q|         |         |
|
```

```
    0+45       1.3212     26.42  |   V     Q         |         |
|
    1+ 0       1.8557     25.87  |     V   Q         |         |
|
    1+15       2.5549     33.85  |       V |  Q      |         |
|
    1+30       3.3731     39.60  |          V   Q    |         |
|
    1+45       4.3216     45.91  |         |   V   Q |         |
|
    2+ 0       5.3619     50.35  |         |       V Q         |
|
    2+15       6.7504     67.20  |         |         |  V  Q   |
|
    2+30       8.7651     97.51  |         |         |         V
Q|
    2+45      10.7809     97.57  |         |         |         |     V
Q|
    3+ 0      11.5597     37.69  |         |    Q    |         |
V|
    3+15      11.6570      4.71  |Q        |         |         |
V
-----------------------------------------------------------------------
```

```
          U n i t   H y d r o g r a p h   A n a l y s i s

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     ----------------------------------------------------------------------
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     Riverside County Synthetic Unit Hydrology Method
     RCFC & WCD Manual date - April 1978


     Program License Serial Number 6097

     ----------------------------------------------------------------------
--
      English (in-lb) Input Units Used
      English Rainfall Data (Inches) Input Values Used

      English Units used in output format



     ----------------------------------------------------------------------
--
     Watershed F, Subarea F2
     Proposed Condition
     100-year, 3-hour

     ----------------------------------------------------------------------
-
     Drainage Area =      88.69(Ac.)  =      0.139 Sq. Mi.
     Drainage Area for Depth-Area Areal Adjustment =      88.69(Ac.)  =
0.139 Sq. Mi.
     Length along longest watercourse =    1200.00(Ft.)
     Length along longest watercourse measured to centroid =
600.00(Ft.)
     Length along longest watercourse =      0.227 Mi.
     Length along longest watercourse measured to centroid =      0.114
Mi.
     Difference in elevation =      24.00(Ft.)
     Slope along watercourse =    105.6000 Ft./Mi.
     Average Manning's 'N' = 0.015
     Lag time =    0.037 Hr.
     Lag time =     2.22 Min.
     25% of lag time =     0.56 Min.
     40% of lag time =     0.89 Min.
     Unit time =    15.00 Min.
     Duration of storm = 3 Hour(s)
     User Entered Base Flow =     0.00(CFS)
```

```
2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       88.69             0.85                  75.39

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       88.69             1.90                 168.51

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    88.690           85.00         0.750
 Total Area Entered =     88.69(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)
(In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                     Sum (F) =
0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-------------------------------------------------------------------
--

            U n i t  H y d r o g r a p h
                  VALLEY S-Curve
-------------------------------------------------------------------
-
            Unit Hydrograph Data
-------------------------------------------------------------------
--
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
--
    1   0.250        675.381         77.819             69.557
    2   0.500       1350.763         22.181             19.826
                                Sum = 100.000   Sum=      89.383
```

```
----------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum
calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective
Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     3.70      0.281          0.061    (  0.084)        0.220
   2   0.50     4.80      0.365          0.061    (  0.109)        0.304
   3   0.75     5.10      0.387          0.061    (  0.116)        0.327
   4   1.00     4.90      0.372          0.061    (  0.112)        0.311
   5   1.25     6.60      0.501          0.061    (  0.150)        0.441
   6   1.50     7.30      0.555          0.061    (  0.166)        0.494
   7   1.75     8.40      0.638          0.061    (  0.191)        0.577
   8   2.00     9.00      0.684          0.061    (  0.205)        0.623
   9   2.25    12.30      0.934          0.061    (  0.280)        0.874
  10   2.50    17.60      1.337          0.061    (  0.401)        1.276
  11   2.75    16.10      1.223          0.061    (  0.367)        1.162
  12   3.00     4.20      0.319          0.061    (  0.096)        0.258
            (Loss Rate Not Used)
     Sum =     100.0                                    Sum =     6.9
      Flood volume = Effective rainfall      1.72(In)
       times area      88.7(Ac.)/[(In)/(Ft.)] =      12.7(Ac.Ft)
      Total soil loss =      0.18(In)
      Total soil loss =     1.348(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =      552759.0 Cubic Feet
      Total soil loss =       58698.6 Cubic Feet
      ---------------------------------------------------------------------
-
       Peak flow rate of this hydrograph =    106.208(CFS)
      ---------------------------------------------------------------------
-
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
-
                    Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0
200.0
  ---------------------------------------------------------------------
    0+15       0.3168     15.33  V  Q      |         |         |
|
    0+30       0.8440     25.52  | V  Q    |         |         |
|
```

```
    0+45       1.4383     28.76  |   VQ    |         |         |
|
    1+ 0       2.0200     28.16  |    QV   |         |         |
|
    1+15       2.7813     36.84  |      QV |         |         |
|
    1+30       3.6719     43.11  |       Q  V        |         |
|
    1+45       4.7045     49.98  |        Q|   V     |         |
|
    2+ 0       5.8368     54.81  |         Q       V |         |
|
    2+15       7.3483     73.16  |         |   Q     |  V      |
|
    2+30       9.5416    106.15  |         |         |Q        V
|
    2+45      11.7360    106.21  |         |         |Q        |     V
|
    3+ 0      12.5837     41.03  |       Q |         |         |
V|
    3+15      12.6896      5.12  |Q        |         |         |
V|
-----------------------------------------------------------------------
```

```
          U n i t   H y d r o g r a p h   A n a l y s i s

          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/27/12 File: SubF33100.out


     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++
     ----------------------------------------------------------------------
-----

     Riverside County Synthetic Unit Hydrology Method
     RCFC & WCD Manual date - April 1978


     Program License Serial Number 6097

     ----------------------------------------------------------------------
--
      English (in-lb) Input Units Used
      English Rainfall Data (Inches) Input Values Used

      English Units used in output format



     ----------------------------------------------------------------------
--
     Watershed F, Subarea F3
     Proposed Condition
     100-year, 3-hour

     ----------------------------------------------------------------------
-
     Drainage Area =      38.99(Ac.)  =      0.061 Sq. Mi.
     Drainage Area for Depth-Area Areal Adjustment =      38.99(Ac.)  =
0.061 Sq. Mi.
     Length along longest watercourse =    1600.00(Ft.)
     Length along longest watercourse measured to centroid =
800.00(Ft.)
     Length along longest watercourse =      0.303 Mi.
     Length along longest watercourse measured to centroid =      0.152
Mi.
     Difference in elevation =      32.00(Ft.)
     Slope along watercourse =    105.6000 Ft./Mi.
     Average Manning's 'N' = 0.015
     Lag time =    0.046 Hr.
     Lag time =     2.76 Min.
     25% of lag time =     0.69 Min.
     40% of lag time =     1.11 Min.
     Unit time =    15.00 Min.
     Duration of storm = 3 Hour(s)
     User Entered Base Flow =     0.00(CFS)
```

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
38.99	0.85	33.14

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
38.99	1.90	74.08

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 1.900(In)

Point rain (area averaged) = 1.900(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.900(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
38.990	85.00	0.750

Total Area Entered = 38.99(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	542.745	72.919	28.653
2	0.500	1085.490	27.081	10.641
			Sum = 100.000	Sum= 39.295

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	3.70	0.281	0.061	(0.084)	0.220
2	0.50	4.80	0.365	0.061	(0.109)	0.304
3	0.75	5.10	0.388	0.061	(0.116)	0.327
4	1.00	4.90	0.372	0.061	(0.112)	0.312
5	1.25	6.60	0.502	0.061	(0.150)	0.441
6	1.50	7.30	0.555	0.061	(0.166)	0.494
7	1.75	8.40	0.638	0.061	(0.191)	0.578
8	2.00	9.00	0.684	0.061	(0.205)	0.623
9	2.25	12.30	0.935	0.061	(0.280)	0.874
10	2.50	17.60	1.337	0.061	(0.401)	1.277
11	2.75	16.10	1.223	0.061	(0.367)	1.163
12	3.00	4.20	0.319	0.061	(0.096)	0.258

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.9

Flood volume = Effective rainfall 1.72(In)
times area 39.0(Ac.)/[(In)/(Ft.)] = 5.6(Ac.Ft)
Total soil loss = 0.18(In)
Total soil loss = 0.592(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 243063.0 Cubic Feet
Total soil loss = 25805.1 Cubic Feet

Peak flow rate of this hydrograph = 46.922(CFS)

++

3 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

```
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5
50.0
  ----------------------------------------------------------------------
    0+15       0.1305      6.32  V    Q    |         |         |
|
    0+30       0.3591     11.06  | V     Q |         |         |
|
```

```
    0+45       0.6195     12.60  |   V     Q         |         |
|
    1+ 0       0.8759     12.41  |     V  Q|         |         |
|
    1+15       1.2055     15.95  |       V | Q       |         |
|
    1+30       1.5950     18.85  |          V   Q    |         |
|
    1+45       2.0457     21.82  |         |   V  Q  |         |
|
    2+ 0       2.5418     24.01  |         |       VQ|         |
|
    2+15       3.1965     31.69  |         |         | V  Q    |
|
    2+30       4.1449     45.90  |         |         |        V|     Q
|
    2+45       5.1143     46.92  |         |         |         |     VQ
|
    3+ 0       5.5231     19.79  |         |    Q    |         |
V|
    3+15       5.5800      2.75  | Q       |         |         |
V|
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

------------------------------------------------------------------


Line A Routed
Proposed Conditions
100 Yr. 24 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: LineAoffsite24100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =   107
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      804.474 (CFS)
               Total volume =     387.592 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        1.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   2650.00 (Ft.)
Elevation difference =   50.00 (Ft.)
Slope of channel =  0.018868 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  2650.00(Ft.)     Elevation difference =  50.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    268.957(CFS)
Depth of flow =     1.507(Ft.)
Average velocity =    15.504(Ft/s)
Total flow rate =   268.957(CFS)
Channel flow top width =   13.015(Ft.)
Depth of flow in channel =   1.51(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   15.50(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  268.957(CFS)
Total capacity of improved channels =    268.957(CFS)
Critical Depth in Channel =    2.56(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    804.474(CFS)
```

```
Depth of flow =     2.862(Ft.)
Average velocity =    21.850(Ft/s)
Total flow rate =   804.474(CFS)
Channel flow top width =   15.725(Ft.)
Depth of flow in channel =   2.86(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   21.85(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  804.474(CFS)
Total capacity of improved channels =    804.474(CFS)
Critical Depth in Channel =    4.94(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9278   Travel time =   2.02 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   5.6653
       dt(routing time-step) =   1.88 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      201.1     402.2     603.4     804.5
----------------------------------------------------------------------
  0+15       0.6669      0.76  O         |         |         |         |
  0+30       4.9101      5.50  O         |         |         |         |
  0+45      11.2124     12.03  O         |         |         |         |
  1+ 0      15.6497     16.17  O         |         |         |         |
  1+15      19.2322     19.67  O         |         |         |         |
  1+30      20.5363     20.66  |O        |         |         |         |
  1+45      19.9379     19.83  O         |         |         |         |
  2+ 0      20.0930     20.13  OI        |         |         |         |
  2+15      21.9824     22.25  |O        |         |         |         |
  2+30      24.1158     24.38  |O        |         |         |         |
  2+45      25.3919     25.54  |O        |         |         |         |
  3+ 0      27.8560     28.19  |O        |         |         |         |
  3+15      30.3272     30.63  |O        |         |         |         |
  3+30      31.4432     31.56  |O        |         |         |         |
  3+45      31.9953     32.06  |O        |         |         |         |
  4+ 0      32.6506     32.74  |O        |         |         |         |
  4+15      34.7919     35.09  |O        |         |         |         |
  4+30      37.3850     37.71  |O        |         |         |         |
  4+45      40.3513     40.73  | O       |         |         |         |
  5+ 0      43.3866     43.77  | O       |         |         |         |
  5+15      45.9540     46.27  | O       |         |         |         |
  5+30      45.2172     45.07  | O       |         |         |         |
  5+45      44.4831     44.40  | O       |         |         |         |
  6+ 0      47.3745     47.80  | O       |         |         |         |
  6+15      50.9368     51.39  | O       |         |         |         |
  6+30      58.2078     59.18  | O       |         |         |         |
  6+45      67.9353     69.19  |  O      |         |         |         |
  7+ 0      81.9530     83.78  |   O     |         |         |         |
  7+15      95.6993     97.40  |   O     |         |         |         |
  7+30     104.8938    105.96  |    O    |         |         |         |
  7+45     120.4986    122.58  |    OI   |         |         |         |
  8+ 0     144.8086    147.99  |      O  |         |         |         |
  8+15     174.3200    178.08  |       O |         |         |         |
  8+30     211.4791    216.25  |         O         |         |         |
  8+45     243.4235    247.31  |         | O       |         |         |
  9+ 0     269.5154    272.69  |         |  O      |         |         |
  9+15     300.7081    304.71  |         |   OI    |         |         |
```

9+30	340.5577	345.68			OI		
9+45	381.7877	386.95			OI		
10+ 0	417.7841	422.19			O	
10+15	439.8467	442.37				O	
10+30	400.5810	394.61			O		
10+45	351.4088	345.24			O		
11+ 0	372.6981	376.62			O		
11+15	409.9058	414.66			O		
11+30	417.4182	417.81			O		
11+45	413.8179	413.25			O		
12+ 0	400.4319	398.60			O		
12+15	402.7592	403.35			O		
12+30	469.0745	478.47				O	
12+45	551.6254	562.08				O	
13+ 0	613.2411	620.55				O	
13+15	671.9200	679.26					O	
13+30	748.8506	758.79					O	
13+45	798.7631	804.47					OI
14+ 0	732.5240	722.24					IO	
14+15	647.3551	636.65					IO	
14+30	644.1442	645.21					O	
14+45	656.8406	658.50					O	
15+ 0	652.5055	651.65					O	
15+15	641.9412	640.55					O	
15+30	624.1428	621.80				IO	
15+45	596.9505	593.40				O		
16+ 0	545.8805	539.09				IO	
16+15	477.5360	468.74				O	
16+30	328.5604	308.53			IO		
16+45	175.0991	156.03		IO			
17+ 0	103.7426	96.27		IO			
17+15	66.9766	62.79		O			
17+30	53.4442	52.11		O			
17+45	51.2153	51.09		O			
18+ 0	49.7507	49.56		O			
18+15	42.5083	41.50		O			
18+30	34.0821	33.02		O			
18+45	29.6974	29.22		O			
19+ 0	25.3349	24.78		O			
19+15	20.5980	20.00	IO				
19+30	19.4849	19.41	O				
19+45	22.5259	22.97		O			
20+ 0	22.6170	22.57		O			
20+15	19.1100	18.62	O				
20+30	18.1785	18.12	O				
20+45	19.0985	19.24	O				
21+ 0	19.0221	18.99	O				
21+15	17.4505	17.23	O				
21+30	16.9892	16.95	O				
21+45	16.6678	16.63	O				
22+ 0	16.6069	16.60	O				
22+15	16.3901	16.36	O				
22+30	16.4357	16.45	O				
22+45	15.9965	15.93	O				
23+ 0	14.4622	14.25	O				
23+15	13.8032	13.74	O				
23+30	13.4774	13.44	O				
23+45	13.2957	13.28	O				
24+ 0	13.1828	13.17	O				
24+15	12.4705	12.37	O				
24+30	8.5409	7.99	O				
24+45	4.1766	3.63	O				
25+ 0	2.2342	2.03	O				
25+15	1.2297	1.11	O				
25+30	0.6414	0.57	O				
25+45	0.3248	0.29	O				
26+ 0	0.1943	0.18	O				
26+15	0.1207	0.11	O				
26+30	0.0625	0.06	O				
26+45	0.0211	0.02	O				
27+ 0	0.0020	0.00	O				

```
  27+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   109
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      798.763 (CFS)
                      Total volume =     387.592 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        0.000 to Point/Station        1.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ___________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: SketcherRT.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      218.5     437.1     655.6     874.2
  ----------------------------------------------------------------------
    0+15       0.3586      1.03  Q         |         |         |         |
    0+30       1.4687      6.38  Q         |         |         |         |
    0+45       2.8202     14.03  Q         |         |         |         |
    1+ 0       4.0959     19.75  Q         |         |         |         |
    1+15       5.0837     24.32  qQ        |         |         |         |
    1+30       5.5589     26.10  qQ        |         |         |         |
    1+45       5.7435     25.68  qQ        |         |         |         |
    2+ 0       6.0390     26.13  qQ        |         |         |         |
    2+15       6.5566     28.54  qQ        |         |         |         |
    2+30       7.0460     31.16  qQ        |         |         |         |
    2+45       7.5845     32.98  qQ        |         |         |         |
    3+ 0       8.2619     36.12  qQ        |         |         |         |
    3+15       8.8563     39.18  qQ        |         |         |         |
    3+30       9.2684     40.71  qQ        |         |         |         |
    3+45       9.5393     41.53  qQ        |         |         |         |
    4+ 0       9.9129     42.56  qQ        |         |         |         |
    4+15      10.4818     45.27  q Q       |         |         |         |
    4+30      11.2004     48.59  q Q       |         |         |         |
    4+45      12.0175     52.37  q Q       |         |         |         |
    5+ 0      12.8992     56.29  q Q       |         |         |         |
    5+15      13.4326     59.39  q Q       |         |         |         |
    5+30      13.4812     58.70  q Q       |         |         |         |
    5+45      13.7549     58.24  q Q       |         |         |         |
    6+ 0      14.3648     61.74  q Q       |         |         |         |
    6+15      15.1316     66.07  q  Q      |         |         |         |
    6+30      15.9804     74.19  q  Q      |         |         |         |
    6+45      16.8830     84.82  q  Q      |         |         |         |
    7+ 0      17.8209     99.77  q   Q     |         |         |         |
    7+15      18.5867    114.29  q    Q    |         |         |         |
    7+30      19.3069    124.20  q    Q    |         |         |         |
    7+45      20.2992    140.80  q     Q   |         |         |         |
    8+ 0      21.6194    166.43  q      Q  |         |         |         |
    8+15      23.5229    197.84  |q       Q|         |         |         |
    8+30      25.8561    237.34  |q        Q         |         |         |
    8+45      28.1447    271.57  |q        | Q       |         |         |
    9+ 0      30.5016    300.02  |q        |  Q      |         |         |
    9+15      33.3378    334.05  |q        |    Q    |         |         |
    9+30      36.7018    377.26  |q        |      Q  |         |         |
    9+45      40.1635    421.95  |q        |        Q|         |         |
```

```
10+ 0      43.5062    461.29  |q        |         |Q        |         |
10+15      44.5060    484.35  | q       |         | Q       |         |
10+30      42.2245    442.81  |q        |         Q         |         |
10+45      40.7099    392.12  |q        |      Q  |         |         |
11+ 0      41.8608    414.56  |q        |       Q |         |         |
11+15      43.4531    453.36  |q        |         Q         |         |
11+30      44.2388    461.66  | q       |         |Q        |         |
11+45      44.0323    457.85  | q       |         Q         |         |
12+ 0      43.2694    443.70  |q        |         Q         |         |
12+15      44.8054    447.56  | q       |         Q         |         |
12+30      49.5268    518.60  | q       |         |  Q      |         |
12+45      55.2192    606.84  | q       |         |     Q   |         |
13+ 0      60.6362    673.88  | q       |         |        Q        |
13+15      66.5571    738.48  |  q      |         |         |  Q      |
13+30      73.0777    821.93  |  q      |         |         |     Q   |
13+45      75.4329    874.20  |  q      |         |         |       Q |
14+ 0      72.0959    804.62  |  q      |         |         |    Q    |
14+15      68.7179    716.07  |  q      |         |         | Q       |
14+30      67.7735    711.92  |  q      |         |         | Q       |
14+45      67.5848    724.43  |  q      |         |         |  Q      |
15+ 0      67.1312    719.64  |  q      |         |         | Q       |
15+15      66.1020    708.04  |  q      |         |         | Q       |
15+30      64.5112    688.65  | q       |         |         |Q        |
15+45      61.6824    658.63  | q       |         |        Q        |
16+ 0      57.7703    603.65  | q       |         |     Q   |         |
16+15      50.5160    528.05  | q       |         |   Q     |         |
16+30      39.3035    367.86  |q        |     Q   |         |         |
16+45      28.8171    203.92  |q       Q|         |         |         |
17+ 0      21.1831    124.93  q    Q    |         |         |         |
17+15      16.4061     83.38  q  Q      |         |         |         |
17+30      13.8909     67.34  q  Q      |         |         |         |
17+45      12.5357     63.75  q Q       |         |         |         |
18+ 0      11.4919     61.24  q Q       |         |         |         |
18+15      10.4823     52.99  q Q       |         |         |         |
18+30       9.6695     43.75  q Q       |         |         |         |
18+45       8.9183     38.62  qQ        |         |         |         |
19+ 0       7.9057     33.24  qQ        |         |         |         |
19+15       6.9630     27.56  qQ        |         |         |         |
19+30       6.6916     26.18  qQ        |         |         |         |
19+45       6.7689     29.29  qQ        |         |         |         |
20+ 0       6.4714     29.09  qQ        |         |         |         |
20+15       6.0200     25.13  qQ        |         |         |         |
20+30       5.8762     24.05  qQ        |         |         |         |
20+45       5.9095     25.01  qQ        |         |         |         |
21+ 0       5.7572     24.78  qQ        |         |         |         |
21+15       5.5292     22.98  qQ        |         |         |         |
21+30       5.3581     22.35  qQ        |         |         |         |
21+45       5.2456     21.91  qQ        |         |         |         |
22+ 0       5.1716     21.78  Q         |         |         |         |
22+15       5.1230     21.51  Q         |         |         |         |
22+30       5.0910     21.53  Q         |         |         |         |
22+45       4.8745     20.87  Q         |         |         |         |
23+ 0       4.6043     19.07  Q         |         |         |         |
23+15       4.4054     18.21  Q         |         |         |         |
23+30       4.2746     17.75  Q         |         |         |         |
23+45       4.1887     17.48  Q         |         |         |         |
24+ 0       4.1322     17.31  Q         |         |         |         |
24+15       3.7041     16.17  Q         |         |         |         |
24+30       2.7760     11.32  Q         |         |         |         |
24+45       1.8676      6.04  Q         |         |         |         |
25+ 0       1.2278      3.46  Q         |         |         |         |
25+15       0.8072      2.04  Q         |         |         |         |
25+30       0.5307      1.17  Q         |         |         |         |
25+45       0.3489      0.67  Q         |         |         |         |
26+ 0       0.2294      0.42  Q         |         |         |         |
26+15       0.1508      0.27  Q         |         |         |         |
26+30       0.0991      0.16  Q         |         |         |         |
26+45       0.0652      0.09  Q         |         |         |         |
27+ 0       0.0428      0.04  Q         |         |         |         |
27+15       0.0282      0.03  Q         |         |         |         |
27+30       0.0185      0.02  Q         |         |         |         |
```

```
   27+45       0.0122      0.01  Q         |         |         |         |
   28+ 0       0.0080      0.01  Q         |         |         |         |
   28+15       0.0053      0.01  Q         |         |         |         |
   28+30       0.0035      0.00  Q         |         |         |         |
   28+45       0.0023      0.00  Q         |         |         |         |
   29+ 0       0.0015      0.00  Q         |         |         |         |
   29+15       0.0010      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   117
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      874.196 (CFS)
                       Total volume =     435.559 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **************************************************************************

        ------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        1.000 to Point/Station        2.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   2650.00 (Ft.)
        Elevation difference =   50.00 (Ft.)
        Slope of channel =  0.018868 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  2650.00(Ft.)     Elevation difference =  50.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =   10.000(Ft.)
        Flow(q) thru subarea =    299.142(CFS)
        Depth of flow =     1.606(Ft.)
        Average velocity =    16.054(Ft/s)
        Total flow rate =   299.142(CFS)
        Channel flow top width =   13.211(Ft.)
        Depth of flow in channel =   1.61(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   16.05(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  299.142(CFS)
        Total capacity of improved channels =    299.142(CFS)
        Critical Depth in Channel =    2.75(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Covered channel
        Flow(q) thru subarea =    874.196(CFS)
        Depth of flow =     3.002(Ft.)
        Average velocity =    22.394(Ft/s)
        Total flow rate =   874.196(CFS)
        Channel flow top width =   16.005(Ft.)
        Depth of flow in channel =   3.00(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   22.39(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  874.196(CFS)
        Total capacity of improved channels =    874.196(CFS)
        Critical Depth in Channel =    5.19(Ft.)
```

```
********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9294   Travel time =   1.97 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   5.7885
       dt(routing time-step) =   1.83 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      218.5     437.1     655.6     874.2
----------------------------------------------------------------------
  0+15       0.9002      1.03  O         |         |         |         |
  0+30       5.7246      6.38  O         |         |         |         |
  0+45      13.0972     14.03  O         |         |         |         |
  1+ 0      19.0474     19.75  O         |         |         |         |
  1+15      23.7574     24.32  |O        |         |         |         |
  1+30      25.8778     26.10  |O        |         |         |         |
  1+45      25.7319     25.68  |O        |         |         |         |
  2+ 0      26.0769     26.13  |O        |         |         |         |
  2+15      28.2449     28.54  |O        |         |         |         |
  2+30      30.8413     31.16  |O        |         |         |         |
  2+45      32.7546     32.98  |O        |         |         |         |
  3+ 0      35.7340     36.12  |O        |         |         |         |
  3+15      38.8089     39.18  |O        |         |         |         |
  3+30      40.5249     40.71  |O        |         |         |         |
  3+45      41.4340     41.53  |O        |         |         |         |
  4+ 0      42.4378     42.56  |O        |         |         |         |
  4+15      44.9425     45.27  | O       |         |         |         |
  4+30      48.1807     48.59  | O       |         |         |         |
  4+45      51.9064     52.37  | O       |         |         |         |
  5+ 0      55.8071     56.29  | O       |         |         |         |
  5+15      59.0076     59.39  | O       |         |         |         |
  5+30      58.7825     58.70  | O       |         |         |         |
  5+45      58.2943     58.24  | O       |         |         |         |
  6+ 0      61.3114     61.74  | O       |         |         |         |
  6+15      65.5394     66.07  | OI      |         |         |         |
  6+30      73.1959     74.19  |  O      |         |         |         |
  6+45      83.5192     84.82  |  O      |         |         |         |
  7+ 0      97.9462     99.77  |   O     |         |         |         |
  7+15     112.5126    114.29  |    O    |         |         |         |
  7+30     122.9891    124.20  |    O    |         |         |         |
  7+45     138.7695    140.80  |     O   |         |         |         |
  8+ 0     163.2958    166.43  |      O  |         |         |         |
  8+15     194.0037    197.84  |       OI|         |         |         |
  8+30     232.5089    237.34  |         O         |         |         |
  8+45     267.3847    271.57  |         | O       |         |         |
  9+ 0     296.5403    300.02  |         |  O      |         |         |
  9+15     329.8873    334.05  |         |    O    |         |         |
  9+30     371.9784    377.26  |         |      O  |         |         |
  9+45     416.4895    421.95  |         |        O|         |         |
 10+ 0     456.4826    461.29  |         |         OI        |         |
 10+15     481.5343    484.35  |         |         | O       |         |
 10+30     447.8830    442.81  |         |         O         |         |
 10+45     398.3131    392.12  |         |      IO |         |         |
 11+ 0     411.8166    414.56  |         |       O |         |         |
 11+15     448.6172    453.36  |         |         O         |         |
 11+30     460.6429    461.66  |         |         |O        |         |
 11+45     458.3154    457.85  |         |         O         |         |
 12+ 0     445.4304    443.70  |         |         O         |         |
 12+15     447.0924    447.56  |         |         O         |         |
 12+30     509.9200    518.60  |         |         |  O      |         |
```

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  12+45     596.0606    606.84  |         |         |      O  |         |
  13+ 0     665.6853    673.88  |         |         |         O         |
  13+15     730.5825    738.48  |         |         |         |  O      |
  13+30     811.7298    821.93  |         |         |         |      O  |
  13+45     867.8084    874.20  |         |         |         |        OI
  14+ 0     813.1227    804.62  |         |         |         |     IO  |
  14+15     726.8942    716.07  |         |         |         | IO      |
  14+30     712.4255    711.92  |         |         |         | O       |
  14+45     722.8968    724.43  |         |         |         |  O      |
  15+ 0     720.2219    719.64  |         |         |         | O       |
  15+15     709.4601    708.04  |         |         |         | O       |
  15+30     691.0235    688.65  |         |         |         |O        |
  15+45     662.3017    658.63  |         |         |         O         |
  16+ 0     610.3701    603.65  |         |         |      O  |         |
  16+15     537.2908    528.05  |         |         |   O     |         |
  16+30     387.4402    367.86  |         |     IO  |         |         |
  16+45     223.9520    203.92  |        IO         |         |         |
  17+ 0     134.5790    124.93  |    IO   |         |         |         |
  17+15      88.4596     83.38  |  IO     |         |         |         |
  17+30      69.2963     67.34  |  O      |         |         |         |
  17+45      64.1890     63.75  | O       |         |         |         |
  18+ 0      61.5491     61.24  | O       |         |         |         |
  18+15      53.9991     52.99  | O       |         |         |         |
  18+30      44.8807     43.75  | O       |         |         |         |
  18+45      39.2434     38.62  |O        |         |         |         |
  19+ 0      33.8975     33.24  |O        |         |         |         |
  19+15      28.2551     27.56  |O        |         |         |         |
  19+30      26.3457     26.18  |O        |         |         |         |
  19+45      28.9137     29.29  |O        |         |         |         |
  20+ 0      29.1136     29.09  |O        |         |         |         |
  20+15      25.6137     25.13  |O        |         |         |         |
  20+30      24.1861     24.05  |O        |         |         |         |
  20+45      24.8915     25.01  |O        |         |         |         |
  21+ 0      24.8072     24.78  |O        |         |         |         |
  21+15      23.1997     22.98  |O        |         |         |         |
  21+30      22.4246     22.35  |O        |         |         |         |
  21+45      21.9664     21.91  |O        |         |         |         |
  22+ 0      21.7949     21.78  O         |         |         |         |
  22+15      21.5455     21.51  O         |         |         |         |
  22+30      21.5251     21.53  O         |         |         |         |
  22+45      20.9512     20.87  O         |         |         |         |
  23+ 0      19.2871     19.07  O         |         |         |         |
  23+15      18.3135     18.21  O         |         |         |         |
  23+30      17.8079     17.75  O         |         |         |         |
  23+45      17.5171     17.48  O         |         |         |         |
  24+ 0      17.3357     17.31  O         |         |         |         |
  24+15      16.3140     16.17  O         |         |         |         |
  24+30      11.9106     11.32  O         |         |         |         |
  24+45       6.6885      6.04  O         |         |         |         |
  25+ 0       3.7775      3.46  O         |         |         |         |
  25+15       2.2110      2.04  O         |         |         |         |
  25+30       1.2778      1.17  O         |         |         |         |
  25+45       0.7346      0.67  O         |         |         |         |
  26+ 0       0.4542      0.42  O         |         |         |         |
  26+15       0.2901      0.27  O         |         |         |         |
  26+30       0.1750      0.16  O         |         |         |         |
  26+45       0.0955      0.09  O         |         |         |         |
  27+ 0       0.0499      0.04  O         |         |         |         |
  27+15       0.0302      0.03  O         |         |         |         |
  27+30       0.0197      0.02  O         |         |         |         |
  27+45       0.0129      0.01  O         |         |         |         |
  28+ 0       0.0085      0.01  O         |         |         |         |
  28+15       0.0056      0.01  O         |         |         |         |
  28+30       0.0037      0.00  O         |         |         |         |
  28+45       0.0024      0.00  O         |         |         |         |
  29+ 0       0.0016      0.00  O         |         |         |         |
  29+15       0.0011      0.00  O         |         |         |         |
  29+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   118
```

```
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      867.808 (CFS)
                Total volume =     435.559 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SUBA1RT.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      223.0     446.0     669.1     892.1
----------------------------------------------------------------------
  0+15       0.0526      0.95  Q         |         |         |         |
  0+30       0.2344      5.96  Q         |         |         |         |
  0+45       0.4770     13.57  Q         |         |         |         |
  1+ 0       0.7430     19.79  Q         |         |         |         |
  1+15       0.9953     24.75  qQ        |         |         |         |
  1+30       1.1884     27.07  qQ        |         |         |         |
  1+45       1.3431     27.08  qQ        |         |         |         |
  2+ 0       1.5094     27.59  qQ        |         |         |         |
  2+15       1.7034     29.95  qQ        |         |         |         |
  2+30       1.8923     32.73  qQ        |         |         |         |
  2+45       2.0918     34.85  qQ        |         |         |         |
  3+ 0       2.3151     38.05  qQ        |         |         |         |
  3+15       2.5298     41.34  qQ        |         |         |         |
  3+30       2.7210     43.25  qQ        |         |         |         |
  3+45       2.8898     44.32  qQ        |         |         |         |
  4+ 0       3.0701     45.51  q Q       |         |         |         |
  4+15       3.2765     48.22  q Q       |         |         |         |
  4+30       3.5075     51.69  q Q       |         |         |         |
  4+45       3.7601     55.67  q Q       |         |         |         |
  5+ 0       4.0320     59.84  q Q       |         |         |         |
  5+15       4.2583     63.27  q Q       |         |         |         |
  5+30       4.4125     63.20  q Q       |         |         |         |
  5+45       4.5937     62.89  q Q       |         |         |         |
  6+ 0       4.8153     66.13  q Q       |         |         |         |
  6+15       5.0612     70.60  q  Q      |         |         |         |
  6+30       5.3270     78.52  q  Q      |         |         |         |
  6+45       5.6105     89.13  q  Q      |         |         |         |
  7+ 0       5.9095    103.86  q   Q     |         |         |         |
  7+15       6.1911    118.70  q    Q    |         |         |         |
  7+30       6.4724    129.46  q    Q    |         |         |         |
  7+45       6.7993    145.57  q     Q   |         |         |         |
  8+ 0       7.1838    170.48  q      Q  |         |         |         |
  8+15       7.6761    201.68  q        Q|         |         |         |
  8+30       8.2630    240.77  q         Q         |         |         |
  8+45       8.8820    276.27  q         | Q       |         |         |
  9+ 0       9.5523    306.09  q         |  Q      |         |         |
  9+15      10.3333    340.22  q         |    Q    |         |         |
  9+30      11.2369    383.22  q         |      Q  |         |         |
  9+45      12.2064    428.70  q         |        Q|         |         |
 10+ 0      13.2111    469.69  q         |         |Q        |         |
 10+15      13.8882    495.42  q         |         | Q       |         |
 10+30      14.0488    461.93  q         |         Q         |         |
 10+45      14.2484    412.56  q         |       Q |         |         |
```

```
11+ 0      14.7535    426.57  q          |         Q|         |          |
11+15      15.2867    463.90  q          |          Q         |          |
11+30      15.7079    476.35  q          |          |Q        |          |
11+45      15.9726    474.29  q          |          |Q        |          |
12+ 0      16.1208    461.55  q          |          Q         |          |
12+15      16.5881    463.68  q          |          Q         |          |
12+30      17.5441    527.46  q          |          |  Q      |          |
12+45      18.7282    614.79  q          |          |      Q  |          |
13+ 0      19.9997    685.68  q          |          |         Q          |
13+15      21.4713    752.05  q          |          |          |  Q      |
13+30      23.1434    834.87  |q         |          |          |      Q  |
13+45      24.2629    892.07  |q         |          |          |        Q
14+ 0      24.5274    837.65  |q         |          |          |      Q  |
14+15      24.6712    751.57  |q         |          |          |  Q      |
14+30      25.0056    737.43  |q         |          |          |  Q      |
14+45      25.3391    748.24  |q         |          |          |  Q      |
15+ 0      25.5785    745.80  |q         |          |          |  Q      |
15+15      25.6816    735.14  |q         |          |          | Q       |
15+30      25.6414    716.66  |q         |          |          | Q       |
15+45      25.3387    687.64  |q         |          |         Q          |
16+ 0      24.7802    635.15  |q         |          |       Q |          |
16+15      23.5777    560.87  |q         |          |    Q    |          |
16+30      21.5847    409.02  q          |        Q |         |          |
16+45      19.4516    243.40  q          Q          |         |          |
17+ 0      17.4910    152.07  q     Q    |          |         |          |
17+15      15.8044    104.26  q   Q      |          |         |          |
17+30      14.4076     83.70  q  Q       |          |         |          |
17+45      13.2087     77.40  q  Q       |          |         |          |
18+ 0      12.1217     73.67  q  Q       |          |         |          |
18+15      11.1144     65.11  q Q        |          |         |          |
18+30      10.2073     55.09  q Q        |          |         |          |
18+45       9.3734     48.62  q Q        |          |         |          |
19+ 0       8.5585     42.46  qQ         |          |         |          |
19+15       7.8054     36.06  qQ         |          |         |          |
19+30       7.1996     33.55  qQ         |          |         |          |
19+45       6.6965     35.61  qQ         |          |         |          |
20+ 0       6.1927     35.31  qQ         |          |         |          |
20+15       5.7159     31.33  qQ         |          |         |          |
20+30       5.3229     29.51  qQ         |          |         |          |
20+45       4.9918     29.88  qQ         |          |         |          |
21+ 0       4.6696     29.48  qQ         |          |         |          |
21+15       4.3691     27.57  qQ         |          |         |          |
21+30       4.1022     26.53  qQ         |          |         |          |
21+45       3.8664     25.83  qQ         |          |         |          |
22+ 0       3.6582     25.45  qQ         |          |         |          |
22+15       3.4743     25.02  qQ         |          |         |          |
22+30       3.3119     24.84  qQ         |          |         |          |
22+45       3.1372     24.09  qQ         |          |         |          |
23+ 0       2.9670     22.25  Q          |          |         |          |
23+15       2.8152     21.13  Q          |          |         |          |
23+30       2.6811     20.49  Q          |          |         |          |
23+45       2.5626     20.08  Q          |          |         |          |
24+ 0       2.4580     19.79  Q          |          |         |          |
24+15       2.3032     18.62  Q          |          |         |          |
24+30       2.0721     13.98  Q          |          |         |          |
24+45       1.8331      8.52  Q          |          |         |          |
25+ 0       1.6191      5.40  Q          |          |         |          |
25+15       1.4300      3.64  Q          |          |         |          |
25+30       1.2630      2.54  Q          |          |         |          |
25+45       1.1156      1.85  Q          |          |         |          |
26+ 0       0.9853      1.44  Q          |          |         |          |
26+15       0.8702      1.16  Q          |          |         |          |
26+30       0.7686      0.94  Q          |          |         |          |
26+45       0.6789      0.77  Q          |          |         |          |
27+ 0       0.5996      0.65  Q          |          |         |          |
27+15       0.5296      0.56  Q          |          |         |          |
27+30       0.4677      0.49  Q          |          |         |          |
27+45       0.4131      0.43  Q          |          |         |          |
28+ 0       0.3649      0.37  Q          |          |         |          |
28+15       0.3223      0.33  Q          |          |         |          |
28+30       0.2846      0.29  Q          |          |         |          |
```

```
   28+45       0.2514      0.25  Q          |          |          |          |
   29+ 0       0.2220      0.22  Q          |          |          |          |
   29+15       0.1961      0.20  Q          |          |          |          |
   29+30       0.1732      0.17  Q          |          |          |          |
   29+45       0.1530      0.15  Q          |          |          |          |
   30+ 0       0.1351      0.14  Q          |          |          |          |
   30+15       0.1193      0.12  Q          |          |          |          |
   30+30       0.1054      0.11  Q          |          |          |          |
   30+45       0.0931      0.09  Q          |          |          |          |
   31+ 0       0.0822      0.08  Q          |          |          |          |
   31+15       0.0726      0.07  Q          |          |          |          |
   31+30       0.0641      0.06  Q          |          |          |          |
   31+45       0.0567      0.06  Q          |          |          |          |
   32+ 0       0.0500      0.05  Q          |          |          |          |
   32+15       0.0442      0.04  Q          |          |          |          |
   32+30       0.0390      0.04  Q          |          |          |          |
   32+45       0.0345      0.03  Q          |          |          |          |
   33+ 0       0.0305      0.03  Q          |          |          |          |
   33+15       0.0269      0.03  Q          |          |          |          |
   33+30       0.0238      0.02  Q          |          |          |          |
   33+45       0.0210      0.02  Q          |          |          |          |
   34+ 0       0.0185      0.02  Q          |          |          |          |
   34+15       0.0164      0.02  Q          |          |          |          |
   34+30       0.0145      0.01  Q          |          |          |          |
   34+45       0.0128      0.01  Q          |          |          |          |
   35+ 0       0.0113      0.01  Q          |          |          |          |
   35+15       0.0100      0.01  Q          |          |          |          |
   35+30       0.0088      0.01  Q          |          |          |          |
   35+45       0.0078      0.01  Q          |          |          |          |
   36+ 0       0.0069      0.01  Q          |          |          |          |
   36+15       0.0061      0.01  Q          |          |          |          |
   36+30       0.0054      0.01  Q          |          |          |          |
   36+45       0.0047      0.00  Q          |          |          |          |
   37+ 0       0.0042      0.00  Q          |          |          |          |
   37+15       0.0037      0.00  Q          |          |          |          |
   37+30       0.0033      0.00  Q          |          |          |          |
   37+45       0.0029      0.00  Q          |          |          |          |
   38+ 0       0.0025      0.00  Q          |          |          |          |
   38+15       0.0022      0.00  Q          |          |          |          |
   38+30       0.0020      0.00  Q          |          |          |          |
   38+45       0.0018      0.00  Q          |          |          |          |
   39+ 0       0.0015      0.00  Q          |          |          |          |
   39+15       0.0014      0.00  Q          |          |          |          |
   39+30       0.0012      0.00  Q          |          |          |          |
   39+45       0.0011      0.00  Q          |          |          |          |
   40+ 0       0.0010      0.00  Q          |          |          |          |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   160
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      892.071 (CFS)
                       Total volume =     455.427 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        1.000 to Point/Station        2.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                       From study/file name: SUBA2RT.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f     H y d r o g r a p h
```

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0 232.9 465.7 698.6 931.4
0+15	0.0535	1.01	Q
0+30	0.2253	6.18	Q
0+45	0.4630	14.04	Q
1+ 0	0.7346	20.53	Q
1+15	1.0061	25.76	qQ
1+30	1.2336	28.30	qQ
1+45	1.4325	28.51	qQ
2+ 0	1.6472	29.23	qQ
2+15	1.8929	31.84	qQ
2+30	2.1400	34.87	qQ
2+45	2.4027	37.25	qQ
3+ 0	2.6935	40.74	qQ
3+15	2.9831	44.32	qQ
3+30	3.2566	46.50	qQ
3+45	3.5137	47.84	q Q
4+ 0	3.7844	49.29	q Q
4+15	4.0827	52.30	q Q
4+30	4.4084	56.10	q Q
4+45	4.7597	60.43	q Q
5+ 0	5.1353	64.97	q Q
5+15	5.4754	68.74	q Q
5+30	5.7526	68.95	q Q
5+45	6.0550	68.94	q Q
6+ 0	6.3966	72.52	q Q
6+15	6.7643	77.36	q Q
6+30	7.1551	85.68	q Q
6+45	7.5678	96.70	q Q
7+ 0	8.0010	111.86	q Q
7+15	8.4243	127.13	q Q
7+30	8.8526	138.31	q Q
7+45	9.3282	154.90	q Q
8+ 0	9.8643	180.34	q Q
8+15	10.5102	212.19	q Q
8+30	11.2589	252.03	q Q
8+45	12.0563	288.32	q Q
9+ 0	12.9207	319.01	q Q
9+15	13.9091	354.13	q Q
9+30	15.0371	398.25	q Q
9+45	16.2567	444.95	q Q
10+ 0	17.5413	487.24	q Q
10+15	18.5527	513.98	q Q
10+30	19.0963	481.03	q Q
10+45	19.6608	432.22	q Q
11+ 0	20.4976	447.07	q Q
11+15	21.3651	485.27	q Q
11+30	22.1341	498.48	q Q
11+45	22.7569	497.04	q Q
12+ 0	23.2627	484.81	q Q
12+15	24.0511	487.73	q Q
12+30	25.2980	552.76	q Q
12+45	26.7860	641.57	q Q
13+ 0	28.3947	714.08	q Q
13+15	30.5868	782.64	q Q
13+30	35.7949	870.67	q Q
13+45	39.3631	931.43	q Q
14+ 0	40.6749	878.32	q Q
14+15	41.5742	793.14	q Q
14+30	42.8261	780.26	q Q
14+45	43.9773	792.21	q Q
15+ 0	44.8223	790.62	q Q
15+15	45.2822	780.42	q Q
15+30	45.3617	762.03	q Q
15+45	44.7975	732.44	q Q
16+ 0	43.6314	678.78	q Q
16+15	40.9670	601.84	q Q

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16+30      36.5092    445.53  |q         |         Q|         |         |
16+45      31.8508    275.25  |q         |Q         |         |         |
17+ 0      29.1031    181.17  |q      Q  |          |         |         |
17+15      27.6844    131.95  |q   Q     |          |         |         |
17+30      26.4374    110.14  |q  Q      |          |         |         |
17+45      25.2978    102.70  |q  Q      |          |         |         |
18+ 0      24.2006     97.87  |q  Q      |          |         |         |
18+15      23.1254     88.24  q  Q       |          |         |         |
18+30      22.0986     77.19  q  Q       |          |         |         |
18+45      21.1031     69.72  q Q        |          |         |         |
19+ 0      20.0945     62.55  q Q        |          |         |         |
19+15      19.1154     55.18  q Q        |          |         |         |
19+30      18.2506     51.80  q Q        |          |         |         |
19+45      17.4674     53.08  q Q        |          |         |         |
20+ 0      16.6761     51.98  q Q        |          |         |         |
20+15      15.9026     47.23  q Q        |          |         |         |
20+30      15.2019     44.71  qQ         |          |         |         |
20+45      14.5581     44.44  qQ         |          |         |         |
21+ 0      13.9255     43.40  qQ         |          |         |         |
21+15      13.3160     40.88  qQ         |          |         |         |
21+30      12.7417     39.27  qQ         |          |         |         |
21+45      12.2020     38.03  qQ         |          |         |         |
22+ 0      11.6948     37.15  qQ         |          |         |         |
22+15      11.2180     36.24  qQ         |          |         |         |
22+30      10.7700     35.61  qQ         |          |         |         |
22+45      10.3198     34.41  qQ         |          |         |         |
23+ 0       9.8818     32.14  qQ         |          |         |         |
23+15       9.4688     30.60  qQ         |          |         |         |
23+30       9.0806     29.57  qQ         |          |         |         |
23+45       8.7157     28.80  qQ         |          |         |         |
24+ 0       8.3728     28.17  qQ         |          |         |         |
24+15       7.9924     26.61  qQ         |          |         |         |
24+30       7.5471     21.53  Q          |          |         |         |
24+45       7.0961     15.62  Q          |          |         |         |
25+ 0       6.6694     12.07  Q          |          |         |         |
25+15       6.2684      9.91  Q          |          |         |         |
25+30       5.8915      8.43  Q          |          |         |         |
25+45       5.5372      7.39  Q          |          |         |         |
26+ 0       5.2043      6.64  Q          |          |         |         |
26+15       4.8913      6.05  Q          |          |         |         |
26+30       4.5972      5.54  Q          |          |         |         |
26+45       4.3208      5.10  Q          |          |         |         |
27+ 0       4.0610      4.71  Q          |          |         |         |
27+15       3.8168      4.38  Q          |          |         |         |
27+30       3.5873      4.07  Q          |          |         |         |
27+45       3.3716      3.80  Q          |          |         |         |
28+ 0       3.1689      3.54  Q          |          |         |         |
28+15       2.9783      3.31  Q          |          |         |         |
28+30       2.7992      3.09  Q          |          |         |         |
28+45       2.6309      2.88  Q          |          |         |         |
29+ 0       2.4727      2.70  Q          |          |         |         |
29+15       2.3240      2.52  Q          |          |         |         |
29+30       2.1843      2.36  Q          |          |         |         |
29+45       2.0529      2.21  Q          |          |         |         |
30+ 0       1.9295      2.06  Q          |          |         |         |
30+15       1.8135      1.93  Q          |          |         |         |
30+30       1.7044      1.81  Q          |          |         |         |
30+45       1.6019      1.70  Q          |          |         |         |
31+ 0       1.5056      1.59  Q          |          |         |         |
31+15       1.4151      1.49  Q          |          |         |         |
31+30       1.3300      1.39  Q          |          |         |         |
31+45       1.2500      1.31  Q          |          |         |         |
32+ 0       1.1749      1.22  Q          |          |         |         |
32+15       1.1042      1.15  Q          |          |         |         |
32+30       1.0378      1.08  Q          |          |         |         |
32+45       0.9754      1.01  Q          |          |         |         |
33+ 0       0.9168      0.95  Q          |          |         |         |
33+15       0.8616      0.89  Q          |          |         |         |
33+30       0.8098      0.83  Q          |          |         |         |
33+45       0.7611      0.78  Q          |          |         |         |
34+ 0       0.7154      0.73  Q          |          |         |         |
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34+15	0.6724	0.69	Q	|	|	|	|
34+30	0.6319	0.65	Q	|	|	|	|
34+45	0.5939	0.61	Q	|	|	|	|
35+ 0	0.5582	0.57	Q	|	|	|	|
35+15	0.5246	0.53	Q	|	|	|	|
35+30	0.4931	0.50	Q	|	|	|	|
35+45	0.4635	0.47	Q	|	|	|	|
36+ 0	0.4356	0.44	Q	|	|	|	|
36+15	0.4094	0.42	Q	|	|	|	|
36+30	0.3848	0.39	Q	|	|	|	|
36+45	0.3616	0.37	Q	|	|	|	|
37+ 0	0.3399	0.34	Q	|	|	|	|
37+15	0.3195	0.32	Q	|	|	|	|
37+30	0.3002	0.30	Q	|	|	|	|
37+45	0.2822	0.29	Q	|	|	|	|
38+ 0	0.2652	0.27	Q	|	|	|	|
38+15	0.2493	0.25	Q	|	|	|	|
38+30	0.2343	0.24	Q	|	|	|	|
38+45	0.2202	0.22	Q	|	|	|	|
39+ 0	0.2070	0.21	Q	|	|	|	|
39+15	0.1945	0.20	Q	|	|	|	|
39+30	0.1828	0.18	Q	|	|	|	|
39+45	0.1718	0.17	Q	|	|	|	|
40+ 0	0.1615	0.16	Q	|	|	|	|
40+15	0.1518	0.15	Q	|	|	|	|
40+30	0.1427	0.14	Q	|	|	|	|
40+45	0.1341	0.13	Q	|	|	|	|
41+ 0	0.1260	0.13	Q	|	|	|	|
41+15	0.1184	0.12	Q	|	|	|	|
41+30	0.1113	0.11	Q	|	|	|	|
41+45	0.1046	0.10	Q	|	|	|	|
42+ 0	0.0983	0.10	Q	|	|	|	|
42+15	0.0924	0.09	Q	|	|	|	|
42+30	0.0869	0.09	Q	|	|	|	|
42+45	0.0816	0.08	Q	|	|	|	|
43+ 0	0.0767	0.08	Q	|	|	|	|
43+15	0.0721	0.07	Q	|	|	|	|
43+30	0.0678	0.07	Q	|	|	|	|
43+45	0.0637	0.06	Q	|	|	|	|
44+ 0	0.0599	0.06	Q	|	|	|	|
44+15	0.0563	0.06	Q	|	|	|	|
44+30	0.0529	0.05	Q	|	|	|	|
44+45	0.0497	0.05	Q	|	|	|	|
45+ 0	0.0467	0.05	Q	|	|	|	|
45+15	0.0439	0.04	Q	|	|	|	|
45+30	0.0413	0.04	Q	|	|	|	|
45+45	0.0388	0.04	Q	|	|	|	|
46+ 0	0.0365	0.04	Q	|	|	|	|
46+15	0.0343	0.03	Q	|	|	|	|
46+30	0.0322	0.03	Q	|	|	|	|
46+45	0.0303	0.03	Q	|	|	|	|
47+ 0	0.0284	0.03	Q	|	|	|	|
47+15	0.0267	0.03	Q	|	|	|	|
47+30	0.0251	0.03	Q	|	|	|	|
47+45	0.0236	0.02	Q	|	|	|	|
48+ 0	0.0222	0.02	Q	|	|	|	|
48+15	0.0209	0.02	Q	|	|	|	|
48+30	0.0196	0.02	Q	|	|	|	|
48+45	0.0184	0.02	Q	|	|	|	|
49+ 0	0.0173	0.02	Q	|	|	|	|
49+15	0.0163	0.02	Q	|	|	|	|
49+30	0.0153	0.02	Q	|	|	|	|
49+45	0.0144	0.01	Q	|	|	|	|
50+ 0	0.0135	0.01	Q	|	|	|	|
50+15	0.0127	0.01	Q	|	|	|	|
50+30	0.0119	0.01	Q	|	|	|	|
50+45	0.0112	0.01	Q	|	|	|	|
51+ 0	0.0105	0.01	Q	|	|	|	|
51+15	0.0099	0.01	Q	|	|	|	|
51+30	0.0093	0.01	Q	|	|	|	|
51+45	0.0088	0.01	Q	|	|	|	|

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   52+ 0       0.0082      0.01  Q         |         |         |         |
   52+15       0.0077      0.01  Q         |         |         |         |
   52+30       0.0073      0.01  Q         |         |         |         |
   52+45       0.0068      0.01  Q         |         |         |         |
   53+ 0       0.0064      0.01  Q         |         |         |         |
   53+15       0.0060      0.01  Q         |         |         |         |
   53+30       0.0057      0.01  Q         |         |         |         |
   53+45       0.0053      0.01  Q         |         |         |         |
   54+ 0       0.0050      0.01  Q         |         |         |         |
   54+15       0.0047      0.00  Q         |         |         |         |
   54+30       0.0044      0.00  Q         |         |         |         |
   54+45       0.0042      0.00  Q         |         |         |         |
   55+ 0       0.0039      0.00  Q         |         |         |         |
   55+15       0.0037      0.00  Q         |         |         |         |
   55+30       0.0035      0.00  Q         |         |         |         |
   55+45       0.0032      0.00  Q         |         |         |         |
   56+ 0       0.0031      0.00  Q         |         |         |         |
   56+15       0.0029      0.00  Q         |         |         |         |
   56+30       0.0027      0.00  Q         |         |         |         |
   56+45       0.0025      0.00  Q         |         |         |         |
   57+ 0       0.0024      0.00  Q         |         |         |         |
   57+15       0.0022      0.00  Q         |         |         |         |
   57+30       0.0021      0.00  Q         |         |         |         |
   57+45       0.0020      0.00  Q         |         |         |         |
   58+ 0       0.0019      0.00  Q         |         |         |         |
   58+15       0.0017      0.00  Q         |         |         |         |
   58+30       0.0016      0.00  Q         |         |         |         |
   58+45       0.0015      0.00  Q         |         |         |         |
   59+ 0       0.0014      0.00  Q         |         |         |         |
   59+15       0.0014      0.00  Q         |         |         |         |
   59+30       0.0013      0.00  Q         |         |         |         |
   59+45       0.0012      0.00  Q         |         |         |         |
   60+ 0       0.0011      0.00  Q         |         |         |         |
   60+15       0.0011      0.00  Q         |         |         |         |
   60+30       0.0010      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   242
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      931.434 (CFS)
                       Total volume =     491.345 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -----------------------------------------------------------------

        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        2.000 to Point/Station        3.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1600.00 (Ft.)
        Elevation difference =   32.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  1600.00(Ft.)     Elevation difference =  32.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =   10.000(Ft.)
        Flow(q) thru subarea =    325.207(CFS)
        Depth of flow =     1.658(Ft.)
```

```
Average velocity =    16.824(Ft/s)
Total flow rate =   325.207(CFS)
Channel flow top width =   13.316(Ft.)
Depth of flow in channel =   1.66(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   16.82(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  325.207(CFS)
Total capacity of improved channels =    325.207(CFS)
Critical Depth in Channel =    2.88(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    931.434(CFS)
Depth of flow =     3.062(Ft.)
Average velocity =    23.289(Ft/s)
Total flow rate =   931.434(CFS)
Channel flow top width =   16.124(Ft.)
Depth of flow in channel =   3.06(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   23.29(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  931.434(CFS)
Total capacity of improved channels =    931.434(CFS)
Critical Depth in Channel =    5.38(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9320   Travel time =   1.15 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   9.7044
       dt(routing time-step) =   1.07 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      232.9     465.7     698.6     931.4
----------------------------------------------------------------------
  0+15       0.9347      1.01  O         |         |         |         |
  0+30       5.8159      6.18  O         |         |         |         |
  0+45      13.4786     14.04  O         |         |         |         |
  1+ 0      20.0635     20.53  O         |         |         |         |
  1+15      25.3864     25.76  |O        |         |         |         |
  1+30      28.1190     28.30  |O        |         |         |         |
  1+45      28.4928     28.51  |O        |         |         |         |
  2+ 0      29.1819     29.23  |O        |         |         |         |
  2+15      31.6557     31.84  |O        |         |         |         |
  2+30      34.6578     34.87  |O        |         |         |         |
  2+45      37.0801     37.25  |O        |         |         |         |
  3+ 0      40.4940     40.74  |O        |         |         |         |
  3+15      44.0671     44.32  |O        |         |         |         |
  3+30      46.3473     46.50  |O        |         |         |         |
  3+45      47.7425     47.84  | O       |         |         |         |
  4+ 0      49.1888     49.29  | O       |         |         |         |
  4+15      52.0876     52.30  | O       |         |         |         |
  4+30      55.8266     56.10  | O       |         |         |         |
  4+45      60.1183     60.43  | O       |         |         |         |
  5+ 0      64.6508     64.97  | O       |         |         |         |
  5+15      68.4733     68.74  | O       |         |         |         |
  5+30      68.9330     68.95  | O       |         |         |         |
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 5+45      68.9433     68.94  | O       |         |         |         |
 6+ 0      72.2686     72.52  |  O      |         |         |         |
 6+15      77.0204     77.36  |  O      |         |         |         |
 6+30      85.0866     85.68  |  O      |         |         |         |
 6+45      95.9135     96.70  |   O     |         |         |         |
 7+ 0     110.7783    111.86  |   O     |         |         |         |
 7+15     126.0415    127.13  |    O    |         |         |         |
 7+30     137.5183    138.31  |    O    |         |         |         |
 7+45     153.7173    154.90  |     O   |         |         |         |
 8+ 0     178.5336    180.34  |      O  |         |         |         |
 8+15     209.9245    212.19  |        O|         |         |         |
 8+30     249.1965    252.03  |         O         |         |         |
 8+45     285.7411    288.32  |         | O       |         |         |
 9+ 0     316.8300    319.01  |         |  O      |         |         |
 9+15     351.6314    354.13  |         |    O    |         |         |
 9+30     395.1135    398.25  |         |     OI  |         |         |
 9+45     441.6303    444.95  |         |       OI|         |         |
10+ 0     484.2270    487.24  |         |         O         |         |
10+15     512.0728    513.98  |         |         |OI       |         |
10+30     483.3719    481.03  |         |         O         |         |
10+45     435.6944    432.22  |         |       O |         |         |
11+ 0     446.0116    447.07  |         |        O|         |         |
11+15     482.5513    485.27  |         |         O         |         |
11+30     497.5447    498.48  |         |         |O        |         |
11+45     497.1474    497.04  |         |         |O        |         |
12+ 0     485.6841    484.81  |         |         O         |         |
12+15     487.5240    487.73  |         |         O         |         |
12+30     548.1357    552.76  |         |         |  O      |         |
12+45     635.2565    641.57  |         |         |      O  |         |
13+ 0     708.9216    714.08  |         |         |         O         |
13+15     777.7631    782.64  |         |         |         |  O      |
13+30     864.4057    870.67  |         |         |         |     O   |
13+45     927.1114    931.43  |         |         |         |       OI
14+ 0     882.1032    878.32  |         |         |         |     O   |
14+15     799.1998    793.14  |         |         |         |   O     |
14+30     781.1737    780.26  |         |         |         |  O      |
14+45     791.3626    792.21  |         |         |         |  OI     |
15+ 0     790.7359    790.62  |         |         |         |  O      |
15+15     781.1494    780.42  |         |         |         |  O      |
15+30     763.3354    762.03  |         |         |         | O       |
15+45     734.5428    732.44  |         |         |         |O        |
16+ 0     682.5990    678.78  |         |         |       O|          |
16+15     607.3096    601.84  |         |         |    IO   |         |
16+30     456.6536    445.53  |         |       O|          |         |
16+45     287.3683    275.25  |         |IO       |         |         |
17+ 0     187.8662    181.17  |      IO |         |         |         |
17+15     135.4503    131.95  |    O    |         |         |         |
17+30     111.6927    110.14  |   O     |         |         |         |
17+45     103.2253    102.70  |   O     |         |         |         |
18+ 0      98.2146     97.87  |   O     |         |         |         |
18+15      88.9241     88.24  |  O      |         |         |         |
18+30      77.9728     77.19  |  O      |         |         |         |
18+45      70.2510     69.72  | IO      |         |         |         |
19+ 0      63.0605     62.55  | O       |         |         |         |
19+15      55.7006     55.18  | O       |         |         |         |
19+30      52.0364     51.80  | O       |         |         |         |
19+45      52.9865     53.08  | O       |         |         |         |
20+ 0      52.0603     51.98  | O       |         |         |         |
20+15      47.5701     47.23  | O       |         |         |         |
20+30      44.8902     44.71  |O        |         |         |         |
20+45      44.4606     44.44  |O        |         |         |         |
21+ 0      43.4762     43.40  |O        |         |         |         |
21+15      41.0639     40.88  |O        |         |         |         |
21+30      39.3835     39.27  |O        |         |         |         |
21+45      38.1227     38.03  |O        |         |         |         |
22+ 0      37.2111     37.15  |O        |         |         |         |
22+15      36.3026     36.24  |O        |         |         |         |
22+30      35.6518     35.61  |O        |         |         |         |
22+45      34.4934     34.41  |O        |         |         |         |
23+ 0      32.2975     32.14  |O        |         |         |         |
23+15      30.7069     30.60  |O        |         |         |         |
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23+30      29.6426     29.57  |O        |         |         |         |
23+45      28.8505     28.80  |O        |         |         |         |
24+ 0      28.2112     28.17  |O        |         |         |         |
24+15      26.7204     26.61  |O        |         |         |         |
24+30      21.8912     21.53  O         |         |         |         |
24+45      16.0384     15.62  O         |         |         |         |
25+ 0      12.3187     12.07  O         |         |         |         |
25+15      10.0629      9.91  O         |         |         |         |
25+30       8.5374      8.43  O         |         |         |         |
25+45       7.4617      7.39  O         |         |         |         |
26+ 0       6.6967      6.64  O         |         |         |         |
26+15       6.0938      6.05  O         |         |         |         |
26+30       5.5772      5.54  O         |         |         |         |
26+45       5.1268      5.10  O         |         |         |         |
27+ 0       4.7379      4.71  O         |         |         |         |
27+15       4.4003      4.38  O         |         |         |         |
27+30       4.0962      4.07  O         |         |         |         |
27+45       3.8174      3.80  O         |         |         |         |
28+ 0       3.5604      3.54  O         |         |         |         |
28+15       3.3230      3.31  O         |         |         |         |
28+30       3.1031      3.09  O         |         |         |         |
28+45       2.8992      2.88  O         |         |         |         |
29+ 0       2.7097      2.70  O         |         |         |         |
29+15       2.5337      2.52  O         |         |         |         |
29+30       2.3691      2.36  O         |         |         |         |
29+45       2.2167      2.21  O         |         |         |         |
30+ 0       2.0747      2.06  O         |         |         |         |
30+15       1.9422      1.93  O         |         |         |         |
30+30       1.8186      1.81  O         |         |         |         |
30+45       1.7032      1.70  O         |         |         |         |
31+ 0       1.5955      1.59  O         |         |         |         |
31+15       1.4948      1.49  O         |         |         |         |
31+30       1.4008      1.39  O         |         |         |         |
31+45       1.3129      1.31  O         |         |         |         |
32+ 0       1.2307      1.22  O         |         |         |         |
32+15       1.1539      1.15  O         |         |         |         |
32+30       1.0819      1.08  O         |         |         |         |
32+45       1.0147      1.01  O         |         |         |         |
33+ 0       0.9517      0.95  O         |         |         |         |
33+15       0.8927      0.89  O         |         |         |         |
33+30       0.8375      0.83  O         |         |         |         |
33+45       0.7858      0.78  O         |         |         |         |
34+ 0       0.7373      0.73  O         |         |         |         |
34+15       0.6919      0.69  O         |         |         |         |
34+30       0.6494      0.65  O         |         |         |         |
34+45       0.6095      0.61  O         |         |         |         |
35+ 0       0.5721      0.57  O         |         |         |         |
35+15       0.5371      0.53  O         |         |         |         |
35+30       0.5042      0.50  O         |         |         |         |
35+45       0.4734      0.47  O         |         |         |         |
36+ 0       0.4445      0.44  O         |         |         |         |
36+15       0.4174      0.42  O         |         |         |         |
36+30       0.3919      0.39  O         |         |         |         |
36+45       0.3681      0.37  O         |         |         |         |
37+ 0       0.3457      0.34  O         |         |         |         |
37+15       0.3246      0.32  O         |         |         |         |
37+30       0.3049      0.30  O         |         |         |         |
37+45       0.2864      0.29  O         |         |         |         |
38+ 0       0.2690      0.27  O         |         |         |         |
38+15       0.2527      0.25  O         |         |         |         |
38+30       0.2374      0.24  O         |         |         |         |
38+45       0.2230      0.22  O         |         |         |         |
39+ 0       0.2095      0.21  O         |         |         |         |
39+15       0.1968      0.20  O         |         |         |         |
39+30       0.1849      0.18  O         |         |         |         |
39+45       0.1737      0.17  O         |         |         |         |
40+ 0       0.1632      0.16  O         |         |         |         |
40+15       0.1525      0.15  O         |         |         |         |
40+30       0.1433      0.14  O         |         |         |         |
40+45       0.1347      0.13  O         |         |         |         |
41+ 0       0.1266      0.13  O         |         |         |         |
```

41+15	0.1190	0.12	O	|	|	|	|
41+30	0.1118	0.11	O	|	|	|	|
41+45	0.1051	0.10	O	|	|	|	|
42+ 0	0.0988	0.10	O	|	|	|	|
42+15	0.0928	0.09	O	|	|	|	|
42+30	0.0873	0.09	O	|	|	|	|
42+45	0.0820	0.08	O	|	|	|	|
43+ 0	0.0771	0.08	O	|	|	|	|
43+15	0.0724	0.07	O	|	|	|	|
43+30	0.0681	0.07	O	|	|	|	|
43+45	0.0640	0.06	O	|	|	|	|
44+ 0	0.0601	0.06	O	|	|	|	|
44+15	0.0565	0.06	O	|	|	|	|
44+30	0.0531	0.05	O	|	|	|	|
44+45	0.0499	0.05	O	|	|	|	|
45+ 0	0.0469	0.05	O	|	|	|	|
45+15	0.0441	0.04	O	|	|	|	|
45+30	0.0415	0.04	O	|	|	|	|
45+45	0.0390	0.04	O	|	|	|	|
46+ 0	0.0366	0.04	O	|	|	|	|
46+15	0.0344	0.03	O	|	|	|	|
46+30	0.0324	0.03	O	|	|	|	|
46+45	0.0304	0.03	O	|	|	|	|
47+ 0	0.0286	0.03	O	|	|	|	|
47+15	0.0269	0.03	O	|	|	|	|
47+30	0.0252	0.03	O	|	|	|	|
47+45	0.0237	0.02	O	|	|	|	|
48+ 0	0.0223	0.02	O	|	|	|	|
48+15	0.0210	0.02	O	|	|	|	|
48+30	0.0197	0.02	O	|	|	|	|
48+45	0.0185	0.02	O	|	|	|	|
49+ 0	0.0174	0.02	O	|	|	|	|
49+15	0.0164	0.02	O	|	|	|	|
49+30	0.0154	0.02	O	|	|	|	|
49+45	0.0144	0.01	O	|	|	|	|
50+ 0	0.0136	0.01	O	|	|	|	|
50+15	0.0128	0.01	O	|	|	|	|
50+30	0.0120	0.01	O	|	|	|	|
50+45	0.0113	0.01	O	|	|	|	|
51+ 0	0.0106	0.01	O	|	|	|	|
51+15	0.0100	0.01	O	|	|	|	|
51+30	0.0094	0.01	O	|	|	|	|
51+45	0.0088	0.01	O	|	|	|	|
52+ 0	0.0083	0.01	O	|	|	|	|
52+15	0.0078	0.01	O	|	|	|	|
52+30	0.0073	0.01	O	|	|	|	|
52+45	0.0069	0.01	O	|	|	|	|
53+ 0	0.0065	0.01	O	|	|	|	|
53+15	0.0061	0.01	O	|	|	|	|
53+30	0.0057	0.01	O	|	|	|	|
53+45	0.0054	0.01	O	|	|	|	|
54+ 0	0.0050	0.01	O	|	|	|	|
54+15	0.0047	0.00	O	|	|	|	|
54+30	0.0044	0.00	O	|	|	|	|
54+45	0.0042	0.00	O	|	|	|	|
55+ 0	0.0039	0.00	O	|	|	|	|
55+15	0.0037	0.00	O	|	|	|	|
55+30	0.0035	0.00	O	|	|	|	|
55+45	0.0033	0.00	O	|	|	|	|
56+ 0	0.0031	0.00	O	|	|	|	|
56+15	0.0029	0.00	O	|	|	|	|
56+30	0.0027	0.00	O	|	|	|	|
56+45	0.0025	0.00	O	|	|	|	|
57+ 0	0.0024	0.00	O	|	|	|	|
57+15	0.0022	0.00	O	|	|	|	|
57+30	0.0021	0.00	O	|	|	|	|
57+45	0.0020	0.00	O	|	|	|	|
58+ 0	0.0019	0.00	O	|	|	|	|
58+15	0.0018	0.00	O	|	|	|	|
58+30	0.0016	0.00	O	|	|	|	|
58+45	0.0015	0.00	O	|	|	|	|

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  59+ 0       0.0015      0.00  O         |         |         |         |
  59+15       0.0014      0.00  O         |         |         |         |
  59+30       0.0013      0.00  O         |         |         |         |
  59+45       0.0012      0.00  O         |         |         |         |
  60+ 0       0.0011      0.00  O         |         |         |         |
  60+15       0.0011      0.00  O         |         |         |         |
  60+30       0.0010      0.00  O         |         |         |         |
  60+45       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   243
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      927.111 (CFS)
                     Total volume =     491.345 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ********************* HYDROGRAPH INFORMATION **********************

                     From study/file name: SUBA3RT.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      238.2     476.5     714.7     953.0
 -------------------------------------------------------------------------
    0+15       0.0398      0.97  Q         |         |         |         |
    0+30       0.1709      5.99  Q         |         |         |         |
    0+45       0.3524     13.83  Q         |         |         |         |
    1+ 0       0.5597     20.62  Q         |         |         |         |
    1+15       0.7669     26.15  qQ        |         |         |         |
    1+30       0.9406     29.06  qQ        |         |         |         |
    1+45       1.0924     29.59  qQ        |         |         |         |
    2+ 0       1.2563     30.44  qQ        |         |         |         |
    2+15       1.4438     33.10  qQ        |         |         |         |
    2+30       1.6324     36.29  qQ        |         |         |         |
    2+45       1.8329     38.91  qQ        |         |         |         |
    3+ 0       2.0549     42.55  qQ        |         |         |         |
    3+15       2.2759     46.34  qQ        |         |         |         |
    3+30       2.4847     48.83  q Q       |         |         |         |
    3+45       2.6809     50.42  q Q       |         |         |         |
    4+ 0       2.8875     52.08  q Q       |         |         |         |
    4+15       3.1152     55.20  q Q       |         |         |         |
    4+30       3.3637     59.19  q Q       |         |         |         |
    4+45       3.6319     63.75  q Q       |         |         |         |
    5+ 0       3.9185     68.57  q Q       |         |         |         |
    5+15       4.1780     72.65  q  Q      |         |         |         |
    5+30       4.3896     73.32  q  Q      |         |         |         |
    5+45       4.6204     73.56  q  Q      |         |         |         |
    6+ 0       4.8810     77.15  q  Q      |         |         |         |
    6+15       5.1616     82.18  q  Q      |         |         |         |
    6+30       5.4599     90.55  q  Q      |         |         |         |
    6+45       5.7749    101.69  q   Q     |         |         |         |
    7+ 0       6.1054    116.88  q   Q     |         |         |         |
    7+15       6.4285    132.47  q    Q    |         |         |         |
    7+30       6.7554    144.27  q     Q   |         |         |         |
    7+45       7.1183    160.84  q     Q   |         |         |         |
    8+ 0       7.5274    186.06  q      Q  |         |         |         |
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 8+15       8.0203    217.94  q         Q|         |         |         |
 8+30       8.5917    257.79  q         Q         |         |         |
 8+45       9.2002    294.94  q         | Q       |         |         |
 9+ 0       9.8599    326.69  q         |  Q      |         |         |
 9+15      10.6141    362.25  q         |    Q    |         |         |
 9+30      11.4749    406.59  q         |      Q  |         |         |
 9+45      12.4057    454.04  q         |        Q|         |         |
10+ 0      13.3860    497.61  q         |         Q         |         |
10+15      14.1578    526.23  q         |         | Q       |         |
10+30      14.5726    497.94  q         |         Q         |         |
10+45      15.0035    450.70  q         |       Q |         |         |
11+ 0      15.6420    461.65  q         |        Q|         |         |
11+15      16.3040    498.86  q         |         Q         |         |
11+30      16.8909    514.44  q         |         |Q        |         |
11+45      17.3662    514.51  q         |         |Q        |         |
12+ 0      17.7522    503.44  q         |         |Q        |         |
12+15      18.3538    505.88  q         |         |Q        |         |
12+30      19.3053    567.44  q         |         |  Q      |         |
12+45      20.4409    655.70  q         |         |      Q  |         |
13+ 0      21.6684    730.59  q         |         |        Q        |
13+15      23.0699    800.83  q         |         |         |  Q      |
13+30      24.6515    889.06  |q        |         |         |      Q  |
13+45      25.8841    953.00  |q        |         |         |        Q
14+ 0      26.5282    908.63  |q        |         |         |       Q |
14+15      27.0698    826.27  |q        |         |         |   Q     |
14+30      27.7260    808.90  |q        |         |         |  Q      |
14+45      28.3700    819.73  |q        |         |         |   Q     |
15+ 0      28.9360    819.67  |q        |         |         |   Q     |
15+15      29.3910    810.54  |q        |         |         |   Q     |
15+30      29.7255    793.06  |q        |         |         |  Q      |
15+45      29.8500    764.39  |q        |         |         | Q       |
16+ 0      29.7602    712.36  |q        |         |        Q|         |
16+15      29.1720    636.48  |q        |         |     Q   |         |
16+30      27.9579    484.61  |q        |         Q         |         |
16+45      26.5520    313.92  |q        |  Q      |         |         |
17+ 0      25.1762    213.04  |q      Q |         |         |         |
17+15      23.9152    159.37  |q    Q   |         |         |         |
17+30      22.7959    134.49  q    Q    |         |         |         |
17+45      21.7686    124.99  q    Q    |         |         |         |
18+ 0      20.7831    119.00  q   Q     |         |         |         |
18+15      19.8234    108.75  q   Q     |         |         |         |
18+30      18.9090     96.88  q   Q     |         |         |         |
18+45      18.0263     88.28  q  Q      |         |         |         |
19+ 0      17.1411     80.20  q  Q      |         |         |         |
19+15      16.2853     71.99  q  Q      |         |         |         |
19+30      15.5232     67.56  q Q       |         |         |         |
19+45      14.8296     67.82  q Q       |         |         |         |
20+ 0      14.1355     66.20  q Q       |         |         |         |
20+15      13.4605     61.03  q Q       |         |         |         |
20+30      12.8461     57.74  q Q       |         |         |         |
20+45      12.2800     56.74  q Q       |         |         |         |
21+ 0      11.7268     55.20  q Q       |         |         |         |
21+15      11.1955     52.26  q Q       |         |         |         |
21+30      10.6952     50.08  q Q       |         |         |         |
21+45      10.2249     48.35  q Q       |         |         |         |
22+ 0       9.7829     46.99  qQ        |         |         |         |
22+15       9.3674     45.67  qQ        |         |         |         |
22+30       8.9770     44.63  qQ        |         |         |         |
22+45       8.5879     43.08  qQ        |         |         |         |
23+ 0       8.2108     40.51  qQ        |         |         |         |
23+15       7.8553     38.56  qQ        |         |         |         |
23+30       7.5212     37.16  qQ        |         |         |         |
23+45       7.2072     36.06  qQ        |         |         |         |
24+ 0       6.9121     35.12  qQ        |         |         |         |
24+15       6.5904     33.31  qQ        |         |         |         |
24+30       6.2210     28.11  qQ        |         |         |         |
24+45       5.8491     21.89  Q         |         |         |         |
25+ 0       5.4974     17.82  Q         |         |         |         |
25+15       5.1668     15.23  Q         |         |         |         |
25+30       4.8561     13.39  Q         |         |         |         |
25+45       4.5641     12.03  Q         |         |         |         |
```

26+ 0	4.2897	10.99	Q	|	|	|	|
26+15	4.0318	10.13	Q	|	|	|	|
26+30	3.7893	9.37	Q	|	|	|	|
26+45	3.5615	8.69	Q	|	|	|	|
27+ 0	3.3473	8.09	Q	|	|	|	|
27+15	3.1461	7.55	Q	|	|	|	|
27+30	2.9569	7.05	Q	|	|	|	|
27+45	2.7791	6.60	Q	|	|	|	|
28+ 0	2.6120	6.17	Q	|	|	|	|
28+15	2.4549	5.78	Q	|	|	|	|
28+30	2.3073	5.41	Q	|	|	|	|
28+45	2.1686	5.07	Q	|	|	|	|
29+ 0	2.0382	4.75	Q	|	|	|	|
29+15	1.9156	4.45	Q	|	|	|	|
29+30	1.8004	4.17	Q	|	|	|	|
29+45	1.6922	3.91	Q	|	|	|	|
30+ 0	1.5904	3.67	Q	|	|	|	|
30+15	1.4948	3.44	Q	|	|	|	|
30+30	1.4049	3.22	Q	|	|	|	|
30+45	1.3204	3.02	Q	|	|	|	|
31+ 0	1.2410	2.84	Q	|	|	|	|
31+15	1.1664	2.66	Q	|	|	|	|
31+30	1.0963	2.50	Q	|	|	|	|
31+45	1.0304	2.34	Q	|	|	|	|
32+ 0	0.9684	2.20	Q	|	|	|	|
32+15	0.9102	2.06	Q	|	|	|	|
32+30	0.8554	1.94	Q	|	|	|	|
32+45	0.8040	1.82	Q	|	|	|	|
33+ 0	0.7557	1.71	Q	|	|	|	|
33+15	0.7102	1.60	Q	|	|	|	|
33+30	0.6675	1.51	Q	|	|	|	|
33+45	0.6274	1.41	Q	|	|	|	|
34+ 0	0.5897	1.33	Q	|	|	|	|
34+15	0.5542	1.25	Q	|	|	|	|
34+30	0.5209	1.17	Q	|	|	|	|
34+45	0.4896	1.10	Q	|	|	|	|
35+ 0	0.4601	1.03	Q	|	|	|	|
35+15	0.4325	0.97	Q	|	|	|	|
35+30	0.4064	0.91	Q	|	|	|	|
35+45	0.3820	0.86	Q	|	|	|	|
36+ 0	0.3590	0.80	Q	|	|	|	|
36+15	0.3374	0.75	Q	|	|	|	|
36+30	0.3172	0.71	Q	|	|	|	|
36+45	0.2981	0.67	Q	|	|	|	|
37+ 0	0.2802	0.63	Q	|	|	|	|
37+15	0.2633	0.59	Q	|	|	|	|
37+30	0.2475	0.55	Q	|	|	|	|
37+45	0.2326	0.52	Q	|	|	|	|
38+ 0	0.2186	0.49	Q	|	|	|	|
38+15	0.2055	0.46	Q	|	|	|	|
38+30	0.1931	0.43	Q	|	|	|	|
38+45	0.1815	0.40	Q	|	|	|	|
39+ 0	0.1706	0.38	Q	|	|	|	|
39+15	0.1603	0.36	Q	|	|	|	|
39+30	0.1507	0.34	Q	|	|	|	|
39+45	0.1416	0.32	Q	|	|	|	|
40+ 0	0.1331	0.30	Q	|	|	|	|
40+15	0.1251	0.28	Q	|	|	|	|
40+30	0.1176	0.26	Q	|	|	|	|
40+45	0.1105	0.25	Q	|	|	|	|
41+ 0	0.1039	0.23	Q	|	|	|	|
41+15	0.0976	0.22	Q	|	|	|	|
41+30	0.0918	0.20	Q	|	|	|	|
41+45	0.0862	0.19	Q	|	|	|	|
42+ 0	0.0811	0.18	Q	|	|	|	|
42+15	0.0762	0.17	Q	|	|	|	|
42+30	0.0716	0.16	Q	|	|	|	|
42+45	0.0673	0.15	Q	|	|	|	|
43+ 0	0.0632	0.14	Q	|	|	|	|
43+15	0.0594	0.13	Q	|	|	|	|
43+30	0.0559	0.12	Q	|	|	|	|

43+45	0.0525	0.12	Q	|	|	|	|
44+ 0	0.0494	0.11	Q	|	|	|	|
44+15	0.0464	0.10	Q	|	|	|	|
44+30	0.0436	0.10	Q	|	|	|	|
44+45	0.0410	0.09	Q	|	|	|	|
45+ 0	0.0385	0.09	Q	|	|	|	|
45+15	0.0362	0.08	Q	|	|	|	|
45+30	0.0340	0.08	Q	|	|	|	|
45+45	0.0320	0.07	Q	|	|	|	|
46+ 0	0.0301	0.07	Q	|	|	|	|
46+15	0.0282	0.06	Q	|	|	|	|
46+30	0.0265	0.06	Q	|	|	|	|
46+45	0.0249	0.06	Q	|	|	|	|
47+ 0	0.0234	0.05	Q	|	|	|	|
47+15	0.0220	0.05	Q	|	|	|	|
47+30	0.0207	0.05	Q	|	|	|	|
47+45	0.0195	0.04	Q	|	|	|	|
48+ 0	0.0183	0.04	Q	|	|	|	|
48+15	0.0172	0.04	Q	|	|	|	|
48+30	0.0162	0.04	Q	|	|	|	|
48+45	0.0152	0.03	Q	|	|	|	|
49+ 0	0.0143	0.03	Q	|	|	|	|
49+15	0.0134	0.03	Q	|	|	|	|
49+30	0.0126	0.03	Q	|	|	|	|
49+45	0.0119	0.03	Q	|	|	|	|
50+ 0	0.0111	0.02	Q	|	|	|	|
50+15	0.0105	0.02	Q	|	|	|	|
50+30	0.0098	0.02	Q	|	|	|	|
50+45	0.0092	0.02	Q	|	|	|	|
51+ 0	0.0087	0.02	Q	|	|	|	|
51+15	0.0082	0.02	Q	|	|	|	|
51+30	0.0077	0.02	Q	|	|	|	|
51+45	0.0072	0.02	Q	|	|	|	|
52+ 0	0.0068	0.02	Q	|	|	|	|
52+15	0.0064	0.01	Q	|	|	|	|
52+30	0.0060	0.01	Q	|	|	|	|
52+45	0.0056	0.01	Q	|	|	|	|
53+ 0	0.0053	0.01	Q	|	|	|	|
53+15	0.0050	0.01	Q	|	|	|	|
53+30	0.0047	0.01	Q	|	|	|	|
53+45	0.0044	0.01	Q	|	|	|	|
54+ 0	0.0041	0.01	Q	|	|	|	|
54+15	0.0039	0.01	Q	|	|	|	|
54+30	0.0036	0.01	Q	|	|	|	|
54+45	0.0034	0.01	Q	|	|	|	|
55+ 0	0.0032	0.01	Q	|	|	|	|
55+15	0.0030	0.01	Q	|	|	|	|
55+30	0.0028	0.01	Q	|	|	|	|
55+45	0.0027	0.01	Q	|	|	|	|
56+ 0	0.0025	0.01	Q	|	|	|	|
56+15	0.0024	0.01	Q	|	|	|	|
56+30	0.0022	0.00	Q	|	|	|	|
56+45	0.0021	0.00	Q	|	|	|	|
57+ 0	0.0020	0.00	Q	|	|	|	|
57+15	0.0018	0.00	Q	|	|	|	|
57+30	0.0017	0.00	Q	|	|	|	|
57+45	0.0016	0.00	Q	|	|	|	|
58+ 0	0.0015	0.00	Q	|	|	|	|
58+15	0.0014	0.00	Q	|	|	|	|
58+30	0.0014	0.00	Q	|	|	|	|
58+45	0.0013	0.00	Q	|	|	|	|
59+ 0	0.0012	0.00	Q	|	|	|	|
59+15	0.0011	0.00	Q	|	|	|	|
59+30	0.0011	0.00	Q	|	|	|	|
59+45	0.0010	0.00	Q	|	|	|	|
60+ 0	0.0000	0.00	Q	|	|	|	|
60+15	0.0000	0.00	Q	|	|	|	|
60+30	0.0000	0.00	Q	|	|	|	|
60+45	0.0000	0.00	Q	|	|	|	|

**********HYDROGRAPH DATA**********

```
                Number of intervals =   243
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      952.996 (CFS)
                Total volume =     518.754 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
****************************************************************************

--------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SUBA4RT.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      253.6     507.2     760.8    1014.4
--------------------------------------------------------------------
  0+15       0.1087      1.08  Q         |         |         |         |
  0+30       0.4449      6.43  Q         |         |         |         |
  0+45       0.9077     14.74  Q         |         |         |         |
  1+ 0       1.4326     22.06  Q         |         |         |         |
  1+15       1.9529     28.11  qQ        |         |         |         |
  1+30       2.3825     31.44  qQ        |         |         |         |
  1+45       2.7529     32.34  qQ        |         |         |         |
  2+ 0       3.1518     33.59  qQ        |         |         |         |
  2+15       3.6091     36.71  qQ        |         |         |         |
  2+30       4.0665     40.36  qQ        |         |         |         |
  2+45       4.5517     43.46  qQ        |         |         |         |
  3+ 0       5.0893     47.64  qQ        |         |         |         |
  3+15       5.6213     51.96  q Q       |         |         |         |
  3+30       6.1189     54.95  q Q       |         |         |         |
  3+45       6.5818     57.01  q Q       |         |         |         |
  4+ 0       7.0695     59.15  q Q       |         |         |         |
  4+15       7.6093     62.81  q Q       |         |         |         |
  4+30       8.2005     67.39  q Q       |         |         |         |
  4+45       8.8395     72.59  q Q       |         |         |         |
  5+ 0       9.5228     78.09  q  Q      |         |         |         |
  5+15      10.1332     82.78  q  Q      |         |         |         |
  5+30      10.6176     83.94  q  Q      |         |         |         |
  5+45      11.1504     84.71  q  Q      |         |         |         |
  6+ 0      11.7587     88.91  q  Q      |         |         |         |
  6+15      12.4162     94.60  q  Q      |         |         |         |
  6+30      13.1169    103.66  q   Q     |         |         |         |
  6+45      13.8577    115.55  q   Q     |         |         |         |
  7+ 0      14.6357    131.52  q    Q    |         |         |         |
  7+15      15.3914    147.86  q    Q    |         |         |         |
  7+30      16.1541    160.43  q     Q   |         |         |         |
  7+45      17.0070    177.84  q      Q  |         |         |         |
  8+ 0      17.9755    204.04  q       Q |         |         |         |
  8+15      19.1556    237.10  q        Q|         |         |         |
  8+30      20.5314    278.32  q         Q         |         |         |
  8+45      21.9952    316.94  q         | Q       |         |         |
  9+ 0      23.5829    350.27  q         |  Q      |         |         |
  9+15      25.4055    387.65  |q        |    Q    |         |         |
  9+30      27.4920    434.08  |q        |      Q  |         |         |
  9+45      29.7462    483.78  |q        |        Q|         |         |
 10+ 0      32.1147    529.73  |q        |         Q         |         |
 10+15      33.9331    560.16  |q        |         | Q       |         |
 10+30      34.8246    532.77  |q        |         |Q        |         |
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10+45      35.7595    486.46  |q        |        Q|         |         |
11+ 0      37.2307    498.88  |q        |        Q|         |         |
11+15      38.7583    537.61  |q        |         |Q        |         |
11+30      40.0883    554.52  |q        |         |Q        |         |
11+45      41.1293    555.64  |q        |         |Q        |         |
12+ 0      41.9411    545.38  |q        |         |Q        |         |
12+15      43.3114    549.19  |q        |         |Q        |         |
12+30      45.5799    613.02  |q        |         |   Q     |         |
12+45      48.3114    704.01  |q        |         |      Q  |         |
13+ 0      51.2651    781.86  | q       |         |         Q         |
13+15      54.6502    855.48  | q       |         |         |  Q      |
13+30      58.4802    947.54  | q       |         |         |     Q   |
13+45      61.3891   1014.38  | q       |         |         |        Q
14+ 0      62.7702    971.40  | q       |         |         |       Q |
14+15      63.8908    890.16  | q       |         |         |    Q    |
14+30      65.3123    874.21  | q       |         |         |   Q     |
14+45      66.7045    886.44  | q       |         |         |   Q     |
15+ 0      67.8986    887.57  | q       |         |         |   Q     |
15+15      68.8112    879.35  | q       |         |         |   Q     |
15+30      69.4201    862.48  | q       |         |         |   Q     |
15+45      69.4976    833.89  | q       |         |         | Q       |
16+ 0      69.0374    781.40  | q       |         |         Q         |
16+15      67.3119    703.79  | q       |         |      Q  |         |
16+30      64.0042    548.62  | q       |         |Q        |         |
16+45      60.2455    374.17  | q       |   Q     |         |         |
17+ 0      56.6092    269.65  | q       Q         |         |         |
17+15      53.3089    212.67  | q     Q |         |         |         |
17+30      50.4088    184.90  |q     Q  |         |         |         |
17+45      47.7749    172.77  |q    Q   |         |         |         |
18+ 0      45.2733    164.27  |q    Q   |         |         |         |
18+15      42.8600    151.61  |q   Q    |         |         |         |
18+30      40.5833    137.47  |q   Q    |         |         |         |
18+45      38.4056    126.68  |q  Q     |         |         |         |
19+ 0      36.2366    116.44  |q  Q     |         |         |         |
19+15      34.1578    106.14  |q  Q     |         |         |         |
19+30      32.3329     99.89  |q Q      |         |         |         |
19+45      30.6937     98.51  |q Q      |         |         |         |
20+ 0      29.0602     95.26  |q Q      |         |         |         |
20+15      27.4823     88.51  |q Q      |         |         |         |
20+30      26.0662     83.80  |q Q      |         |         |         |
20+45      24.7781     81.52  q  Q      |         |         |         |
21+ 0      23.5256     78.73  q  Q      |         |         |         |
21+15      22.3313     74.59  q Q       |         |         |         |
21+30      21.2177     71.30  q Q       |         |         |         |
21+45      20.1817     68.53  q Q       |         |         |         |
22+ 0      19.2181     66.21  q Q       |         |         |         |
22+15      18.3217     63.99  q Q       |         |         |         |
22+30      17.4879     62.12  q Q       |         |         |         |
22+45      16.6552     59.74  q Q       |         |         |         |
23+ 0      15.8515     56.36  q Q       |         |         |         |
23+15      15.1011     53.66  q Q       |         |         |         |
23+30      14.4031     51.57  q Q       |         |         |         |
23+45      13.7538     49.81  qQ        |         |         |         |
24+ 0      13.1498     48.27  qQ        |         |         |         |
24+15      12.4738     45.78  qQ        |         |         |         |
24+30      11.6725     39.78  qQ        |         |         |         |
24+45      10.8633     32.75  qQ        |         |         |         |
25+ 0      10.1050     27.92  qQ        |         |         |         |
25+15       9.3997     24.63  Q         |         |         |         |
25+30       8.7437     22.14  Q         |         |         |         |
25+45       8.1334     20.16  Q         |         |         |         |
26+ 0       7.5657     18.55  Q         |         |         |         |
26+15       7.0377     17.16  Q         |         |         |         |
26+30       6.5465     15.91  Q         |         |         |         |
26+45       6.0895     14.78  Q         |         |         |         |
27+ 0       5.6645     13.75  Q         |         |         |         |
27+15       5.2691     12.82  Q         |         |         |         |
27+30       4.9014     11.95  Q         |         |         |         |
27+45       4.5593     11.16  Q         |         |         |         |
28+ 0       4.2411     10.41  Q         |         |         |         |
28+15       3.9450      9.72  Q         |         |         |         |
```

28+30	3.6697	9.08	Q	|	|	|	|
28+45	3.4136	8.48	Q	|	|	|	|
29+ 0	3.1753	7.92	Q	|	|	|	|
29+15	2.9537	7.40	Q	|	|	|	|
29+30	2.7475	6.92	Q	|	|	|	|
29+45	2.5558	6.46	Q	|	|	|	|
30+ 0	2.3774	6.04	Q	|	|	|	|
30+15	2.2114	5.65	Q	|	|	|	|
30+30	2.0571	5.28	Q	|	|	|	|
30+45	1.9135	4.94	Q	|	|	|	|
31+ 0	1.7800	4.62	Q	|	|	|	|
31+15	1.6557	4.32	Q	|	|	|	|
31+30	1.5402	4.04	Q	|	|	|	|
31+45	1.4327	3.78	Q	|	|	|	|
32+ 0	1.3327	3.53	Q	|	|	|	|
32+15	1.2397	3.30	Q	|	|	|	|
32+30	1.1531	3.09	Q	|	|	|	|
32+45	1.0726	2.89	Q	|	|	|	|
33+ 0	0.9978	2.71	Q	|	|	|	|
33+15	0.9281	2.53	Q	|	|	|	|
33+30	0.8634	2.37	Q	|	|	|	|
33+45	0.8031	2.22	Q	|	|	|	|
34+ 0	0.7470	2.07	Q	|	|	|	|
34+15	0.6949	1.94	Q	|	|	|	|
34+30	0.6464	1.82	Q	|	|	|	|
34+45	0.6013	1.70	Q	|	|	|	|
35+ 0	0.5593	1.59	Q	|	|	|	|
35+15	0.5203	1.49	Q	|	|	|	|
35+30	0.4840	1.39	Q	|	|	|	|
35+45	0.4502	1.31	Q	|	|	|	|
36+ 0	0.4188	1.22	Q	|	|	|	|
36+15	0.3895	1.14	Q	|	|	|	|
36+30	0.3623	1.07	Q	|	|	|	|
36+45	0.3371	1.00	Q	|	|	|	|
37+ 0	0.3135	0.94	Q	|	|	|	|
37+15	0.2916	0.88	Q	|	|	|	|
37+30	0.2713	0.82	Q	|	|	|	|
37+45	0.2524	0.77	Q	|	|	|	|
38+ 0	0.2347	0.72	Q	|	|	|	|
38+15	0.2184	0.68	Q	|	|	|	|
38+30	0.2031	0.63	Q	|	|	|	|
38+45	0.1889	0.59	Q	|	|	|	|
39+ 0	0.1758	0.56	Q	|	|	|	|
39+15	0.1635	0.52	Q	|	|	|	|
39+30	0.1521	0.49	Q	|	|	|	|
39+45	0.1415	0.46	Q	|	|	|	|
40+ 0	0.1316	0.43	Q	|	|	|	|
40+15	0.1224	0.40	Q	|	|	|	|
40+30	0.1139	0.37	Q	|	|	|	|
40+45	0.1059	0.35	Q	|	|	|	|
41+ 0	0.0985	0.33	Q	|	|	|	|
41+15	0.0916	0.31	Q	|	|	|	|
41+30	0.0852	0.29	Q	|	|	|	|
41+45	0.0793	0.27	Q	|	|	|	|
42+ 0	0.0738	0.25	Q	|	|	|	|
42+15	0.0686	0.24	Q	|	|	|	|
42+30	0.0638	0.22	Q	|	|	|	|
42+45	0.0594	0.21	Q	|	|	|	|
43+ 0	0.0552	0.20	Q	|	|	|	|
43+15	0.0514	0.18	Q	|	|	|	|
43+30	0.0478	0.17	Q	|	|	|	|
43+45	0.0445	0.16	Q	|	|	|	|
44+ 0	0.0413	0.15	Q	|	|	|	|
44+15	0.0385	0.14	Q	|	|	|	|
44+30	0.0358	0.13	Q	|	|	|	|
44+45	0.0333	0.12	Q	|	|	|	|
45+ 0	0.0310	0.12	Q	|	|	|	|
45+15	0.0288	0.11	Q	|	|	|	|
45+30	0.0268	0.10	Q	|	|	|	|
45+45	0.0249	0.10	Q	|	|	|	|
46+ 0	0.0232	0.09	Q	|	|	|	|

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   46+15       0.0216      0.08  Q          |          |          |          |
   46+30       0.0201      0.08  Q          |          |          |          |
   46+45       0.0187      0.07  Q          |          |          |          |
   47+ 0       0.0174      0.07  Q          |          |          |          |
   47+15       0.0161      0.07  Q          |          |          |          |
   47+30       0.0150      0.06  Q          |          |          |          |
   47+45       0.0140      0.06  Q          |          |          |          |
   48+ 0       0.0130      0.05  Q          |          |          |          |
   48+15       0.0121      0.05  Q          |          |          |          |
   48+30       0.0112      0.05  Q          |          |          |          |
   48+45       0.0105      0.04  Q          |          |          |          |
   49+ 0       0.0097      0.04  Q          |          |          |          |
   49+15       0.0090      0.04  Q          |          |          |          |
   49+30       0.0084      0.04  Q          |          |          |          |
   49+45       0.0078      0.03  Q          |          |          |          |
   50+ 0       0.0073      0.03  Q          |          |          |          |
   50+15       0.0068      0.03  Q          |          |          |          |
   50+30       0.0063      0.03  Q          |          |          |          |
   50+45       0.0059      0.03  Q          |          |          |          |
   51+ 0       0.0055      0.02  Q          |          |          |          |
   51+15       0.0051      0.02  Q          |          |          |          |
   51+30       0.0047      0.02  Q          |          |          |          |
   51+45       0.0044      0.02  Q          |          |          |          |
   52+ 0       0.0041      0.02  Q          |          |          |          |
   52+15       0.0038      0.02  Q          |          |          |          |
   52+30       0.0035      0.02  Q          |          |          |          |
   52+45       0.0033      0.02  Q          |          |          |          |
   53+ 0       0.0031      0.01  Q          |          |          |          |
   53+15       0.0028      0.01  Q          |          |          |          |
   53+30       0.0026      0.01  Q          |          |          |          |
   53+45       0.0025      0.01  Q          |          |          |          |
   54+ 0       0.0023      0.01  Q          |          |          |          |
   54+15       0.0021      0.01  Q          |          |          |          |
   54+30       0.0020      0.01  Q          |          |          |          |
   54+45       0.0018      0.01  Q          |          |          |          |
   55+ 0       0.0017      0.01  Q          |          |          |          |
   55+15       0.0016      0.01  Q          |          |          |          |
   55+30       0.0015      0.01  Q          |          |          |          |
   55+45       0.0014      0.01  Q          |          |          |          |
   56+ 0       0.0013      0.01  Q          |          |          |          |
   56+15       0.0012      0.01  Q          |          |          |          |
   56+30       0.0011      0.01  Q          |          |          |          |
   56+45       0.0010      0.01  Q          |          |          |          |
   57+ 0       0.0010      0.01  Q          |          |          |          |
   57+15       0.0000      0.00  Q          |          |          |          |
   57+30       0.0000      0.00  Q          |          |          |          |
   57+45       0.0000      0.00  Q          |          |          |          |
   58+ 0       0.0000      0.00  Q          |          |          |          |
   58+15       0.0000      0.00  Q          |          |          |          |
   58+30       0.0000      0.00  Q          |          |          |          |
   58+45       0.0000      0.00  Q          |          |          |          |
   59+ 0       0.0000      0.00  Q          |          |          |          |
   59+15       0.0000      0.00  Q          |          |          |          |
   59+30       0.0000      0.00  Q          |          |          |          |
   59+45       0.0000      0.00  Q          |          |          |          |
   60+ 0       0.0000      0.00  Q          |          |          |          |
   60+15       0.0000      0.00  Q          |          |          |          |
   60+30       0.0000      0.00  Q          |          |          |          |
   60+45       0.0000      0.00  Q          |          |          |          |
---------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                Number of intervals =   243
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =     1014.385 (CFS)
                Total volume =     579.556 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***************************************************************************
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Process from Point/Station        3.000 to Point/Station        4.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1600.00 (Ft.)
Elevation difference =   30.00 (Ft.)
Slope of channel =  0.018750 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1600.00(Ft.)     Elevation difference =  30.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    366.543(CFS)
Depth of flow =     1.814(Ft.)
Average velocity =    17.107(Ft/s)
Total flow rate =   366.543(CFS)
Channel flow top width =   13.627(Ft.)
Depth of flow in channel =   1.81(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.11(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  366.543(CFS)
Total capacity of improved channels =    366.543(CFS)
Critical Depth in Channel =    3.13(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =   1014.385(CFS)
Depth of flow =     3.274(Ft.)
Average velocity =    23.338(Ft/s)
Total flow rate =  1014.385(CFS)
Channel flow top width =   16.549(Ft.)
Depth of flow in channel =   3.27(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   23.34(Ft/s)
Travel time  =    0.00 min.
Individual channel flow = 1014.385(CFS)
Total capacity of improved channels =   1014.385(CFS)
Critical Depth in Channel =    5.63(Ft.)


********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9321   Travel time =   1.14 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   9.7226
       dt(routing time-step) =   1.07 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


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                 P R I N T  O F  S T O R M
              R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

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Time(h+m) Out = O(CFS) In = I  0      253.6     507.2     760.8    1014.4
-----------------------------------------------------------------------
  0+15       1.0063      1.08  O         |         |         |         |
  0+30       6.0519      6.43  O         |         |         |         |
  0+45      14.1489     14.74  O         |         |         |         |
  1+ 0      21.5363     22.06  O         |         |         |         |
  1+15      27.6766     28.11  |O        |         |         |         |
  1+30      31.2052     31.44  |O        |         |         |         |
  1+45      32.2745     32.34  |O        |         |         |         |
  2+ 0      33.5011     33.59  |O        |         |         |         |
  2+15      36.4872     36.71  |O        |         |         |         |
  2+30      40.0977     40.36  |O        |         |         |         |
  2+45      43.2440     43.46  |O        |         |         |         |
  3+ 0      47.3419     47.64  |O        |         |         |         |
  3+15      51.6572     51.96  | O       |         |         |         |
  3+30      54.7389     54.95  | O       |         |         |         |
  3+45      56.8594     57.01  | O       |         |         |         |
  4+ 0      58.9938     59.15  | O       |         |         |         |
  4+15      62.5518     62.81  | O       |         |         |         |
  4+30      67.0657     67.39  | O       |         |         |         |
  4+45      72.2205     72.59  | O       |         |         |         |
  5+ 0      77.7013     78.09  |  O      |         |         |         |
  5+15      82.4514     82.78  |  O      |         |         |         |
  5+30      83.8581     83.94  |  O      |         |         |         |
  5+45      84.6591     84.71  |  O      |         |         |         |
  6+ 0      88.6105     88.91  |  O      |         |         |         |
  6+15      94.1943     94.60  |  O      |         |         |         |
  6+30     103.0198    103.66  |   O     |         |         |         |
  6+45     114.7023    115.55  |   O     |         |         |         |
  7+ 0     130.3852    131.52  |    O    |         |         |         |
  7+15     146.7010    147.86  |    O    |         |         |         |
  7+30     159.5356    160.43  |     O   |         |         |         |
  7+45     176.6060    177.84  |     OI  |         |         |         |
  8+ 0     202.1766    204.04  |      OI |         |         |         |
  8+15     234.7527    237.10  |        O|         |         |         |
  8+30     275.3929    278.32  |         O         |         |         |
  8+45     314.1946    316.94  |         | O       |         |         |
  9+ 0     347.9058    350.27  |         |  O      |         |         |
  9+15     384.9971    387.65  |         |    O    |         |         |
  9+30     430.7838    434.08  |         |     OI  |         |         |
  9+45     480.2532    483.78  |         |       OI|         |         |
 10+ 0     526.4655    529.73  |         |         O         |         |
 10+15     558.0027    560.16  |         |         | O       |         |
 10+30     534.7143    532.77  |         |         |O        |         |
 10+45     489.7457    486.46  |         |        O|         |         |
 11+ 0     498.0020    498.88  |         |        O|         |         |
 11+15     534.8637    537.61  |         |         |O        |         |
 11+30     553.3231    554.52  |         |         |O        |         |
 11+45     555.5634    555.64  |         |         |O        |         |
 12+ 0     546.1063    545.38  |         |         |O        |         |
 12+15     548.9186    549.19  |         |         |O        |         |
 12+30     608.4886    613.02  |         |         |  OI     |         |
 12+45     697.5484    704.01  |         |         |      O  |         |
 13+ 0     776.3277    781.86  |         |         |         O         |
 13+15     850.2553    855.48  |         |         |         |  O      |
 13+30     941.0013    947.54  |         |         |         |      O  |
 13+45    1009.6382   1014.38  |         |         |         |        OI
 14+ 0     974.4536    971.40  |         |         |         |       O |
 14+15     895.9287    890.16  |         |         |         |    O    |
 14+30     875.3443    874.21  |         |         |         |   O     |
 14+45     885.5690    886.44  |         |         |         |   O     |
 15+ 0     887.4900    887.57  |         |         |         |   O     |
 15+15     879.9352    879.35  |         |         |         |   O     |
 15+30     863.6788    862.48  |         |         |         |   O     |
 15+45     835.9204    833.89  |         |         |         | O       |
 16+ 0     785.1238    781.40  |         |         |         O         |
 16+15     709.3036    703.79  |         |         |      O  |         |
 16+30     559.6338    548.62  |         |         |IO       |         |
 16+45     386.5522    374.17  |         |   IO    |         |         |
 17+ 0     277.0725    269.65  |         O         |         |         |
 17+15     216.7200    212.67  |       O |         |         |         |
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17+30     186.8696    184.90  |      O  |         |         |         |
17+45     173.6301    172.77  |     O   |         |         |         |
18+ 0     164.8744    164.27  |     O   |         |         |         |
18+15     152.5067    151.61  |    IO   |         |         |         |
18+30     138.4692    137.47  |    O    |         |         |         |
18+45     127.4485    126.68  |   IO    |         |         |         |
19+ 0     117.1656    116.44  |   O     |         |         |         |
19+15     106.8747    106.14  |   O     |         |         |         |
19+30     100.3363     99.89  |  O      |         |         |         |
19+45      98.6080     98.51  |  O      |         |         |         |
20+ 0      95.4871     95.26  |  O      |         |         |         |
20+15      88.9917     88.51  |  O      |         |         |         |
20+30      84.1370     83.80  |  O      |         |         |         |
20+45      81.6808     81.52  |  O      |         |         |         |
21+ 0      78.9267     78.73  |  O      |         |         |         |
21+15      74.8845     74.59  | O       |         |         |         |
21+30      71.5302     71.30  | O       |         |         |         |
21+45      68.7257     68.53  | O       |         |         |         |
22+ 0      66.3765     66.21  | O       |         |         |         |
22+15      64.1494     63.99  | O       |         |         |         |
22+30      62.2498     62.12  | O       |         |         |         |
22+45      59.9055     59.74  | O       |         |         |         |
23+ 0      56.5995     56.36  | O       |         |         |         |
23+15      53.8547     53.66  | O       |         |         |         |
23+30      51.7158     51.57  | O       |         |         |         |
23+45      49.9362     49.81  |O        |         |         |         |
24+ 0      48.3823     48.27  |O        |         |         |         |
24+15      45.9612     45.78  |O        |         |         |         |
24+30      40.2107     39.78  |O        |         |         |         |
24+45      33.2502     32.75  |O        |         |         |         |
25+ 0      28.2640     27.92  |O        |         |         |         |
25+15      24.8632     24.63  O        |         |         |         |
25+30      22.3142     22.14  O        |         |         |         |
25+45      20.2997     20.16  O        |         |         |         |
26+ 0      18.6662     18.55  O        |         |         |         |
26+15      17.2618     17.16  O        |         |         |         |
26+30      16.0018     15.91  O        |         |         |         |
26+45      14.8584     14.78  O        |         |         |         |
27+ 0      13.8227     13.75  O        |         |         |         |
27+15      12.8819     12.82  O        |         |         |         |
27+30      12.0156     11.95  O        |         |         |         |
27+45      11.2124     11.16  O        |         |         |         |
28+ 0      10.4662     10.41  O        |         |         |         |
28+15       9.7720      9.72  O        |         |         |         |
28+30       9.1257      9.08  O        |         |         |         |
28+45       8.5238      8.48  O        |         |         |         |
29+ 0       7.9629      7.92  O        |         |         |         |
29+15       7.4399      7.40  O        |         |         |         |
29+30       6.9516      6.92  O        |         |         |         |
29+45       6.4968      6.46  O        |         |         |         |
30+ 0       6.0724      6.04  O        |         |         |         |
30+15       5.6764      5.65  O        |         |         |         |
30+30       5.3067      5.28  O        |         |         |         |
30+45       4.9615      4.94  O        |         |         |         |
31+ 0       4.6392      4.62  O        |         |         |         |
31+15       4.3382      4.32  O        |         |         |         |
31+30       4.0571      4.04  O        |         |         |         |
31+45       3.7945      3.78  O        |         |         |         |
32+ 0       3.5491      3.53  O        |         |         |         |
32+15       3.3199      3.30  O        |         |         |         |
32+30       3.1057      3.09  O        |         |         |         |
32+45       2.9055      2.89  O        |         |         |         |
33+ 0       2.7183      2.71  O        |         |         |         |
33+15       2.5434      2.53  O        |         |         |         |
33+30       2.3799      2.37  O        |         |         |         |
33+45       2.2271      2.22  O        |         |         |         |
34+ 0       2.0841      2.07  O        |         |         |         |
34+15       1.9505      1.94  O        |         |         |         |
34+30       1.8255      1.82  O        |         |         |         |
34+45       1.7086      1.70  O        |         |         |         |
35+ 0       1.5993      1.59  O        |         |         |         |
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35+15	1.4970	1.49	O	|	|	|	|
35+30	1.4014	1.39	O	|	|	|	|
35+45	1.3119	1.31	O	|	|	|	|
36+ 0	1.2282	1.22	O	|	|	|	|
36+15	1.1499	1.14	O	|	|	|	|
36+30	1.0766	1.07	O	|	|	|	|
36+45	1.0080	1.00	O	|	|	|	|
37+ 0	0.9439	0.94	O	|	|	|	|
37+15	0.8838	0.88	O	|	|	|	|
37+30	0.8276	0.82	O	|	|	|	|
37+45	0.7751	0.77	O	|	|	|	|
38+ 0	0.7258	0.72	O	|	|	|	|
38+15	0.6798	0.68	O	|	|	|	|
38+30	0.6366	0.63	O	|	|	|	|
38+45	0.5963	0.59	O	|	|	|	|
39+ 0	0.5585	0.56	O	|	|	|	|
39+15	0.5231	0.52	O	|	|	|	|
39+30	0.4900	0.49	O	|	|	|	|
39+45	0.4590	0.46	O	|	|	|	|
40+ 0	0.4300	0.43	O	|	|	|	|
40+15	0.4020	0.40	O	|	|	|	|
40+30	0.3766	0.37	O	|	|	|	|
40+45	0.3528	0.35	O	|	|	|	|
41+ 0	0.3306	0.33	O	|	|	|	|
41+15	0.3097	0.31	O	|	|	|	|
41+30	0.2902	0.29	O	|	|	|	|
41+45	0.2719	0.27	O	|	|	|	|
42+ 0	0.2548	0.25	O	|	|	|	|
42+15	0.2388	0.24	O	|	|	|	|
42+30	0.2237	0.22	O	|	|	|	|
42+45	0.2097	0.21	O	|	|	|	|
43+ 0	0.1965	0.20	O	|	|	|	|
43+15	0.1841	0.18	O	|	|	|	|
43+30	0.1726	0.17	O	|	|	|	|
43+45	0.1617	0.16	O	|	|	|	|
44+ 0	0.1516	0.15	O	|	|	|	|
44+15	0.1421	0.14	O	|	|	|	|
44+30	0.1331	0.13	O	|	|	|	|
44+45	0.1248	0.12	O	|	|	|	|
45+ 0	0.1170	0.12	O	|	|	|	|
45+15	0.1096	0.11	O	|	|	|	|
45+30	0.1028	0.10	O	|	|	|	|
45+45	0.0963	0.10	O	|	|	|	|
46+ 0	0.0903	0.09	O	|	|	|	|
46+15	0.0846	0.08	O	|	|	|	|
46+30	0.0793	0.08	O	|	|	|	|
46+45	0.0744	0.07	O	|	|	|	|
47+ 0	0.0697	0.07	O	|	|	|	|
47+15	0.0653	0.07	O	|	|	|	|
47+30	0.0613	0.06	O	|	|	|	|
47+45	0.0574	0.06	O	|	|	|	|
48+ 0	0.0538	0.05	O	|	|	|	|
48+15	0.0505	0.05	O	|	|	|	|
48+30	0.0473	0.05	O	|	|	|	|
48+45	0.0444	0.04	O	|	|	|	|
49+ 0	0.0416	0.04	O	|	|	|	|
49+15	0.0390	0.04	O	|	|	|	|
49+30	0.0366	0.04	O	|	|	|	|
49+45	0.0343	0.03	O	|	|	|	|
50+ 0	0.0322	0.03	O	|	|	|	|
50+15	0.0301	0.03	O	|	|	|	|
50+30	0.0283	0.03	O	|	|	|	|
50+45	0.0265	0.03	O	|	|	|	|
51+ 0	0.0249	0.02	O	|	|	|	|
51+15	0.0233	0.02	O	|	|	|	|
51+30	0.0219	0.02	O	|	|	|	|
51+45	0.0205	0.02	O	|	|	|	|
52+ 0	0.0192	0.02	O	|	|	|	|
52+15	0.0180	0.02	O	|	|	|	|
52+30	0.0169	0.02	O	|	|	|	|
52+45	0.0159	0.02	O	|	|	|	|

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  53+ 0       0.0149      0.01  O         |         |         |         |
  53+15       0.0139      0.01  O         |         |         |         |
  53+30       0.0131      0.01  O         |         |         |         |
  53+45       0.0123      0.01  O         |         |         |         |
  54+ 0       0.0115      0.01  O         |         |         |         |
  54+15       0.0108      0.01  O         |         |         |         |
  54+30       0.0101      0.01  O         |         |         |         |
  54+45       0.0095      0.01  O         |         |         |         |
  55+ 0       0.0089      0.01  O         |         |         |         |
  55+15       0.0084      0.01  O         |         |         |         |
  55+30       0.0078      0.01  O         |         |         |         |
  55+45       0.0074      0.01  O         |         |         |         |
  56+ 0       0.0069      0.01  O         |         |         |         |
  56+15       0.0065      0.01  O         |         |         |         |
  56+30       0.0061      0.01  O         |         |         |         |
  56+45       0.0057      0.01  O         |         |         |         |
  57+ 0       0.0054      0.01  O         |         |         |         |
  57+15       0.0042      0.00  O         |         |         |         |
  57+30       0.0039      0.00  O         |         |         |         |
  57+45       0.0036      0.00  O         |         |         |         |
  58+ 0       0.0034      0.00  O         |         |         |         |
  58+15       0.0032      0.00  O         |         |         |         |
  58+30       0.0030      0.00  O         |         |         |         |
  58+45       0.0028      0.00  O         |         |         |         |
  59+ 0       0.0027      0.00  O         |         |         |         |
  59+15       0.0025      0.00  O         |         |         |         |
  59+30       0.0024      0.00  O         |         |         |         |
  59+45       0.0022      0.00  O         |         |         |         |
  60+ 0       0.0012      0.00  O         |         |         |         |
  60+15       0.0011      0.00  O         |         |         |         |
  60+30       0.0010      0.00  O         |         |         |         |
  60+45       0.0001      0.00  O         |         |         |         |
  61+ 0       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   244
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =     1009.638 (CFS)
                      Total volume =     579.556 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       -----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        3.000 to Point/Station        4.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ********************* HYDROGRAPH INFORMATION **********************

                      From study/file name: SUBA524100.rte
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ----------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      267.3     534.7     802.0    1069.3
  ----------------------------------------------------------------------
    0+15       1.8182      2.82  Q         |         |         |         |
    0+30       3.9986     10.05  Q         |         |         |         |
    0+45       4.8726     19.02  Q         |         |         |         |
    1+ 0       5.9009     27.44  qQ        |         |         |         |
    1+15       5.6275     33.30  qQ        |         |         |         |
    1+30       5.1109     36.32  qQ        |         |         |         |
    1+45       4.9918     37.27  qQ        |         |         |         |
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 2+ 0       5.9009     39.40  qQ        |         |         |         |
 2+15       6.5366     43.02  qQ        |         |         |         |
 2+30       6.6557     46.75  qQ        |         |         |         |
 2+45       7.5648     50.81  qQ        |         |         |         |
 3+ 0       8.2005     55.54  q Q       |         |         |         |
 3+15       8.3196     59.98  q Q       |         |         |         |
 3+30       8.3196     63.06  q Q       |         |         |         |
 3+45       8.3196     65.18  q Q       |         |         |         |
 4+ 0       9.2287     68.22  q Q       |         |         |         |
 4+15       9.8644     72.42  q Q       |         |         |         |
 4+30      10.8927     77.96  q Q       |         |         |         |
 4+45      11.5283     83.75  q  Q      |         |         |         |
 5+ 0      12.5566     90.26  q  Q      |         |         |         |
 5+15      11.3741     93.83  q  Q      |         |         |         |
 5+30      11.1310     94.99  q  Q      |         |         |         |
 5+45      12.4374     97.10  q  Q      |         |         |         |
 6+ 0      13.1923    101.80  q  Q      |         |         |         |
 6+15      14.2205    108.41  q   Q     |         |         |         |
 6+30      14.8562    117.88  q   Q     |         |         |         |
 6+45      15.8845    130.59  q   Q     |         |         |         |
 7+ 0      16.5201    146.91  q    Q    |         |         |         |
 7+15      16.6393    163.34  q     Q   |         |         |         |
 7+30      17.5484    177.08  q     Q   |         |         |         |
 7+45      19.0932    195.70  q      Q  |         |         |         |
 8+ 0      20.7571    222.93  q       Q |         |         |         |
 8+15      24.0317    258.78  q        Q|         |         |         |
 8+30      25.9845    301.38  q         |Q        |         |         |
 8+45      27.7347    341.93  |q        | Q       |         |         |
 9+ 0      30.0710    377.98  |q        |   Q     |         |         |
 9+15      33.8751    418.87  |q        |    Q    |         |         |
 9+30      37.2874    468.07  |q        |      Q  |         |         |
 9+45      39.9607    520.21  |q        |        Q|         |         |
10+ 0      42.4625    568.93  |q        |         |Q        |         |
10+15      34.5734    592.58  |q        |         | Q       |         |
10+30      28.5093    563.22  |q        |         |Q        |         |
10+45      33.9325    523.68  |q        |        Q|         |         |
11+ 0      38.5930    536.59  |q        |         Q         |         |
11+15      38.2641    573.13  |q        |         |Q        |         |
11+30      37.4735    590.80  |q        |         | Q       |         |
11+45      34.8220    590.39  |q        |         | Q       |         |
12+ 0      34.4195    580.53  |q        |         |Q        |         |
12+15      44.1918    593.11  |q        |         | Q       |         |
12+30      52.1298    660.62  |q        |         |   Q     |         |
12+45      56.9380    754.49  | q       |         |       Q |         |
13+ 0      60.3328    836.66  | q       |         |         |Q        |
13+15      68.1834    918.44  | q       |         |         |   Q     |
13+30      73.0012   1014.00  | q       |         |         |     Q   |
13+45      59.6721   1069.31  | q       |         |         |       Q |
14+ 0      49.7873   1024.24  |q        |         |         |      Q  |
14+15      53.2126    949.14  |q        |         |         |    Q    |
14+30      55.6478    930.99  | q       |         |         |   Q     |
14+45      55.5207    941.09  | q       |         |         |    Q    |
15+ 0      54.1505    941.64  | q       |         |         |    Q    |
15+15      52.0409    931.98  |q        |         |         |   Q     |
15+30      49.7596    913.44  |q        |         |         |   Q     |
15+45      43.5806    879.50  |q        |         |         | Q       |
16+ 0      39.8707    824.99  |q        |         |        Q        |
16+15      21.4299    730.73  q         |         |      Q  |         |
16+30       8.9890    568.62  q         |         |Q        |         |
16+45       5.7466    392.30  q         |   Q     |         |         |
17+ 0       5.1109    282.18  q         Q         |         |         |
17+15       6.8100    223.53  q       Q |         |         |         |
17+30       8.0813    194.95  q      Q  |         |         |         |
17+45       8.3196    181.95  q     Q   |         |         |         |
18+ 0       7.4105    172.28  q     Q   |         |         |         |
18+15       6.7749    159.28  q    Q    |         |         |         |
18+30       6.6557    145.12  q    Q    |         |         |         |
18+45       5.7466    133.20  q   Q     |         |         |         |
19+ 0       4.2018    121.37  q   Q     |         |         |         |
19+15       4.3561    111.23  q   Q     |         |         |         |
19+30       5.7817    106.12  q  Q      |         |         |         |
```

19+45	5.6275	104.24	q Q			
20+ 0	4.2018	99.69	q Q			
20+15	4.3561	93.35	q Q			
20+30	4.8726	89.01	q Q			
20+45	4.9918	86.67	q Q			
21+ 0	4.0827	83.01	q Q			
21+15	4.3561	79.24	q Q			
21+30	3.9635	75.49	q Q			
21+45	4.3561	73.08	q Q			
22+ 0	3.9635	70.34	q Q			
22+15	4.3561	68.51	q Q			
22+30	3.9635	66.21	q Q			
22+45	3.4470	63.35	q Q			
23+ 0	3.3279	59.93	q Q			
23+15	3.3279	57.18	q Q			
23+30	3.3279	55.04	q Q			
23+45	3.3279	53.26	qQ			
24+ 0	3.3279	51.71	qQ			
24+15	1.5097	47.47	qQ			
24+30	0.2383	40.45	qQ			
24+45	0.0000	33.25	qQ			
25+ 0	0.0000	28.26	qQ			
25+15	0.0000	24.86	Q			
25+30	0.0000	22.31	Q			
25+45	0.0000	20.30	Q			
26+ 0	0.0000	18.67	Q			
26+15	0.0000	17.26	Q			
26+30	0.0000	16.00	Q			
26+45	0.0000	14.86	Q			
27+ 0	0.0000	13.82	Q			
27+15	0.0000	12.88	Q			
27+30	0.0000	12.02	Q			
27+45	0.0000	11.21	Q			
28+ 0	0.0000	10.47	Q			
28+15	0.0000	9.77	Q			
28+30	0.0000	9.13	Q			
28+45	0.0000	8.52	Q			
29+ 0	0.0000	7.96	Q			
29+15	0.0000	7.44	Q			
29+30	0.0000	6.95	Q			
29+45	0.0000	6.50	Q			
30+ 0	0.0000	6.07	Q			
30+15	0.0000	5.68	Q			
30+30	0.0000	5.31	Q			
30+45	0.0000	4.96	Q			
31+ 0	0.0000	4.64	Q			
31+15	0.0000	4.34	Q			
31+30	0.0000	4.06	Q			
31+45	0.0000	3.79	Q			
32+ 0	0.0000	3.55	Q			
32+15	0.0000	3.32	Q			
32+30	0.0000	3.11	Q			
32+45	0.0000	2.91	Q			
33+ 0	0.0000	2.72	Q			
33+15	0.0000	2.54	Q			
33+30	0.0000	2.38	Q			
33+45	0.0000	2.23	Q			
34+ 0	0.0000	2.08	Q			
34+15	0.0000	1.95	Q			
34+30	0.0000	1.83	Q			
34+45	0.0000	1.71	Q			
35+ 0	0.0000	1.60	Q			
35+15	0.0000	1.50	Q			
35+30	0.0000	1.40	Q			
35+45	0.0000	1.31	Q			
36+ 0	0.0000	1.23	Q			
36+15	0.0000	1.15	Q			
36+30	0.0000	1.08	Q			
36+45	0.0000	1.01	Q			
37+ 0	0.0000	0.94	Q			
37+15	0.0000	0.88	Q			

37+30	0.0000	0.83	Q				
37+45	0.0000	0.78	Q				
38+ 0	0.0000	0.73	Q				
38+15	0.0000	0.68	Q				
38+30	0.0000	0.64	Q				
38+45	0.0000	0.60	Q				
39+ 0	0.0000	0.56	Q				
39+15	0.0000	0.52	Q				
39+30	0.0000	0.49	Q				
39+45	0.0000	0.46	Q				
40+ 0	0.0000	0.43	Q				
40+15	0.0000	0.40	Q				
40+30	0.0000	0.38	Q				
40+45	0.0000	0.35	Q				
41+ 0	0.0000	0.33	Q				
41+15	0.0000	0.31	Q				
41+30	0.0000	0.29	Q				
41+45	0.0000	0.27	Q				
42+ 0	0.0000	0.25	Q				
42+15	0.0000	0.24	Q				
42+30	0.0000	0.22	Q				
42+45	0.0000	0.21	Q				
43+ 0	0.0000	0.20	Q				
43+15	0.0000	0.18	Q				
43+30	0.0000	0.17	Q				
43+45	0.0000	0.16	Q				
44+ 0	0.0000	0.15	Q				
44+15	0.0000	0.14	Q				
44+30	0.0000	0.13	Q				
44+45	0.0000	0.12	Q				
45+ 0	0.0000	0.12	Q				
45+15	0.0000	0.11	Q				
45+30	0.0000	0.10	Q				
45+45	0.0000	0.10	Q				
46+ 0	0.0000	0.09	Q				
46+15	0.0000	0.08	Q				
46+30	0.0000	0.08	Q				
46+45	0.0000	0.07	Q				
47+ 0	0.0000	0.07	Q				
47+15	0.0000	0.07	Q				
47+30	0.0000	0.06	Q				
47+45	0.0000	0.06	Q				
48+ 0	0.0000	0.05	Q				
48+15	0.0000	0.05	Q				
48+30	0.0000	0.05	Q				
48+45	0.0000	0.04	Q				
49+ 0	0.0000	0.04	Q				
49+15	0.0000	0.04	Q				
49+30	0.0000	0.04	Q				
49+45	0.0000	0.03	Q				
50+ 0	0.0000	0.03	Q				
50+15	0.0000	0.03	Q				
50+30	0.0000	0.03	Q				
50+45	0.0000	0.03	Q				
51+ 0	0.0000	0.02	Q				
51+15	0.0000	0.02	Q				
51+30	0.0000	0.02	Q				
51+45	0.0000	0.02	Q				
52+ 0	0.0000	0.02	Q				
52+15	0.0000	0.02	Q				
52+30	0.0000	0.02	Q				
52+45	0.0000	0.02	Q				
53+ 0	0.0000	0.01	Q				
53+15	0.0000	0.01	Q				
53+30	0.0000	0.01	Q				
53+45	0.0000	0.01	Q				
54+ 0	0.0000	0.01	Q				
54+15	0.0000	0.01	Q				
54+30	0.0000	0.01	Q				
54+45	0.0000	0.01	Q				
55+ 0	0.0000	0.01	Q				

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  55+15       0.0000      0.01  Q         |         |         |         |
  55+30       0.0000      0.01  Q         |         |         |         |
  55+45       0.0000      0.01  Q         |         |         |         |
  56+ 0       0.0000      0.01  Q         |         |         |         |
  56+15       0.0000      0.01  Q         |         |         |         |
  56+30       0.0000      0.01  Q         |         |         |         |
  56+45       0.0000      0.01  Q         |         |         |         |
  57+ 0       0.0000      0.01  Q         |         |         |         |
  57+15       0.0000      0.00  Q         |         |         |         |
  57+30       0.0000      0.00  Q         |         |         |         |
  57+45       0.0000      0.00  Q         |         |         |         |
  58+ 0       0.0000      0.00  Q         |         |         |         |
  58+15       0.0000      0.00  Q         |         |         |         |
  58+30       0.0000      0.00  Q         |         |         |         |
  58+45       0.0000      0.00  Q         |         |         |         |
  59+ 0       0.0000      0.00  Q         |         |         |         |
  59+15       0.0000      0.00  Q         |         |         |         |
  59+30       0.0000      0.00  Q         |         |         |         |
  59+45       0.0000      0.00  Q         |         |         |         |
  60+ 0       0.0000      0.00  Q         |         |         |         |
  60+15       0.0000      0.00  Q         |         |         |         |
  60+30       0.0000      0.00  Q         |         |         |         |
  60+45       0.0000      0.00  Q         |         |         |         |
  61+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   244
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =     1069.310 (CFS)
                     Total volume =     619.230 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ---------------------------------------------------------------------


      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        3.000 to Point/Station        4.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ____________________________________________________________________
      ******************** HYDROGRAPH INFORMATION *********************

                     From study/file name: SUBA624100.rte
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

      ---------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0      303.9     607.8     911.6    1215.5
  ----------------------------------------------------------------------
    0+15       4.4550      7.28  Q         |         |         |         |
    0+30       9.7976     19.85  Q         |         |         |         |
    0+45      11.9391     30.96  qQ        |         |         |         |
    1+ 0      14.4586     41.90  qQ        |         |         |         |
    1+15      13.7886     47.09  qQ        |         |         |         |
    1+30      12.5230     48.84  qQ        |         |         |         |
    1+45      12.2311     49.50  qQ        |         |         |         |
    2+ 0      14.4586     53.86  qQ        |         |         |         |
    2+15      16.0161     59.04  qQ        |         |         |         |
    2+30      16.3081     63.06  q Q       |         |         |         |
    2+45      18.5356     69.34  q Q       |         |         |         |
    3+ 0      20.0931     75.64  q Q       |         |         |         |
    3+15      20.3851     80.36  q Q       |         |         |         |
    3+30      20.3851     83.44  q Q       |         |         |         |
    3+45      20.3851     85.56  q Q       |         |         |         |
    4+ 0      22.6126     90.84  q Q       |         |         |         |
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 4+15      24.1701     96.59  q  Q      |         |         |         |
 4+30      26.6896    104.65  q  Q      |         |         |         |
 4+45      28.2472    112.00  q  Q      |         |         |         |
 5+ 0      30.7666    121.02  |q Q      |         |         |         |
 5+15      27.8691    121.69  q   Q     |         |         |         |
 5+30      27.2735    122.26  q   Q     |         |         |         |
 5+45      30.4747    127.57  |q  Q     |         |         |         |
 6+ 0      32.3242    134.13  |q  Q     |         |         |         |
 6+15      34.8436    143.26  |q  Q     |         |         |         |
 6+30      36.4012    154.28  |q   Q    |         |         |         |
 6+45      38.9207    169.51  |q   Q    |         |         |         |
 7+ 0      40.4782    187.38  |q    Q   |         |         |         |
 7+15      40.7702    204.11  |q    Q   |         |         |         |
 7+30      42.9977    220.08  |q     Q  |         |         |         |
 7+45      46.7827    242.48  |q     Q  |         |         |         |
 8+ 0      50.8598    273.79  |q       Q|         |         |         |
 8+15      58.8787    317.66  |q        Q         |         |         |
 8+30      63.6602    365.04  | q       | Q       |         |         |
 8+45      67.9480    409.88  | q       |  Q      |         |         |
 9+ 0      73.6727    451.65  | q       |   Q     |         |         |
 9+15      82.9937    501.87  | q       |     Q   |         |         |
 9+30      91.3548    559.43  |  q      |       Q |         |         |
 9+45      97.9050    618.12  |  q      |         Q         |         |
10+ 0     104.0353    672.96  |  q      |         | Q       |         |
10+15      84.7053    677.28  | q       |         | Q       |         |
10+30      69.8469    633.07  | q       |         Q         |         |
10+45      83.1352    606.81  | q       |        Q|         |         |
11+ 0      94.5545    631.15  |  q      |         Q         |         |
11+15      93.7488    666.88  |  q      |         |Q        |         |
11+30      91.8116    682.61  |  q      |         | Q       |         |
11+45      85.3151    675.70  | q       |         | Q       |         |
12+ 0      84.3288    664.85  | q       |         |Q        |         |
12+15     108.2734    701.38  |  q      |         |  Q      |         |
12+30     127.7235    788.34  |   q     |         |    Q    |         |
12+45     139.5047    893.99  |   q     |         |       Q|         |
13+ 0     147.8231    984.48  |   q     |         |         | Q       |
13+15     167.0588   1085.50  |    q    |         |         |    Q    |
13+30     178.8636   1192.87  |    q    |         |         |       Q|
13+45     146.2043   1215.51  |   q     |         |         |        Q
14+ 0     121.9844   1146.23  |   q     |         |         |      Q  |
14+15     130.3774   1079.52  |   q     |         |         |    Q    |
14+30     136.3443   1067.34  |   q     |         |         |    Q    |
14+45     136.0330   1077.12  |   q     |         |         |    Q    |
15+ 0     132.6756   1074.32  |   q     |         |         |    Q    |
15+15     127.5066   1059.48  |   q     |         |         |   Q     |
15+30     121.9170   1035.36  |   q     |         |         |   Q     |
15+45     106.7772    986.28  |  q      |         |         | Q       |
16+ 0      97.6872    922.68  |  q      |         |         Q         |
16+15      52.5058    783.24  |q        |         |    Q    |         |
16+30      22.0248    590.65  q         |        Q|         |         |
16+45      14.0806    406.38  q         |  Q      |         |         |
17+ 0      12.5230    294.71  q       Q|         |         |         |
17+15      16.6861    240.22  q      Q  |         |         |         |
17+30      19.8012    214.75  q      Q  |         |         |         |
17+45      20.3851    202.33  q     Q   |         |         |         |
18+ 0      18.1576    190.44  q     Q   |         |         |         |
18+15      16.6000    175.88  q    Q    |         |         |         |
18+30      16.3081    161.43  q    Q    |         |         |         |
18+45      14.0806    147.28  q   Q     |         |         |         |
19+ 0      10.2955    131.66  q   Q     |         |         |         |
19+15      10.6735    121.90  q   Q     |         |         |         |
19+30      14.1666    120.28  q  Q      |         |         |         |
19+45      13.7886    118.02  q  Q      |         |         |         |
20+ 0      10.2955    109.98  q  Q      |         |         |         |
20+15      10.6735    104.02  q  Q      |         |         |         |
20+30      11.9391    100.95  q  Q      |         |         |         |
20+45      12.2311     98.90  q  Q      |         |         |         |
21+ 0      10.0035     93.01  q  Q      |         |         |         |
21+15      10.6735     89.91  q Q       |         |         |         |
21+30       9.7116     85.21  q Q       |         |         |         |
21+45      10.6735     83.76  q Q       |         |         |         |
```

22+ 0	9.7116	80.05	q Q				
22+15	10.6735	79.18	q Q				
22+30	9.7116	75.92	q Q				
22+45	8.4460	71.80	q Q				
23+ 0	8.1540	68.08	q Q				
23+15	8.1540	65.34	q Q				
23+30	8.1540	63.20	q Q				
23+45	8.1540	61.42	q Q				
24+ 0	8.1540	59.86	qQ				
24+15	3.6990	51.17	qQ				
24+30	0.5839	41.03	qQ				
24+45	0.0000	33.25	qQ				
25+ 0	0.0000	28.26	Q				
25+15	0.0000	24.86	Q				
25+30	0.0000	22.31	Q				
25+45	0.0000	20.30	Q				
26+ 0	0.0000	18.67	Q				
26+15	0.0000	17.26	Q				
26+30	0.0000	16.00	Q				
26+45	0.0000	14.86	Q				
27+ 0	0.0000	13.82	Q				
27+15	0.0000	12.88	Q				
27+30	0.0000	12.02	Q				
27+45	0.0000	11.21	Q				
28+ 0	0.0000	10.47	Q				
28+15	0.0000	9.77	Q				
28+30	0.0000	9.13	Q				
28+45	0.0000	8.52	Q				
29+ 0	0.0000	7.96	Q				
29+15	0.0000	7.44	Q				
29+30	0.0000	6.95	Q				
29+45	0.0000	6.50	Q				
30+ 0	0.0000	6.07	Q				
30+15	0.0000	5.68	Q				
30+30	0.0000	5.31	Q				
30+45	0.0000	4.96	Q				
31+ 0	0.0000	4.64	Q				
31+15	0.0000	4.34	Q				
31+30	0.0000	4.06	Q				
31+45	0.0000	3.79	Q				
32+ 0	0.0000	3.55	Q				
32+15	0.0000	3.32	Q				
32+30	0.0000	3.11	Q				
32+45	0.0000	2.91	Q				
33+ 0	0.0000	2.72	Q				
33+15	0.0000	2.54	Q				
33+30	0.0000	2.38	Q				
33+45	0.0000	2.23	Q				
34+ 0	0.0000	2.08	Q				
34+15	0.0000	1.95	Q				
34+30	0.0000	1.83	Q				
34+45	0.0000	1.71	Q				
35+ 0	0.0000	1.60	Q				
35+15	0.0000	1.50	Q				
35+30	0.0000	1.40	Q				
35+45	0.0000	1.31	Q				
36+ 0	0.0000	1.23	Q				
36+15	0.0000	1.15	Q				
36+30	0.0000	1.08	Q				
36+45	0.0000	1.01	Q				
37+ 0	0.0000	0.94	Q				
37+15	0.0000	0.88	Q				
37+30	0.0000	0.83	Q				
37+45	0.0000	0.78	Q				
38+ 0	0.0000	0.73	Q				
38+15	0.0000	0.68	Q				
38+30	0.0000	0.64	Q				
38+45	0.0000	0.60	Q				
39+ 0	0.0000	0.56	Q				
39+15	0.0000	0.52	Q				
39+30	0.0000	0.49	Q				

39+45	0.0000	0.46	Q				
40+ 0	0.0000	0.43	Q				
40+15	0.0000	0.40	Q				
40+30	0.0000	0.38	Q				
40+45	0.0000	0.35	Q				
41+ 0	0.0000	0.33	Q				
41+15	0.0000	0.31	Q				
41+30	0.0000	0.29	Q				
41+45	0.0000	0.27	Q				
42+ 0	0.0000	0.25	Q				
42+15	0.0000	0.24	Q				
42+30	0.0000	0.22	Q				
42+45	0.0000	0.21	Q				
43+ 0	0.0000	0.20	Q				
43+15	0.0000	0.18	Q				
43+30	0.0000	0.17	Q				
43+45	0.0000	0.16	Q				
44+ 0	0.0000	0.15	Q				
44+15	0.0000	0.14	Q				
44+30	0.0000	0.13	Q				
44+45	0.0000	0.12	Q				
45+ 0	0.0000	0.12	Q				
45+15	0.0000	0.11	Q				
45+30	0.0000	0.10	Q				
45+45	0.0000	0.10	Q				
46+ 0	0.0000	0.09	Q				
46+15	0.0000	0.08	Q				
46+30	0.0000	0.08	Q				
46+45	0.0000	0.07	Q				
47+ 0	0.0000	0.07	Q				
47+15	0.0000	0.07	Q				
47+30	0.0000	0.06	Q				
47+45	0.0000	0.06	Q				
48+ 0	0.0000	0.05	Q				
48+15	0.0000	0.05	Q				
48+30	0.0000	0.05	Q				
48+45	0.0000	0.04	Q				
49+ 0	0.0000	0.04	Q				
49+15	0.0000	0.04	Q				
49+30	0.0000	0.04	Q				
49+45	0.0000	0.03	Q				
50+ 0	0.0000	0.03	Q				
50+15	0.0000	0.03	Q				
50+30	0.0000	0.03	Q				
50+45	0.0000	0.03	Q				
51+ 0	0.0000	0.02	Q				
51+15	0.0000	0.02	Q				
51+30	0.0000	0.02	Q				
51+45	0.0000	0.02	Q				
52+ 0	0.0000	0.02	Q				
52+15	0.0000	0.02	Q				
52+30	0.0000	0.02	Q				
52+45	0.0000	0.02	Q				
53+ 0	0.0000	0.01	Q				
53+15	0.0000	0.01	Q				
53+30	0.0000	0.01	Q				
53+45	0.0000	0.01	Q				
54+ 0	0.0000	0.01	Q				
54+15	0.0000	0.01	Q				
54+30	0.0000	0.01	Q				
54+45	0.0000	0.01	Q				
55+ 0	0.0000	0.01	Q				
55+15	0.0000	0.01	Q				
55+30	0.0000	0.01	Q				
55+45	0.0000	0.01	Q				
56+ 0	0.0000	0.01	Q				
56+15	0.0000	0.01	Q				
56+30	0.0000	0.01	Q				
56+45	0.0000	0.01	Q				
57+ 0	0.0000	0.01	Q				
57+15	0.0000	0.00	Q				

```
   57+30       0.0000      0.00  Q         |         |         |         |
   57+45       0.0000      0.00  Q         |         |         |         |
   58+ 0       0.0000      0.00  Q         |         |         |         |
   58+15       0.0000      0.00  Q         |         |         |         |
   58+30       0.0000      0.00  Q         |         |         |         |
   58+45       0.0000      0.00  Q         |         |         |         |
   59+ 0       0.0000      0.00  Q         |         |         |         |
   59+15       0.0000      0.00  Q         |         |         |         |
   59+30       0.0000      0.00  Q         |         |         |         |
   59+45       0.0000      0.00  Q         |         |         |         |
   60+ 0       0.0000      0.00  Q         |         |         |         |
   60+15       0.0000      0.00  Q         |         |         |         |
   60+30       0.0000      0.00  Q         |         |         |         |
   60+45       0.0000      0.00  Q         |         |         |         |
   61+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                       Number of intervals =   244
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =     1215.515 (CFS)
                       Total volume =     716.435 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        3.000 to Point/Station        4.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file LineA24hr.rte
        ****************************HYDROGRAPH DATA****************************
                       Number of intervals =     0
                       Time interval =    0.0 (Min.)
                       Maximum/Peak flow rate =        0.000 (CFS)
                       Total volume =       0.000 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 02/02/12

      ----------------------------------------------------------------------


      Line A, Sketcher Site, routed thru basin
      100 yr 24 hr


      ----------------------------------------------------------------------


      Program License Serial Number 6097

      ----------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: Sketcher24100.rte
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       88.411 (CFS)
                    Total volume =      47.969 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        1.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.00(Ft.)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Initial basin depth =   0.00 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000      5.000    100.000      3.967        6.033
         4.000     10.000    150.000      8.450       11.550
      ----------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours) (CFS)   (CFS)     (Ac.Ft) .0      22.1   44.21   66.31   88.41 (Ft.)
 0.250    2.28    0.36      0.020  O       |       |       |       |     2.00
 0.500    4.92    1.47      0.075  OI      |       |       |       |     2.01
```

```
 0.750    5.91    2.82      0.143  |OI     |       |       |       |     2.03
 1.000    7.18    4.10      0.207  |OI     |       |       |       |     2.04
 1.250    6.78    5.08      0.256  |OI     |       |       |       |     2.05
 1.500    6.16    5.56      0.280  | O     |       |       |       |     2.06
 1.750    6.04    5.74      0.289  | O     |       |       |       |     2.06
 2.000    7.18    6.04      0.304  | O     |       |       |       |     2.06
 2.250    7.92    6.56      0.330  | O     |       |       |       |     2.07
 2.500    8.05    7.05      0.354  | O     |       |       |       |     2.07
 2.750    9.19    7.58      0.381  | OI    |       |       |       |     2.08
 3.000    9.94    8.26      0.415  | OI    |       |       |       |     2.08
 3.250   10.06    8.86      0.445  |  O    |       |       |       |     2.09
 3.500   10.06    9.27      0.465  |  O    |       |       |       |     2.09
 3.750   10.06    9.54      0.479  |  O    |       |       |       |     2.10
 4.000   11.20    9.91      0.497  |  OI   |       |       |       |     2.10
 4.250   11.95   10.48      0.526  |  OI   |       |       |       |     2.10
 4.500   13.21   11.20      0.562  |   O   |       |       |       |     2.11
 4.750   13.96   12.02      0.603  |   OI  |       |       |       |     2.12
 5.000   15.22   12.90      0.647  |   OI  |       |       |       |     2.13
 5.250   13.69   13.43      0.673  |   O   |       |       |       |     2.13
 5.500   13.46   13.48      0.676  |   O   |       |       |       |     2.13
 5.750   15.10   13.75      0.689  |   OI  |       |       |       |     2.14
 6.000   15.97   14.36      0.720  |    O  |       |       |       |     2.14
 6.250   17.24   15.13      0.758  |    OI |       |       |       |     2.15
 6.500   17.98   15.98      0.801  |    OI |       |       |       |     2.16
 6.750   19.25   16.88      0.846  |     O |       |       |       |     2.17
 7.000   19.99   17.82      0.893  |     OI|       |       |       |     2.18
 7.250   20.12   18.59      0.931  |     OI|       |       |       |     2.19
 7.500   21.26   19.31      0.967  |     OI|       |       |       |     2.19
 7.750   23.15   20.30      1.017  |      OI       |       |       |     2.20
 8.000   25.16   21.62      1.083  |      O|I      |       |       |     2.22
 8.250   29.19   23.52      1.178  |       O I     |       |       |     2.24
 8.500   31.48   25.86      1.294  |       |O I    |       |       |     2.26
 8.750   33.60   28.14      1.409  |       | O I   |       |       |     2.28
 9.000   36.45   30.50      1.526  |       |  O I  |       |       |     2.31
 9.250   41.11   33.34      1.668  |       |   O I |       |       |     2.33
 9.500   45.20   36.70      1.836  |       |    O  I       |       |     2.37
 9.750   48.41   40.16      2.009  |       |     O |I      |       |     2.40
10.000   51.43   43.51      2.176  |       |      O| I     |       |     2.44
10.250   41.42   44.51      2.226  |       |     I O       |       |     2.45
10.500   34.28   42.22      2.112  |       |   I  O|       |       |     2.42
10.750   41.33   40.71      2.037  |       |     O |       |       |     2.41
11.000   46.81   41.86      2.094  |       |      OI       |       |     2.42
11.250   46.21   43.45      2.174  |       |      OI       |       |     2.43
11.500   45.28   44.24      2.213  |       |       O       |       |     2.44
11.750   41.99   44.03      2.203  |       |      O|       |       |     2.44
12.000   41.62   43.27      2.165  |       |      O|       |       |     2.43
12.250   53.88   44.81      2.241  |       |       O  I    |       |     2.45
12.500   63.29   49.53      2.477  |       |       |O    I |       |     2.50
12.750   69.00   55.22      2.762  |       |       |  O    I       |     2.55
13.000   73.07   60.64      3.033  |       |       |    O  | I     |     2.61
13.250   82.77   66.56      3.329  |       |       |       O    I  |     2.67
13.500   88.41   73.08      3.654  |       |       |       | O     I     2.73
13.750   71.49   75.43      3.772  |       |       |       |I O    |     2.75
14.000   59.89   72.10      3.605  |       |       |    I  | O     |     2.72
14.250   64.58   68.72      3.437  |       |       |      IO       |     2.69
14.500   67.34   67.77      3.389  |       |       |       O       |     2.68
14.750   67.10   67.58      3.380  |       |       |       O       |     2.68
15.000   65.42   67.13      3.357  |       |       |      IO       |     2.67
15.250   62.84   66.10      3.306  |       |       |     IO|       |     2.66
15.500   60.08   64.51      3.226  |       |       |    I O|       |     2.65
15.750   52.43   61.68      3.085  |       |       | I   O |       |     2.62
16.000   48.10   57.77      2.889  |       |       |I  O   |       |     2.58
16.250   25.09   50.52      2.527  |       |I      | O     |       |     2.51
16.500   10.48   39.30      1.966  |  I    |     O |       |       |     2.39
16.750    6.91   28.82      1.442  | I     | O     |       |       |     2.29
17.000    6.16   21.18      1.061  | I    O|       |       |       |     2.21
17.250    8.32   16.41      0.822  |  I O  |       |       |       |     2.16
17.500    9.81   13.89      0.696  |  I O  |       |       |       |     2.14
17.750   10.06   12.54      0.628  |  IO   |       |       |       |     2.13
18.000    8.92   11.49      0.576  |  IO   |       |       |       |     2.11
18.250    8.17   10.48      0.526  | IO    |       |       |       |     2.10
```

```
18.500    8.05    9.67      0.485  | IO    |       |       |       |     2.10
18.750    6.91    8.92      0.448  | IO    |       |       |       |     2.09
19.000    5.02    7.91      0.397  |IO     |       |       |       |     2.08
19.250    5.29    6.96      0.350  |IO     |       |       |       |     2.07
19.500    7.05    6.69      0.336  | O     |       |       |       |     2.07
19.750    6.78    6.77      0.340  | O     |       |       |       |     2.07
20.000    5.02    6.47      0.325  |IO     |       |       |       |     2.06
20.250    5.29    6.02      0.303  |IO     |       |       |       |     2.06
20.500    5.91    5.88      0.296  | O     |       |       |       |     2.06
20.750    6.04    5.91      0.297  | O     |       |       |       |     2.06
21.000    4.89    5.76      0.290  |IO     |       |       |       |     2.06
21.250    5.29    5.53      0.278  |IO     |       |       |       |     2.06
21.500    4.77    5.36      0.270  |O      |       |       |       |     2.05
21.750    5.29    5.25      0.264  |O      |       |       |       |     2.05
22.000    4.77    5.17      0.260  |O      |       |       |       |     2.05
22.250    5.29    5.12      0.258  |O      |       |       |       |     2.05
22.500    4.77    5.09      0.256  |O      |       |       |       |     2.05
22.750    4.15    4.87      0.246  |O      |       |       |       |     2.05
23.000    4.02    4.60      0.232  |O      |       |       |       |     2.05
23.250    4.02    4.41      0.222  |O      |       |       |       |     2.04
23.500    4.02    4.27      0.216  |O      |       |       |       |     2.04
23.750    4.02    4.19      0.211  |O      |       |       |       |     2.04
24.000    4.02    4.13      0.208  |O      |       |       |       |     2.04
24.250    1.74    3.70      0.187  IO     |       |       |       |     2.04
24.500    0.25    2.78      0.141  IO     |       |       |       |     2.03
24.750    0.00    1.87      0.095  O      |       |       |       |     2.02
25.000    0.00    1.23      0.063  O      |       |       |       |     2.01
25.250    0.00    0.81      0.042  O      |       |       |       |     2.01
25.500    0.00    0.53      0.028  O      |       |       |       |     2.01
25.750    0.00    0.35      0.019  O      |       |       |       |     2.00
26.000    0.00    0.23      0.013  O      |       |       |       |     2.00
26.250    0.00    0.15      0.009  O      |       |       |       |     2.00
26.500    0.00    0.10      0.007  O      |       |       |       |     2.00
26.750    0.00    0.07      0.005  O      |       |       |       |     2.00
27.000    0.00    0.04      0.004  O      |       |       |       |     2.00
27.250    0.00    0.03      0.003  O      |       |       |       |     2.00
27.500    0.00    0.02      0.003  O      |       |       |       |     2.00
27.750    0.00    0.01      0.003  O      |       |       |       |     2.00
28.000    0.00    0.01      0.002  O      |       |       |       |     2.00
28.250    0.00    0.01      0.002  O      |       |       |       |     2.00
28.500    0.00    0.00      0.002  O      |       |       |       |     2.00
28.750    0.00    0.00      0.002  O      |       |       |       |     2.00
29.000    0.00    0.00      0.002  O      |       |       |       |     2.00
29.250    0.00    0.00      0.002  O      |       |       |       |     2.00

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =   117
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       75.433 (CFS)
                     Total volume =      47.967 (Ac.Ft)
             Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        1.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SketcherRT.rte
      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =     0
                     Time interval =    0.0 (Min.)
```

```
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ---------------------------------------------------------------------


      Subdrain Area A1, Prop Condition
      Routed Through Basin
      100 Yr. 24 Hr.

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA124100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       36.812 (CFS)
                    Total volume =      19.870 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000      5.000     30.000      4.690        5.310
        4.000      7.000     40.000      6.587        7.413
        6.000     12.000     50.000     11.483       12.517
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0       9.2   18.41   27.61   36.81 (Ft.)
 0.250    1.07    0.05      0.011  O       |       |       |       |     2.00
```

0.500	2.15	0.23	0.041	OI					2.01
0.750	2.47	0.48	0.081	O I					2.02
1.000	3.03	0.74	0.126	O I					2.02
1.250	2.77	1.00	0.168	O I					2.03
1.500	2.53	1.19	0.200	|OI					2.04
1.750	2.50	1.34	0.226	|OI					2.04
2.000	3.03	1.51	0.253	|OI					2.05
2.250	3.31	1.70	0.286	|OI					2.06
2.500	3.33	1.89	0.317	|OI					2.06
2.750	3.87	2.09	0.350	|O I					2.07
3.000	4.14	2.32	0.388	| OI					2.08
3.250	4.17	2.53	0.423	| OI					2.08
3.500	4.17	2.72	0.455	| OI					2.09
3.750	4.17	2.89	0.483	| OI					2.10
4.000	4.70	3.07	0.513	| O I					2.10
4.250	4.97	3.28	0.548	| O I					2.11
4.500	5.53	3.51	0.586	| OI					2.12
4.750	5.81	3.76	0.628	| O I					2.13
5.000	6.37	4.03	0.674	| O I					2.13
5.250	5.57	4.26	0.711	| OI					2.14
5.500	5.59	4.41	0.737	| OI					2.15
5.750	6.34	4.59	0.767	| O I					2.15
6.000	6.64	4.82	0.804	| OI					2.16
6.250	7.20	5.06	0.845	| O I					2.17
6.500	7.47	5.33	0.889	| O I					2.18
6.750	8.03	5.61	0.937	| O I					2.19
7.000	8.31	5.91	0.986	| O I					2.20
7.250	8.33	6.19	1.033	| O I					2.21
7.500	8.87	6.47	1.080	| O I					2.22
7.750	9.68	6.80	1.135	| O I					2.23
8.000	10.51	7.18	1.199	| O |I					2.24
8.250	12.29	7.68	1.281	| O | I					2.26
8.500	13.11	8.26	1.378	| O| I					2.28
8.750	14.01	8.88	1.482	| O| I					2.30
9.000	15.23	9.55	1.593	| O I					2.32
9.250	17.25	10.33	1.723	| O I |					2.34
9.500	18.89	11.24	1.874	| |O I					2.37
9.750	20.18	12.21	2.035	| | O |I					2.41
10.000	21.44	13.21	2.203	| | O | I					2.44
10.250	16.58	13.89	2.316	| | O I |					2.46
10.500	13.95	14.05	2.342	| | O |					2.47
10.750	17.57	14.25	2.376	| | O I|					2.47
11.000	19.58	14.75	2.460	| | O |I					2.49
11.250	19.06	15.29	2.549	| | O I					2.51
11.500	18.73	15.71	2.619	| | O I					2.52
11.750	17.22	15.97	2.663	| | OI |					2.53
12.000	17.26	16.12	2.688	| | OI|					2.54
12.250	22.98	16.59	2.765	| | O | I					2.55
12.500	26.57	17.54	2.925	| | O| I|					2.58
12.750	28.80	18.73	3.122	| | O |I					2.62
13.000	30.43	20.00	3.334	| | |O | I					2.67
13.250	34.77	21.47	3.579	| | | O | I |					2.72
13.500	36.81	23.14	3.858	| | | O | I|					2.77
13.750	28.65	24.26	4.044	| | | O I					2.81
14.000	24.41	24.53	4.088	| | | O |					2.82
14.250	27.11	24.67	4.112	| | | O I|					2.82
14.500	27.96	25.01	4.168	| | | O I					2.83
14.750	27.76	25.34	4.223	| | | O I					2.84
15.000	27.01	25.58	4.263	| | | OI|					2.85
15.250	25.91	25.68	4.281	| | | O |					2.86
15.500	24.77	25.64	4.274	| | | IO |					2.85
15.750	21.33	25.34	4.223	| | | I O |					2.84
16.000	19.78	24.78	4.130	| | |I O |					2.83
16.250	9.18	23.58	3.930	| I| | O |					2.79
16.500	3.84	21.58	3.598	| I | | O |					2.72
16.750	2.80	19.45	3.243	| I | O |					2.65
17.000	2.53	17.49	2.916	| I | O| |					2.58
17.250	3.57	15.80	2.635	| I | O |					2.53
17.500	4.12	14.41	2.402	| I | O |					2.48
17.750	4.17	13.21	2.202	| I | O |					2.44
18.000	3.63	12.12	2.021	| I | O |					2.40

18.250	3.36	11.11	1.854	| I |O	|	|	|	2.37
18.500	3.33	10.21	1.702	| I O	|	|	|	2.34
18.750	2.80	9.37	1.563	| I O	|	|	|	2.31
19.000	1.99	8.56	1.428	|I O|	|	|	|	2.29
19.250	2.23	7.81	1.302	|I O |	|	|	|	2.26
19.500	3.01	7.20	1.201	| I O |	|	|	|	2.24
19.750	2.77	6.70	1.118	| I O |	|	|	|	2.22
20.000	1.99	6.19	1.034	|I O |	|	|	|	2.21
20.250	2.23	5.72	0.954	|I O |	|	|	|	2.19
20.500	2.47	5.32	0.889	| I O |	|	|	|	2.18
20.750	2.50	4.99	0.833	| I O |	|	|	|	2.17
21.000	1.97	4.67	0.780	|I O |	|	|	|	2.16
21.250	2.23	4.37	0.730	|I O |	|	|	|	2.15
21.500	1.94	4.10	0.685	|I O |	|	|	|	2.14
21.750	2.23	3.87	0.646	|I O |	|	|	|	2.13
22.000	1.94	3.66	0.611	|I O |	|	|	|	2.12
22.250	2.23	3.47	0.581	|I O |	|	|	|	2.12
22.500	1.94	3.31	0.554	|IO |	|	|	|	2.11
22.750	1.69	3.14	0.525	|IO |	|	|	|	2.10
23.000	1.67	2.97	0.496	|IO |	|	|	|	2.10
23.250	1.67	2.82	0.471	|IO |	|	|	|	2.09
23.500	1.67	2.68	0.449	|IO |	|	|	|	2.09
23.750	1.67	2.56	0.429	|IO |	|	|	|	2.09
24.000	1.67	2.46	0.411	|IO |	|	|	|	2.08
24.250	0.60	2.30	0.386	I O |	|	|	|	2.08
24.500	0.05	2.07	0.347	IO |	|	|	|	2.07
24.750	0.00	1.83	0.307	IO |	|	|	|	2.06
25.000	0.00	1.62	0.272	IO |	|	|	|	2.05
25.250	0.00	1.43	0.240	IO |	|	|	|	2.05
25.500	0.00	1.26	0.212	IO |	|	|	|	2.04
25.750	0.00	1.12	0.188	O |	|	|	|	2.04
26.000	0.00	0.99	0.166	O |	|	|	|	2.03
26.250	0.00	0.87	0.147	O |	|	|	|	2.03
26.500	0.00	0.77	0.130	O |	|	|	|	2.03
26.750	0.00	0.68	0.115	O |	|	|	|	2.02
27.000	0.00	0.60	0.102	O |	|	|	|	2.02
27.250	0.00	0.53	0.090	O |	|	|	|	2.02
27.500	0.00	0.47	0.080	O |	|	|	|	2.02
27.750	0.00	0.41	0.071	O |	|	|	|	2.01
28.000	0.00	0.36	0.063	O |	|	|	|	2.01
28.250	0.00	0.32	0.056	O |	|	|	|	2.01
28.500	0.00	0.28	0.049	O |	|	|	|	2.01
28.750	0.00	0.25	0.044	O |	|	|	|	2.01
29.000	0.00	0.22	0.039	O |	|	|	|	2.01
29.250	0.00	0.20	0.035	O |	|	|	|	2.01
29.500	0.00	0.17	0.031	O |	|	|	|	2.01
29.750	0.00	0.15	0.027	O |	|	|	|	2.01
30.000	0.00	0.14	0.024	O |	|	|	|	2.00
30.250	0.00	0.12	0.022	O |	|	|	|	2.00
30.500	0.00	0.11	0.019	O |	|	|	|	2.00
30.750	0.00	0.09	0.017	O |	|	|	|	2.00
31.000	0.00	0.08	0.016	O |	|	|	|	2.00
31.250	0.00	0.07	0.014	O |	|	|	|	2.00
31.500	0.00	0.06	0.013	O |	|	|	|	2.00
31.750	0.00	0.06	0.011	O |	|	|	|	2.00
32.000	0.00	0.05	0.010	O |	|	|	|	2.00
32.250	0.00	0.04	0.009	O |	|	|	|	2.00
32.500	0.00	0.04	0.008	O |	|	|	|	2.00
32.750	0.00	0.03	0.008	O |	|	|	|	2.00
33.000	0.00	0.03	0.007	O |	|	|	|	2.00
33.250	0.00	0.03	0.006	O |	|	|	|	2.00
33.500	0.00	0.02	0.006	O |	|	|	|	2.00
33.750	0.00	0.02	0.005	O |	|	|	|	2.00
34.000	0.00	0.02	0.005	O |	|	|	|	2.00
34.250	0.00	0.02	0.005	O |	|	|	|	2.00
34.500	0.00	0.01	0.004	O |	|	|	|	2.00
34.750	0.00	0.01	0.004	O |	|	|	|	2.00
35.000	0.00	0.01	0.004	O |	|	|	|	2.00
35.250	0.00	0.01	0.003	O |	|	|	|	2.00
35.500	0.00	0.01	0.003	O |	|	|	|	2.00
35.750	0.00	0.01	0.003	O |	|	|	|	2.00

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36.000    0.00    0.01      0.003  O       |       |       |       |     2.00
36.250    0.00    0.01      0.003  O       |       |       |       |     2.00
36.500    0.00    0.01      0.003  O       |       |       |       |     2.00
36.750    0.00    0.00      0.003  O       |       |       |       |     2.00
37.000    0.00    0.00      0.003  O       |       |       |       |     2.00
37.250    0.00    0.00      0.002  O       |       |       |       |     2.00
37.500    0.00    0.00      0.002  O       |       |       |       |     2.00
37.750    0.00    0.00      0.002  O       |       |       |       |     2.00
38.000    0.00    0.00      0.002  O       |       |       |       |     2.00
38.250    0.00    0.00      0.002  O       |       |       |       |     2.00
38.500    0.00    0.00      0.002  O       |       |       |       |     2.00
38.750    0.00    0.00      0.002  O       |       |       |       |     2.00
39.000    0.00    0.00      0.002  O       |       |       |       |     2.00
39.250    0.00    0.00      0.002  O       |       |       |       |     2.00
39.500    0.00    0.00      0.002  O       |       |       |       |     2.00
39.750    0.00    0.00      0.002  O       |       |       |       |     2.00
40.000    0.00    0.00      0.002  O       |       |       |       |     1.99

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =   160
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       25.682 (CFS)
                     Total volume =      19.868 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SUBF1RT.rte
      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =     0
                     Time interval =    0.0 (Min.)
                     Maximum/Peak flow rate =        0.000 (CFS)
                     Total volume =       0.000 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ---------------------------------------------------------------------


      Subdrain Area A2 Routed Through Basin A2
      100 Yr. 24 Hr.


      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA224100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       66.545 (CFS)
                    Total volume =      35.920 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000     10.000     30.000      9.690       10.310
         4.000     15.000     70.000     14.277       15.723
         6.000     22.000    120.000     20.760       23.240
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      16.6   33.27   49.91   66.55 (Ft.)
 0.250    1.93    0.05      0.020  O       |       |       |       |     2.00
```

0.500	3.89	0.23	0.077	OI	2.01
0.750	4.47	0.46	0.156	O I	2.02
1.000	5.49	0.73	0.246	O I	2.02
1.250	5.01	1.01	0.337	O I	2.03
1.500	4.57	1.23	0.413	O I	2.04
1.750	4.52	1.43	0.479	O I	2.05
2.000	5.49	1.65	0.551	O I	2.05
2.250	5.98	1.89	0.633	O I	2.06
2.500	6.03	2.14	0.715	OI	2.07
2.750	6.99	2.40	0.802	O I	2.08
3.000	7.49	2.69	0.899	O I	2.09
3.250	7.53	2.98	0.996	O I	2.10
3.500	7.53	3.26	1.087	O I	2.11
3.750	7.53	3.51	1.173	O I	2.12
4.000	8.50	3.78	1.263	O I	2.13
4.250	8.99	4.08	1.362	O I	2.14
4.500	10.01	4.41	1.471	O I	2.15
4.750	10.50	4.76	1.588	O I	2.16
5.000	11.51	5.14	1.713	O I	2.17
5.250	10.07	5.48	1.827	O I	2.18
5.500	10.10	5.75	1.919	O I	2.19
5.750	11.47	6.06	2.020	O I	2.20
6.000	12.01	6.40	2.133	O I	2.21
6.250	13.02	6.76	2.256	O I	2.23
6.500	13.51	7.16	2.386	O I	2.24
6.750	14.52	7.57	2.524	O I	2.25
7.000	15.02	8.00	2.668	O I	2.27
7.250	15.06	8.42	2.809	O I	2.28
7.500	16.03	8.85	2.952	O I	2.30
7.750	17.49	9.33	3.111	O I	2.31
8.000	19.00	9.86	3.289	O I	2.33
8.250	22.22	10.51	3.504	O I	2.35
8.500	23.71	11.26	3.754	O I	2.38
8.750	25.33	12.06	4.020	O I	2.40
9.000	27.53	12.92	4.308	O I	2.43
9.250	31.18	13.91	4.637	O I	2.46
9.500	34.15	15.04	5.013	O I	2.50
9.750	36.49	16.26	5.420	O I	2.54
10.000	38.75	17.54	5.848	O I	2.58
10.250	29.97	18.55	6.185	O I	2.62
10.500	25.21	19.10	6.366	O I	2.64
10.750	31.76	19.66	6.554	O I	2.66
11.000	35.39	20.50	6.833	O I	2.68
11.250	34.45	21.37	7.122	O I	2.71
11.500	33.85	22.13	7.378	O I	2.74
11.750	31.13	22.76	7.586	O I	2.76
12.000	31.21	23.26	7.755	O I	2.78
12.250	41.54	24.05	8.017	O I	2.80
12.500	48.03	25.30	8.433	O I	2.84
12.750	52.06	26.79	8.929	O I	2.89
13.000	55.02	28.39	9.465	O I	2.95
13.250	62.85	30.59	10.073	O I	3.01
13.500	66.55	35.79	10.724	O I	3.14
13.750	51.79	39.36	11.170	O I	3.23
14.000	44.12	40.67	11.334	O I	3.27
14.250	49.01	41.57	11.447	O I	3.29
14.500	50.54	42.83	11.603	O I	3.32
14.750	50.19	43.98	11.747	O I	3.35
15.000	48.83	44.82	11.853	O I	3.37
15.250	46.84	45.28	11.910	O I	3.38
15.500	44.77	45.36	11.920	O I	3.38
15.750	38.56	44.80	11.850	O I	3.37
16.000	35.76	43.63	11.704	O I	3.34
16.250	16.60	40.97	11.371	O I	3.27
16.500	6.93	36.51	10.814	O I	3.16
16.750	5.06	31.85	10.231	O I	3.05
17.000	4.57	29.10	9.701	O I	2.97
17.250	6.45	27.68	9.228	O I	2.92
17.500	7.44	26.44	8.813	O I	2.88
17.750	7.53	25.30	8.433	O I	2.84
18.000	6.57	24.20	8.067	O I	2.81

```
18.250    6.07   23.13      7.709  | I     |  O    |       |       |     2.77
18.500    6.03   22.10      7.367  | I     | O     |       |       |     2.74
18.750    5.06   21.10      7.035  | I     | O     |       |       |     2.70
19.000    3.60   20.09      6.699  |I      |O      |       |       |     2.67
19.250    4.03   19.12      6.372  |I      |O      |       |       |     2.64
19.500    5.44   18.25      6.084  | I     O       |       |       |     2.61
19.750    5.01   17.47      5.823  | I     O       |       |       |     2.58
20.000    3.60   16.68      5.559  |I      O       |       |       |     2.56
20.250    4.03   15.90      5.302  |I     O|       |       |       |     2.53
20.500    4.47   15.20      5.068  | I    O|       |       |       |     2.51
20.750    4.52   14.56      4.854  | I    O|       |       |       |     2.49
21.000    3.55   13.93      4.643  |I    O |       |       |       |     2.46
21.250    4.03   13.32      4.440  |I    O |       |       |       |     2.44
21.500    3.51   12.74      4.248  |I    O |       |       |       |     2.42
21.750    4.03   12.20      4.068  |I   O  |       |       |       |     2.41
22.000    3.51   11.69      3.899  |I   O  |       |       |       |     2.39
22.250    4.03   11.22      3.740  |I   O  |       |       |       |     2.37
22.500    3.51   10.77      3.591  |I   O  |       |       |       |     2.36
22.750    3.06   10.32      3.441  |I  O   |       |       |       |     2.34
23.000    3.01    9.88      3.295  |I  O   |       |       |       |     2.33
23.250    3.01    9.47      3.157  |I  O   |       |       |       |     2.32
23.500    3.01    9.08      3.028  |I  O   |       |       |       |     2.30
23.750    3.01    8.72      2.906  |I  O   |       |       |       |     2.29
24.000    3.01    8.37      2.792  |I  O   |       |       |       |     2.28
24.250    1.08    7.99      2.665  I  O    |       |       |       |     2.27
24.500    0.09    7.55      2.517  I  O    |       |       |       |     2.25
24.750    0.00    7.10      2.367  I  O    |       |       |       |     2.24
25.000    0.00    6.67      2.224  I  O    |       |       |       |     2.22
25.250    0.00    6.27      2.091  I  O    |       |       |       |     2.21
25.500    0.00    5.89      1.965  I O     |       |       |       |     2.20
25.750    0.00    5.54      1.847  I O     |       |       |       |     2.18
26.000    0.00    5.20      1.736  I O     |       |       |       |     2.17
26.250    0.00    4.89      1.632  I O     |       |       |       |     2.16
26.500    0.00    4.60      1.534  I O     |       |       |       |     2.15
26.750    0.00    4.32      1.442  I O     |       |       |       |     2.14
27.000    0.00    4.06      1.355  IO      |       |       |       |     2.14
27.250    0.00    3.82      1.274  IO      |       |       |       |     2.13
27.500    0.00    3.59      1.197  IO      |       |       |       |     2.12
27.750    0.00    3.37      1.125  IO      |       |       |       |     2.11
28.000    0.00    3.17      1.058  IO      |       |       |       |     2.11
28.250    0.00    2.98      0.994  IO      |       |       |       |     2.10
28.500    0.00    2.80      0.935  IO      |       |       |       |     2.09
28.750    0.00    2.63      0.878  IO      |       |       |       |     2.09
29.000    0.00    2.47      0.826  IO      |       |       |       |     2.08
29.250    0.00    2.32      0.776  IO      |       |       |       |     2.08
29.500    0.00    2.18      0.730  IO      |       |       |       |     2.07
29.750    0.00    2.05      0.686  O       |       |       |       |     2.07
30.000    0.00    1.93      0.645  O       |       |       |       |     2.06
30.250    0.00    1.81      0.606  O       |       |       |       |     2.06
30.500    0.00    1.70      0.570  O       |       |       |       |     2.06
30.750    0.00    1.60      0.536  O       |       |       |       |     2.05
31.000    0.00    1.51      0.503  O       |       |       |       |     2.05
31.250    0.00    1.42      0.473  O       |       |       |       |     2.05
31.500    0.00    1.33      0.445  O       |       |       |       |     2.04
31.750    0.00    1.25      0.418  O       |       |       |       |     2.04
32.000    0.00    1.17      0.393  O       |       |       |       |     2.04
32.250    0.00    1.10      0.370  O       |       |       |       |     2.04
32.500    0.00    1.04      0.348  O       |       |       |       |     2.03
32.750    0.00    0.98      0.327  O       |       |       |       |     2.03
33.000    0.00    0.92      0.307  O       |       |       |       |     2.03
33.250    0.00    0.86      0.289  O       |       |       |       |     2.03
33.500    0.00    0.81      0.272  O       |       |       |       |     2.03
33.750    0.00    0.76      0.255  O       |       |       |       |     2.03
34.000    0.00    0.72      0.240  O       |       |       |       |     2.02
34.250    0.00    0.67      0.226  O       |       |       |       |     2.02
34.500    0.00    0.63      0.212  O       |       |       |       |     2.02
34.750    0.00    0.59      0.200  O       |       |       |       |     2.02
35.000    0.00    0.56      0.188  O       |       |       |       |     2.02
35.250    0.00    0.52      0.177  O       |       |       |       |     2.02
35.500    0.00    0.49      0.166  O       |       |       |       |     2.02
35.750    0.00    0.46      0.156  O       |       |       |       |     2.02
```

36.000	0.00	0.44	0.147	O	|	|	|	|	2.01
36.250	0.00	0.41	0.138	O	|	|	|	|	2.01
36.500	0.00	0.38	0.130	O	|	|	|	|	2.01
36.750	0.00	0.36	0.122	O	|	|	|	|	2.01
37.000	0.00	0.34	0.115	O	|	|	|	|	2.01
37.250	0.00	0.32	0.108	O	|	|	|	|	2.01
37.500	0.00	0.30	0.102	O	|	|	|	|	2.01
37.750	0.00	0.28	0.096	O	|	|	|	|	2.01
38.000	0.00	0.27	0.090	O	|	|	|	|	2.01
38.250	0.00	0.25	0.085	O	|	|	|	|	2.01
38.500	0.00	0.23	0.080	O	|	|	|	|	2.01
38.750	0.00	0.22	0.075	O	|	|	|	|	2.01
39.000	0.00	0.21	0.071	O	|	|	|	|	2.01
39.250	0.00	0.19	0.066	O	|	|	|	|	2.01
39.500	0.00	0.18	0.063	O	|	|	|	|	2.01
39.750	0.00	0.17	0.059	O	|	|	|	|	2.01
40.000	0.00	0.16	0.055	O	|	|	|	|	2.01
40.250	0.00	0.15	0.052	O	|	|	|	|	2.01
40.500	0.00	0.14	0.049	O	|	|	|	|	2.00
40.750	0.00	0.13	0.046	O	|	|	|	|	2.00
41.000	0.00	0.13	0.044	O	|	|	|	|	2.00
41.250	0.00	0.12	0.041	O	|	|	|	|	2.00
41.500	0.00	0.11	0.039	O	|	|	|	|	2.00
41.750	0.00	0.10	0.037	O	|	|	|	|	2.00
42.000	0.00	0.10	0.034	O	|	|	|	|	2.00
42.250	0.00	0.09	0.032	O	|	|	|	|	2.00
42.500	0.00	0.09	0.031	O	|	|	|	|	2.00
42.750	0.00	0.08	0.029	O	|	|	|	|	2.00
43.000	0.00	0.08	0.027	O	|	|	|	|	2.00
43.250	0.00	0.07	0.026	O	|	|	|	|	2.00
43.500	0.00	0.07	0.024	O	|	|	|	|	2.00
43.750	0.00	0.06	0.023	O	|	|	|	|	2.00
44.000	0.00	0.06	0.022	O	|	|	|	|	2.00
44.250	0.00	0.06	0.020	O	|	|	|	|	2.00
44.500	0.00	0.05	0.019	O	|	|	|	|	2.00
44.750	0.00	0.05	0.018	O	|	|	|	|	2.00
45.000	0.00	0.05	0.017	O	|	|	|	|	2.00
45.250	0.00	0.04	0.016	O	|	|	|	|	2.00
45.500	0.00	0.04	0.015	O	|	|	|	|	2.00
45.750	0.00	0.04	0.015	O	|	|	|	|	2.00
46.000	0.00	0.04	0.014	O	|	|	|	|	2.00
46.250	0.00	0.03	0.013	O	|	|	|	|	2.00
46.500	0.00	0.03	0.012	O	|	|	|	|	2.00
46.750	0.00	0.03	0.012	O	|	|	|	|	2.00
47.000	0.00	0.03	0.011	O	|	|	|	|	2.00
47.250	0.00	0.03	0.011	O	|	|	|	|	2.00
47.500	0.00	0.03	0.010	O	|	|	|	|	2.00
47.750	0.00	0.02	0.010	O	|	|	|	|	2.00
48.000	0.00	0.02	0.009	O	|	|	|	|	2.00
48.250	0.00	0.02	0.009	O	|	|	|	|	2.00
48.500	0.00	0.02	0.008	O	|	|	|	|	2.00
48.750	0.00	0.02	0.008	O	|	|	|	|	2.00
49.000	0.00	0.02	0.007	O	|	|	|	|	2.00
49.250	0.00	0.02	0.007	O	|	|	|	|	2.00
49.500	0.00	0.02	0.007	O	|	|	|	|	2.00
49.750	0.00	0.01	0.006	O	|	|	|	|	2.00
50.000	0.00	0.01	0.006	O	|	|	|	|	2.00
50.250	0.00	0.01	0.006	O	|	|	|	|	2.00
50.500	0.00	0.01	0.006	O	|	|	|	|	2.00
50.750	0.00	0.01	0.005	O	|	|	|	|	2.00
51.000	0.00	0.01	0.005	O	|	|	|	|	2.00
51.250	0.00	0.01	0.005	O	|	|	|	|	2.00
51.500	0.00	0.01	0.005	O	|	|	|	|	2.00
51.750	0.00	0.01	0.005	O	|	|	|	|	2.00
52.000	0.00	0.01	0.004	O	|	|	|	|	2.00
52.250	0.00	0.01	0.004	O	|	|	|	|	2.00
52.500	0.00	0.01	0.004	O	|	|	|	|	2.00
52.750	0.00	0.01	0.004	O	|	|	|	|	2.00
53.000	0.00	0.01	0.004	O	|	|	|	|	2.00
53.250	0.00	0.01	0.004	O	|	|	|	|	2.00
53.500	0.00	0.01	0.004	O	|	|	|	|	2.00

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53.750    0.00    0.01      0.003  O       |       |       |       |     2.00
54.000    0.00    0.01      0.003  O       |       |       |       |     2.00
54.250    0.00    0.00      0.003  O       |       |       |       |     2.00
54.500    0.00    0.00      0.003  O       |       |       |       |     2.00
54.750    0.00    0.00      0.003  O       |       |       |       |     2.00
55.000    0.00    0.00      0.003  O       |       |       |       |     2.00
55.250    0.00    0.00      0.003  O       |       |       |       |     2.00
55.500    0.00    0.00      0.003  O       |       |       |       |     2.00
55.750    0.00    0.00      0.003  O       |       |       |       |     2.00
56.000    0.00    0.00      0.003  O       |       |       |       |     2.00
56.250    0.00    0.00      0.003  O       |       |       |       |     2.00
56.500    0.00    0.00      0.003  O       |       |       |       |     2.00
56.750    0.00    0.00      0.003  O       |       |       |       |     2.00
57.000    0.00    0.00      0.002  O       |       |       |       |     2.00
57.250    0.00    0.00      0.002  O       |       |       |       |     2.00
57.500    0.00    0.00      0.002  O       |       |       |       |     2.00
57.750    0.00    0.00      0.002  O       |       |       |       |     2.00
58.000    0.00    0.00      0.002  O       |       |       |       |     2.00
58.250    0.00    0.00      0.002  O       |       |       |       |     2.00
58.500    0.00    0.00      0.002  O       |       |       |       |     2.00
58.750    0.00    0.00      0.002  O       |       |       |       |     2.00
59.000    0.00    0.00      0.002  O       |       |       |       |     2.00
59.250    0.00    0.00      0.002  O       |       |       |       |     2.00
59.500    0.00    0.00      0.002  O       |       |       |       |     2.00
59.750    0.00    0.00      0.002  O       |       |       |       |     2.00
60.000    0.00    0.00      0.002  O       |       |       |       |     2.00
60.250    0.00    0.00      0.002  O       |       |       |       |     2.00
60.500    0.00    0.00      0.002  O       |       |       |       |     2.00

Remaining water in basin =    0.00 (Ac.Ft)

****************************HYDROGRAPH DATA****************************
               Number of intervals =   242
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       45.362 (CFS)
               Total volume =      35.918 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBF2RT.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ---------------------------------------------------------------------


      Subdrain Area A3 Routed Through Basin
      Proposed Condition
      100 Yr. 24 Hr.

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA324100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       50.782 (CFS)
                    Total volume =      27.411 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000     10.000     30.000      9.690       10.310
        4.000     15.000     50.000     14.483       15.517
        6.000     20.900     60.000     20.280       21.520
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      12.7   25.39   38.09   50.78 (Ft.)
 0.250    1.47    0.04      0.015  O       |       |       |       |     2.00
```

0.500	2.97	0.17	0.059	OI	2.01
0.750	3.41	0.35	0.119	O I	2.01
1.000	4.19	0.56	0.188	O I	2.02
1.250	3.83	0.77	0.257	O I	2.03
1.500	3.48	0.94	0.315	O I	2.03
1.750	3.45	1.09	0.366	O I	2.04
2.000	4.19	1.26	0.420	O I	2.04
2.250	4.56	1.44	0.483	O I	2.05
2.500	4.60	1.63	0.546	|OI	2.05
2.750	5.34	1.83	0.613	|O I	2.06
3.000	5.71	2.05	0.687	|O I	2.07
3.250	5.75	2.28	0.760	|O I	2.08
3.500	5.75	2.48	0.830	|O I	2.08
3.750	5.75	2.68	0.895	|O I	2.09
4.000	6.49	2.89	0.964	|O I	2.10
4.250	6.86	3.12	1.040	|O I	2.10
4.500	7.63	3.36	1.123	| O I	2.11
4.750	8.01	3.63	1.212	| O I	2.12
5.000	8.78	3.92	1.308	| O I	2.13
5.250	7.69	4.18	1.394	| O I	2.14
5.500	7.71	4.39	1.465	| O I	2.15
5.750	8.75	4.62	1.542	| O I	2.15
6.000	9.16	4.88	1.628	| O I	2.16
6.250	9.93	5.16	1.722	| O I |	2.17
6.500	10.31	5.46	1.821	| O I |	2.18
6.750	11.08	5.77	1.926	| O I |	2.19
7.000	11.46	6.11	2.036	| O I|	2.20
7.250	11.50	6.43	2.144	| O I|	2.21
7.500	12.23	6.76	2.253	| O I|	2.23
7.750	13.35	7.12	2.374	| O I	2.24
8.000	14.50	7.53	2.510	| O |I	2.25
8.250	16.95	8.02	2.675	| O | I	2.27
8.500	18.09	8.59	2.865	| O | I	2.29
8.750	19.33	9.20	3.068	| O | I	2.31
9.000	21.01	9.86	3.288	| O | I	2.33
9.250	23.80	10.61	3.539	| O | I |	2.35
9.500	26.06	11.47	3.826	| O| I	2.38
9.750	27.84	12.41	4.136	| O| |I	2.41
10.000	29.57	13.39	4.463	| O | I	2.45
10.250	22.87	14.16	4.720	| O I |	2.47
10.500	19.24	14.57	4.858	| |O I |	2.49
10.750	24.24	15.00	5.002	| |O I|	2.50
11.000	27.01	15.64	5.215	| |O |I	2.52
11.250	26.29	16.30	5.435	| | O I	2.54
11.500	25.83	16.89	5.631	| | O I	2.56
11.750	23.76	17.37	5.789	| | O I |	2.58
12.000	23.81	17.75	5.918	| | O I|	2.59
12.250	31.70	18.35	6.119	| | O | I	2.61
12.500	36.65	19.31	6.436	| | O | I|	2.64
12.750	39.73	20.44	6.814	| | O | |I	2.68
13.000	41.98	21.67	7.223	| | O | | I	2.72
13.250	47.97	23.07	7.690	| | O | | I |	2.77
13.500	50.78	24.65	8.217	| | O| | I	2.82
13.750	39.52	25.88	8.628	| | O I	2.86
14.000	33.67	26.53	8.843	| | O I |	2.88
14.250	37.40	27.07	9.023	| | |O I|	2.90
14.500	38.57	27.73	9.242	| | |O I	2.92
14.750	38.30	28.37	9.457	| | |O I	2.95
15.000	37.27	28.94	9.645	| | | O I|	2.96
15.250	35.74	29.39	9.797	| | | O I |	2.98
15.500	34.16	29.73	9.909	| | | O I |	2.99
15.750	29.43	29.85	9.950	| | | O |	2.99
16.000	27.29	29.76	9.920	| | |IO |	2.99
16.250	12.67	29.17	9.724	| I| | O |	2.97
16.500	5.29	27.96	9.319	| I | |O |	2.93
16.750	3.86	26.55	8.851	| I | O |	2.89
17.000	3.48	25.18	8.392	| I | O| |	2.84
17.250	4.92	23.92	7.972	| I | O| |	2.80
17.500	5.68	22.80	7.599	| I | O | |	2.76
17.750	5.75	21.77	7.257	| I | O | |	2.73
18.000	5.01	20.78	6.928	| I | O | |	2.69

```
18.250    4.63   19.82      6.608  | I     |   O   |       |       |     2.66
18.500    4.60   18.91      6.304  | I     |  O    |       |       |     2.63
18.750    3.86   18.03      6.009  | I     |  O    |       |       |     2.60
19.000    2.75   17.14      5.714  |I      | O     |       |       |     2.57
19.250    3.07   16.29      5.429  |I      | O     |       |       |     2.54
19.500    4.15   15.52      5.175  | I     |O      |       |       |     2.52
19.750    3.83   14.83      4.944  | I     |O      |       |       |     2.49
20.000    2.75   14.14      4.713  |I      O       |       |       |     2.47
20.250    3.07   13.46      4.488  |I      O       |       |       |     2.45
20.500    3.41   12.85      4.283  | I     O       |       |       |     2.43
20.750    3.45   12.28      4.094  | I    O|       |       |       |     2.41
21.000    2.71   11.73      3.910  |I     O|       |       |       |     2.39
21.250    3.07   11.20      3.733  |I     O|       |       |       |     2.37
21.500    2.68   10.70      3.566  |I    O |       |       |       |     2.36
21.750    3.07   10.22      3.409  |I    O |       |       |       |     2.34
22.000    2.68    9.78      3.262  |I    O |       |       |       |     2.33
22.250    3.07    9.37      3.124  |I   O  |       |       |       |     2.31
22.500    2.68    8.98      2.993  |I   O  |       |       |       |     2.30
22.750    2.33    8.59      2.864  |I   O  |       |       |       |     2.29
23.000    2.30    8.21      2.738  |I   O  |       |       |       |     2.27
23.250    2.30    7.86      2.620  |I  O   |       |       |       |     2.26
23.500    2.30    7.52      2.508  |I  O   |       |       |       |     2.25
23.750    2.30    7.21      2.404  |I  O   |       |       |       |     2.24
24.000    2.30    6.91      2.305  |I  O   |       |       |       |     2.23
24.250    0.82    6.59      2.198  I   O   |       |       |       |     2.22
24.500    0.07    6.22      2.075  I  O    |       |       |       |     2.21
24.750    0.00    5.85      1.951  I  O    |       |       |       |     2.19
25.000    0.00    5.50      1.834  I  O    |       |       |       |     2.18
25.250    0.00    5.17      1.724  I  O    |       |       |       |     2.17
25.500    0.00    4.86      1.620  I  O    |       |       |       |     2.16
25.750    0.00    4.56      1.523  I O     |       |       |       |     2.15
26.000    0.00    4.29      1.431  I O     |       |       |       |     2.14
26.250    0.00    4.03      1.345  I O     |       |       |       |     2.13
26.500    0.00    3.79      1.265  I O     |       |       |       |     2.13
26.750    0.00    3.56      1.189  I O     |       |       |       |     2.12
27.000    0.00    3.35      1.117  I O     |       |       |       |     2.11
27.250    0.00    3.15      1.050  IO      |       |       |       |     2.10
27.500    0.00    2.96      0.987  IO      |       |       |       |     2.10
27.750    0.00    2.78      0.928  IO      |       |       |       |     2.09
28.000    0.00    2.61      0.872  IO      |       |       |       |     2.09
28.250    0.00    2.45      0.820  IO      |       |       |       |     2.08
28.500    0.00    2.31      0.771  IO      |       |       |       |     2.08
28.750    0.00    2.17      0.724  IO      |       |       |       |     2.07
29.000    0.00    2.04      0.681  IO      |       |       |       |     2.07
29.250    0.00    1.92      0.640  IO      |       |       |       |     2.06
29.500    0.00    1.80      0.602  IO      |       |       |       |     2.06
29.750    0.00    1.69      0.566  IO      |       |       |       |     2.06
30.000    0.00    1.59      0.532  IO      |       |       |       |     2.05
30.250    0.00    1.49      0.500  O       |       |       |       |     2.05
30.500    0.00    1.40      0.470  O       |       |       |       |     2.05
30.750    0.00    1.32      0.442  O       |       |       |       |     2.04
31.000    0.00    1.24      0.415  O       |       |       |       |     2.04
31.250    0.00    1.17      0.390  O       |       |       |       |     2.04
31.500    0.00    1.10      0.367  O       |       |       |       |     2.04
31.750    0.00    1.03      0.345  O       |       |       |       |     2.03
32.000    0.00    0.97      0.324  O       |       |       |       |     2.03
32.250    0.00    0.91      0.305  O       |       |       |       |     2.03
32.500    0.00    0.86      0.287  O       |       |       |       |     2.03
32.750    0.00    0.80      0.270  O       |       |       |       |     2.03
33.000    0.00    0.76      0.254  O       |       |       |       |     2.03
33.250    0.00    0.71      0.238  O       |       |       |       |     2.02
33.500    0.00    0.67      0.224  O       |       |       |       |     2.02
33.750    0.00    0.63      0.211  O       |       |       |       |     2.02
34.000    0.00    0.59      0.198  O       |       |       |       |     2.02
34.250    0.00    0.55      0.186  O       |       |       |       |     2.02
34.500    0.00    0.52      0.175  O       |       |       |       |     2.02
34.750    0.00    0.49      0.165  O       |       |       |       |     2.02
35.000    0.00    0.46      0.155  O       |       |       |       |     2.02
35.250    0.00    0.43      0.146  O       |       |       |       |     2.01
35.500    0.00    0.41      0.137  O       |       |       |       |     2.01
35.750    0.00    0.38      0.129  O       |       |       |       |     2.01
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36.000	0.00	0.36	0.121	O	|	|	|	|	2.01
36.250	0.00	0.34	0.114	O	|	|	|	|	2.01
36.500	0.00	0.32	0.107	O	|	|	|	|	2.01
36.750	0.00	0.30	0.101	O	|	|	|	|	2.01
37.000	0.00	0.28	0.095	O	|	|	|	|	2.01
37.250	0.00	0.26	0.089	O	|	|	|	|	2.01
37.500	0.00	0.25	0.084	O	|	|	|	|	2.01
37.750	0.00	0.23	0.079	O	|	|	|	|	2.01
38.000	0.00	0.22	0.075	O	|	|	|	|	2.01
38.250	0.00	0.21	0.070	O	|	|	|	|	2.01
38.500	0.00	0.19	0.066	O	|	|	|	|	2.01
38.750	0.00	0.18	0.062	O	|	|	|	|	2.01
39.000	0.00	0.17	0.059	O	|	|	|	|	2.01
39.250	0.00	0.16	0.055	O	|	|	|	|	2.01
39.500	0.00	0.15	0.052	O	|	|	|	|	2.00
39.750	0.00	0.14	0.049	O	|	|	|	|	2.00
40.000	0.00	0.13	0.046	O	|	|	|	|	2.00
40.250	0.00	0.13	0.043	O	|	|	|	|	2.00
40.500	0.00	0.12	0.041	O	|	|	|	|	2.00
40.750	0.00	0.11	0.038	O	|	|	|	|	2.00
41.000	0.00	0.10	0.036	O	|	|	|	|	2.00
41.250	0.00	0.10	0.034	O	|	|	|	|	2.00
41.500	0.00	0.09	0.032	O	|	|	|	|	2.00
41.750	0.00	0.09	0.030	O	|	|	|	|	2.00
42.000	0.00	0.08	0.029	O	|	|	|	|	2.00
42.250	0.00	0.08	0.027	O	|	|	|	|	2.00
42.500	0.00	0.07	0.026	O	|	|	|	|	2.00
42.750	0.00	0.07	0.024	O	|	|	|	|	2.00
43.000	0.00	0.06	0.023	O	|	|	|	|	2.00
43.250	0.00	0.06	0.021	O	|	|	|	|	2.00
43.500	0.00	0.06	0.020	O	|	|	|	|	2.00
43.750	0.00	0.05	0.019	O	|	|	|	|	2.00
44.000	0.00	0.05	0.018	O	|	|	|	|	2.00
44.250	0.00	0.05	0.017	O	|	|	|	|	2.00
44.500	0.00	0.04	0.016	O	|	|	|	|	2.00
44.750	0.00	0.04	0.015	O	|	|	|	|	2.00
45.000	0.00	0.04	0.015	O	|	|	|	|	2.00
45.250	0.00	0.04	0.014	O	|	|	|	|	2.00
45.500	0.00	0.03	0.013	O	|	|	|	|	2.00
45.750	0.00	0.03	0.012	O	|	|	|	|	2.00
46.000	0.00	0.03	0.012	O	|	|	|	|	2.00
46.250	0.00	0.03	0.011	O	|	|	|	|	2.00
46.500	0.00	0.03	0.011	O	|	|	|	|	2.00
46.750	0.00	0.02	0.010	O	|	|	|	|	2.00
47.000	0.00	0.02	0.009	O	|	|	|	|	2.00
47.250	0.00	0.02	0.009	O	|	|	|	|	2.00
47.500	0.00	0.02	0.009	O	|	|	|	|	2.00
47.750	0.00	0.02	0.008	O	|	|	|	|	2.00
48.000	0.00	0.02	0.008	O	|	|	|	|	2.00
48.250	0.00	0.02	0.007	O	|	|	|	|	2.00
48.500	0.00	0.02	0.007	O	|	|	|	|	2.00
48.750	0.00	0.02	0.007	O	|	|	|	|	2.00
49.000	0.00	0.01	0.006	O	|	|	|	|	2.00
49.250	0.00	0.01	0.006	O	|	|	|	|	2.00
49.500	0.00	0.01	0.006	O	|	|	|	|	2.00
49.750	0.00	0.01	0.006	O	|	|	|	|	2.00
50.000	0.00	0.01	0.005	O	|	|	|	|	2.00
50.250	0.00	0.01	0.005	O	|	|	|	|	2.00
50.500	0.00	0.01	0.005	O	|	|	|	|	2.00
50.750	0.00	0.01	0.005	O	|	|	|	|	2.00
51.000	0.00	0.01	0.005	O	|	|	|	|	2.00
51.250	0.00	0.01	0.004	O	|	|	|	|	2.00
51.500	0.00	0.01	0.004	O	|	|	|	|	2.00
51.750	0.00	0.01	0.004	O	|	|	|	|	2.00
52.000	0.00	0.01	0.004	O	|	|	|	|	2.00
52.250	0.00	0.01	0.004	O	|	|	|	|	2.00
52.500	0.00	0.01	0.004	O	|	|	|	|	2.00
52.750	0.00	0.01	0.004	O	|	|	|	|	2.00
53.000	0.00	0.01	0.003	O	|	|	|	|	2.00
53.250	0.00	0.00	0.003	O	|	|	|	|	2.00
53.500	0.00	0.00	0.003	O	|	|	|	|	2.00

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53.750    0.00    0.00      0.003  O       |       |       |       |     2.00
54.000    0.00    0.00      0.003  O       |       |       |       |     2.00
54.250    0.00    0.00      0.003  O       |       |       |       |     2.00
54.500    0.00    0.00      0.003  O       |       |       |       |     2.00
54.750    0.00    0.00      0.003  O       |       |       |       |     2.00
55.000    0.00    0.00      0.003  O       |       |       |       |     2.00
55.250    0.00    0.00      0.003  O       |       |       |       |     2.00
55.500    0.00    0.00      0.003  O       |       |       |       |     2.00
55.750    0.00    0.00      0.003  O       |       |       |       |     2.00
56.000    0.00    0.00      0.003  O       |       |       |       |     2.00
56.250    0.00    0.00      0.002  O       |       |       |       |     2.00
56.500    0.00    0.00      0.002  O       |       |       |       |     2.00
56.750    0.00    0.00      0.002  O       |       |       |       |     2.00
57.000    0.00    0.00      0.002  O       |       |       |       |     2.00
57.250    0.00    0.00      0.002  O       |       |       |       |     2.00
57.500    0.00    0.00      0.002  O       |       |       |       |     2.00
57.750    0.00    0.00      0.002  O       |       |       |       |     2.00
58.000    0.00    0.00      0.002  O       |       |       |       |     2.00
58.250    0.00    0.00      0.002  O       |       |       |       |     2.00
58.500    0.00    0.00      0.002  O       |       |       |       |     2.00
58.750    0.00    0.00      0.002  O       |       |       |       |     2.00
59.000    0.00    0.00      0.002  O       |       |       |       |     2.00
59.250    0.00    0.00      0.002  O       |       |       |       |     2.00
59.500    0.00    0.00      0.002  O       |       |       |       |     2.00
59.750    0.00    0.00      0.002  O       |       |       |       |     2.00

Remaining water in basin =    0.00 (Ac.Ft)

****************************HYDROGRAPH DATA****************************
               Number of intervals =   239
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       29.850 (CFS)
               Total volume =      27.409 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*******************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBF3RT.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/26/12

      ----------------------------------------------------------------


      Subdrain Area A4, Routed Through Basin A4
      Proposed Conditions
      100 Yr. 24 Hr.

      ----------------------------------------------------------------


      Program License Serial Number 6097

      ------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBA424100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      112.647 (CFS)
                    Total volume =      60.804 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.001      0.002        0.002
        3.000     20.000     70.000     19.277       20.723
        4.000     25.000    150.000     23.450       26.550
        6.000     38.800    200.000     36.734       40.866
      ----------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                    Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      28.2   56.32   84.49  112.65 (Ft.)
 0.250    3.27    0.11      0.033  O       |       |       |       |     2.00
```

0.500	6.58	0.44	0.129	OI	2.01
0.750	7.57	0.91	0.261	O I	2.01
1.000	9.29	1.43	0.411	O I	2.02
1.250	8.49	1.95	0.560	O I	2.03
1.500	7.73	2.38	0.682	O I	2.03
1.750	7.65	2.75	0.788	O I	2.04
2.000	9.29	3.15	0.902	O I	2.05
2.250	10.12	3.61	1.033	OI	2.05
2.500	10.20	4.07	1.163	OI	2.06
2.750	11.84	4.55	1.302	O I	2.07
3.000	12.67	5.09	1.456	O I	2.07
3.250	12.75	5.62	1.608	O I	2.08
3.500	12.75	6.12	1.750	O I	2.09
3.750	12.75	6.58	1.882	O I	2.09
4.000	14.39	7.07	2.021	O I	2.10
4.250	15.22	7.61	2.176	O I	2.11
4.500	16.94	8.20	2.345	O I	2.12
4.750	17.77	8.84	2.527	O I	2.13
5.000	19.49	9.52	2.722	O I	2.14
5.250	17.05	10.13	2.897	O I	2.14
5.500	17.09	10.62	3.035	OI	2.15
5.750	19.41	11.15	3.187	O I	2.16
6.000	20.32	11.76	3.361	O I	2.17
6.250	22.04	12.42	3.549	O I	2.18
6.500	22.87	13.12	3.749	O I	2.19
6.750	24.59	13.86	3.961	O I	2.20
7.000	25.42	14.64	4.183	O I	2.21
7.250	25.50	15.39	4.399	O I	2.22
7.500	27.14	16.15	4.617	O I	2.23
7.750	29.61	17.01	4.860	O I	2.24
8.000	32.16	17.98	5.137	O I	2.26
8.250	37.61	19.16	5.474	O I	2.27
8.500	40.13	20.53	5.867	O I	2.29
8.750	42.88	22.00	6.286	O I	2.31
9.000	46.61	23.58	6.739	O I	2.34
9.250	52.78	25.41	7.260	O I	2.36
9.500	57.82	27.49	7.856	O I	2.39
9.750	61.76	29.75	8.500	O I	2.42
10.000	65.60	32.11	9.177	O I	2.46
10.250	50.74	33.93	9.696	O I	2.48
10.500	42.68	34.82	9.951	O I	2.50
10.750	53.76	35.76	10.218	O I	2.51
11.000	59.91	37.23	10.638	O I	2.53
11.250	58.32	38.76	11.075	O I	2.55
11.500	57.31	40.09	11.455	O I	2.57
11.750	52.70	41.13	11.752	O I	2.59
12.000	52.82	41.94	11.984	O I	2.60
12.250	70.32	43.31	12.375	O I	2.62
12.500	81.30	45.58	13.023	O I	2.65
12.750	88.13	48.31	13.804	O I	2.69
13.000	93.13	51.27	14.648	O I	2.73
13.250	106.40	54.65	15.615	O I	2.78
13.500	112.65	58.48	16.709	O I	2.84
13.750	87.67	61.39	17.540	O I	2.88
14.000	74.69	62.77	17.935	O I	2.90
14.250	82.96	63.89	18.255	O I	2.91
14.500	85.56	65.31	18.661	O I	2.93
14.750	84.96	66.70	19.058	O I	2.95
15.000	82.66	67.90	19.400	O I	2.97
15.250	79.28	68.81	19.660	O I	2.98
15.500	75.79	69.42	19.834	O I	2.99
15.750	65.28	69.50	19.856	O I	2.99
16.000	60.53	69.04	19.725	O I	2.99
16.250	28.10	67.31	19.232	O I	2.96
16.500	11.74	64.00	18.287	O I	2.91
16.750	8.56	60.25	17.213	O I	2.86
17.000	7.73	56.61	16.174	O I	2.81
17.250	10.92	53.31	15.232	O I	2.76
17.500	12.59	50.41	14.403	O I	2.72
17.750	12.75	47.77	13.651	O I	2.68
18.000	11.12	45.27	12.936	O I	2.65

```
18.250   10.28   42.86     12.246  | I     |   O   |       |       |     2.61
18.500   10.20   40.58     11.596  | I     |  O    |       |       |     2.58
18.750    8.56   38.41     10.974  | I     | O     |       |       |     2.55
19.000    6.09   36.24     10.354  |I      | O     |       |       |     2.52
19.250    6.81   34.16      9.760  |I      |O      |       |       |     2.49
19.500    9.21   32.33      9.239  | I     |O      |       |       |     2.46
19.750    8.49   30.69      8.771  | I     O       |       |       |     2.44
20.000    6.09   29.06      8.304  |I      O       |       |       |     2.42
20.250    6.81   27.48      7.853  |I     O|       |       |       |     2.39
20.500    7.57   26.07      7.449  | I    O|       |       |       |     2.37
20.750    7.65   24.78      7.081  | I    O|       |       |       |     2.35
21.000    6.01   23.53      6.723  |I    O |       |       |       |     2.34
21.250    6.81   22.33      6.382  |I    O |       |       |       |     2.32
21.500    5.94   21.22      6.063  |I    O |       |       |       |     2.30
21.750    6.81   20.18      5.767  |I   O  |       |       |       |     2.29
22.000    5.94   19.22      5.492  |I   O  |       |       |       |     2.27
22.250    6.81   18.32      5.236  |I   O  |       |       |       |     2.26
22.500    5.94   17.49      4.998  |I  O   |       |       |       |     2.25
22.750    5.18   16.66      4.760  |I  O   |       |       |       |     2.24
23.000    5.10   15.85      4.530  |I  O   |       |       |       |     2.23
23.250    5.10   15.10      4.316  |I  O   |       |       |       |     2.22
23.500    5.10   14.40      4.117  |I  O   |       |       |       |     2.21
23.750    5.10   13.75      3.931  |I O    |       |       |       |     2.20
24.000    5.10   13.15      3.758  |I O    |       |       |       |     2.19
24.250    1.83   12.47      3.565  I  O    |       |       |       |     2.18
24.500    0.16   11.67      3.336  I  O    |       |       |       |     2.17
24.750    0.00   10.86      3.105  I  O    |       |       |       |     2.16
25.000    0.00   10.11      2.889  I O     |       |       |       |     2.14
25.250    0.00    9.40      2.687  I O     |       |       |       |     2.13
25.500    0.00    8.74      2.500  I O     |       |       |       |     2.12
25.750    0.00    8.13      2.325  I O     |       |       |       |     2.12
26.000    0.00    7.57      2.163  I O     |       |       |       |     2.11
26.250    0.00    7.04      2.012  IO      |       |       |       |     2.10
26.500    0.00    6.55      1.872  IO      |       |       |       |     2.09
26.750    0.00    6.09      1.741  IO      |       |       |       |     2.09
27.000    0.00    5.66      1.620  IO      |       |       |       |     2.08
27.250    0.00    5.27      1.507  IO      |       |       |       |     2.08
27.500    0.00    4.90      1.402  IO      |       |       |       |     2.07
27.750    0.00    4.56      1.304  IO      |       |       |       |     2.07
28.000    0.00    4.24      1.213  IO      |       |       |       |     2.06
28.250    0.00    3.95      1.129  IO      |       |       |       |     2.06
28.500    0.00    3.67      1.050  IO      |       |       |       |     2.05
28.750    0.00    3.41      0.977  O       |       |       |       |     2.05
29.000    0.00    3.18      0.909  O       |       |       |       |     2.05
29.250    0.00    2.95      0.846  O       |       |       |       |     2.04
29.500    0.00    2.75      0.787  O       |       |       |       |     2.04
29.750    0.00    2.56      0.732  O       |       |       |       |     2.04
30.000    0.00    2.38      0.681  O       |       |       |       |     2.03
30.250    0.00    2.21      0.634  O       |       |       |       |     2.03
30.500    0.00    2.06      0.589  O       |       |       |       |     2.03
30.750    0.00    1.91      0.548  O       |       |       |       |     2.03
31.000    0.00    1.78      0.510  O       |       |       |       |     2.03
31.250    0.00    1.66      0.475  O       |       |       |       |     2.02
31.500    0.00    1.54      0.442  O       |       |       |       |     2.02
31.750    0.00    1.43      0.411  O       |       |       |       |     2.02
32.000    0.00    1.33      0.382  O       |       |       |       |     2.02
32.250    0.00    1.24      0.356  O       |       |       |       |     2.02
32.500    0.00    1.15      0.331  O       |       |       |       |     2.02
32.750    0.00    1.07      0.308  O       |       |       |       |     2.02
33.000    0.00    1.00      0.287  O       |       |       |       |     2.01
33.250    0.00    0.93      0.267  O       |       |       |       |     2.01
33.500    0.00    0.86      0.248  O       |       |       |       |     2.01
33.750    0.00    0.80      0.231  O       |       |       |       |     2.01
34.000    0.00    0.75      0.215  O       |       |       |       |     2.01
34.250    0.00    0.69      0.200  O       |       |       |       |     2.01
34.500    0.00    0.65      0.186  O       |       |       |       |     2.01
34.750    0.00    0.60      0.173  O       |       |       |       |     2.01
35.000    0.00    0.56      0.162  O       |       |       |       |     2.01
35.250    0.00    0.52      0.150  O       |       |       |       |     2.01
35.500    0.00    0.48      0.140  O       |       |       |       |     2.01
35.750    0.00    0.45      0.130  O       |       |       |       |     2.01
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36.000	0.00	0.42	0.121	O	|	|	|	|	2.01
36.250	0.00	0.39	0.113	O	|	|	|	|	2.01
36.500	0.00	0.36	0.105	O	|	|	|	|	2.01
36.750	0.00	0.34	0.098	O	|	|	|	|	2.00
37.000	0.00	0.31	0.091	O	|	|	|	|	2.00
37.250	0.00	0.29	0.085	O	|	|	|	|	2.00
37.500	0.00	0.27	0.079	O	|	|	|	|	2.00
37.750	0.00	0.25	0.074	O	|	|	|	|	2.00
38.000	0.00	0.23	0.069	O	|	|	|	|	2.00
38.250	0.00	0.22	0.064	O	|	|	|	|	2.00
38.500	0.00	0.20	0.060	O	|	|	|	|	2.00
38.750	0.00	0.19	0.056	O	|	|	|	|	2.00
39.000	0.00	0.18	0.052	O	|	|	|	|	2.00
39.250	0.00	0.16	0.048	O	|	|	|	|	2.00
39.500	0.00	0.15	0.045	O	|	|	|	|	2.00
39.750	0.00	0.14	0.042	O	|	|	|	|	2.00
40.000	0.00	0.13	0.039	O	|	|	|	|	2.00
40.250	0.00	0.12	0.037	O	|	|	|	|	2.00
40.500	0.00	0.11	0.034	O	|	|	|	|	2.00
40.750	0.00	0.11	0.032	O	|	|	|	|	2.00
41.000	0.00	0.10	0.030	O	|	|	|	|	2.00
41.250	0.00	0.09	0.028	O	|	|	|	|	2.00
41.500	0.00	0.09	0.026	O	|	|	|	|	2.00
41.750	0.00	0.08	0.024	O	|	|	|	|	2.00
42.000	0.00	0.07	0.023	O	|	|	|	|	2.00
42.250	0.00	0.07	0.021	O	|	|	|	|	2.00
42.500	0.00	0.06	0.020	O	|	|	|	|	2.00
42.750	0.00	0.06	0.019	O	|	|	|	|	2.00
43.000	0.00	0.06	0.017	O	|	|	|	|	2.00
43.250	0.00	0.05	0.016	O	|	|	|	|	2.00
43.500	0.00	0.05	0.015	O	|	|	|	|	2.00
43.750	0.00	0.04	0.014	O	|	|	|	|	2.00
44.000	0.00	0.04	0.014	O	|	|	|	|	2.00
44.250	0.00	0.04	0.013	O	|	|	|	|	2.00
44.500	0.00	0.04	0.012	O	|	|	|	|	2.00
44.750	0.00	0.03	0.011	O	|	|	|	|	2.00
45.000	0.00	0.03	0.011	O	|	|	|	|	2.00
45.250	0.00	0.03	0.010	O	|	|	|	|	2.00
45.500	0.00	0.03	0.009	O	|	|	|	|	2.00
45.750	0.00	0.02	0.009	O	|	|	|	|	2.00
46.000	0.00	0.02	0.008	O	|	|	|	|	2.00
46.250	0.00	0.02	0.008	O	|	|	|	|	2.00
46.500	0.00	0.02	0.007	O	|	|	|	|	2.00
46.750	0.00	0.02	0.007	O	|	|	|	|	2.00
47.000	0.00	0.02	0.007	O	|	|	|	|	2.00
47.250	0.00	0.02	0.006	O	|	|	|	|	2.00
47.500	0.00	0.02	0.006	O	|	|	|	|	2.00
47.750	0.00	0.01	0.006	O	|	|	|	|	2.00
48.000	0.00	0.01	0.005	O	|	|	|	|	2.00
48.250	0.00	0.01	0.005	O	|	|	|	|	2.00
48.500	0.00	0.01	0.005	O	|	|	|	|	2.00
48.750	0.00	0.01	0.005	O	|	|	|	|	2.00
49.000	0.00	0.01	0.004	O	|	|	|	|	2.00
49.250	0.00	0.01	0.004	O	|	|	|	|	2.00
49.500	0.00	0.01	0.004	O	|	|	|	|	2.00
49.750	0.00	0.01	0.004	O	|	|	|	|	2.00
50.000	0.00	0.01	0.004	O	|	|	|	|	2.00
50.250	0.00	0.01	0.004	O	|	|	|	|	2.00
50.500	0.00	0.01	0.004	O	|	|	|	|	2.00
50.750	0.00	0.01	0.003	O	|	|	|	|	2.00
51.000	0.00	0.01	0.003	O	|	|	|	|	2.00
51.250	0.00	0.01	0.003	O	|	|	|	|	2.00
51.500	0.00	0.00	0.003	O	|	|	|	|	2.00
51.750	0.00	0.00	0.003	O	|	|	|	|	2.00
52.000	0.00	0.00	0.003	O	|	|	|	|	2.00
52.250	0.00	0.00	0.003	O	|	|	|	|	2.00
52.500	0.00	0.00	0.003	O	|	|	|	|	2.00
52.750	0.00	0.00	0.003	O	|	|	|	|	2.00
53.000	0.00	0.00	0.003	O	|	|	|	|	2.00
53.250	0.00	0.00	0.003	O	|	|	|	|	2.00
53.500	0.00	0.00	0.002	O	|	|	|	|	2.00

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53.750    0.00    0.00      0.002  O       |       |       |       |     2.00
54.000    0.00    0.00      0.002  O       |       |       |       |     2.00
54.250    0.00    0.00      0.002  O       |       |       |       |     2.00
54.500    0.00    0.00      0.002  O       |       |       |       |     2.00
54.750    0.00    0.00      0.002  O       |       |       |       |     2.00
55.000    0.00    0.00      0.002  O       |       |       |       |     2.00
55.250    0.00    0.00      0.002  O       |       |       |       |     2.00
55.500    0.00    0.00      0.002  O       |       |       |       |     2.00
55.750    0.00    0.00      0.002  O       |       |       |       |     2.00
56.000    0.00    0.00      0.002  O       |       |       |       |     2.00
56.250    0.00    0.00      0.002  O       |       |       |       |     2.00
56.500    0.00    0.00      0.002  O       |       |       |       |     2.00
56.750    0.00    0.00      0.002  O       |       |       |       |     2.00
57.000    0.00    0.00      0.002  O       |       |       |       |     1.99

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =   228
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       69.498 (CFS)
                     Total volume =      60.802 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

      ----------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file SUBF4RT.rte
      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =     0
                     Time interval =    0.0 (Min.)
                     Maximum/Peak flow rate =        0.000 (CFS)
                     Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************

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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  02/02/12 File: LineFoffsite24100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Line F, Offsite
100 yr 24 hr


--------------------------------------------------------------------
Drainage Area =    1643.00(Ac.)  =      2.567 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =    1643.00(Ac.)  =      2.567 Sq. Mi.
Length along longest watercourse =   20000.00(Ft.)
Length along longest watercourse measured to centroid =   10000.00(Ft.)
Length along longest watercourse =      3.788 Mi.
Length along longest watercourse measured to centroid =      1.894 Mi.
Difference in elevation =    4000.00(Ft.)
Slope along watercourse =   1056.0000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.406 Hr.
Lag time =    24.33 Min.
25% of lag time =     6.08 Min.
40% of lag time =     9.73 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1643.00           1.80                2957.40

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1643.00           4.50                7393.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.68 %
Adjusted average point rain =    4.486(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
  1643.000           92.00         0.150
 Total Area Entered =   1643.00(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
92.0	92.0	0.104	0.150	0.090	1.000	0.090
					Sum (F) =	0.090

Area averaged mean soil loss (F) (In/Hr) = 0.090
Minimum soil loss rate ((In/Hr)) = 0.045
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.780

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	61.647	5.828	96.496
2	0.500	123.295	33.332	551.928
3	0.750	184.942	33.227	550.184
4	1.000	246.589	12.119	200.671
5	1.250	308.236	6.971	115.433
6	1.500	369.884	4.136	68.478
7	1.750	431.531	2.175	36.022
8	2.000	493.178	0.830	13.740
9	2.250	554.826	0.525	8.691
10	2.500	616.473	0.434	7.178
11	2.750	678.120	0.300	4.967
12	3.000	739.768	0.124	2.047
			Sum = 100.000	Sum= 1655.836

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.159)	0.028	0.008
2	0.50	0.30	0.054	(0.157)	0.042	0.012
3	0.75	0.30	0.054	(0.155)	0.042	0.012
4	1.00	0.40	0.072	(0.153)	0.056	0.016
5	1.25	0.30	0.054	(0.152)	0.042	0.012
6	1.50	0.30	0.054	(0.150)	0.042	0.012
7	1.75	0.30	0.054	(0.148)	0.042	0.012
8	2.00	0.40	0.072	(0.146)	0.056	0.016
9	2.25	0.40	0.072	(0.144)	0.056	0.016
10	2.50	0.40	0.072	(0.143)	0.056	0.016
11	2.75	0.50	0.090	(0.141)	0.070	0.020
12	3.00	0.50	0.090	(0.139)	0.070	0.020
13	3.25	0.50	0.090	(0.137)	0.070	0.020
14	3.50	0.50	0.090	(0.136)	0.070	0.020
15	3.75	0.50	0.090	(0.134)	0.070	0.020
16	4.00	0.60	0.108	(0.132)	0.084	0.024
17	4.25	0.60	0.108	(0.131)	0.084	0.024
18	4.50	0.70	0.126	(0.129)	0.098	0.028
19	4.75	0.70	0.126	(0.127)	0.098	0.028
20	5.00	0.80	0.144	(0.126)	0.112	0.032
21	5.25	0.60	0.108	(0.124)	0.084	0.024
22	5.50	0.70	0.126	(0.122)	0.098	0.028
23	5.75	0.80	0.144	(0.121)	0.112	0.032
24	6.00	0.80	0.144	(0.119)	0.112	0.032
25	6.25	0.90	0.161	0.118	(0.126)	0.044
26	6.50	0.90	0.161	0.116	(0.126)	0.045
27	6.75	1.00	0.179	0.115	(0.140)	0.065
28	7.00	1.00	0.179	0.113	(0.140)	0.066
29	7.25	1.00	0.179	0.111	(0.140)	0.068
30	7.50	1.10	0.197	0.110	(0.154)	0.087

31	7.75	1.20	0.215	0.108	(	0.168)	0.107
32	8.00	1.30	0.233	0.107	(	0.182)	0.126
33	8.25	1.50	0.269	0.105	(	0.210)	0.164
34	8.50	1.50	0.269	0.104	(	0.210)	0.165
35	8.75	1.60	0.287	0.103	(	0.224)	0.185
36	9.00	1.70	0.305	0.101	(	0.238)	0.204
37	9.25	1.90	0.341	0.100	(	0.266)	0.241
38	9.50	2.00	0.359	0.098	(	0.280)	0.261
39	9.75	2.10	0.377	0.097	(	0.294)	0.280
40	10.00	2.20	0.395	0.095	(	0.308)	0.299
41	10.25	1.50	0.269	0.094	(	0.210)	0.175
42	10.50	1.50	0.269	0.093	(	0.210)	0.176
43	10.75	2.00	0.359	0.091	(	0.280)	0.267
44	11.00	2.00	0.359	0.090	(	0.280)	0.269
45	11.25	1.90	0.341	0.089	(	0.266)	0.252
46	11.50	1.90	0.341	0.087	(	0.266)	0.254
47	11.75	1.70	0.305	0.086	(	0.238)	0.219
48	12.00	1.80	0.323	0.085	(	0.252)	0.238
49	12.25	2.50	0.449	0.084	(	0.350)	0.365
50	12.50	2.60	0.466	0.082	(	0.364)	0.384
51	12.75	2.80	0.502	0.081	(	0.392)	0.421
52	13.00	2.90	0.520	0.080	(	0.406)	0.440
53	13.25	3.40	0.610	0.079	(	0.476)	0.531
54	13.50	3.40	0.610	0.077	(	0.476)	0.533
55	13.75	2.30	0.413	0.076	(	0.322)	0.336
56	14.00	2.30	0.413	0.075	(	0.322)	0.338
57	14.25	2.70	0.484	0.074	(	0.378)	0.410
58	14.50	2.60	0.466	0.073	(	0.364)	0.394
59	14.75	2.60	0.466	0.072	(	0.364)	0.395
60	15.00	2.50	0.449	0.071	(	0.350)	0.378
61	15.25	2.40	0.431	0.070	(	0.336)	0.361
62	15.50	2.30	0.413	0.068	(	0.322)	0.344
63	15.75	1.90	0.341	0.067	(	0.266)	0.273
64	16.00	1.90	0.341	0.066	(	0.266)	0.275
65	16.25	0.40	0.072	(0.065)		0.056	0.016
66	16.50	0.40	0.072	(0.064)		0.056	0.016
67	16.75	0.30	0.054	(0.063)		0.042	0.012
68	17.00	0.30	0.054	(0.062)		0.042	0.012
69	17.25	0.50	0.090	0.062	(	0.070)	0.028
70	17.50	0.50	0.090	0.061	(	0.070)	0.029
71	17.75	0.50	0.090	0.060	(	0.070)	0.030
72	18.00	0.40	0.072	(0.059)		0.056	0.016
73	18.25	0.40	0.072	(0.058)		0.056	0.016
74	18.50	0.40	0.072	(0.057)		0.056	0.016
75	18.75	0.30	0.054	(0.056)		0.042	0.012
76	19.00	0.20	0.036	(0.055)		0.028	0.008
77	19.25	0.30	0.054	(0.055)		0.042	0.012
78	19.50	0.40	0.072	0.054	(	0.056)	0.018
79	19.75	0.30	0.054	(0.053)		0.042	0.012
80	20.00	0.20	0.036	(0.052)		0.028	0.008
81	20.25	0.30	0.054	(0.052)		0.042	0.012
82	20.50	0.30	0.054	(0.051)		0.042	0.012
83	20.75	0.30	0.054	(0.050)		0.042	0.012
84	21.00	0.20	0.036	(0.050)		0.028	0.008
85	21.25	0.30	0.054	(0.049)		0.042	0.012
86	21.50	0.20	0.036	(0.049)		0.028	0.008
87	21.75	0.30	0.054	(0.048)		0.042	0.012
88	22.00	0.20	0.036	(0.048)		0.028	0.008
89	22.25	0.30	0.054	(0.047)		0.042	0.012
90	22.50	0.20	0.036	(0.047)		0.028	0.008
91	22.75	0.20	0.036	(0.046)		0.028	0.008
92	23.00	0.20	0.036	(0.046)		0.028	0.008
93	23.25	0.20	0.036	(0.046)		0.028	0.008
94	23.50	0.20	0.036	(0.045)		0.028	0.008
95	23.75	0.20	0.036	(0.045)		0.028	0.008
96	24.00	0.20	0.036	(0.045)		0.028	0.008

(Loss Rate Not Used)

Sum = 100.0 Sum = 11.3

Flood volume = Effective rainfall 2.83(In)

times area 1643.0(Ac.)/[(In)/(Ft.)] = 387.6(Ac.Ft)

Total soil loss = 1.65(In)

```
Total soil loss =   226.556(Ac.Ft)
Total rainfall =      4.49(In)
Flood volume =    16883495.4 Cubic Feet
Total soil loss =     9868785.5 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    804.474(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      225.0     450.0     675.0     900.0
-------------------------------------------------------------------
  0+15       0.0157      0.76  Q         |         |         |         |
  0+30       0.1294      5.50  Q         |         |         |         |
  0+45       0.3780     12.03  Q         |         |         |         |
  1+ 0       0.7120     16.17  Q         |         |         |         |
  1+15       1.1184     19.67  Q         |         |         |         |
  1+30       1.5453     20.66  Q         |         |         |         |
  1+45       1.9551     19.83  Q         |         |         |         |
  2+ 0       2.3710     20.13  Q         |         |         |         |
  2+15       2.8306     22.25  Q         |         |         |         |
  2+30       3.3344     24.38  VQ        |         |         |         |
  2+45       3.8620     25.54  VQ        |         |         |         |
  3+ 0       4.4444     28.19  VQ        |         |         |         |
  3+15       5.0773     30.63  VQ        |         |         |         |
  3+30       5.7294     31.56  VQ        |         |         |         |
  3+45       6.3917     32.06  VQ        |         |         |         |
  4+ 0       7.0681     32.74  VQ        |         |         |         |
  4+15       7.7930     35.09  VQ        |         |         |         |
  4+30       8.5722     37.71  VQ        |         |         |         |
  4+45       9.4137     40.73  VQ        |         |         |         |
  5+ 0      10.3179     43.77  |Q        |         |         |         |
  5+15      11.2739     46.27  |VQ       |         |         |         |
  5+30      12.2050     45.07  |VQ       |         |         |         |
  5+45      13.1223     44.40  |Q        |         |         |         |
  6+ 0      14.1099     47.80  |VQ       |         |         |         |
  6+15      15.1716     51.39  |VQ       |         |         |         |
  6+30      16.3944     59.18  |VQ       |         |         |         |
  6+45      17.8239     69.19  |V Q      |         |         |         |
  7+ 0      19.5548     83.78  | VQ      |         |         |         |
  7+15      21.5673     97.40  | V Q     |         |         |         |
  7+30      23.7566    105.96  | V Q     |         |         |         |
  7+45      26.2892    122.58  | V  Q    |         |         |         |
  8+ 0      29.3467    147.99  |  V  Q   |         |         |         |
  8+15      33.0261    178.08  |  V   Q  |         |         |         |
  8+30      37.4941    216.25  |  V     Q|         |         |         |
  8+45      42.6038    247.31  |   V     Q         |         |         |
  9+ 0      48.2378    272.69  |   V     | Q       |         |         |
  9+15      54.5335    304.71  |    V    |  Q      |         |         |
  9+30      61.6757    345.68  |     V   |    Q    |         |         |
  9+45      69.6705    386.95  |      V  |      Q  |         |         |
 10+ 0      78.3934    422.19  |       V |       Q |         |         |
 10+15      87.5333    442.37  |        V|        Q|         |         |
 10+30      95.6864    394.61  |        V|      Q  |         |         |
 10+45     102.8193    345.24  |         V    Q    |         |         |
 11+ 0     110.6008    376.62  |          V    Q   |         |         |
 11+15     119.1682    414.66  |         | V     Q |         |         |
 11+30     127.8007    417.81  |         |  V    Q |         |         |
 11+45     136.3388    413.25  |         |   V   Q |         |         |
 12+ 0     144.5744    398.60  |         |   V  Q  |         |         |
 12+15     152.9081    403.35  |         |    V Q  |         |         |
 12+30     162.7938    478.47  |         |     V   |Q        |         |
 12+45     174.4070    562.08  |         |      V  |   Q     |         |
 13+ 0     187.2283    620.55  |         |        V|      Q  |         |
 13+15     201.2626    679.26  |         |         V         Q         |
 13+30     216.9402    758.79  |         |         | V       |  Q      |
 13+45     233.5616    804.47  |         |         |   V     |    Q    |
```

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  14+ 0     248.4840    722.24  |         |         |    V    | Q       |
  14+15     261.6380    636.65  |         |         |      VQ |         |
  14+30     274.9688    645.21  |         |         |       Q |         |
  14+45     288.5742    658.50  |         |         |        Q|         |
  15+ 0     302.0381    651.65  |         |         |       Q  V        |
  15+15     315.2726    640.55  |         |         |       Q | V       |
  15+30     328.1197    621.80  |         |         |      Q  |  V      |
  15+45     340.3800    593.40  |         |         |     Q   |    V    |
  16+ 0     351.5183    539.09  |         |         |  Q      |     V   |
  16+15     361.2030    468.74  |         |        Q        |      V  |
  16+30     367.5775    308.53  |         |  Q      |         |      V  |
  16+45     370.8013    156.03  |     Q   |         |         |       V |
  17+ 0     372.7904     96.27  |   Q     |         |         |       V |
  17+15     374.0877     62.79  | Q       |         |         |       V |
  17+30     375.1643     52.11  | Q       |         |         |       V |
  17+45     376.2199     51.09  | Q       |         |         |       V |
  18+ 0     377.2438     49.56  | Q       |         |         |       V |
  18+15     378.1013     41.50  |Q        |         |         |        V|
  18+30     378.7836     33.02  |Q        |         |         |        V|
  18+45     379.3873     29.22  |Q        |         |         |        V|
  19+ 0     379.8993     24.78  |Q        |         |         |        V|
  19+15     380.3125     20.00  Q         |         |         |        V|
  19+30     380.7136     19.41  Q         |         |         |        V|
  19+45     381.1882     22.97  |Q        |         |         |        V|
  20+ 0     381.6544     22.57  |Q        |         |         |        V|
  20+15     382.0391     18.62  Q         |         |         |        V|
  20+30     382.4134     18.12  Q         |         |         |        V|
  20+45     382.8109     19.24  Q         |         |         |        V|
  21+ 0     383.2032     18.99  Q         |         |         |        V|
  21+15     383.5592     17.23  Q         |         |         |        V|
  21+30     383.9095     16.95  Q         |         |         |        V|
  21+45     384.2531     16.63  Q         |         |         |        V|
  22+ 0     384.5961     16.60  Q         |         |         |        V|
  22+15     384.9341     16.36  Q         |         |         |        V|
  22+30     385.2739     16.45  Q         |         |         |        V|
  22+45     385.6031     15.93  Q         |         |         |        V|
  23+ 0     385.8976     14.25  Q         |         |         |        V|
  23+15     386.1815     13.74  Q         |         |         |        V|
  23+30     386.4591     13.44  Q         |         |         |        V|
  23+45     386.7334     13.28  Q         |         |         |        V|
  24+ 0     387.0055     13.17  Q         |         |         |        V|
  24+15     387.2611     12.37  Q         |         |         |        V|
  24+30     387.4263      7.99  Q         |         |         |        V|
  24+45     387.5013      3.63  Q         |         |         |        V|
  25+ 0     387.5433      2.03  Q         |         |         |        V|
  25+15     387.5664      1.11  Q         |         |         |        V|
  25+30     387.5782      0.57  Q         |         |         |        V|
  25+45     387.5842      0.29  Q         |         |         |        V|
  26+ 0     387.5879      0.18  Q         |         |         |        V|
  26+15     387.5902      0.11  Q         |         |         |        V|
  26+30     387.5914      0.06  Q         |         |         |        V|
  26+45     387.5917      0.02  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  02/02/12 File: Sketcher24100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Line A, offsite, Sketcher Site
100 yr 24 hr


--------------------------------------------------------------------
Drainage Area =     158.40(Ac.)  =      0.248 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     158.40(Ac.)  =      0.248 Sq. Mi.
Length along longest watercourse =    1400.00(Ft.)
Length along longest watercourse measured to centroid =     700.00(Ft.)
Length along longest watercourse =      0.265 Mi.
Length along longest watercourse measured to centroid =      0.133 Mi.
Difference in elevation =      28.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.083 Hr.
Lag time =     4.99 Min.
25% of lag time =     1.25 Min.
40% of lag time =     2.00 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.40           1.80                 285.12

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      158.40           4.50                 712.80

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   158.400           85.00         0.750
 Total Area Entered =    158.40(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	300.358	56.717	90.541
2	0.500	600.716	37.109	59.239
3	0.750	901.075	6.175	9.857
		Sum = 100.000	Sum=	159.637

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
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40	10.00	2.20	0.396	0.064	(	0.119)	0.331
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42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
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50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.559
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 158.4(Ac.)/[(In)/(Ft.)] = 48.0(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 11.412(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 2089540.2 Cubic Feet
Total soil loss = 497123.3 Cubic Feet

Peak flow rate of this hydrograph = 88.411(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 22.5 45.0 67.5 90.0
0+15	0.0472	2.28	VQ | | | |
0+30	0.1487	4.92	V Q | | | |
0+45	0.2709	5.91	V Q | | | |
1+ 0	0.4191	7.18	V Q | | | |
1+15	0.5593	6.78	V Q | | | |
1+30	0.6865	6.16	V Q | | | |
1+45	0.8112	6.04	V Q | | | |
2+ 0	0.9595	7.18	V Q | | | |
2+15	1.1232	7.92	V Q | | | |
2+30	1.2895	8.05	V Q | | | |
2+45	1.4793	9.19	|V Q | | | |
3+ 0	1.6846	9.94	|V Q | | | |
3+15	1.8924	10.06	|V Q | | | |
3+30	2.1003	10.06	|V Q | | | |
3+45	2.3081	10.06	|V Q | | | |
4+ 0	2.5395	11.20	| V Q | | | |
4+15	2.7864	11.95	| V Q | | | |
4+30	3.0593	13.21	| V Q | | | |
4+45	3.3477	13.96	| V Q | | | |
5+ 0	3.6623	15.22	| V Q | | | |
5+15	3.9451	13.69	| V Q | | | |
5+30	4.2232	13.46	| V Q | | | |
5+45	4.5352	15.10	| V Q | | | |
6+ 0	4.8652	15.97	| V Q | | | |
6+15	5.2213	17.24	| V Q | | | |
6+30	5.5928	17.98	| V Q | | | |
6+45	5.9905	19.25	| V Q | | | |
7+ 0	6.4036	19.99	| V Q | | | |
7+15	6.8193	20.12	| V Q | | | |
7+30	7.2585	21.26	| V Q| | | |
7+45	7.7368	23.15	| V Q | | |
8+ 0	8.2566	25.16	| V |Q | | |
8+15	8.8597	29.19	| V | Q | | |
8+30	9.5100	31.48	| V | Q | | |
8+45	10.2042	33.60	| V | Q | | |
9+ 0	10.9573	36.45	| V| Q | | |
9+15	11.8067	41.11	| V| Q | | |
9+30	12.7407	45.20	| V Q | | |
9+45	13.7409	48.41	| V |Q | |
10+ 0	14.8035	51.43	| V | Q | |
10+15	15.6593	41.42	| V Q | | |
10+30	16.3674	34.28	| V Q | | |
10+45	17.2214	41.33	| V Q | | |
11+ 0	18.1885	46.81	| V Q | |
11+15	19.1432	46.21	| V Q | |
11+30	20.0789	45.28	| V Q | |
11+45	20.9464	41.99	| VQ | |
12+ 0	21.8063	41.62	| Q | |
12+15	22.9196	53.88	| V| Q |
12+30	24.2273	63.29	| V Q |
12+45	25.6528	69.00	| V Q |
13+ 0	27.1625	73.07	| | V | Q |
13+15	28.8726	82.77	| | V | Q |
13+30	30.6993	88.41	| | V | Q|
13+45	32.1765	71.49	| | V |Q |
14+ 0	33.4139	59.89	| | QV | |
14+15	34.7482	64.58	| | Q | |
14+30	36.1395	67.34	| | QV |
14+45	37.5260	67.10	| | Q V |
15+ 0	38.8776	65.42	| | Q| V |
15+15	40.1759	62.84	| | Q | V |
15+30	41.4172	60.08	| | Q | V |
15+45	42.5004	52.43	| | | Q | V |
16+ 0	43.4941	48.10	| | |Q | V |

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   16+15      44.0126     25.09  |         |Q        |         |     V   |
   16+30      44.2291     10.48  |   Q     |         |         |     V   |
   16+45      44.3718      6.91  |  Q      |         |         |      V  |
   17+ 0      44.4991      6.16  | Q       |         |         |      V  |
   17+15      44.6709      8.32  |  Q      |         |         |      V  |
   17+30      44.8736      9.81  |   Q     |         |         |      V  |
   17+45      45.0815     10.06  |   Q     |         |         |      V  |
   18+ 0      45.2657      8.92  |  Q      |         |         |      V  |
   18+15      45.4345      8.17  |  Q      |         |         |      V  |
   18+30      45.6008      8.05  |  Q      |         |         |       V |
   18+45      45.7435      6.91  |  Q      |         |         |       V |
   19+ 0      45.8472      5.02  | Q       |         |         |       V |
   19+15      45.9565      5.29  | Q       |         |         |       V |
   19+30      46.1022      7.05  |  Q      |         |         |       V |
   19+45      46.2423      6.78  |  Q      |         |         |       V |
   20+ 0      46.3460      5.02  | Q       |         |         |       V |
   20+15      46.4553      5.29  | Q       |         |         |       V |
   20+30      46.5774      5.91  | Q       |         |         |       V |
   20+45      46.7021      6.04  | Q       |         |         |       V |
   21+ 0      46.8032      4.89  | Q       |         |         |        V|
   21+15      46.9125      5.29  | Q       |         |         |        V|
   21+30      47.0111      4.77  | Q       |         |         |        V|
   21+45      47.1204      5.29  | Q       |         |         |        V|
   22+ 0      47.2189      4.77  | Q       |         |         |        V|
   22+15      47.3282      5.29  | Q       |         |         |        V|
   22+30      47.4268      4.77  | Q       |         |         |        V|
   22+45      47.5125      4.15  |Q        |         |         |        V|
   23+ 0      47.5956      4.02  |Q        |         |         |        V|
   23+15      47.6787      4.02  |Q        |         |         |        V|
   23+30      47.7619      4.02  |Q        |         |         |        V|
   23+45      47.8450      4.02  |Q        |         |         |        V|
   24+ 0      47.9281      4.02  |Q        |         |         |        V|
   24+15      47.9641      1.74  Q         |         |         |        V|
   24+30      47.9692      0.25  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/26/12 File: SUBA124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A1
Proposed Conditions
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =      65.60(Ac.)  =      0.102 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      65.60(Ac.)  =      0.102 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       65.60           1.80                 118.08

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       65.60           4.50                 295.20

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    65.600           85.00         0.750
 Total Area Entered =     65.60(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	386.627	64.140	42.405
2	0.500	773.254	32.781	21.672
3	0.750	1159.882	3.079	2.036
		Sum = 100.000	Sum=	66.113

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
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17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.313

40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
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50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 65.6(Ac.)/[(In)/(Ft.)] = 19.9(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 4.727(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 865541.8 Cubic Feet
Total soil loss = 205896.9 Cubic Feet

Peak flow rate of this hydrograph = 36.812(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 10.0 20.0 30.0 40.0
0+15	0.0221	1.07	VQ | | | |
0+30	0.0665	2.15	V Q | | | |
0+45	0.1176	2.47	V Q | | | |
1+ 0	0.1803	3.03	V Q | | | |
1+15	0.2376	2.77	V Q | | | |
1+30	0.2898	2.53	V Q | | | |
1+45	0.3415	2.50	V Q | | | |
2+ 0	0.4042	3.03	V Q | | | |
2+15	0.4725	3.31	V Q | | | |
2+30	0.5414	3.33	V Q | | | |
2+45	0.6213	3.87	|V Q | | | |
3+ 0	0.7068	4.14	|V Q | | | |
3+15	0.7929	4.17	|V Q | | | |
3+30	0.8790	4.17	|V Q | | | |
3+45	0.9651	4.17	|V Q | | | |
4+ 0	1.0622	4.70	| V Q | | | |
4+15	1.1650	4.97	| V Q | | | |
4+30	1.2794	5.53	| V Q | | | |
4+45	1.3994	5.81	| V Q | | | |
5+ 0	1.5309	6.37	| V Q | | | |
5+15	1.6461	5.57	| V Q | | | |
5+30	1.7615	5.59	| V Q | | | |
5+45	1.8925	6.34	| V Q | | | |
6+ 0	2.0297	6.64	| V Q | | | |
6+15	2.1785	7.20	| V Q | | | |
6+30	2.3329	7.47	| V Q | | | |
6+45	2.4989	8.03	| V Q | | | |
7+ 0	2.6706	8.31	| V Q | | | |
7+15	2.8428	8.33	| V Q | | | |
7+30	3.0260	8.87	| V Q | | | |
7+45	3.2259	9.68	| V Q| | | |
8+ 0	3.4430	10.51	| V Q | | |
8+15	3.6969	12.29	| V | Q | | |
8+30	3.9679	13.11	| V | Q | | |
8+45	4.2574	14.01	| V | Q | | |
9+ 0	4.5721	15.23	| V| Q | | |
9+15	4.9285	17.25	| V| Q | | |
9+30	5.3189	18.89	| V Q | | |
9+45	5.7359	20.18	| V Q | |
10+ 0	6.1788	21.44	| V |Q | |
10+15	6.5214	16.58	| V Q | | |
10+30	6.8096	13.95	| Q | | |
10+45	7.1726	17.57	| V Q | | |
11+ 0	7.5771	19.58	| V Q| | |
11+15	7.9709	19.06	| V Q| | |
11+30	8.3578	18.73	| V Q | | |
11+45	8.7137	17.22	| Q | | |
12+ 0	9.0703	17.26	| QV | | |
12+15	9.5451	22.98	| V| Q | |
12+30	10.0941	26.57	| V Q | |
12+45	10.6891	28.80	| V Q | |
13+ 0	11.3179	30.43	| V Q |
13+15	12.0363	34.77	| V | Q |
13+30	12.7969	36.81	| V | Q |
13+45	13.3888	28.65	| V Q | |
14+ 0	13.8931	24.41	| Q V | |
14+15	14.4532	27.11	| Q V| |
14+30	15.0309	27.96	| Q V |
14+45	15.6045	27.76	| Q V |
15+ 0	16.1627	27.01	| Q | V |
15+15	16.6980	25.91	| Q | V |
15+30	17.2097	24.77	| Q | V |
15+45	17.6504	21.33	| |Q | V |
16+ 0	18.0591	19.78	| | Q| | V |

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   16+15      18.2489      9.18  |         Q|         |         |     V   |
   16+30      18.3281      3.84  |  Q       |         |         |     V   |
   16+45      18.3860      2.80  | Q        |         |         |      V  |
   17+ 0      18.4381      2.53  | Q        |         |         |      V  |
   17+15      18.5119      3.57  |  Q       |         |         |      V  |
   17+30      18.5969      4.12  |   Q      |         |         |      V  |
   17+45      18.6830      4.17  |   Q      |         |         |      V  |
   18+ 0      18.7580      3.63  |  Q       |         |         |      V  |
   18+15      18.8274      3.36  |  Q       |         |         |      V  |
   18+30      18.8963      3.33  |  Q       |         |         |       V |
   18+45      18.9541      2.80  | Q        |         |         |       V |
   19+ 0      18.9953      1.99  |Q         |         |         |       V |
   19+15      19.0413      2.23  | Q        |         |         |       V |
   19+30      19.1035      3.01  |  Q       |         |         |       V |
   19+45      19.1608      2.77  | Q        |         |         |       V |
   20+ 0      19.2019      1.99  |Q         |         |         |       V |
   20+15      19.2479      2.23  | Q        |         |         |       V |
   20+30      19.2990      2.47  | Q        |         |         |       V |
   20+45      19.3507      2.50  | Q        |         |         |       V |
   21+ 0      19.3913      1.97  |Q         |         |         |        V|
   21+15      19.4373      2.23  | Q        |         |         |        V|
   21+30      19.4774      1.94  |Q         |         |         |        V|
   21+45      19.5234      2.23  | Q        |         |         |        V|
   22+ 0      19.5635      1.94  |Q         |         |         |        V|
   22+15      19.6095      2.23  | Q        |         |         |        V|
   22+30      19.6496      1.94  |Q         |         |         |        V|
   22+45      19.6845      1.69  |Q         |         |         |        V|
   23+ 0      19.7190      1.67  |Q         |         |         |        V|
   23+15      19.7534      1.67  |Q         |         |         |        V|
   23+30      19.7878      1.67  |Q         |         |         |        V|
   23+45      19.8223      1.67  |Q         |         |         |        V|
   24+ 0      19.8567      1.67  |Q         |         |         |        V|
   24+15      19.8690      0.60  Q          |         |         |        V|
   24+30      19.8701      0.05  Q          |         |         |        V|
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/26/12 File: SUBA224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A2 Proposed Condition
100 Yr. 24 Hr.


--------------------------------------------------------------------
Drainage Area =     118.60(Ac.)  =      0.185 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     118.60(Ac.)  =      0.185 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      118.60           1.80                 213.48

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      118.60           4.50                 533.70

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   118.600           85.00         0.750
 Total Area Entered =    118.60(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	386.627	64.140	76.664
2	0.500	773.254	32.781	39.182
3	0.750	1159.882	3.079	3.680
		Sum = 100.000	Sum=	119.527

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.312

40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 118.6(Ac.)/[(In)/(Ft.)] = 35.9(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 8.545(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1564653.8 Cubic Feet
Total soil loss = 372228.4 Cubic Feet

Peak flow rate of this hydrograph = 66.545(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 17.5 35.0 52.5 70.0
0+15	0.0399	1.93	VQ | | | |
0+30	0.1202	3.89	V Q | | | |
0+45	0.2126	4.47	V Q | | | |
1+ 0	0.3260	5.49	V Q | | | |
1+15	0.4296	5.01	V Q | | | |
1+30	0.5239	4.57	V Q | | | |
1+45	0.6173	4.52	V Q | | | |
2+ 0	0.7306	5.49	V Q | | | |
2+15	0.8542	5.98	V Q | | | |
2+30	0.9787	6.03	V Q | | | |
2+45	1.1231	6.99	|V Q | | | |
3+ 0	1.2778	7.49	|V Q | | | |
3+15	1.4334	7.53	|V Q | | | |
3+30	1.5890	7.53	|V Q | | | |
3+45	1.7447	7.53	|V Q | | | |
4+ 0	1.9203	8.50	| V Q | | | |
4+15	2.1061	8.99	| V Q | | | |
4+30	2.3128	10.01	| V Q | | | |
4+45	2.5297	10.50	| V Q | | | |
5+ 0	2.7675	11.51	| V Q | | | |
5+15	2.9756	10.07	| V Q | | | |
5+30	3.1843	10.10	| V Q | | | |
5+45	3.4212	11.47	| V Q | | | |
6+ 0	3.6692	12.01	| V Q | | | |
6+15	3.9382	13.02	| V Q | | | |
6+30	4.2173	13.51	| V Q | | | |
6+45	4.5174	14.52	| V Q | | | |
7+ 0	4.8277	15.02	| V Q | | | |
7+15	5.1390	15.06	| V Q | | | |
7+30	5.4702	16.03	| V Q| | | |
7+45	5.8316	17.49	| V Q| | | |
8+ 0	6.2241	19.00	| V Q | | |
8+15	6.6831	22.22	| V | Q | | |
8+30	7.1729	23.71	| V | Q | | |
8+45	7.6963	25.33	| V | Q | | |
9+ 0	8.2652	27.53	| V| Q | | |
9+15	8.9094	31.18	| V| Q | | |
9+30	9.6151	34.15	| V Q| | |
9+45	10.3690	36.49	| V Q | |
10+ 0	11.1696	38.75	| V | Q | |
10+15	11.7889	29.97	| V Q | | |
10+30	12.3098	25.21	| VQ | | |
10+45	12.9660	31.76	| V Q | | |
11+ 0	13.6973	35.39	| V Q | |
11+15	14.4091	34.45	| V Q| | |
11+30	15.1086	33.85	| V Q| | |
11+45	15.7518	31.13	| Q | | |
12+ 0	16.3965	31.21	| QV | | |
12+15	17.2549	41.54	| V| Q | |
12+30	18.2472	48.03	| V Q | |
12+45	19.3229	52.06	| V Q| |
13+ 0	20.4596	55.02	| | V |Q |
13+15	21.7582	62.85	| | V | Q |
13+30	23.1331	66.55	| | V | Q
13+45	24.2031	51.79	| | V Q| |
14+ 0	25.1148	44.12	| | Q V | |
14+15	26.1273	49.01	| | QV| |
14+30	27.1715	50.54	| | Q V |
14+45	28.2086	50.19	| | Q V |
15+ 0	29.2175	48.83	| | Q | V |
15+15	30.1852	46.84	| | Q | V |
15+30	31.1102	44.77	| | Q | V |
15+45	31.9069	38.56	| | | Q | V |
16+ 0	32.6457	35.76	| | Q | V |

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   16+15      32.9887     16.60  |        Q|         |         |     V   |
   16+30      33.1320      6.93  |  Q      |         |         |     V   |
   16+45      33.2365      5.06  | Q       |         |         |      V  |
   17+ 0      33.3309      4.57  | Q       |         |         |      V  |
   17+15      33.4642      6.45  |  Q      |         |         |      V  |
   17+30      33.6179      7.44  |   Q     |         |         |      V  |
   17+45      33.7735      7.53  |   Q     |         |         |      V  |
   18+ 0      33.9092      6.57  |  Q      |         |         |      V  |
   18+15      34.0346      6.07  |  Q      |         |         |      V  |
   18+30      34.1591      6.03  |  Q      |         |         |       V |
   18+45      34.2637      5.06  | Q       |         |         |       V |
   19+ 0      34.3380      3.60  | Q       |         |         |       V |
   19+15      34.4212      4.03  | Q       |         |         |       V |
   19+30      34.5336      5.44  |  Q      |         |         |       V |
   19+45      34.6372      5.01  | Q       |         |         |       V |
   20+ 0      34.7116      3.60  | Q       |         |         |       V |
   20+15      34.7947      4.03  | Q       |         |         |       V |
   20+30      34.8871      4.47  | Q       |         |         |       V |
   20+45      34.9805      4.52  | Q       |         |         |       V |
   21+ 0      35.0539      3.55  | Q       |         |         |        V|
   21+15      35.1371      4.03  | Q       |         |         |        V|
   21+30      35.2096      3.51  | Q       |         |         |        V|
   21+45      35.2927      4.03  | Q       |         |         |        V|
   22+ 0      35.3652      3.51  | Q       |         |         |        V|
   22+15      35.4484      4.03  | Q       |         |         |        V|
   22+30      35.5208      3.51  | Q       |         |         |        V|
   22+45      35.5840      3.06  |Q        |         |         |        V|
   23+ 0      35.6463      3.01  |Q        |         |         |        V|
   23+15      35.7085      3.01  |Q        |         |         |        V|
   23+30      35.7708      3.01  |Q        |         |         |        V|
   23+45      35.8330      3.01  |Q        |         |         |        V|
   24+ 0      35.8953      3.01  |Q        |         |         |        V|
   24+15      35.9176      1.08  Q         |         |         |        V|
   24+30      35.9195      0.09  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/26/12 File: SUBA324100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A2
Proposed Condition
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =      90.50(Ac.)  =      0.141 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      90.50(Ac.)  =      0.141 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       90.50           1.80                 162.90

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       90.50           4.50                 407.25

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    90.500           85.00         0.750
 Total Area Entered =     90.50(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	386.627	64.140	58.500
2	0.500	773.254	32.781	29.898
3	0.750	1159.882	3.079	2.808
		Sum = 100.000	Sum=	91.207

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.313

40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 90.5(Ac.)/[(In)/(Ft.)] = 27.4(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 6.521(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1194012.9 Cubic Feet
Total soil loss = 284043.3 Cubic Feet

Peak flow rate of this hydrograph = 50.782(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 15.0 30.0 45.0 60.0
0+15	0.0305	1.47	Q | | | |
0+30	0.0917	2.97	VQ | | | |
0+45	0.1623	3.41	V Q | | | |
1+ 0	0.2488	4.19	V Q | | | |
1+15	0.3278	3.83	V Q | | | |
1+30	0.3998	3.48	V Q | | | |
1+45	0.4710	3.45	V Q | | | |
2+ 0	0.5575	4.19	V Q | | | |
2+15	0.6518	4.56	V Q | | | |
2+30	0.7468	4.60	V Q | | | |
2+45	0.8571	5.34	|V Q | | | |
3+ 0	0.9751	5.71	|V Q | | | |
3+15	1.0939	5.75	|V Q | | | |
3+30	1.2126	5.75	|V Q | | | |
3+45	1.3314	5.75	|V Q | | | |
4+ 0	1.4654	6.49	| V Q | | | |
4+15	1.6072	6.86	| V Q | | | |
4+30	1.7649	7.63	| V Q | | | |
4+45	1.9304	8.01	| V Q | | | |
5+ 0	2.1119	8.78	| V Q | | | |
5+15	2.2707	7.69	| V Q | | | |
5+30	2.4300	7.71	| V Q | | | |
5+45	2.6107	8.75	| V Q | | | |
6+ 0	2.8000	9.16	| V Q | | | |
6+15	3.0053	9.93	| V Q | | | |
6+30	3.2183	10.31	| V Q | | | |
6+45	3.4473	11.08	| V Q | | | |
7+ 0	3.6841	11.46	| V Q | | | |
7+15	3.9216	11.50	| V Q | | | |
7+30	4.1744	12.23	| V Q | | | |
7+45	4.4501	13.35	| V Q | | | |
8+ 0	4.7497	14.50	| V Q| | | |
8+15	5.0999	16.95	| V |Q | | |
8+30	5.4737	18.09	| V | Q | | |
8+45	5.8731	19.33	| V | Q | | |
9+ 0	6.3073	21.01	| V| Q | | |
9+15	6.7989	23.80	| V| Q | | |
9+30	7.3374	26.06	| V Q | | |
9+45	7.9127	27.84	| V Q | | |
10+ 0	8.5237	29.57	| | V Q| | |
10+15	8.9963	22.87	| | V Q | | |
10+30	9.3938	19.24	| | QV | | |
10+45	9.8946	24.24	| | V Q | | |
11+ 0	10.4526	27.01	| | V Q | | |
11+15	10.9958	26.29	| | VQ | | |
11+30	11.5296	25.83	| | VQ | | |
11+45	12.0205	23.76	| | Q V | | |
12+ 0	12.5125	23.81	| | Q V | | |
12+15	13.1675	31.70	| | V|Q | |
12+30	13.9248	36.65	| | V Q | |
12+45	14.7456	39.73	| | V Q | |
13+ 0	15.6131	41.98	| | | V Q | |
13+15	16.6041	47.97	| | V |Q |
13+30	17.6533	50.78	| | V | Q |
13+45	18.4698	39.52	| | Q | |
14+ 0	19.1655	33.67	| | | Q V | |
14+15	19.9382	37.40	| | Q V| |
14+30	20.7351	38.57	| | Q V |
14+45	21.5264	38.30	| | Q V |
15+ 0	22.2964	37.27	| | Q | V |
15+15	23.0348	35.74	| | Q | V |
15+30	23.7407	34.16	| | | Q | V |
15+45	24.3487	29.43	| | Q| | V |
16+ 0	24.9125	27.29	| | Q | | V |

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   16+15      25.1743     12.67  |        Q |         |         |     V   |
   16+30      25.2836      5.29  |  Q       |         |         |     V   |
   16+45      25.3634      3.86  | Q        |         |         |      V  |
   17+ 0      25.4353      3.48  | Q        |         |         |      V  |
   17+15      25.5371      4.92  |  Q       |         |         |      V  |
   17+30      25.6544      5.68  |  Q       |         |         |      V  |
   17+45      25.7731      5.75  |  Q       |         |         |      V  |
   18+ 0      25.8767      5.01  |  Q       |         |         |      V  |
   18+15      25.9724      4.63  |  Q       |         |         |      V  |
   18+30      26.0674      4.60  |  Q       |         |         |       V |
   18+45      26.1472      3.86  | Q        |         |         |       V |
   19+ 0      26.2039      2.75  |Q         |         |         |       V |
   19+15      26.2674      3.07  | Q        |         |         |       V |
   19+30      26.3532      4.15  | Q        |         |         |       V |
   19+45      26.4322      3.83  | Q        |         |         |       V |
   20+ 0      26.4890      2.75  |Q         |         |         |       V |
   20+15      26.5524      3.07  | Q        |         |         |       V |
   20+30      26.6230      3.41  | Q        |         |         |       V |
   20+45      26.6942      3.45  | Q        |         |         |       V |
   21+ 0      26.7502      2.71  |Q         |         |         |        V|
   21+15      26.8137      3.07  | Q        |         |         |        V|
   21+30      26.8690      2.68  |Q         |         |         |        V|
   21+45      26.9325      3.07  | Q        |         |         |        V|
   22+ 0      26.9877      2.68  |Q         |         |         |        V|
   22+15      27.0512      3.07  | Q        |         |         |        V|
   22+30      27.1065      2.68  |Q         |         |         |        V|
   22+45      27.1547      2.33  |Q         |         |         |        V|
   23+ 0      27.2022      2.30  |Q         |         |         |        V|
   23+15      27.2498      2.30  |Q         |         |         |        V|
   23+30      27.2973      2.30  |Q         |         |         |        V|
   23+45      27.3448      2.30  |Q         |         |         |        V|
   24+ 0      27.3923      2.30  |Q         |         |         |        V|
   24+15      27.4093      0.82  Q          |         |         |        V|
   24+30      27.4108      0.07  Q          |         |         |         V
-----------------------------------------------------------------------
```

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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/26/12 File: SUBA424100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area B4
Proposed Condition
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     200.80(Ac.)  =      0.314 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     200.80(Ac.)  =      0.314 Sq. Mi.
Length along longest watercourse =    2500.00(Ft.)
Length along longest watercourse measured to centroid =    1250.00(Ft.)
Length along longest watercourse =      0.473 Mi.
Length along longest watercourse measured to centroid =      0.237 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      200.80           1.80                 361.44

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      200.80           4.50                 903.60

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    4.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   200.800           85.00         0.750
 Total Area Entered =    200.80(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	386.627	64.140	129.799
2	0.500	773.254	32.781	66.338
3	0.750	1159.882	3.079	6.231
		Sum = 100.000	Sum=	202.369

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.293
39	9.75	2.10	0.378	0.065	(0.113)	0.312

40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.559
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 200.8(Ac.)/[(In)/(Ft.)] = 60.8(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 14.467(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 2648614.5 Cubic Feet
Total soil loss = 630167.1 Cubic Feet

Peak flow rate of this hydrograph = 112.647(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+15	0.0676	3.27	Q	|	|	|	|
0+30	0.2035	6.58	VQ	|	|	|	|
0+45	0.3600	7.57	VQ	|	|	|	|
1+ 0	0.5518	9.29	VQ	|	|	|	|
1+15	0.7272	8.49	VQ	|	|	|	|
1+30	0.8869	7.73	VQ	|	|	|	|
1+45	1.0449	7.65	VQ	|	|	|	|
2+ 0	1.2368	9.29	VQ	|	|	|	|
2+15	1.4459	10.12	V Q	|	|	|	|
2+30	1.6567	10.20	VQ	|	|	|	|
2+45	1.9012	11.84	|VQ	|	|	|	|
3+ 0	2.1631	12.67	|VQ	|	|	|	|
3+15	2.4265	12.75	|VQ	|	|	|	|
3+30	2.6900	12.75	|VQ	|	|	|	|
3+45	2.9534	12.75	|VQ	|	|	|	|
4+ 0	3.2506	14.39	| Q	|	|	|	|
4+15	3.5652	15.22	| VQ	|	|	|	|
4+30	3.9151	16.94	| VQ	|	|	|	|
4+45	4.2823	17.77	| VQ	|	|	|	|
5+ 0	4.6849	19.49	| Q	|	|	|	|
5+15	5.0372	17.05	| Q	|	|	|	|
5+30	5.3904	17.09	| Q	|	|	|	|
5+45	5.7914	19.41	| Q	|	|	|	|
6+ 0	6.2113	20.32	| Q	|	|	|	|
6+15	6.6666	22.04	| Q	|	|	|	|
6+30	7.1392	22.87	| Q	|	|	|	|
6+45	7.6472	24.59	| QV	|	|	|	|
7+ 0	8.1724	25.42	| Q	|	|	|	|
7+15	8.6993	25.50	| Q	|	|	|	|
7+30	9.2600	27.14	| QV	|	|	|	|
7+45	9.8718	29.61	| QV	|	|	|	|
8+ 0	10.5362	32.16	| Q	|	|	|	|
8+15	11.3132	37.61	| Q	|	|	|	|
8+30	12.1423	40.13	| VQ	|	|	|	|
8+45	13.0282	42.88	| Q	|	|	|	|
9+ 0	13.9912	46.61	| Q|	|	|	|	|
9+15	15.0818	52.78	| VQ	|	|	|	|
9+30	16.2763	57.82	| VQ	|	|	|	|
9+45	17.5524	61.76	| VQ	|	|	|	|
10+ 0	18.9077	65.60	| | VQ	|	|	|	|
10+15	19.9560	50.74	| Q V	|	|	|	|
10+30	20.8378	42.68	| Q | V	|	|	|	|
10+45	21.9485	53.76	| Q V	|	|	|	|
11+ 0	23.1864	59.91	| |Q V	|	|	|	|
11+15	24.3914	58.32	| |Q V	|	|	|	|
11+30	25.5754	57.31	| |Q V	|	|	|	|
11+45	26.6642	52.70	| Q V	|	|	|	|
12+ 0	27.7556	52.82	| Q V	|	|	|	|
12+15	29.2086	70.32	| Q V|	|	|	|	|
12+30	30.8884	81.30	| Q V	|	|	|	|
12+45	32.7092	88.13	| Q V	|	|	|	|
13+ 0	34.6334	93.13	| Q | V	|	|	|	|
13+15	36.8318	106.40	| |Q V	|	|	|	|
13+30	39.1592	112.65	| | Q V	|	|	|	|
13+45	40.9705	87.67	| Q | V	|	|	|	|
14+ 0	42.5136	74.69	| Q | V	|	|	|	|
14+15	44.2277	82.96	| Q | V|	|	|	|	|
14+30	45.9953	85.56	| Q | V	|	|	|	|
14+45	47.7508	84.96	| Q | V	|	|	|	|
15+ 0	49.4587	82.66	| Q | | V	|	|	|	|
15+15	51.0968	79.28	| Q | | V	|	|	|	|
15+30	52.6626	75.79	| Q | | V	|	|	|	|
15+45	54.0113	65.28	| Q | | V	|	|	|	|
16+ 0	55.2619	60.53	| Q | | V	|	|	|	|

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   16+15      55.8426     28.10  |    Q    |         |         |     V   |
   16+30      56.0851     11.74  | Q       |         |         |     V   |
   16+45      56.2621      8.56  |Q        |         |         |      V  |
   17+ 0      56.4217      7.73  |Q        |         |         |      V  |
   17+15      56.6474     10.92  | Q       |         |         |      V  |
   17+30      56.9076     12.59  | Q       |         |         |      V  |
   17+45      57.1711     12.75  | Q       |         |         |      V  |
   18+ 0      57.4007     11.12  | Q       |         |         |      V  |
   18+15      57.6131     10.28  | Q       |         |         |      V  |
   18+30      57.8238     10.20  | Q       |         |         |       V |
   18+45      58.0008      8.56  |Q        |         |         |       V |
   19+ 0      58.1267      6.09  |Q        |         |         |       V |
   19+15      58.2675      6.81  |Q        |         |         |       V |
   19+30      58.4577      9.21  |Q        |         |         |       V |
   19+45      58.6331      8.49  |Q        |         |         |       V |
   20+ 0      58.7590      6.09  |Q        |         |         |       V |
   20+15      58.8998      6.81  |Q        |         |         |       V |
   20+30      59.0562      7.57  |Q        |         |         |       V |
   20+45      59.2143      7.65  |Q        |         |         |       V |
   21+ 0      59.3386      6.01  |Q        |         |         |        V|
   21+15      59.4793      6.81  |Q        |         |         |        V|
   21+30      59.6020      5.94  |Q        |         |         |        V|
   21+45      59.7428      6.81  |Q        |         |         |        V|
   22+ 0      59.8654      5.94  |Q        |         |         |        V|
   22+15      60.0062      6.81  |Q        |         |         |        V|
   22+30      60.1289      5.94  |Q        |         |         |        V|
   22+45      60.2359      5.18  |Q        |         |         |        V|
   23+ 0      60.3413      5.10  |Q        |         |         |        V|
   23+15      60.4467      5.10  |Q        |         |         |        V|
   23+30      60.5520      5.10  |Q        |         |         |        V|
   23+45      60.6574      5.10  |Q        |         |         |        V|
   24+ 0      60.7628      5.10  |Q        |         |         |        V|
   24+15      60.8006      1.83  Q         |         |         |        V|
   24+30      60.8038      0.16  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/26/12 File: SUBA524100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A5
Proposed Condition
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     131.00(Ac.)  =      0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     131.00(Ac.)  =      0.205 Sq. Mi.
Length along longest watercourse =    3200.00(Ft.)
Length along longest watercourse measured to centroid =    1600.00(Ft.)
Length along longest watercourse =      0.606 Mi.
Length along longest watercourse measured to centroid =      0.303 Mi.
Difference in elevation =      32.00(Ft.)
Slope along watercourse =     52.8000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.089 Hr.
Lag time =     5.34 Min.
25% of lag time =     1.33 Min.
40% of lag time =     2.14 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      131.00           1.80                 235.80

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      131.00           4.50                 589.50

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   131.000           85.00         0.750
 Total Area Entered =    131.00(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	280.942	54.636	72.132
2	0.500	561.885	38.203	50.437
3	0.750	842.827	7.161	9.454
			Sum = 100.000	Sum= 132.023

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
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38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.312

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48	12.00	1.80	0.324	0.057	(	0.097)	0.267
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52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
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56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 131.0(Ac.)/[(In)/(Ft.)] = 39.7(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 9.439(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1728196.1 Cubic Feet
Total soil loss = 411141.4 Cubic Feet

Peak flow rate of this hydrograph = 73.001(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 20.0 40.0 60.0 80.0
0+15	0.0376	1.82	Q | | | |
0+30	0.1202	4.00	VQ | | | |
0+45	0.2209	4.87	V Q | | | |
1+ 0	0.3428	5.90	V Q | | | |
1+15	0.4590	5.63	V Q | | | |
1+30	0.5646	5.11	V Q | | | |
1+45	0.6678	4.99	V Q | | | |
2+ 0	0.7897	5.90	V Q | | | |
2+15	0.9248	6.54	V Q | | | |
2+30	1.0623	6.66	V Q | | | |
2+45	1.2186	7.56	|V Q | | | |
3+ 0	1.3880	8.20	|V Q | | | |
3+15	1.5599	8.32	|V Q | | | |
3+30	1.7318	8.32	|V Q | | | |
3+45	1.9037	8.32	|V Q | | | |
4+ 0	2.0944	9.23	| V Q | | | |
4+15	2.2982	9.86	| V Q | | | |
4+30	2.5232	10.89	| V Q | | | |
4+45	2.7614	11.53	| V Q | | | |
5+ 0	3.0208	12.56	| V Q | | | |
5+15	3.2558	11.37	| V Q | | | |
5+30	3.4858	11.13	| V Q | | | |
5+45	3.7428	12.44	| V Q | | | |
6+ 0	4.0154	13.19	| V Q | | | |
6+15	4.3092	14.22	| V Q | | | |
6+30	4.6161	14.86	| V Q | | | |
6+45	4.9443	15.88	| V Q | | | |
7+ 0	5.2856	16.52	| V Q | | | |
7+15	5.6294	16.64	| V Q | | | |
7+30	5.9920	17.55	| V Q | | | |
7+45	6.3865	19.09	| V Q| | | |
8+ 0	6.8153	20.76	| V Q | | |
8+15	7.3119	24.03	| V | Q | | |
8+30	7.8487	25.98	| V | Q | | |
8+45	8.4218	27.73	| V | Q | | |
9+ 0	9.0431	30.07	| V| Q | | |
9+15	9.7430	33.88	| V| Q | | |
9+30	10.5134	37.29	| V Q | | |
9+45	11.3390	39.96	| V Q| | |
10+ 0	12.2163	42.46	| V |Q | |
10+15	12.9307	34.57	| V Q | | |
10+30	13.5197	28.51	| VQ | | |
10+45	14.2208	33.93	| V Q | | |
11+ 0	15.0182	38.59	| V Q| | |
11+15	15.8087	38.26	| V Q| | |
11+30	16.5830	37.47	| V Q | | |
11+45	17.3024	34.82	| Q | | |
12+ 0	18.0136	34.42	| QV | | |
12+15	18.9266	44.19	| V| Q | |
12+30	20.0037	52.13	| V Q | |
12+45	21.1801	56.94	| V Q | |
13+ 0	22.4267	60.33	| | V Q |
13+15	23.8354	68.18	| | V | Q |
13+30	25.3437	73.00	| | V | Q |
13+45	26.5766	59.67	| | V Q| |
14+ 0	27.6052	49.79	| | Q V | |
14+15	28.7047	53.21	| | Q V | |
14+30	29.8544	55.65	| | Q V |
14+45	31.0016	55.52	| | Q V |
15+ 0	32.1204	54.15	| | Q | V |
15+15	33.1956	52.04	| | Q | V |
15+30	34.2237	49.76	| | Q | V |
15+45	35.1241	43.58	| | |Q | V |
16+ 0	35.9479	39.87	| | Q| | V |

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   16+15      36.3906     21.43  |         Q         |         |     V   |
   16+30      36.5764      8.99  |    Q      |         |         |     V   |
   16+45      36.6951      5.75  | Q         |         |         |     V   |
   17+ 0      36.8007      5.11  | Q         |         |         |      V  |
   17+15      36.9414      6.81  |  Q        |         |         |      V  |
   17+30      37.1084      8.08  |   Q       |         |         |      V  |
   17+45      37.2803      8.32  |   Q       |         |         |      V  |
   18+ 0      37.4334      7.41  |  Q        |         |         |      V  |
   18+15      37.5734      6.77  |  Q        |         |         |      V  |
   18+30      37.7109      6.66  |  Q        |         |         |       V |
   18+45      37.8296      5.75  | Q         |         |         |       V |
   19+ 0      37.9164      4.20  | Q         |         |         |       V |
   19+15      38.0064      4.36  | Q         |         |         |       V |
   19+30      38.1259      5.78  | Q         |         |         |       V |
   19+45      38.2421      5.63  | Q         |         |         |       V |
   20+ 0      38.3290      4.20  | Q         |         |         |       V |
   20+15      38.4190      4.36  | Q         |         |         |       V |
   20+30      38.5196      4.87  | Q         |         |         |       V |
   20+45      38.6228      4.99  | Q         |         |         |       V |
   21+ 0      38.7071      4.08  | Q         |         |         |        V|
   21+15      38.7971      4.36  | Q         |         |         |        V|
   21+30      38.8790      3.96  |Q          |         |         |        V|
   21+45      38.9690      4.36  | Q         |         |         |        V|
   22+ 0      39.0509      3.96  |Q          |         |         |        V|
   22+15      39.1409      4.36  | Q         |         |         |        V|
   22+30      39.2228      3.96  |Q          |         |         |        V|
   22+45      39.2940      3.45  |Q          |         |         |        V|
   23+ 0      39.3628      3.33  |Q          |         |         |        V|
   23+15      39.4315      3.33  |Q          |         |         |        V|
   23+30      39.5003      3.33  |Q          |         |         |        V|
   23+45      39.5691      3.33  |Q          |         |         |        V|
   24+ 0      39.6378      3.33  |Q          |         |         |        V|
   24+15      39.6690      1.51  Q           |         |         |        V|
   24+30      39.6739      0.24  Q           |         |         |        V|
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/26/12 File: SUBA624100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Subdrain Area A6
Proposed Condition
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     321.10(Ac.)  =      0.502 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     321.10(Ac.)  =      0.502 Sq. Mi.
Length along longest watercourse =    3200.00(Ft.)
Length along longest watercourse measured to centroid =    1600.00(Ft.)
Length along longest watercourse =      0.606 Mi.
Length along longest watercourse measured to centroid =      0.303 Mi.
Difference in elevation =      32.00(Ft.)
Slope along watercourse =     52.8000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.089 Hr.
Lag time =     5.34 Min.
25% of lag time =     1.33 Min.
40% of lag time =     2.14 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      321.10           1.80                 577.98

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      321.10           4.50                1444.95

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    4.497(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   321.100           85.00         0.750
 Total Area Entered =    321.10(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	280.942	54.636	176.806
2	0.500	561.885	38.203	123.628
3	0.750	842.827	7.161	23.174
			Sum = 100.000	Sum= 323.609

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
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19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.274
38	9.50	2.00	0.360	0.066	(0.108)	0.293
39	9.75	2.10	0.378	0.065	(0.113)	0.312

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50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.183)	0.558
54	13.50	3.40	0.612	0.052	(	0.183)	0.559
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.367
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 321.1(Ac.)/[(In)/(Ft.)] = 97.2(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 23.131(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 4234287.8 Cubic Feet
Total soil loss = 1007591.2 Cubic Feet

Peak flow rate of this hydrograph = 178.864(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+15	0.0920	4.46	Q	|	|	|	|
0+30	0.2945	9.80	VQ	|	|	|	|
0+45	0.5412	11.94	V Q	|	|	|	|
1+ 0	0.8399	14.46	V Q	|	|	|	|
1+15	1.1248	13.79	V Q	|	|	|	|
1+30	1.3835	12.52	V Q	|	|	|	|
1+45	1.6362	12.23	V Q	|	|	|	|
2+ 0	1.9349	14.46	V Q	|	|	|	|
2+15	2.2659	16.02	V Q	|	|	|	|
2+30	2.6028	16.31	V Q	|	|	|	|
2+45	2.9858	18.54	|V Q	|	|	|	|
3+ 0	3.4009	20.09	|V Q	|	|	|	|
3+15	3.8221	20.39	|V Q	|	|	|	|
3+30	4.2433	20.39	|V Q	|	|	|	|
3+45	4.6645	20.39	|V Q	|	|	|	|
4+ 0	5.1317	22.61	| V Q	|	|	|	|
4+15	5.6310	24.17	| V Q	|	|	|	|
4+30	6.1825	26.69	| V Q	|	|	|	|
4+45	6.7661	28.25	| V Q	|	|	|	|
5+ 0	7.4018	30.77	| V Q	|	|	|	|
5+15	7.9776	27.87	| V Q	|	|	|	|
5+30	8.5411	27.27	| V Q	|	|	|	|
5+45	9.1707	30.47	| V Q	|	|	|	|
6+ 0	9.8386	32.32	| V Q	|	|	|	|
6+15	10.5585	34.84	| V Q	|	|	|	|
6+30	11.3106	36.40	| V Q	|	|	|	|
6+45	12.1147	38.92	| V Q	|	|	|	|
7+ 0	12.9511	40.48	| V Q |	|	|	|	|
7+15	13.7934	40.77	| V Q |	|	|	|	|
7+30	14.6818	43.00	| V Q |	|	|	|	|
7+45	15.6484	46.78	| V Q|	|	|	|	|
8+ 0	16.6992	50.86	| V Q	|	|	|	|
8+15	17.9157	58.88	| V |Q	|	|	|	|
8+30	19.2310	63.66	| V | Q	|	|	|	|
8+45	20.6349	67.95	| V | Q	|	|	|	|
9+ 0	22.1570	73.67	| V| Q	|	|	|	|
9+15	23.8718	82.99	| V| Q	|	|	|	|
9+30	25.7593	91.35	| V Q |	|	|	|	|
9+45	27.7821	97.91	| V Q|	|	|	|	|
10+ 0	29.9316	104.04	| | V Q	|	|	|	|
10+15	31.6817	84.71	| V Q |	|	|	|	|
10+30	33.1248	69.85	| Q |	|	|	|	|
10+45	34.8425	83.14	| V Q |	|	|	|	|
11+ 0	36.7961	94.55	| V Q |	|	|	|	|
11+15	38.7331	93.75	| V Q |	|	|	|	|
11+30	40.6300	91.81	| V Q |	|	|	|	|
11+45	42.3927	85.32	| Q |	|	|	|	|
12+ 0	44.1350	84.33	| Q V |	|	|	|	|
12+15	46.3721	108.27	| V|Q	|	|	|	|
12+30	49.0110	127.72	| V Q	|	|	|	|
12+45	51.8933	139.50	| V Q |	|	|	|	|
13+ 0	54.9475	147.82	| V Q|	|	|	|	|
13+15	58.3992	167.06	| V | Q	|	|	|	|
13+30	62.0947	178.86	| V | Q	|	|	|	|
13+45	65.1154	146.20	| V Q|	|	|	|	|
14+ 0	67.6358	121.98	| Q V |	|	|	|	|
14+15	70.3295	130.38	| Q V |	|	|	|	|
14+30	73.1466	136.34	| Q V	|	|	|	|
14+45	75.9572	136.03	| Q V	|	|	|	|
15+ 0	78.6984	132.68	| Q | V	|	|	|	|
15+15	81.3328	127.51	| Q | V	|	|	|	|
15+30	83.8518	121.92	| Q | V	|	|	|	|
15+45	86.0579	106.78	|Q | V	|	|	|	|
16+ 0	88.0762	97.69	| Q| | V	|	|	|	|

```
   16+15      89.1611     52.51  |         Q         |         |     V   |
   16+30      89.6161     22.02  |    Q      |         |         |     V   |
   16+45      89.9071     14.08  | Q         |         |         |     V   |
   17+ 0      90.1658     12.52  | Q         |         |         |      V  |
   17+15      90.5105     16.69  |  Q        |         |         |      V  |
   17+30      90.9197     19.80  |  Q        |         |         |      V  |
   17+45      91.3408     20.39  |   Q       |         |         |      V  |
   18+ 0      91.7160     18.16  |  Q        |         |         |      V  |
   18+15      92.0590     16.60  |  Q        |         |         |      V  |
   18+30      92.3959     16.31  |  Q        |         |         |       V |
   18+45      92.6868     14.08  | Q         |         |         |       V |
   19+ 0      92.8996     10.30  | Q         |         |         |       V |
   19+15      93.1201     10.67  | Q         |         |         |       V |
   19+30      93.4128     14.17  | Q         |         |         |       V |
   19+45      93.6977     13.79  | Q         |         |         |       V |
   20+ 0      93.9104     10.30  | Q         |         |         |       V |
   20+15      94.1309     10.67  | Q         |         |         |       V |
   20+30      94.3776     11.94  | Q         |         |         |       V |
   20+45      94.6303     12.23  | Q         |         |         |       V |
   21+ 0      94.8370     10.00  | Q         |         |         |        V|
   21+15      95.0575     10.67  | Q         |         |         |        V|
   21+30      95.2582      9.71  |Q          |         |         |        V|
   21+45      95.4787     10.67  | Q         |         |         |        V|
   22+ 0      95.6793      9.71  |Q          |         |         |        V|
   22+15      95.8999     10.67  | Q         |         |         |        V|
   22+30      96.1005      9.71  |Q          |         |         |        V|
   22+45      96.2750      8.45  |Q          |         |         |        V|
   23+ 0      96.4435      8.15  |Q          |         |         |        V|
   23+15      96.6120      8.15  |Q          |         |         |        V|
   23+30      96.7804      8.15  |Q          |         |         |        V|
   23+45      96.9489      8.15  |Q          |         |         |        V|
   24+ 0      97.1174      8.15  |Q          |         |         |        V|
   24+15      97.1938      3.70  Q           |         |         |        V|
   24+30      97.2059      0.58  Q           |         |         |         V
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/07/12

------------------------------------------------------------------


Watershed B, Line B
Proposed Condition
100 Yr. 24 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: OffsiteB124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    99
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       27.237 (CFS)
               Total volume =       7.185 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   5000.00 (Ft.)
Elevation difference =  100.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  5000.00(Ft.)     Elevation difference = 100.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =   10.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      4.827(CFS)
Depth of flow =     0.133(Ft.)
Average velocity =     3.589(Ft/s)
Total flow rate =     4.827(CFS)
Channel flow top width =   10.265(Ft.)
Depth of flow in channel =   0.13(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    3.59(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    4.827(CFS)
Total capacity of improved channels =      4.827(CFS)
Critical Depth in Channel =    0.19(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     27.237(CFS)
```

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Depth of flow =     0.376(Ft.)
Average velocity =     6.989(Ft/s)
Total flow rate =    27.237(CFS)
Channel flow top width =   10.751(Ft.)
Depth of flow in channel =   0.38(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    6.99(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   27.237(CFS)
Total capacity of improved channels =     27.237(CFS)
Critical Depth in Channel =    0.60(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8043   Travel time =  11.92 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   1.3760
       dt(routing time-step) =   9.59 (min.),   c* =   0.8940

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        6.8      13.6      20.4      27.2
----------------------------------------------------------------------
  0+15       0.0403      0.13  O         |         |         |         |
  0+30       0.1924      0.36  O         |         |         |         |
  0+45       0.3813      0.48  O         |         |         |         |
  1+ 0       0.4945      0.56  O         |         |         |         |
  1+15       0.5628      0.59  O         |         |         |         |
  1+30       0.5624      0.52  O         |         |         |         |
  1+45       0.5172      0.50  O         |         |         |         |
  2+ 0       0.5249      0.56  O         |         |         |         |
  2+15       0.5879      0.65  O         |         |         |         |
  2+30       0.6490      0.67  O         |         |         |         |
  2+45       0.6850      0.73  |O        |         |         |         |
  3+ 0       0.7542      0.82  |O        |         |         |         |
  3+15       0.8161      0.83  |O        |         |         |         |
  3+30       0.8319      0.84  |O        |         |         |         |
  3+45       0.8353      0.84  |O        |         |         |         |
  4+ 0       0.8558      0.90  |O        |         |         |         |
  4+15       0.9218      0.99  |O        |         |         |         |
  4+30       1.0034      1.06  |O        |         |         |         |
  4+45       1.0852      1.15  |O        |         |         |         |
  5+ 0       1.1701      1.23  |O        |         |         |         |
  5+15       1.2119      1.19  |O        |         |         |         |
  5+30       1.1650      1.10  |O        |         |         |         |
  5+45       1.1444      1.22  |O        |         |         |         |
  6+ 0       1.2435      1.32  |O        |         |         |         |
  6+15       1.3347      1.40  |OI       |         |         |         |
  6+30       1.4191      1.49  | O       |         |         |         |
  6+45       1.5044      1.56  | O       |         |         |         |
  7+ 0       1.5865      1.65  | O       |         |         |         |
  7+15       1.6514      1.67  | O       |         |         |         |
  7+30       1.6877      1.73  | O       |         |         |         |
  7+45       1.7772      1.88  | O       |         |         |         |
  8+ 0       1.9251      2.05  | OI      |         |         |         |
  8+15       2.1087      2.28  |  O      |         |         |         |
  8+30       2.3212      2.47  |  O      |         |         |         |
  8+45       2.4839      2.56  |  O      |         |         |         |
  9+ 0       2.6053      2.72  |  O      |         |         |         |
  9+15       2.7801      2.95  |   O     |         |         |         |
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  9+30       3.0102      3.20  |   O     |         |         |         |
  9+45       3.2385      3.38  |   O     |         |         |         |
 10+ 0       3.4214      3.55  |    O    |         |         |         |
 10+15       3.4306      3.22  |   IO    |         |         |         |
 10+30       3.0504      2.63  |  IO     |         |         |         |
 10+45       2.7404      2.84  |   O     |         |         |         |
 11+ 0       2.9632      3.25  |   O     |         |         |         |
 11+15       3.2274      3.27  |   O     |         |         |         |
 11+30       3.2382      3.19  |   O     |         |         |         |
 11+45       3.1528      3.05  |   O     |         |         |         |
 12+ 0       3.0270      2.94  |   O     |         |         |         |
 12+15       3.9538      6.06  |    O  I |         |         |         |
 12+30       7.4692     11.13  |         O     I   |         |         |
 12+45      11.7864     14.38  |         |      O  |I        |         |
 13+ 0      15.1000     17.47  |         |         | O  I    |         |
 13+15      18.7584     22.24  |         |         |      O  | I       |
 13+30      23.4811     27.24  |         |         |         |   O     I
 13+45      25.0068     21.55  |         |         |         |I    O   |
 14+ 0      19.0180     12.55  |         |       I |      O  |         |
 14+15      13.6610     13.87  |         |         O         |         |
 14+30      14.7975     16.82  |         |         |O  I     |         |
 14+45      16.6485     16.95  |         |         |   O     |         |
 15+ 0      16.8368     16.70  |         |         |   O     |         |
 15+15      16.3516     15.57  |         |         | I O     |         |
 15+30      15.2548     14.33  |         |         |IO       |         |
 15+45      13.4066     11.17  |         |     I  O|         |         |
 16+ 0      10.3487      7.89  |         |I   O    |         |         |
 16+15       7.2130      4.98  |      I  O         |         |         |
 16+30       4.0532      1.37  | I  O    |         |         |         |
 16+45       1.4478      0.72  |IO       |         |         |         |
 17+ 0       0.7344      0.52  IO        |         |         |         |
 17+15       0.5774      0.63  O         |         |         |         |
 17+30       0.6790      0.80  OI        |         |         |         |
 17+45       0.7971      0.83  |O        |         |         |         |
 18+ 0       0.8081      0.77  |O        |         |         |         |
 18+15       0.7488      0.69  |O        |         |         |         |
 18+30       0.6880      0.67  IO        |         |         |         |
 18+45       0.6521      0.61  O         |         |         |         |
 19+ 0       0.5627      0.46  O         |         |         |         |
 19+15       0.4550      0.42  O         |         |         |         |
 19+30       0.4638      0.55  O         |         |         |         |
 19+45       0.5519      0.59  O         |         |         |         |
 20+ 0       0.5394      0.45  O         |         |         |         |
 20+15       0.4509      0.42  O         |         |         |         |
 20+30       0.4432      0.49  O         |         |         |         |
 20+45       0.4859      0.50  O         |         |         |         |
 21+ 0       0.4779      0.44  O         |         |         |         |
 21+15       0.4351      0.41  O         |         |         |         |
 21+30       0.4197      0.42  O         |         |         |         |
 21+45       0.4196      0.41  O         |         |         |         |
 22+ 0       0.4164      0.42  O         |         |         |         |
 22+15       0.4193      0.41  O         |         |         |         |
 22+30       0.4164      0.42  O         |         |         |         |
 22+45       0.3991      0.35  O         |         |         |         |
 23+ 0       0.3504      0.34  O         |         |         |         |
 23+15       0.3376      0.33  O         |         |         |         |
 23+30       0.3346      0.33  O         |         |         |         |
 23+45       0.3343      0.33  O         |         |         |         |
 24+ 0       0.3343      0.33  O         |         |         |         |
 24+15       0.2939      0.21  O         |         |         |         |
 24+30       0.1621      0.04  O         |         |         |         |
 24+45       0.0391      0.01  O         |         |         |         |
 25+ 0       0.0075      0.00  O         |         |         |         |
 25+15       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   101
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       25.007 (CFS)
                     Total volume =       7.185 (Ac.Ft)
               Status of hydrographs being held in storage
```

```
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubB1Bsn.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       40.9      81.9     122.8     163.8
-------------------------------------------------------------------
  0+15       0.6912      0.73  Q         |         |         |         |
  0+30       2.7280      2.92  Q         |         |         |         |
  0+45       5.2080      5.59  |Q        |         |         |         |
  1+ 0       7.5492      8.04  |Q        |         |         |         |
  1+15       9.3613      9.92  | Q       |         |         |         |
  1+30      10.2301     10.79  | Q       |         |         |         |
  1+45      10.5670     11.08  | Q       |         |         |         |
  2+ 0      11.1111     11.64  | Q       |         |         |         |
  2+15      12.0641     12.65  | qQ      |         |         |         |
  2+30      12.9635     13.61  |  Q      |         |         |         |
  2+45      13.9542     14.64  |  Q      |         |         |         |
  3+ 0      15.2009     15.96  |  Q      |         |         |         |
  3+15      16.2933     17.11  |  qQ     |         |         |         |
  3+30      17.0500     17.88  |   Q     |         |         |         |
  3+45      17.5476     18.38  |   Q     |         |         |         |
  4+ 0      18.2356     19.09  |   Q     |         |         |         |
  4+15      19.2833     20.21  |   Q     |         |         |         |
  4+30      20.6059     21.61  |    Q    |         |         |         |
  4+45      22.1093     23.19  |    Q    |         |         |         |
  5+ 0      23.7314     24.90  |    qQ   |         |         |         |
  5+15      24.7098     25.92  |     Q   |         |         |         |
  5+30      24.7962     25.96  |     Q   |         |         |         |
  5+45      25.3021     26.45  |     Q   |         |         |         |
  6+ 0      26.4259     27.67  |     Q   |         |         |         |
  6+15      27.8371     29.17  |     qQ  |         |         |         |
  6+30      29.3986     30.82  |      Q  |         |         |         |
  6+45      31.0590     32.56  |      Q  |         |         |         |
  7+ 0      32.7844     34.37  |       Q |         |         |         |
  7+15      34.1917     35.84  |       Q |         |         |         |
  7+30      35.5163     37.20  |       qQ|         |         |         |
  7+45      37.3435     39.12  |        Q|         |         |         |
  8+ 0      39.7739     41.70  |        qQ         |         |         |
  8+15      43.2782     45.39  |         qQ        |         |         |
  8+30      47.5710     49.89  |         |qQ       |         |         |
  8+45      51.7783     54.26  |         | qQ      |         |         |
  9+ 0      56.1131     58.72  |         |  qQ     |         |         |
  9+15      61.3328     64.11  |         |   qQ    |         |         |
  9+30      67.5231     70.53  |         |     qQ  |         |         |
  9+45      73.8900     77.13  |         |       Q |         |         |
 10+ 0      80.0372     83.46  |         |        qQ         |         |
 10+15      81.8590     85.29  |         |        qQ         |         |
 10+30      77.6418     80.69  |         |       qQ|         |         |
 10+45      74.8672     77.61  |         |       Q |         |         |
 11+ 0      77.0027     79.97  |         |       qQ|         |         |
 11+15      79.9306     83.16  |         |        qQ         |         |
 11+30      81.3696     84.61  |         |        qQ         |         |
 11+45      80.9836     84.14  |         |        qQ         |         |
```

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12+ 0      79.5778     82.60  |          |         qQ         |          |
12+15      82.4212     86.38  |          |          qQ        |          |
12+30      91.1255     98.59  |          |          | q Q     |          |
12+45     101.5981    113.38  |          |          |   q  Q  |          |
13+ 0     111.5582    126.66  |          |          |      q  Q          |
13+15     122.4529    141.21  |          |          |        q|   Q      |
13+30     134.4498    157.93  |          |          |         | q     Q  |
13+45     138.7498    163.76  |          |          |         |  q      Q
14+ 0     132.5763    151.59  |          |          |         | q    Q   |
14+15     126.3722    140.03  |          |          |         q   Q      |
14+30     124.6533    139.45  |          |          |         q   Q      |
14+45     124.3083    140.96  |          |          |         q   Q      |
15+ 0     123.4714    140.31  |          |          |         q   Q      |
15+15     121.5747    137.93  |          |          |        q|  Q       |
15+30     118.6453    133.90  |          |          |       q | Q        |
15+45     113.4340    126.84  |          |          |      q  Q          |
16+ 0     106.2324    116.58  |          |          |    q  Q |          |
16+15      92.8664    100.08  |          |          | q Q     |          |
16+30      72.2195     76.27  |          |      qQ |          |          |
16+45      52.9444     54.39  |          | qQ       |          |          |
17+ 0      38.9235     39.66  |        Q|          |          |          |
17+15      30.1543     30.73  |      Q   |          |          |          |
17+30      25.5409     26.22  |     Q    |          |          |          |
17+45      23.0532     23.85  |    Q     |          |          |          |
18+ 0      21.1336     21.94  |    Q     |          |          |          |
18+15      19.2761     20.02  |   Q      |          |          |          |
18+30      17.7821     18.47  |   Q      |          |          |          |
18+45      16.4004     17.05  |   Q      |          |          |          |
19+ 0      14.5357     15.10  |  Q       |          |          |          |
19+15      12.8025     13.26  |  Q       |          |          |          |
19+30      12.3081     12.77  |  Q       |          |          |          |
19+45      12.4517     13.00  |  Q       |          |          |          |
20+ 0      11.9011     12.44  | qQ       |          |          |          |
20+15      11.0703     11.52  | Q        |          |          |          |
20+30      10.8082     11.25  | Q        |          |          |          |
20+45      10.8703     11.36  | Q        |          |          |          |
21+ 0      10.5885     11.07  | Q        |          |          |          |
21+15      10.1689     10.60  | Q        |          |          |          |
21+30       9.8546     10.27  | Q        |          |          |          |
21+45       9.6480     10.07  | Q        |          |          |          |
22+ 0       9.5121      9.93  | Q        |          |          |          |
22+15       9.4228      9.84  | Q        |          |          |          |
22+30       9.3640      9.78  | Q        |          |          |          |
22+45       8.9644      9.36  | Q        |          |          |          |
23+ 0       8.4674      8.82  | Q        |          |          |          |
23+15       8.1021      8.44  |qQ        |          |          |          |
23+30       7.8620      8.20  |qQ        |          |          |          |
23+45       7.7041      8.04  |Q         |          |          |          |
24+ 0       7.6003      7.93  |Q         |          |          |          |
24+15       6.8101      7.10  |Q         |          |          |          |
24+30       5.0999      5.26  |Q         |          |          |          |
24+45       3.4300      3.47  Q          |          |          |          |
25+ 0       2.2551      2.26  Q          |          |          |          |
25+15       1.4827      1.48  Q          |          |          |          |
25+30       0.9748      0.97  Q          |          |          |          |
25+45       0.6409      0.64  Q          |          |          |          |
26+ 0       0.4214      0.42  Q          |          |          |          |
26+15       0.2771      0.28  Q          |          |          |          |
26+30       0.1822      0.18  Q          |          |          |          |
26+45       0.1198      0.12  Q          |          |          |          |
27+ 0       0.0787      0.08  Q          |          |          |          |
27+15       0.0518      0.05  Q          |          |          |          |
27+30       0.0340      0.03  Q          |          |          |          |
27+45       0.0224      0.02  Q          |          |          |          |
28+ 0       0.0147      0.01  Q          |          |          |          |
28+15       0.0097      0.01  Q          |          |          |          |
28+30       0.0064      0.01  Q          |          |          |          |
28+45       0.0042      0.00  Q          |          |          |          |
29+ 0       0.0027      0.00  Q          |          |          |          |
29+15       0.0018      0.00  Q          |          |          |          |
29+30       0.0012      0.00  Q          |          |          |          |
```

```
   29+45       0.0010      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   119
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      163.757 (CFS)
                       Total volume =      95.413 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        2.000 to Point/Station        3.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        _____________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   3000.00 (Ft.)
        Elevation difference =   60.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  3000.00(Ft.)     Elevation difference =  60.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =     62.214(CFS)
        Depth of flow =     0.617(Ft.)
        Average velocity =     9.494(Ft/s)
        Total flow rate =    62.214(CFS)
        Channel flow top width =   11.234(Ft.)
        Depth of flow in channel =   0.62(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =    9.49(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =   62.214(CFS)
        Total capacity of improved channels =     62.214(CFS)
        Critical Depth in Channel =    1.03(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Covered channel
        Flow(q) thru subarea =    163.757(CFS)
        Depth of flow =     1.103(Ft.)
        Average velocity =    13.378(Ft/s)
        Total flow rate =   163.757(CFS)
        Channel flow top width =   12.205(Ft.)
        Depth of flow in channel =   1.10(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   13.38(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  163.757(CFS)
        Total capacity of improved channels =    163.757(CFS)
        Critical Depth in Channel =    1.91(Ft.)


        ********************** SCS CONVEX CHANNEL ROUTING ********************
        Convex method of stream routing  data items:
        Using equation: Outflow =
        O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
                 where c* = 1 - (1-c)^e and dt = c(length)/velocity
                 c(v/v+1.7) =   0.8873   Travel time =   3.74 (min.)
```

```
        dt*(unit time interval) =  15.00(min.),  e=   3.3489
        dt(routing time-step) =   3.32 (min.),   c* =   0.9993

   Output hydrograph delayed by 0  unit time increments


   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
   ----------------------------------------------------------------------
              Hydrograph in  15   Minute intervals (CFS)

   ----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       40.9      81.9     122.8     163.8
-----------------------------------------------------------------------
  0+15       0.5694      0.73  O         |         |         |         |
  0+30       2.4352      2.92  O         |         |         |         |
  0+45       4.9975      5.59  |O        |         |         |         |
  1+ 0       7.4995      8.04  |O        |         |         |         |
  1+15       9.5071      9.92  | O       |         |         |         |
  1+30      10.5998     10.79  | O       |         |         |         |
  1+45      11.0194     11.08  | O       |         |         |         |
  2+ 0      11.5136     11.64  | O       |         |         |         |
  2+15      12.4267     12.65  |  O      |         |         |         |
  2+30      13.3995     13.61  |  O      |         |         |         |
  2+45      14.4115     14.64  |  O      |         |         |         |
  3+ 0      15.6633     15.96  |  O      |         |         |         |
  3+15      16.8534     17.11  |   O     |         |         |         |
  3+30      17.7106     17.88  |   O     |         |         |         |
  3+45      18.2717     18.38  |   O     |         |         |         |
  4+ 0      18.9343     19.09  |   O     |         |         |         |
  4+15      19.9582     20.21  |   O     |         |         |         |
  4+30      21.2980     21.61  |    O    |         |         |         |
  4+45      22.8430     23.19  |    O    |         |         |         |
  5+ 0      24.5230     24.90  |    OI   |         |         |         |
  5+15      25.6954     25.92  |     O   |         |         |         |
  5+30      25.9523     25.96  |     O   |         |         |         |
  5+45      26.3389     26.45  |     O   |         |         |         |
  6+ 0      27.3984     27.67  |     O   |         |         |         |
  6+15      28.8387     29.17  |      O  |         |         |         |
  6+30      30.4527     30.82  |      O  |         |         |         |
  6+45      32.1763     32.56  |      O  |         |         |         |
  7+ 0      33.9702     34.37  |       O |         |         |         |
  7+15      35.5166     35.84  |       O |         |         |         |
  7+30      36.9022     37.20  |        O|         |         |         |
  7+45      38.6957     39.12  |        O|         |         |         |
  8+ 0      41.1274     41.70  |         O         |         |         |
  8+15      44.5693     45.39  |         OI        |         |         |
  8+30      48.8933     49.89  |         |OI       |         |         |
  8+45      53.2931     54.26  |         |  O      |         |         |
  9+ 0      57.7303     58.72  |         |   O     |         |         |
  9+15      62.9169     64.11  |         |    O    |         |         |
  9+30      69.1098     70.53  |         |     OI  |         |         |
  9+45      75.6661     77.13  |         |       O |         |         |
 10+ 0      82.0550     83.46  |         |         O         |         |
 10+15      84.8830     85.29  |         |         O         |         |
 10+30      81.7107     80.69  |         |        O|         |         |
 10+45      78.2918     77.61  |         |       IO|         |         |
 11+ 0      79.4438     79.97  |         |        O|         |         |
 11+15      82.4503     83.16  |         |         O         |         |
 11+30      84.2860     84.61  |         |         O         |         |
 11+45      84.2406     84.14  |         |         O         |         |
 12+ 0      82.9442     82.60  |         |         O         |         |
 12+15      85.5398     86.38  |         |         OI        |         |
 12+30      95.8863     98.59  |         |         |  OI     |         |
 12+45     110.1053    113.38  |         |         |     OI  |         |
 13+ 0     123.7146    126.66  |         |         |         O         |
 13+15     137.9845    141.21  |         |         |         |  OI     |
 13+30     154.2239    157.93  |         |         |         |      OI |
 13+45     162.4631    163.76  |         |         |         |        OI
 14+ 0     154.2885    151.59  |         |         |         |      O  |
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   14+15     142.5968    140.03  |         |         |         |   O     |
   14+30     139.5816    139.45  |         |         |         |   O     |
   14+45     140.6231    140.96  |         |         |         |   O     |
   15+ 0     140.4517    140.31  |         |         |         |   O     |
   15+15     138.4542    137.93  |         |         |         |  O      |
   15+30     134.7926    133.90  |         |         |         | O       |
   15+45     128.4056    126.84  |         |         |        IO        |
   16+ 0     118.8556    116.58  |         |         |      IO|         |
   16+15     103.7376    100.08  |         |         |   IO   |         |
   16+30      81.5506     76.27  |         |       IO|        |         |
   16+45      59.2442     54.39  |         |  IO     |        |         |
   17+ 0      42.9262     39.66  |        IO         |        |         |
   17+15      32.7118     30.73  |      O  |         |        |         |
   17+30      27.2210     26.22  |     O   |         |        |         |
   17+45      24.3761     23.85  |    O    |         |        |         |
   18+ 0      22.3650     21.94  |    O    |         |        |         |
   18+15      20.4499     20.02  |   O     |         |        |         |
   18+30      18.8149     18.47  |   O     |         |        |         |
   18+45      17.3668     17.05  |   O     |         |        |         |
   19+ 0      15.5316     15.10  |  O      |         |        |         |
   19+15      13.6658     13.26  |  O      |         |        |         |
   19+30      12.8798     12.77  |  O      |         |        |         |
   19+45      12.9523     13.00  |  O      |         |        |         |
   20+ 0      12.5652     12.44  |  O      |         |        |         |
   20+15      11.7250     11.52  | O       |         |        |         |
   20+30      11.3114     11.25  | O       |         |        |         |
   20+45      11.3330     11.36  | O       |         |        |         |
   21+ 0      11.1306     11.07  | O       |         |        |         |
   21+15      10.7065     10.60  | O       |         |        |         |
   21+30      10.3474     10.27  | O       |         |        |         |
   21+45      10.1134     10.07  | O       |         |        |         |
   22+ 0       9.9594      9.93  | O       |         |        |         |
   22+15       9.8612      9.84  | O       |         |        |         |
   22+30       9.7941      9.78  | O       |         |        |         |
   22+45       9.4559      9.36  | O       |         |        |         |
   23+ 0       8.9388      8.82  | O       |         |        |         |
   23+15       8.5236      8.44  | O       |         |        |         |
   23+30       8.2505      8.20  | O       |         |        |         |
   23+45       8.0735      8.04  |O        |         |        |         |
   24+ 0       7.9576      7.93  |O        |         |        |         |
   24+15       7.2881      7.10  |O        |         |        |         |
   24+30       5.6703      5.26  |O        |         |        |         |
   24+45       3.8666      3.47  O         |         |        |         |
   25+ 0       2.5302      2.26  O         |         |        |         |
   25+15       1.6557      1.48  O         |         |        |         |
   25+30       1.0875      0.97  O         |         |        |         |
   25+45       0.7150      0.64  O         |         |        |         |
   26+ 0       0.4701      0.42  O         |         |        |         |
   26+15       0.3091      0.28  O         |         |        |         |
   26+30       0.2032      0.18  O         |         |        |         |
   26+45       0.1336      0.12  O         |         |        |         |
   27+ 0       0.0878      0.08  O         |         |        |         |
   27+15       0.0578      0.05  O         |         |        |         |
   27+30       0.0380      0.03  O         |         |        |         |
   27+45       0.0250      0.02  O         |         |        |         |
   28+ 0       0.0164      0.01  O         |         |        |         |
   28+15       0.0108      0.01  O         |         |        |         |
   28+30       0.0071      0.01  O         |         |        |         |
   28+45       0.0047      0.00  O         |         |        |         |
   29+ 0       0.0031      0.00  O         |         |        |         |
   29+15       0.0020      0.00  O         |         |        |         |
   29+30       0.0013      0.00  O         |         |        |         |
   29+45       0.0010      0.00  O         |         |        |         |
   30+ 0       0.0000      0.00  O         |         |        |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                        Number of intervals =   120
                        Time interval =   15.0 (Min.)
                        Maximum/Peak flow rate =      162.463 (CFS)
                        Total volume =      95.413 (Ac.Ft)
                  Status of hydrographs being held in storage
```

```
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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Process from Point/Station        2.000 to Point/Station        3.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubB2Bsn.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       69.9     139.7     209.6     279.4
-------------------------------------------------------------------
  0+15       0.6477      1.22  Q         |         |         |         |
  0+30       2.5379      4.97  Q         |         |         |         |
  0+45       4.7339      9.73  qQ        |         |         |         |
  1+ 0       6.7020     14.20  q Q       |         |         |         |
  1+15       8.1206     17.63  |qQ       |         |         |         |
  1+30       8.6508     19.25  |qQ       |         |         |         |
  1+45       8.7409     19.76  |qQ       |         |         |         |
  2+ 0       9.0999     20.61  |qQ       |         |         |         |
  2+15       9.8761     22.30  |q Q      |         |         |         |
  2+30      10.5923     23.99  |q Q      |         |         |         |
  2+45      11.3931     25.80  |q Q      |         |         |         |
  3+ 0      12.4297     28.09  |q  Q     |         |         |         |
  3+15      13.2993     30.15  |q  Q     |         |         |         |
  3+30      13.8482     31.56  |q  Q     |         |         |         |
  3+45      14.1717     32.44  | q Q     |         |         |         |
  4+ 0      14.7047     33.64  | q Q     |         |         |         |
  4+15      15.5834     35.54  | q  Q    |         |         |         |
  4+30      16.7023     38.00  | q  Q    |         |         |         |
  4+45      17.9627     40.81  | q  Q    |         |         |         |
  5+ 0      19.3066     43.83  | q   Q   |         |         |         |
  5+15      20.0150     45.71  | q   Q   |         |         |         |
  5+30      19.9043     45.86  | q   Q   |         |         |         |
  5+45      20.2650     46.60  | q   Q   |         |         |         |
  6+ 0      21.2280     48.63  |  q  Q   |         |         |         |
  6+15      22.4330     51.27  |  q   Q  |         |         |         |
  6+30      23.7443     54.20  |  q   Q  |         |         |         |
  6+45      25.1180     57.29  |  q    Q |         |         |         |
  7+ 0      26.5287     60.50  |  q    Q |         |         |         |
  7+15      27.6188     63.14  |  q     Q|         |         |         |
  7+30      28.6400     65.54  |   q    Q|         |         |         |
  7+45      30.1487     68.84  |   q    Q|         |         |         |
  8+ 0      32.2036     73.33  |   q     Q         |         |         |
  8+15      35.2228     79.79  |    q    |Q        |         |         |
  8+30      38.8886     87.78  |    q    | Q       |         |         |
  8+45      42.3626     95.66  |     q   |  Q      |         |         |
  9+ 0      45.8976    103.63  |     q   |   Q     |         |         |
  9+15      50.2282    113.15  |      q  |     Q   |         |         |
  9+30      55.3966    124.51  |      q  |      Q  |         |         |
  9+45      60.6208    136.29  |       q |        Q|         |         |
 10+ 0      65.5595    147.61  |        q|         |Q        |         |
 10+15      66.3647    151.25  |        q|         |Q        |         |
 10+30      61.7037    143.41  |       q |         Q         |         |
 10+45      58.9549    137.25  |       q |        Q|         |         |
 11+ 0      61.0905    140.53  |       q |         Q         |         |
 11+15      63.7942    146.24  |        q|         Q         |         |
 11+30      64.9266    149.21  |        q|         |Q        |         |
 11+45      64.3307    148.57  |        q|         |Q        |         |
```

12+ 0	62.8868	145.83		q	Q	
12+15	65.6091	151.15		q		Q	
12+30	73.6957	169.58		q	Q	
12+45	82.9660	193.07			q	Q	
13+ 0	91.3452	215.06			q	Q
13+15	100.8616	238.85			q		Q
13+30	121.5617	275.79			q		Q
13+45	116.9541	279.42			q		Q
14+ 0	99.1632	253.45			q		Q
14+15	95.6237	238.22			q		Q
14+30	95.7761	235.36			q		Q
14+45	96.6106	237.23			q		Q
15+ 0	96.5237	236.98			q		Q
15+15	95.1956	233.65			q		Q
15+30	92.8173	227.61			q		Q
15+45	88.2999	216.71			q		Q
16+ 0	82.0572	200.91			q	Q	
16+15	70.1923	173.93		q	Q	
16+30	51.9525	133.50		q	Q		
16+45	35.7970	95.04		q	Q		
17+ 0	24.9977	67.92		q Q			
17+15	19.0594	51.77		q Q			
17+30	16.6525	43.87		q Q			
17+45	15.7514	40.13		q Q			
18+ 0	14.9510	37.32		q Q			
18+15	13.9147	34.36	q Q			
18+30	13.0452	31.86	q Q			
18+45	12.1540	29.52	q Q			
19+ 0	10.7219	26.25	q Q			
19+15	9.3969	23.06	q Q			
19+30	9.2278	22.11	q Q			
19+45	9.5727	22.53	q Q			
20+ 0	9.1642	21.73	q Q			
20+15	8.4789	20.20	qQ			
20+30	8.3445	19.66	qQ			
20+45	8.4875	19.82	qQ			
21+ 0	8.2659	19.40	qQ			
21+15	7.9131	18.62	qQ			
21+30	7.6687	18.02	qQ			
21+45	7.5247	17.64	qQ			
22+ 0	7.4398	17.40	qQ			
22+15	7.3897	17.25	qQ			
22+30	7.3603	17.15	qQ			
22+45	7.0006	16.46	qQ			
23+ 0	6.5663	15.51 q Q			
23+15	6.2739	14.80 q Q			
23+30	6.1016	14.35 q Q			
23+45	6.0001	14.07 q Q			
24+ 0	5.9402	13.90 qQ			
24+15	5.2203	12.51 qQ			
24+30	3.6668	9.34 qQ			
24+45	2.2339	6.10 Q			
25+ 0	1.3165	3.85 Q			
25+15	0.7758	2.43 Q			
25+30	0.4572	1.54 Q			
25+45	0.2695	0.98 Q			
26+ 0	0.1588	0.63 Q			
26+15	0.0936	0.40 Q			
26+30	0.0552	0.26 Q			
26+45	0.0325	0.17 Q			
27+ 0	0.0192	0.11 Q			
27+15	0.0113	0.07 Q			
27+30	0.0067	0.04 Q			
27+45	0.0039	0.03 Q			
28+ 0	0.0023	0.02 Q			
28+15	0.0014	0.01 Q			
28+30	0.0010	0.01 Q			
28+45	0.0000	0.00 Q			
29+ 0	0.0000	0.00 Q			
29+15	0.0000	0.00 Q			
29+30	0.0000	0.00 Q			

```
   29+45       0.0000      0.00  Q         |         |         |         |
   30+ 0       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   120
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      279.417 (CFS)
                       Total volume =     165.204 (Ac.Ft)
                Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
                Peak (CFS)      0.000     0.000     0.000     0.000     0.000
                Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        3.000 to Point/Station        4.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ___________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   2000.00 (Ft.)
        Elevation difference =   40.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  2000.00(Ft.)     Elevation difference =  40.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =   10.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =    107.725(CFS)
        Depth of flow =     0.858(Ft.)
        Average velocity =    11.562(Ft/s)
        Total flow rate =   107.725(CFS)
        Channel flow top width =   11.716(Ft.)
        Depth of flow in channel =   0.86(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   11.56(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  107.725(CFS)
        Total capacity of improved channels =    107.725(CFS)
        Critical Depth in Channel =    1.45(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Covered channel
        Flow(q) thru subarea =    279.417(CFS)
        Depth of flow =     1.516(Ft.)
        Average velocity =    16.010(Ft/s)
        Total flow rate =   279.417(CFS)
        Channel flow top width =   13.031(Ft.)
        Depth of flow in channel =   1.52(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   16.01(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  279.417(CFS)
        Total capacity of improved channels =    279.417(CFS)
        Critical Depth in Channel =    2.63(Ft.)


        ********************** SCS CONVEX CHANNEL ROUTING *********************
        Convex method of stream routing  data items:
        Using equation: Outflow =
        O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
                 where c* = 1 - (1-c)^e and dt = c(length)/velocity
```

```
          c(v/v+1.7) =   0.9040   Travel time =   2.08 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   5.6464
        dt(routing time-step) =   1.88 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       69.9     139.7     209.6     279.4
----------------------------------------------------------------------
  0+15       1.0644      1.22  O         |         |         |         |
  0+30       4.5018      4.97  O         |         |         |         |
  0+45       9.1344      9.73  |O        |         |         |         |
  1+ 0      13.6406     14.20  |OI       |         |         |         |
  1+15      17.1978     17.63  | O       |         |         |         |
  1+30      19.0469     19.25  | O       |         |         |         |
  1+45      19.6964     19.76  | O       |         |         |         |
  2+ 0      20.5065     20.61  | O       |         |         |         |
  2+15      22.0909     22.30  |  O      |         |         |         |
  2+30      23.7798     23.99  |  O      |         |         |         |
  2+45      25.5771     25.80  |  O      |         |         |         |
  3+ 0      27.8059     28.09  |  OI     |         |         |         |
  3+15      29.8942     30.15  |   O     |         |         |         |
  3+30      31.3823     31.56  |   O     |         |         |         |
  3+45      32.3324     32.44  |   O     |         |         |         |
  4+ 0      33.4890     33.64  |   O     |         |         |         |
  4+15      35.3028     35.54  |    O    |         |         |         |
  4+30      37.6918     38.00  |    O    |         |         |         |
  4+45      40.4537     40.81  |    O    |         |         |         |
  5+ 0      43.4502     43.83  |     O   |         |         |         |
  5+15      45.4744     45.71  |     O   |         |         |         |
  5+30      45.8382     45.86  |     O   |         |         |         |
  5+45      46.5101     46.60  |     O   |         |         |         |
  6+ 0      48.3726     48.63  |     O   |         |         |         |
  6+15      50.9398     51.27  |      O  |         |         |         |
  6+30      53.8299     54.20  |      O  |         |         |         |
  6+45      56.9057     57.29  |       O |         |         |         |
  7+ 0      60.0968     60.50  |       O |         |         |         |
  7+15      62.8045     63.14  |       OI|         |         |         |
  7+30      65.2402     65.54  |        O|         |         |         |
  7+45      68.4301     68.84  |        O|         |         |         |
  8+ 0      72.7680     73.33  |         O         |         |         |
  8+15      78.9814     79.79  |         |O        |         |         |
  8+30      86.7794     87.78  |         | O       |         |         |
  8+45      94.6677     95.66  |         |  O      |         |         |
  9+ 0     102.6275    103.63  |         |   O     |         |         |
  9+15     111.9509    113.15  |         |     O   |         |         |
  9+30     123.0808    124.51  |         |      O  |         |         |
  9+45     134.8087    136.29  |         |        O|         |         |
 10+ 0     146.1931    147.61  |         |         OI        |         |
 10+15     150.7918    151.25  |         |         |O        |         |
 10+30     144.3973    143.41  |         |         O         |         |
 10+45     138.0206    137.25  |         |        O|         |         |
 11+ 0     140.1218    140.53  |         |         O         |         |
 11+15     145.5280    146.24  |         |         O         |         |
 11+30     148.8402    149.21  |         |         |O        |         |
 11+45     148.6518    148.57  |         |         |O        |         |
 12+ 0     146.1749    145.83  |         |         O         |         |
 12+15     150.4816    151.15  |         |         |O        |         |
 12+30     167.2690    169.58  |         |         |  OI     |         |
 12+45     190.1238    193.07  |         |         |      O  |         |
 13+ 0     212.3007    215.06  |         |         |         O         |
 13+15     235.8614    238.85  |         |         |         |  OI     |
 13+30     271.1505    275.79  |         |         |         |       OI|
 13+45     278.9615    279.42  |         |         |         |        OI
```

```
  14+ 0     256.7098    253.45  |         |         |         |     O   |
  14+15     240.1318    238.22  |         |         |         |   O     |
  14+30     235.7170    235.36  |         |         |         |  O      |
  14+45     236.9983    237.23  |         |         |         |  O      |
  15+ 0     237.0078    236.98  |         |         |         |  O      |
  15+15     234.0671    233.65  |         |         |         |  O      |
  15+30     228.3678    227.61  |         |         |         | O       |
  15+45     218.0738    216.71  |         |         |         |O        |
  16+ 0     202.8945    200.91  |         |         |       IO|         |
  16+15     177.3157    173.93  |         |         |   IO    |         |
  16+30     138.5758    133.50  |         |       O|         |         |
  16+45      99.8674     95.04  |         |  IO     |         |         |
  17+ 0      71.3266     67.92  |       IO        |         |         |
  17+15      53.7980     51.77  |      O  |         |         |         |
  17+30      44.8645     43.87  |     O   |         |         |         |
  17+45      40.5976     40.13  |    O    |         |         |         |
  18+ 0      37.6688     37.32  |    O    |         |         |         |
  18+15      34.7349     34.36  |   O     |         |         |         |
  18+30      32.1744     31.86  |   O     |         |         |         |
  18+45      29.8144     29.52  |   O     |         |         |         |
  19+ 0      26.6634     26.25  |  O      |         |         |         |
  19+15      23.4630     23.06  |  O      |         |         |         |
  19+30      22.2274     22.11  |  O      |         |         |         |
  19+45      22.4727     22.53  |  O      |         |         |         |
  20+ 0      21.8293     21.73  |  O      |         |         |         |
  20+15      20.3953     20.20  | O       |         |         |         |
  20+30      19.7246     19.66  | O       |         |         |         |
  20+45      19.7999     19.82  | O       |         |         |         |
  21+ 0      19.4498     19.40  | O       |         |         |         |
  21+15      18.7171     18.62  | O       |         |         |         |
  21+30      18.0919     18.02  | O       |         |         |         |
  21+45      17.6855     17.64  | O       |         |         |         |
  22+ 0      17.4291     17.40  | O       |         |         |         |
  22+15      17.2695     17.25  | O       |         |         |         |
  22+30      17.1665     17.15  | O       |         |         |         |
  22+45      16.5441     16.46  | O       |         |         |         |
  23+ 0      15.6245     15.51  | O       |         |         |         |
  23+15      14.8863     14.80  | O       |         |         |         |
  23+30      14.4081     14.35  | O       |         |         |         |
  23+45      14.1085     14.07  | O       |         |         |         |
  24+ 0      13.9199     13.90  |O        |         |         |         |
  24+15      12.6828     12.51  |O        |         |         |         |
  24+30       9.7351      9.34  |O        |         |         |         |
  24+45       6.5066      6.10  O         |         |         |         |
  25+ 0       4.1295      3.85  O         |         |         |         |
  25+15       2.6091      2.43  O         |         |         |         |
  25+30       1.6560      1.54  O         |         |         |         |
  25+45       1.0548      0.98  O         |         |         |         |
  26+ 0       0.6735      0.63  O         |         |         |         |
  26+15       0.4311      0.40  O         |         |         |         |
  26+30       0.2765      0.26  O         |         |         |         |
  26+45       0.1777      0.17  O         |         |         |         |
  27+ 0       0.1144      0.11  O         |         |         |         |
  27+15       0.0738      0.07  O         |         |         |         |
  27+30       0.0477      0.04  O         |         |         |         |
  27+45       0.0309      0.03  O         |         |         |         |
  28+ 0       0.0200      0.02  O         |         |         |         |
  28+15       0.0130      0.01  O         |         |         |         |
  28+30       0.0086      0.01  O         |         |         |         |
  28+45       0.0051      0.00  O         |         |         |         |
  29+ 0       0.0033      0.00  O         |         |         |         |
  29+15       0.0021      0.00  O         |         |         |         |
  29+30       0.0014      0.00  O         |         |         |         |
  29+45       0.0011      0.00  O         |         |         |         |
  30+ 0       0.0001      0.00  O         |         |         |         |
  30+15       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   121
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      278.962 (CFS)
```

```
                Total volume =     165.204 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SubB324100.rte
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      141.9     283.8     425.6     567.5
-----------------------------------------------------------------------
  0+15       4.0989      5.16  Q         |         |         |         |
  0+30      12.8629     17.36  qQ        |         |         |         |
  0+45      17.9198     27.05  |Q        |         |         |         |
  1+ 0      21.5730     35.21  |qQ       |         |         |         |
  1+15      23.6678     40.87  |qQ       |         |         |         |
  1+30      21.6692     40.72  |qQ       |         |         |         |
  1+45      21.3481     41.04  |qQ       |         |         |         |
  2+ 0      23.2257     43.73  |q Q      |         |         |         |
  2+15      26.5297     48.62  |q Q      |         |         |         |
  2+30      27.2277     51.01  |q Q      |         |         |         |
  2+45      29.6541     55.23  | qQ      |         |         |         |
  3+ 0      33.2164     61.02  | q Q     |         |         |         |
  3+15      34.2181     64.11  | q Q     |         |         |         |
  3+30      34.5950     65.98  | q Q     |         |         |         |
  3+45      34.8001     67.13  | q Q     |         |         |         |
  4+ 0      37.0014     70.49  | q Q     |         |         |         |
  4+15      40.3586     75.66  | q  Q    |         |         |         |
  4+30      43.2580     80.95  |  q Q    |         |         |         |
  4+45      46.9921     87.45  |  q  Q   |         |         |         |
  5+ 0      50.0965     93.55  |  q  Q   |         |         |         |
  5+15      49.8835     95.36  |  q  Q   |         |         |         |
  5+30      46.2735     92.11  |  q  Q   |         |         |         |
  5+45      50.5093     97.02  |  q  Q   |         |         |         |
  6+ 0      54.1676    102.54  |  q   Q  |         |         |         |
  6+15      57.1855    108.13  |   q  Q  |         |         |         |
  6+30      60.8211    114.65  |   q   Q |         |         |         |
  6+45      64.0773    120.98  |   q   Q |         |         |         |
  7+ 0      67.9633    128.06  |   q    Q|         |         |         |
  7+15      69.0182    131.82  |   q    Q|         |         |         |
  7+30      71.5964    136.84  |    q   Q|         |         |         |
  7+45      77.2082    145.64  |    q    Q         |         |         |
  8+ 0      83.6166    156.38  |    q    |Q        |         |         |
  8+15      93.8717    172.85  |     q   | Q       |         |         |
  8+30     104.7551    191.53  |      q  |  Q      |         |         |
  8+45     111.1936    205.86  |      q  |   Q     |         |         |
  9+ 0     120.8059    223.43  |       q |    Q    |         |         |
  9+15     133.9050    245.86  |        q|      Q  |         |         |
  9+30     149.1231    272.20  |         q        Q|         |         |
  9+45     160.6391    295.45  |         |q        Q         |         |
 10+ 0     171.6915    317.88  |         | q       | Q       |         |
 10+15     159.0709    309.86  |         |q        |Q        |         |
 10+30     128.4953    272.89  |        q|        Q|         |         |
 10+45     136.1969    274.22  |        q|        Q|         |         |
 11+ 0     157.4253    297.55  |         |q        Q         |         |
 11+15     159.2359    304.76  |         |q        |Q        |         |
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11+30     156.1108    304.95  |          |q         |Q         |          |
11+45     150.9977    299.65  |          q          |Q         |          |
12+ 0     145.3658    291.54  |          q          Q          |          |
12+15     168.4166    318.90  |          |q         | Q        |          |
12+30     205.3126    372.58  |          |   q      |     Q    |          |
12+45     224.8853    415.01  |          |    q     |        Q|          |
13+ 0     242.7122    455.01  |          |      q   |          | Q        |
13+15     267.8408    503.70  |          |       q  |          |    Q     |
13+30     296.3768    567.53  |          |          q          |         Q
13+45     272.0301    550.99  |          |         q|          |        Q |
14+ 0     223.1345    479.84  |          |    q     |          |  Q       |
14+15     223.6092    463.74  |          |    q     |          | Q        |
14+30     235.4575    471.17  |          |     q    |          |  Q       |
14+45     232.7191    469.72  |          |     q    |          |  Q       |
15+ 0     228.7636    465.77  |          |     q    |          | Q        |
15+15     222.0855    456.15  |          |    q     |          | Q        |
15+30     214.1283    442.50  |          |    q     |          |Q         |
15+45     196.0515    414.13  |          |  q       |        Q|          |
16+ 0     175.2154    378.11  |          | q        |     Q    |          |
16+15     129.4605    306.78  |        q|          |Q         |          |
16+30      61.1550    199.73  |   q      |   Q      |          |          |
16+45      41.1190    140.99  | q      Q|          |          |          |
17+ 0      29.5345    100.86  | q    Q  |          |          |          |
17+15      28.7765     82.57  | q  Q    |          |          |          |
17+30      32.1415     77.01  | q  Q    |          |          |          |
17+45      33.6361     74.23  | q  Q    |          |          |          |
18+ 0      32.1886     69.86  | q Q     |          |          |          |
18+15      29.2416     63.98  | q Q     |          |          |          |
18+30      28.6954     60.87  | q Q     |          |          |          |
18+45      26.2690     56.08  |q Q      |          |          |          |
19+ 0      20.6572     47.32  |q Q      |          |          |          |
19+15      18.3478     41.81  |qQ       |          |          |          |
19+30      22.5277     44.76  |q Q      |          |          |          |
19+45      24.1033     46.58  |q Q      |          |          |          |
20+ 0      19.5664     41.40  |qQ       |          |          |          |
20+15      17.8390     38.23  |qQ       |          |          |          |
20+30      20.3264     40.05  |qQ       |          |          |          |
20+45      20.7461     40.55  |qQ       |          |          |          |
21+ 0      18.7166     38.17  |qQ       |          |          |          |
21+15      17.4621     36.18  |qQ       |          |          |          |
21+30      18.0718     36.16  |qQ       |          |          |          |
21+45      17.2370     34.92  |qQ       |          |          |          |
22+ 0      17.8668     35.30  |qQ       |          |          |          |
22+15      17.0852     34.35  |qQ       |          |          |          |
22+30      17.8668     35.03  |qQ       |          |          |          |
22+45      15.0357     31.58  |qQ       |          |          |          |
23+ 0      14.5095     30.13  |qQ       |          |          |          |
23+15      14.1859     29.07  q Q       |          |          |          |
23+30      14.1326     28.54  q Q       |          |          |          |
23+45      13.9808     28.09  qQ        |          |          |          |
24+ 0      13.9808     27.90  qQ        |          |          |          |
24+15       9.8818     22.56  qQ        |          |          |          |
24+30       3.1673     12.90  Q         |          |          |          |
24+45       1.4677      7.97  Q         |          |          |          |
25+ 0       0.7138      4.84  Q         |          |          |          |
25+15       0.3037      2.91  Q         |          |          |          |
25+30       0.0000      1.66  Q         |          |          |          |
25+45       0.0000      1.05  Q         |          |          |          |
26+ 0       0.0000      0.67  Q         |          |          |          |
26+15       0.0000      0.43  Q         |          |          |          |
26+30       0.0000      0.28  Q         |          |          |          |
26+45       0.0000      0.18  Q         |          |          |          |
27+ 0       0.0000      0.11  Q         |          |          |          |
27+15       0.0000      0.07  Q         |          |          |          |
27+30       0.0000      0.05  Q         |          |          |          |
27+45       0.0000      0.03  Q         |          |          |          |
28+ 0       0.0000      0.02  Q         |          |          |          |
28+15       0.0000      0.01  Q         |          |          |          |
28+30       0.0000      0.01  Q         |          |          |          |
28+45       0.0000      0.01  Q         |          |          |          |
29+ 0       0.0000      0.00  Q         |          |          |          |
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  29+15       0.0000      0.00  Q         |         |         |         |
  29+30       0.0000      0.00  Q         |         |         |         |
  29+45       0.0000      0.00  Q         |         |         |         |
  30+ 0       0.0000      0.00  Q         |         |         |         |
  30+15       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   121
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      567.527 (CFS)
                      Total volume =     331.862 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        3.000 to Point/Station        4.000
       **** RETARDING BASIN ROUTING ****
       ______________________________________________________________________

       User entry of depth-outflow-storage data
       ---------------------------------------------------------------------
       Total number of inflow hydrograph intervals = 121
       Hydrograph time unit = 15.000 (Min.)
       Initial depth in storage basin =   0.10(Ft.)
       ---------------------------------------------------------------------
       ---------------------------------------------------------------------
       Initial basin depth =   0.10 (Ft.)
       Initial basin storage =      2.00 (Ac.Ft)
       Initial basin outflow =  25.00 (CFS)
       ---------------------------------------------------------------------
       ---------------------------------------------------------------------
       Depth vs. Storage and Depth vs. Discharge data:
        Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
            (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
       ---------------------------------------------------------------------
          0.000      0.000      0.000      0.000        0.000
          1.000     20.000    250.000     17.417       22.583
          2.000     30.000    350.000     26.384       33.616
          3.000     40.000    500.000     34.835       45.165
       ---------------------------------------------------------------------
                      Hydrograph Detention Basin Routing
       ---------------------------------------------------------------------

       Graph values: 'I'= unit inflow; 'O'=outflow at time shown
       ---------------------------------------------------------------------
  Time   Inflow  Outflow    Storage                                      Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0     141.9  283.76  425.65  567.53 (Ft.)
  0.250    5.16   17.01      1.361  O       |       |       |       |     0.07
  0.500   17.36   15.70      1.256  O       |       |       |       |     0.06
  0.750   27.05   17.19      1.375  OI      |       |       |       |     0.07
  1.000   35.21   20.38      1.630  |O      |       |       |       |     0.08
  1.250   40.87   24.42      1.953  |OI     |       |       |       |     0.10
  1.500   40.72   28.16      2.253  |OI     |       |       |       |     0.11
  1.750   41.04   31.07      2.486  |OI     |       |       |       |     0.12
  2.000   43.73   33.66      2.693  |OI     |       |       |       |     0.13
  2.250   48.62   36.52      2.922  | O     |       |       |       |     0.15
  2.500   51.01   39.56      3.165  | O     |       |       |       |     0.16
  2.750   55.23   42.66      3.413  | OI    |       |       |       |     0.17
  3.000   61.02   46.20      3.696  | OI    |       |       |       |     0.18
  3.250   64.11   49.94      3.996  | OI    |       |       |       |     0.20
  3.500   65.98   53.40      4.272  |  O    |       |       |       |     0.21
  3.750   67.13   56.41      4.513  |  O    |       |       |       |     0.23
  4.000   70.49   59.24      4.740  |  O    |       |       |       |     0.24
  4.250   75.66   62.41      4.993  |  OI   |       |       |       |     0.25
  4.500   80.95   66.04      5.284  |  OI   |       |       |       |     0.26
```

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 4.750   87.45   70.20      5.616  |  OI   |       |       |       |     0.28
 5.000   93.55   74.84      5.987  |   OI  |       |       |       |     0.30
 5.250   95.36   79.33      6.346  |   OI  |       |       |       |     0.32
 5.500   92.11   82.62      6.610  |   OI  |       |       |       |     0.33
 5.750   97.02   85.35      6.828  |   OI  |       |       |       |     0.34
 6.000  102.54   88.65      7.092  |   OI  |       |       |       |     0.35
 6.250  108.13   92.47      7.397  |    OI |       |       |       |     0.37
 6.500  114.65   96.80      7.744  |    OI |       |       |       |     0.39
 6.750  120.98  101.60      8.128  |    OI |       |       |       |     0.41
 7.000  128.06  106.85      8.548  |     OI|       |       |       |     0.43
 7.250  131.82  112.13      8.970  |     OI|       |       |       |     0.45
 7.500  136.84  117.21      9.377  |     OI|       |       |       |     0.47
 7.750  145.64  122.70      9.816  |     O I       |       |       |     0.49
 8.000  156.38  129.18     10.334  |      OI       |       |       |     0.52
 8.250  172.85  137.28     10.983  |      O|I      |       |       |     0.55
 8.500  191.53  147.56     11.805  |       O I     |       |       |     0.59
 8.750  205.86  159.25     12.740  |       O  I    |       |       |     0.64
 9.000  223.43  171.92     13.754  |       |O  I   |       |       |     0.69
 9.250  245.86  186.27     14.902  |       | O  I  |       |       |     0.75
 9.500  272.20  202.91     16.233  |       |  O   I|       |       |     0.81
 9.750  295.45  221.42     17.714  |       |   O   I       |       |     0.89
10.000  317.88  240.92     19.273  |       |    O  |I      |       |     0.96
10.250  309.86  256.23     20.623  |       |     O |I      |       |     1.06
10.500  272.89  262.81     21.281  |       |     OI|       |       |     1.13
10.750  274.22  264.82     21.482  |       |     OI|       |       |     1.15
11.000  297.55  268.77     21.877  |       |      OI       |       |     1.19
11.250  304.76  274.83     22.483  |       |      O|I      |       |     1.25
11.500  304.95  280.45     23.045  |       |      O|I      |       |     1.30
11.750  299.65  284.54     23.454  |       |       O       |       |     1.35
12.000  291.54  286.61     23.661  |       |       O       |       |     1.37
12.250  318.90  290.10     24.010  |       |       OI      |       |     1.40
12.500  372.58  300.52     25.052  |       |       O    I  |       |     1.51
12.750  415.01  317.99     26.799  |       |       |O     I|       |     1.68
13.000  455.01  339.90     28.990  |       |       |  O    |I      |     1.90
13.250  503.70  372.95     31.530  |       |       |    O  |   I   |     2.15
13.500  567.53  416.60     34.440  |       |       |      O|       I     2.44
13.750  550.99  454.88     36.992  |       |       |       |O     I|     2.70
14.000  479.84  471.12     38.075  |       |       |       | OI    |     2.81
14.250  463.74  471.30     38.087  |       |       |       | O     |     2.81
14.500  471.17  470.27     38.018  |       |       |       | O     |     2.80
14.750  469.72  470.32     38.021  |       |       |       | O     |     2.80
15.000  465.77  469.63     37.975  |       |       |       | O     |     2.80
15.250  456.15  467.30     37.820  |       |       |       |IO     |     2.78
15.500  442.50  462.48     37.499  |       |       |       I O     |     2.75
15.750  414.13  453.31     36.887  |       |       |      I|O      |     2.69
16.000  378.11  437.96     35.864  |       |       |    I  O       |     2.59
16.250  306.78  412.33     34.155  |       |       |I     O|       |     2.42
16.500  199.73  369.65     31.310  |       |  I    |   O   |       |     2.13
16.750  140.99  326.39     27.639  |      I|       | O     |       |     1.76
17.000  100.86  287.91     23.791  |    I  |       O       |       |     1.38
17.250   82.57  251.17     20.117  |   I   |     O |       |       |     1.01
17.500   77.01  212.23     16.979  |   I   |  O    |       |       |     0.85
17.750   74.23  180.99     14.479  |   I   | O     |       |       |     0.72
18.000   69.86  156.07     12.485  |  I    O       |       |       |     0.62
18.250   63.98  135.68     10.854  |  I   O|       |       |       |     0.54
18.500   60.87  118.92      9.514  |  I  O |       |       |       |     0.48
18.750   56.08  105.10      8.408  |  I O  |       |       |       |     0.42
19.000   47.32   92.88      7.431  | I  O  |       |       |       |     0.37
19.250   41.81   81.83      6.547  | I O   |       |       |       |     0.33
19.500   44.76   73.01      5.841  | I O   |       |       |       |     0.29
19.750   46.58   66.76      5.341  | IO    |       |       |       |     0.27
20.000   41.40   61.55      4.924  | IO    |       |       |       |     0.25
20.250   38.23   56.58      4.526  | IO    |       |       |       |     0.23
20.500   40.05   52.59      4.207  | O     |       |       |       |     0.21
20.750   40.55   49.78      3.982  | O     |       |       |       |     0.20
21.000   38.17   47.40      3.792  | O     |       |       |       |     0.19
21.250   36.18   45.06      3.605  | O     |       |       |       |     0.18
21.500   36.16   43.02      3.442  | O     |       |       |       |     0.17
21.750   34.92   41.31      3.305  |IO     |       |       |       |     0.17
22.000   35.30   39.89      3.192  |IO     |       |       |       |     0.16
22.250   34.35   38.73      3.099  |IO     |       |       |       |     0.15
```

```
22.500   35.03   37.81      3.025  |IO     |       |       |       |     0.15
22.750   31.58   36.78      2.942  |IO     |       |       |       |     0.15
23.000   30.13   35.43      2.834  |O      |       |       |       |     0.14
23.250   29.07   34.09      2.728  |O      |       |       |       |     0.14
23.500   28.54   32.88      2.631  |O      |       |       |       |     0.13
23.750   28.09   31.84      2.547  |O      |       |       |       |     0.13
24.000   27.90   30.96      2.477  |O      |       |       |       |     0.12
24.250   22.56   29.65      2.372  |O      |       |       |       |     0.12
24.500   12.90   26.92      2.154  IO     |       |       |       |     0.11
24.750    7.97   23.15      1.852  IO     |       |       |       |     0.09
25.000    4.84   19.32      1.546  IO     |       |       |       |     0.08
25.250    2.91   15.79      1.263  O      |       |       |       |     0.06
25.500    1.66   12.70      1.016  O      |       |       |       |     0.05
25.750    1.05   10.11      0.809  O      |       |       |       |     0.04
26.000    0.67    7.99      0.639  O      |       |       |       |     0.03
26.250    0.43    6.29      0.503  O      |       |       |       |     0.03
26.500    0.28    4.93      0.395  O      |       |       |       |     0.02
26.750    0.18    3.86      0.309  O      |       |       |       |     0.02
27.000    0.11    3.01      0.241  O      |       |       |       |     0.01
27.250    0.07    2.34      0.187  O      |       |       |       |     0.01
27.500    0.05    1.82      0.146  O      |       |       |       |     0.01
27.750    0.03    1.41      0.113  O      |       |       |       |     0.01
28.000    0.02    1.10      0.088  O      |       |       |       |     0.00
28.250    0.01    0.85      0.068  O      |       |       |       |     0.00
28.500    0.01    0.66      0.053  O      |       |       |       |     0.00
28.750    0.01    0.51      0.041  O      |       |       |       |     0.00
29.000    0.00    0.39      0.031  O      |       |       |       |     0.00
29.250    0.00    0.30      0.024  O      |       |       |       |     0.00
29.500    0.00    0.23      0.019  O      |       |       |       |     0.00
29.750    0.00    0.18      0.014  O      |       |       |       |     0.00
30.000    0.00    0.14      0.011  O      |       |       |       |     0.00
30.250    0.00    0.11      0.009  O      |       |       |       |     0.00
30.500    0.00    0.08      0.007  O      |       |       |       |     0.00
```

```
****************************HYDROGRAPH DATA****************************
               Number of intervals =   122
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      471.304 (CFS)
               Total volume =     333.339 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file LineB24hr.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/30/12


      ------------------------------------------------------------------
--


      Watershed B, Basin B1
      Proposed Condition
      100-year, 24-hour

      ------------------------------------------------------------------
-


      Program License Serial Number 6097

      ------------------------------------------------------------------
-
      ******************** HYDROGRAPH INFORMATION *********************

                 From study/file name: SubB124100.rte
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =    98
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =      162.645 (CFS)
                 Total volume =      88.230 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station        1.000 to Point/Station
2.000
      **** RETARDING BASIN ROUTING ****
      ___________________________________________________________________
___

      User entry of depth-outflow-storage data
      ------------------------------------------------------------------
-
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
```

```
      Initial depth in storage basin =   0.10(Ft.)
      ------------------------------------------------------------------
-
      ------------------------------------------------------------------
-
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ------------------------------------------------------------------
--
      ------------------------------------------------------------------
-
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ------------------------------------------------------------------
--
          0.000      0.000      0.000      0.000        0.000
          1.000      0.001      0.001      0.001        0.001
          2.000      0.002      0.001      0.002        0.002
          3.000     10.000    200.000      7.934       12.066
          4.000     15.000    225.000     12.676       17.324
          6.000     18.700    247.000     16.148       21.252
      ------------------------------------------------------------------
-
                  Hydrograph Detention Basin Routing
      ------------------------------------------------------------------
--

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ------------------------------------------------------------------
--
  Time   Inflow  Outflow    Storage
Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0      40.7   81.32  121.98  162.64
(Ft.)
  0.250    4.22    0.69      0.037  O       |       |       |       |
2.00
  0.500    9.06    2.73      0.138  OI      |       |       |       |
2.01
  0.750   10.88    5.21      0.262  |OI     |       |       |       |
2.03
  1.000   13.21    7.55      0.379  |OI     |       |       |       |
2.04
  1.250   12.47    9.36      0.470  |OI     |       |       |       |
2.05
  1.500   11.33   10.23      0.513  | O     |       |       |       |
2.05
  1.750   11.10   10.57      0.530  | O     |       |       |       |
2.05
  2.000   13.21   11.11      0.557  | O     |       |       |       |
2.06
  2.250   14.58   12.06      0.605  | O     |       |       |       |
2.06
```

```
  2.500   14.80   12.96      0.650  | O     |       |       |       |
2.06
  2.750   16.91   13.95      0.700  | OI    |       |       |       |
2.07
  3.000   18.28   15.20      0.762  | OI    |       |       |       |
2.08
  3.250   18.50   16.29      0.816  |  O    |       |       |       |
2.08
  3.500   18.50   17.05      0.854  |  O    |       |       |       |
2.09
  3.750   18.50   17.55      0.879  |  O    |       |       |       |
2.09
  4.000   20.61   18.24      0.914  |  OI   |       |       |       |
2.09
  4.250   21.98   19.28      0.966  |  OI   |       |       |       |
2.10
  4.500   24.31   20.61      1.032  |   O   |       |       |       |
2.10
  4.750   25.68   22.11      1.107  |   OI  |       |       |       |
2.11
  5.000   28.01   23.73      1.188  |   OI  |       |       |       |
2.12
  5.250   25.16   24.71      1.237  |   O   |       |       |       |
2.12
  5.500   24.76   24.80      1.242  |   O   |       |       |       |
2.12
  5.750   27.79   25.30      1.267  |   OI  |       |       |       |
2.13
  6.000   29.38   26.43      1.323  |    O  |       |       |       |
2.13
  6.250   31.71   27.84      1.394  |    OI |       |       |       |
2.14
  6.500   33.08   29.40      1.472  |    OI |       |       |       |
2.15
  6.750   35.41   31.06      1.555  |     O |       |       |       |
2.16
  7.000   36.78   32.78      1.641  |     OI|       |       |       |
2.16
  7.250   37.01   34.19      1.711  |     OI|       |       |       |
2.17
  7.500   39.11   35.52      1.777  |     OI|       |       |       |
2.18
  7.750   42.59   37.34      1.869  |      OI       |       |       |
2.19
  8.000   46.29   39.77      1.990  |      O|I      |       |       |
2.20
  8.250   53.72   43.28      2.165  |       O I     |       |       |
2.22
  8.500   57.90   47.57      2.380  |       |O I    |       |       |
2.24
  8.750   61.81   51.78      2.590  |       | O I   |       |       |
2.26
  9.000   67.06   56.11      2.807  |       |  O I  |       |       |
2.28
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  9.250   75.64   61.33      3.068  |        |   O I |        |        |
2.31
  9.500   83.17   67.52      3.377  |        |    O  I        |        |
2.34
  9.750   89.06   73.89      3.696  |        |     O |I       |        |
2.37
 10.000   94.62   80.04      4.003  |        |      O| I     |        |
2.40
 10.250   76.09   81.86      4.094  |        |     I O        |        |
2.41
 10.500   63.00   77.64      3.883  |        |   I  O|        |        |
2.39
 10.750   76.08   74.87      3.745  |        |     O |        |        |
2.37
 11.000   86.12   77.00      3.851  |        |      OI        |        |
2.39
 11.250   84.98   79.93      3.998  |        |      OI        |        |
2.40
 11.500   83.28   81.37      4.070  |        |       O        |        |
2.41
 11.750   77.20   80.98      4.050  |        |      O|        |        |
2.40
 12.000   76.56   79.58      3.980  |        |      O|        |        |
2.40
 12.250   99.20   82.42      4.122  |        |       O  I     |        |
2.41
 12.500  116.47   91.13      4.557  |        |       |O    I |        |
2.46
 12.750  126.93  101.60      5.081  |        |       |  O    I        |
2.51
 13.000  134.42  111.56      5.579  |        |       |    O  | I      |
2.56
 13.250  152.31  122.45      6.123  |        |       |       O    I  |
2.61
 13.500  162.64  134.45      6.723  |        |       |       | O     I
2.67
 13.750  131.36  138.75      6.938  |        |       |       |I O    |
2.69
 14.000  110.09  132.58      6.629  |        |       |    I  | O     |
2.66
 14.250  118.84  126.37      6.319  |        |       |      IO        |
2.63
 14.500  123.87  124.65      6.233  |        |       |       O        |
2.62
 14.750  123.42  124.31      6.216  |        |       |       O        |
2.62
 15.000  120.31  123.47      6.174  |        |       |      IO        |
2.62
 15.250  115.56  121.57      6.079  |        |       |     IO|        |
2.61
 15.500  110.49  118.65      5.933  |        |       |    I O|        |
2.59
 15.750   96.38  113.43      5.673  |        |       | I   O |        |
2.57
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 16.000   88.44  106.23      5.313  |       |       |I  O   |       |
2.53
 16.250   45.98   92.87      4.644  |       |I      | O     |       |
2.46
 16.500   19.20   72.22      3.612  |  I    |     O |       |       |
2.36
 16.750   12.69   52.94      2.649  | I     | O     |       |       |
2.26
 17.000   11.33   38.92      1.948  | I    O|       |       |       |
2.19
 17.250   15.32   30.15      1.509  |  I O  |       |       |       |
2.15
 17.500   18.05   25.54      1.279  |  I O  |       |       |       |
2.13
 17.750   18.50   23.05      1.154  |  IO   |       |       |       |
2.12
 18.000   16.39   21.13      1.058  |  IO   |       |       |       |
2.11
 18.250   15.03   19.28      0.966  | IO    |       |       |       |
2.10
 18.500   14.80   17.78      0.891  | IO    |       |       |       |
2.09
 18.750   12.69   16.40      0.822  | IO    |       |       |       |
2.08
 19.000    9.22   14.54      0.729  |IO     |       |       |       |
2.07
 19.250    9.73   12.80      0.642  |IO     |       |       |       |
2.06
 19.500   12.98   12.31      0.617  | O     |       |       |       |
2.06
 19.750   12.47   12.45      0.624  | O     |       |       |       |
2.06
 20.000    9.22   11.90      0.597  |IO     |       |       |       |
2.06
 20.250    9.73   11.07      0.555  |IO     |       |       |       |
2.06
 20.500   10.88   10.81      0.542  | O     |       |       |       |
2.05
 20.750   11.10   10.87      0.545  | O     |       |       |       |
2.05
 21.000    8.99   10.59      0.531  |IO     |       |       |       |
2.05
 21.250    9.73   10.17      0.510  |IO     |       |       |       |
2.05
 21.500    8.77    9.85      0.495  |O      |       |       |       |
2.05
 21.750    9.73    9.65      0.484  |O      |       |       |       |
2.05
 22.000    8.77    9.51      0.477  |O      |       |       |       |
2.05
 22.250    9.73    9.42      0.473  |O      |       |       |       |
2.05
 22.500    8.77    9.36      0.470  |O      |       |       |       |
2.05
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```
 22.750    7.63    8.96      0.450  |O      |       |       |       |
2.04
 23.000    7.40    8.47      0.425  |O      |       |       |       |
2.04
 23.250    7.40    8.10      0.407  |O      |       |       |       |
2.04
 23.500    7.40    7.86      0.395  |O      |       |       |       |
2.04
 23.750    7.40    7.70      0.387  |O      |       |       |       |
2.04
 24.000    7.40    7.60      0.382  |O      |       |       |       |
2.04
 24.250    3.19    6.81      0.342  IO     |       |       |       |
2.03
 24.500    0.45    5.10      0.257  IO     |       |       |       |
2.03
 24.750    0.00    3.43      0.173  O      |       |       |       |
2.02
 25.000    0.00    2.26      0.115  O      |       |       |       |
2.01
 25.250    0.00    1.48      0.076  O      |       |       |       |
2.01
 25.500    0.00    0.97      0.051  O      |       |       |       |
2.00
 25.750    0.00    0.64      0.034  O      |       |       |       |
2.00
 26.000    0.00    0.42      0.023  O      |       |       |       |
2.00
 26.250    0.00    0.28      0.016  O      |       |       |       |
2.00
 26.500    0.00    0.18      0.011  O      |       |       |       |
2.00
 26.750    0.00    0.12      0.008  O      |       |       |       |
2.00
 27.000    0.00    0.08      0.006  O      |       |       |       |
2.00
 27.250    0.00    0.05      0.005  O      |       |       |       |
2.00
 27.500    0.00    0.03      0.004  O      |       |       |       |
2.00
 27.750    0.00    0.02      0.003  O      |       |       |       |
2.00
 28.000    0.00    0.01      0.003  O      |       |       |       |
2.00
 28.250    0.00    0.01      0.002  O      |       |       |       |
2.00
 28.500    0.00    0.01      0.002  O      |       |       |       |
2.00
 28.750    0.00    0.00      0.002  O      |       |       |       |
2.00
 29.000    0.00    0.00      0.002  O      |       |       |       |
2.00
 29.250    0.00    0.00      0.002  O      |       |       |       |
2.00
```

```
 29.500    0.00    0.00      0.002  O       |       |       |       |
2.00
 29.750    0.00    0.00      0.002  O       |       |       |       |
1.99


      Remaining water in basin =    0.00 (Ac.Ft)


      ****************************HYDROGRAPH
DATA***************************
                 Number of intervals =   119
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =      138.750 (CFS)
                 Total volume =      88.228 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****

      ------------------------------------------------------------------
-


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station        1.000 to Point/Station
2.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ___________________________________________________________________
___
      Current stream hydrograph saved in file SubB1Bsn.rte
      ****************************HYDROGRAPH
DATA***************************
                 Number of intervals =     0
                 Time interval =    0.0 (Min.)
                 Maximum/Peak flow rate =        0.000 (CFS)
                 Total volume =       0.000 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****

      ------------------------------------------------------------------
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```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/04/12

      ---------------------------------------------------------------------


      Watershed B, Basin B2
      Proposed Condition
      100 Yr. 24 Hr.

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubB224100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      128.657 (CFS)
                    Total volume =      69.793 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000      4.000    100.000      2.967        5.033
         4.000      5.000    175.000      3.192        6.808
         6.000      6.000    250.000      3.417        8.583
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      32.2   64.33   96.49  128.66 (Ft.)
 0.250    3.33    0.65      0.028  O       |       |       |       |     2.01
```

```
 0.500    7.17    2.54      0.103  OI      |       |       |       |     2.03
 0.750    8.60    4.73      0.191  |OI     |       |       |       |     2.05
 1.000   10.45    6.70      0.270  |OI     |       |       |       |     2.07
 1.250    9.86    8.12      0.327  | O     |       |       |       |     2.08
 1.500    8.96    8.65      0.348  | O     |       |       |       |     2.09
 1.750    8.78    8.74      0.351  | O     |       |       |       |     2.09
 2.000   10.45    9.10      0.366  | O     |       |       |       |     2.09
 2.250   11.53    9.88      0.397  | O     |       |       |       |     2.10
 2.500   11.71   10.59      0.425  | O     |       |       |       |     2.11
 2.750   13.38   11.39      0.457  | OI    |       |       |       |     2.11
 3.000   14.46   12.43      0.499  |  O    |       |       |       |     2.12
 3.250   14.64   13.30      0.534  |  O    |       |       |       |     2.13
 3.500   14.64   13.85      0.556  |  O    |       |       |       |     2.14
 3.750   14.64   14.17      0.569  |  O    |       |       |       |     2.14
 4.000   16.30   14.70      0.590  |  OI   |       |       |       |     2.15
 4.250   17.39   15.58      0.625  |  OI   |       |       |       |     2.16
 4.500   19.23   16.70      0.670  |   O   |       |       |       |     2.17
 4.750   20.31   17.96      0.720  |   OI  |       |       |       |     2.18
 5.000   22.16   19.31      0.774  |   OI  |       |       |       |     2.19
 5.250   19.91   20.01      0.802  |   O   |       |       |       |     2.20
 5.500   19.59   19.90      0.798  |   O   |       |       |       |     2.20
 5.750   21.98   20.27      0.812  |    O  |       |       |       |     2.20
 6.000   23.24   21.23      0.851  |    O  |       |       |       |     2.21
 6.250   25.08   22.43      0.899  |    OI |       |       |       |     2.22
 6.500   26.17   23.74      0.951  |    OI |       |       |       |     2.24
 6.750   28.01   25.12      1.006  |     O |       |       |       |     2.25
 7.000   29.09   26.53      1.063  |     OI|       |       |       |     2.27
 7.250   29.27   27.62      1.106  |     OI|       |       |       |     2.28
 7.500   30.94   28.64      1.147  |      O|       |       |       |     2.29
 7.750   33.69   30.15      1.207  |      OI       |       |       |     2.30
 8.000   36.62   32.20      1.289  |       OI      |       |       |     2.32
 8.250   42.50   35.22      1.410  |       O I     |       |       |     2.35
 8.500   45.80   38.89      1.557  |       |O I    |       |       |     2.39
 8.750   48.89   42.36      1.696  |       | O I   |       |       |     2.42
 9.000   53.05   45.90      1.837  |       |  O I  |       |       |     2.46
 9.250   59.84   50.23      2.010  |       |   O I |       |       |     2.50
 9.500   65.79   55.40      2.217  |       |    O  I       |       |     2.55
 9.750   70.45   60.62      2.426  |       |      O|I      |       |     2.61
10.000   74.85   65.56      2.623  |       |       O I     |       |     2.66
10.250   60.19   66.36      2.655  |       |     I O       |       |     2.66
10.500   49.84   61.70      2.469  |       |   I  O|       |       |     2.62
10.750   60.18   58.95      2.359  |       |     O |       |       |     2.59
11.000   68.13   61.09      2.444  |       |      OI       |       |     2.61
11.250   67.22   63.79      2.552  |       |      OI       |       |     2.64
11.500   65.88   64.93      2.598  |       |       O       |       |     2.65
11.750   61.07   64.33      2.574  |       |      IO       |       |     2.64
12.000   60.56   62.89      2.516  |       |      O|       |       |     2.63
12.250   78.47   65.61      2.625  |       |       O  I    |       |     2.66
12.500   92.13   73.70      2.948  |       |       | O   I |       |     2.74
12.750  100.41   82.97      3.319  |       |       |   O   I       |     2.83
13.000  106.33   91.35      3.654  |       |       |     O | I     |     2.91
13.250  120.48  100.86      4.011  |       |       |       |O   I  |     3.01
13.500  128.66  121.56      4.287  |       |       |       |     O I     3.29
13.750  103.91  116.95      4.226  |       |       |       |I   O  |     3.23
14.000   87.09   99.16      3.967  |       |       |    I  O       |     2.99
14.250   94.00   95.62      3.825  |       |       |      O|       |     2.96
14.500   97.99   95.78      3.831  |       |       |      OI       |     2.96
14.750   97.63   96.61      3.864  |       |       |       O       |     2.97
15.000   95.17   96.52      3.861  |       |       |      IO       |     2.97
15.250   91.41   95.20      3.808  |       |       |     IO|       |     2.95
15.500   87.40   92.82      3.713  |       |       |    I O|       |     2.93
15.750   76.24   88.30      3.532  |       |       | I  O  |       |     2.88
16.000   69.96   82.06      3.283  |       |       |I  O   |       |     2.82
16.250   36.37   70.19      2.808  |       |I      |O      |       |     2.70
16.500   15.18   51.95      2.079  |  I    |   O   |       |       |     2.52
16.750   10.04   35.80      1.433  | I     O       |       |       |     2.36
17.000    8.96   25.00      1.001  | I   O |       |       |       |     2.25
17.250   12.12   19.06      0.764  |  IO   |       |       |       |     2.19
17.500   14.28   16.65      0.668  |  IO   |       |       |       |     2.17
17.750   14.64   15.75      0.632  |  O    |       |       |       |     2.16
18.000   12.97   14.95      0.600  |  O    |       |       |       |     2.15
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18.250   11.89   13.91      0.558  | IO    |       |       |       |     2.14
18.500   11.71   13.05      0.524  | IO    |       |       |       |     2.13
18.750   10.04   12.15      0.488  | IO    |       |       |       |     2.12
19.000    7.29   10.72      0.431  |IO     |       |       |       |     2.11
19.250    7.70    9.40      0.378  |IO     |       |       |       |     2.09
19.500   10.27    9.23      0.371  | O     |       |       |       |     2.09
19.750    9.86    9.57      0.385  | O     |       |       |       |     2.10
20.000    7.29    9.16      0.368  |IO     |       |       |       |     2.09
20.250    7.70    8.48      0.341  |IO     |       |       |       |     2.08
20.500    8.60    8.34      0.336  | O     |       |       |       |     2.08
20.750    8.78    8.49      0.341  | O     |       |       |       |     2.08
21.000    7.11    8.27      0.332  |IO     |       |       |       |     2.08
21.250    7.70    7.91      0.318  |O      |       |       |       |     2.08
21.500    6.94    7.67      0.309  |O      |       |       |       |     2.08
21.750    7.70    7.52      0.303  |O      |       |       |       |     2.08
22.000    6.94    7.44      0.299  |O      |       |       |       |     2.07
22.250    7.70    7.39      0.297  |O      |       |       |       |     2.07
22.500    6.94    7.36      0.296  |O      |       |       |       |     2.07
22.750    6.03    7.00      0.282  |O      |       |       |       |     2.07
23.000    5.85    6.57      0.264  |O      |       |       |       |     2.07
23.250    5.85    6.27      0.253  |O      |       |       |       |     2.06
23.500    5.85    6.10      0.246  |O      |       |       |       |     2.06
23.750    5.85    6.00      0.242  |O      |       |       |       |     2.06
24.000    5.85    5.94      0.239  |O      |       |       |       |     2.06
24.250    2.52    5.22      0.211  IO     |       |       |       |     2.05
24.500    0.36    3.67      0.149  O      |       |       |       |     2.04
24.750    0.00    2.23      0.091  O      |       |       |       |     2.02
25.000    0.00    1.32      0.055  O      |       |       |       |     2.01
25.250    0.00    0.78      0.033  O      |       |       |       |     2.01
25.500    0.00    0.46      0.020  O      |       |       |       |     2.00
25.750    0.00    0.27      0.013  O      |       |       |       |     2.00
26.000    0.00    0.16      0.008  O      |       |       |       |     2.00
26.250    0.00    0.09      0.006  O      |       |       |       |     2.00
26.500    0.00    0.06      0.004  O      |       |       |       |     2.00
26.750    0.00    0.03      0.003  O      |       |       |       |     2.00
27.000    0.00    0.02      0.003  O      |       |       |       |     2.00
27.250    0.00    0.01      0.002  O      |       |       |       |     2.00
27.500    0.00    0.01      0.002  O      |       |       |       |     2.00
27.750    0.00    0.00      0.002  O      |       |       |       |     2.00
28.000    0.00    0.00      0.002  O      |       |       |       |     2.00
28.250    0.00    0.00      0.002  O      |       |       |       |     2.00
28.500    0.00    0.00      0.002  O      |       |       |       |     1.99

       Remaining water in basin =    0.00 (Ac.Ft)

       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   114
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      121.562 (CFS)
                      Total volume =      69.791 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ______________________________________________________________________
       Current stream hydrograph saved in file SubB2Bsn.rte
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
```

```
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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```

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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/27/12 File: OffsiteB124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Offsite B1
Proposed Condition
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      92.10(Ac.)  =      0.144 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      92.10(Ac.)  =      0.144 Sq. Mi.
Length along longest watercourse =    3800.00(Ft.)
Length along longest watercourse measured to centroid =    1780.00(Ft.)
Length along longest watercourse =      0.720 Mi.
Length along longest watercourse measured to centroid =      0.337 Mi.
Difference in elevation =     226.00(Ft.)
Slope along watercourse =    314.0211 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.141 Hr.
Lag time =     8.46 Min.
25% of lag time =     2.11 Min.
40% of lag time =     3.38 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           1.80                 165.78

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       92.10           4.50                 414.45

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.000           46.00         0.000
    28.000           66.00         0.000
```

3.500	77.00	0.000
41.600	83.00	0.000

Total Area Entered = 92.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.206	0.126
66.0	66.0	0.405	0.000	0.405	0.304	0.123
77.0	77.0	0.279	0.000	0.279	0.038	0.011
83.0	83.0	0.210	0.000	0.210	0.452	0.095
					Sum (F) =	0.355

Area averaged mean soil loss (F) (In/Hr) = 0.355
Minimum soil loss rate ((In/Hr)) = 0.177
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	177.319	37.414	34.727
2	0.500	354.637	52.090	48.350
3	0.750	531.956	8.760	8.131
4	1.000	709.274	1.737	1.612
			Sum = 100.000	Sum= 92.820

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.626)	0.032	0.004
2	0.50	0.30	0.054	(0.619)	0.049	0.005
3	0.75	0.30	0.054	(0.612)	0.049	0.005
4	1.00	0.40	0.072	(0.605)	0.065	0.007
5	1.25	0.30	0.054	(0.597)	0.049	0.005
6	1.50	0.30	0.054	(0.590)	0.049	0.005
7	1.75	0.30	0.054	(0.583)	0.049	0.005
8	2.00	0.40	0.072	(0.576)	0.065	0.007
9	2.25	0.40	0.072	(0.569)	0.065	0.007
10	2.50	0.40	0.072	(0.562)	0.065	0.007
11	2.75	0.50	0.090	(0.556)	0.081	0.009
12	3.00	0.50	0.090	(0.549)	0.081	0.009
13	3.25	0.50	0.090	(0.542)	0.081	0.009
14	3.50	0.50	0.090	(0.535)	0.081	0.009
15	3.75	0.50	0.090	(0.528)	0.081	0.009
16	4.00	0.60	0.108	(0.522)	0.097	0.011
17	4.25	0.60	0.108	(0.515)	0.097	0.011
18	4.50	0.70	0.126	(0.509)	0.113	0.013
19	4.75	0.70	0.126	(0.502)	0.113	0.013
20	5.00	0.80	0.144	(0.496)	0.130	0.014
21	5.25	0.60	0.108	(0.489)	0.097	0.011
22	5.50	0.70	0.126	(0.483)	0.113	0.013
23	5.75	0.80	0.144	(0.477)	0.130	0.014
24	6.00	0.80	0.144	(0.470)	0.130	0.014
25	6.25	0.90	0.162	(0.464)	0.146	0.016
26	6.50	0.90	0.162	(0.458)	0.146	0.016
27	6.75	1.00	0.180	(0.452)	0.162	0.018
28	7.00	1.00	0.180	(0.446)	0.162	0.018
29	7.25	1.00	0.180	(0.440)	0.162	0.018
30	7.50	1.10	0.198	(0.434)	0.178	0.020
31	7.75	1.20	0.216	(0.428)	0.194	0.022
32	8.00	1.30	0.234	(0.422)	0.211	0.023

33	8.25	1.50	0.270	(0.416)		0.243	0.027
34	8.50	1.50	0.270	(0.410)		0.243	0.027
35	8.75	1.60	0.288	(0.404)		0.259	0.029
36	9.00	1.70	0.306	(0.399)		0.275	0.031
37	9.25	1.90	0.342	(0.393)		0.308	0.034
38	9.50	2.00	0.360	(0.387)		0.324	0.036
39	9.75	2.10	0.378	(0.382)		0.340	0.038
40	10.00	2.20	0.396	(0.376)		0.356	0.040
41	10.25	1.50	0.270	(0.371)		0.243	0.027
42	10.50	1.50	0.270	(0.366)		0.243	0.027
43	10.75	2.00	0.360	(0.360)		0.324	0.036
44	11.00	2.00	0.360	(0.355)		0.324	0.036
45	11.25	1.90	0.342	(0.350)		0.308	0.034
46	11.50	1.90	0.342	(0.345)		0.308	0.034
47	11.75	1.70	0.306	(0.339)		0.275	0.031
48	12.00	1.80	0.324	(0.334)		0.292	0.032
49	12.25	2.50	0.450	0.329	(	0.405)	0.121
50	12.50	2.60	0.468	0.324	(	0.421)	0.143
51	12.75	2.80	0.504	0.320	(	0.454)	0.184
52	13.00	2.90	0.522	0.315	(	0.470)	0.207
53	13.25	3.40	0.612	0.310	(	0.551)	0.302
54	13.50	3.40	0.612	0.305	(	0.551)	0.307
55	13.75	2.30	0.414	0.301	(	0.373)	0.113
56	14.00	2.30	0.414	0.296	(	0.373)	0.118
57	14.25	2.70	0.486	0.292	(	0.437)	0.194
58	14.50	2.60	0.468	0.287	(	0.421)	0.181
59	14.75	2.60	0.468	0.283	(	0.421)	0.185
60	15.00	2.50	0.450	0.278	(	0.405)	0.171
61	15.25	2.40	0.432	0.274	(	0.389)	0.158
62	15.50	2.30	0.414	0.270	(	0.373)	0.144
63	15.75	1.90	0.342	0.266	(	0.308)	0.076
64	16.00	1.90	0.342	0.262	(	0.308)	0.080
65	16.25	0.40	0.072	(0.258)		0.065	0.007
66	16.50	0.40	0.072	(0.254)		0.065	0.007
67	16.75	0.30	0.054	(0.250)		0.049	0.005
68	17.00	0.30	0.054	(0.246)		0.049	0.005
69	17.25	0.50	0.090	(0.243)		0.081	0.009
70	17.50	0.50	0.090	(0.239)		0.081	0.009
71	17.75	0.50	0.090	(0.235)		0.081	0.009
72	18.00	0.40	0.072	(0.232)		0.065	0.007
73	18.25	0.40	0.072	(0.228)		0.065	0.007
74	18.50	0.40	0.072	(0.225)		0.065	0.007
75	18.75	0.30	0.054	(0.222)		0.049	0.005
76	19.00	0.20	0.036	(0.219)		0.032	0.004
77	19.25	0.30	0.054	(0.216)		0.049	0.005
78	19.50	0.40	0.072	(0.213)		0.065	0.007
79	19.75	0.30	0.054	(0.210)		0.049	0.005
80	20.00	0.20	0.036	(0.207)		0.032	0.004
81	20.25	0.30	0.054	(0.204)		0.049	0.005
82	20.50	0.30	0.054	(0.202)		0.049	0.005
83	20.75	0.30	0.054	(0.199)		0.049	0.005
84	21.00	0.20	0.036	(0.197)		0.032	0.004
85	21.25	0.30	0.054	(0.194)		0.049	0.005
86	21.50	0.20	0.036	(0.192)		0.032	0.004
87	21.75	0.30	0.054	(0.190)		0.049	0.005
88	22.00	0.20	0.036	(0.188)		0.032	0.004
89	22.25	0.30	0.054	(0.186)		0.049	0.005
90	22.50	0.20	0.036	(0.184)		0.032	0.004
91	22.75	0.20	0.036	(0.183)		0.032	0.004
92	23.00	0.20	0.036	(0.181)		0.032	0.004
93	23.25	0.20	0.036	(0.180)		0.032	0.004
94	23.50	0.20	0.036	(0.179)		0.032	0.004
95	23.75	0.20	0.036	(0.178)		0.032	0.004
96	24.00	0.20	0.036	(0.177)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.7

Flood volume = Effective rainfall 0.94(In)
times area 92.1(Ac.)/[(In)/(Ft.)] = 7.2(Ac.Ft)
Total soil loss = 3.56(In)
Total soil loss = 27.346(Ac.Ft)
Total rainfall = 4.50(In)

```
Flood volume =      312975.8 Cubic Feet
Total soil loss =     1191207.0 Cubic Feet
-----------------------------------------------------------------------
 Peak flow rate of this hydrograph =     27.237(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-----------------------------------------------------------------------
  0+15       0.0026      0.13  Q         |         |         |         |
  0+30       0.0101      0.36  Q         |         |         |         |
  0+45       0.0199      0.48  Q         |         |         |         |
  1+ 0       0.0315      0.56  Q         |         |         |         |
  1+15       0.0437      0.59  Q         |         |         |         |
  1+30       0.0543      0.52  Q         |         |         |         |
  1+45       0.0648      0.50  Q         |         |         |         |
  2+ 0       0.0764      0.56  Q         |         |         |         |
  2+15       0.0899      0.65  Q         |         |         |         |
  2+30       0.1036      0.67  Q         |         |         |         |
  2+45       0.1187      0.73  Q         |         |         |         |
  3+ 0       0.1356      0.82  VQ        |         |         |         |
  3+15       0.1528      0.83  VQ        |         |         |         |
  3+30       0.1701      0.84  VQ        |         |         |         |
  3+45       0.1874      0.84   Q        |         |         |         |
  4+ 0       0.2059      0.90  |Q        |         |         |         |
  4+15       0.2263      0.99  |Q        |         |         |         |
  4+30       0.2482      1.06  |Q        |         |         |         |
  4+45       0.2720      1.15  |Q        |         |         |         |
  5+ 0       0.2974      1.23  |Q        |         |         |         |
  5+15       0.3221      1.19  |Q        |         |         |         |
  5+30       0.3448      1.10  |Q        |         |         |         |
  5+45       0.3700      1.22  |QV       |         |         |         |
  6+ 0       0.3972      1.32  |QV       |         |         |         |
  6+15       0.4261      1.40  |QV       |         |         |         |
  6+30       0.4568      1.49  |QV       |         |         |         |
  6+45       0.4891      1.56  | Q       |         |         |         |
  7+ 0       0.5233      1.65  | Q       |         |         |         |
  7+15       0.5577      1.67  | QV      |         |         |         |
  7+30       0.5936      1.73  | QV      |         |         |         |
  7+45       0.6325      1.88  | QV      |         |         |         |
  8+ 0       0.6748      2.05  | QV      |         |         |         |
  8+15       0.7218      2.28  |  QV     |         |         |         |
  8+30       0.7729      2.47  |  QV     |         |         |         |
  8+45       0.8258      2.56  |  QV     |         |         |         |
  9+ 0       0.8820      2.72  |  QV     |         |         |         |
  9+15       0.9429      2.95  |  Q V    |         |         |         |
  9+30       1.0090      3.20  |   QV    |         |         |         |
  9+45       1.0789      3.38  |   Q V   |         |         |         |
 10+ 0       1.1522      3.55  |   Q V   |         |         |         |
 10+15       1.2187      3.22  |   Q V   |         |         |         |
 10+30       1.2730      2.63  |  Q   V  |         |         |         |
 10+45       1.3317      2.84  |  Q   V  |         |         |         |
 11+ 0       1.3989      3.25  |   Q  V  |         |         |         |
 11+15       1.4664      3.27  |   Q   V |         |         |         |
 11+30       1.5324      3.19  |   Q   V |         |         |         |
 11+45       1.5955      3.05  |   Q   V |         |         |         |
 12+ 0       1.6562      2.94  |  Q     V|         |         |         |
 12+15       1.7814      6.06  |       QV|         |         |         |
 12+30       2.0112     11.13  |          V  Q     |         |         |
 12+45       2.3083     14.38  |         | V      Q|         |         |
 13+ 0       2.6693     17.47  |         |   V     |  Q      |         |
 13+15       3.1288     22.24  |         |      V  |         Q|         |
 13+30       3.6915     27.24  |         |         V         |     Q   |
 13+45       4.1368     21.55  |         |         |  V    Q |         |
 14+ 0       4.3962     12.55  |         |     Q   |   V     |         |
 14+15       4.6827     13.87  |         |       Q |     V   |         |
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```
   14+30       5.0302     16.82  |         |         | Q     V |         |
   14+45       5.3804     16.95  |         |         | Q      V|         |
   15+ 0       5.7255     16.70  |         |         | Q        V        |
   15+15       6.0473     15.57  |         |         Q         |  V      |
   15+30       6.3433     14.33  |         |        Q|         |    V    |
   15+45       6.5740     11.17  |         |   Q     |         |     V   |
   16+ 0       6.7371      7.89  |         Q         |         |      V  |
   16+15       6.8399      4.98  |     Q   |         |         |       V |
   16+30       6.8683      1.37  |Q        |         |         |       V |
   16+45       6.8832      0.72  Q         |         |         |       V |
   17+ 0       6.8940      0.52  Q         |         |         |       V |
   17+15       6.9070      0.63  Q         |         |         |       V |
   17+30       6.9235      0.80  |Q        |         |         |       V |
   17+45       6.9407      0.83  |Q        |         |         |       V |
   18+ 0       6.9566      0.77  |Q        |         |         |       V |
   18+15       6.9708      0.69  Q         |         |         |       V |
   18+30       6.9847      0.67  Q         |         |         |       V |
   18+45       6.9972      0.61  Q         |         |         |       V |
   19+ 0       7.0066      0.46  Q         |         |         |        V|
   19+15       7.0153      0.42  Q         |         |         |        V|
   19+30       7.0266      0.55  Q         |         |         |        V|
   19+45       7.0387      0.59  Q         |         |         |        V|
   20+ 0       7.0481      0.45  Q         |         |         |        V|
   20+15       7.0567      0.42  Q         |         |         |        V|
   20+30       7.0667      0.49  Q         |         |         |        V|
   20+45       7.0770      0.50  Q         |         |         |        V|
   21+ 0       7.0861      0.44  Q         |         |         |        V|
   21+15       7.0947      0.41  Q         |         |         |        V|
   21+30       7.1034      0.42  Q         |         |         |        V|
   21+45       7.1119      0.41  Q         |         |         |        V|
   22+ 0       7.1207      0.42  Q         |         |         |        V|
   22+15       7.1292      0.41  Q         |         |         |        V|
   22+30       7.1380      0.42  Q         |         |         |        V|
   22+45       7.1452      0.35  Q         |         |         |        V|
   23+ 0       7.1521      0.34  Q         |         |         |        V|
   23+15       7.1591      0.33  Q         |         |         |        V|
   23+30       7.1660      0.33  Q         |         |         |        V|
   23+45       7.1729      0.33  Q         |         |         |        V|
   24+ 0       7.1798      0.33  Q         |         |         |        V|
   24+15       7.1841      0.21  Q         |         |         |        V|
   24+30       7.1848      0.04  Q         |         |         |        V|
   24+45       7.1849      0.01  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/30/12 File: SubB124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B Onsite b1
Proposed Condition
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =     291.43(Ac.)  =      0.455 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     291.43(Ac.)  =      0.455 Sq. Mi.
Length along longest watercourse =    3500.00(Ft.)
Length along longest watercourse measured to centroid =    1700.00(Ft.)
Length along longest watercourse =      0.663 Mi.
Length along longest watercourse measured to centroid =      0.322 Mi.
Difference in elevation =      70.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.083 Hr.
Lag time =     4.96 Min.
25% of lag time =     1.24 Min.
40% of lag time =     1.98 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      291.43           1.80                 524.57

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      291.43           4.50                1311.43

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    4.497(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   291.430           85.00         0.750
 Total Area Entered =    291.43(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	302.705	56.956	167.284
2	0.500	605.409	36.980	108.612
3	0.750	908.114	6.064	17.810
		Sum = 100.000	Sum=	293.707

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.274
38	9.50	2.00	0.360	0.066	(0.108)	0.293
39	9.75	2.10	0.378	0.065	(0.113)	0.312

40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.183)	0.559
54	13.50	3.40	0.612	0.052	(	0.183)	0.559
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 291.4(Ac.)/[(In)/(Ft.)] = 88.2(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 20.994(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 3843285.8 Cubic Feet
Total soil loss = 914513.6 Cubic Feet

Peak flow rate of this hydrograph = 162.645(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+15	0.0871	4.22	Q	|	|	|	|
0+30	0.2743	9.06	VQ	|	|	|	|
0+45	0.4990	10.88	V Q	|	|	|	|
1+ 0	0.7719	13.21	V Q	|	|	|	|
1+15	1.0296	12.47	V Q	|	|	|	|
1+30	1.2636	11.33	V Q	|	|	|	|
1+45	1.4930	11.10	V Q	|	|	|	|
2+ 0	1.7659	13.21	V Q	|	|	|	|
2+15	2.0671	14.58	V Q	|	|	|	|
2+30	2.3729	14.80	VQ	|	|	|	|
2+45	2.7223	16.91	|V Q	|	|	|	|
3+ 0	3.0999	18.28	|V Q	|	|	|	|
3+15	3.4822	18.50	|V Q	|	|	|	|
3+30	3.8645	18.50	|V Q	|	|	|	|
3+45	4.2468	18.50	|V Q	|	|	|	|
4+ 0	4.6726	20.61	| V Q	|	|	|	|
4+15	5.1267	21.98	| V Q	|	|	|	|
4+30	5.6290	24.31	| V Q	|	|	|	|
4+45	6.1595	25.68	| V Q	|	|	|	|
5+ 0	6.7383	28.01	| V Q	|	|	|	|
5+15	7.2582	25.16	| V Q	|	|	|	|
5+30	7.7698	24.76	| VQ	|	|	|	|
5+45	8.3439	27.79	| V Q	|	|	|	|
6+ 0	8.9509	29.38	| VQ	|	|	|	|
6+15	9.6061	31.71	| V Q	|	|	|	|
6+30	10.2896	33.08	| V Q	|	|	|	|
6+45	11.0212	35.41	| V Q	|	|	|	|
7+ 0	11.7812	36.78	| V Q	|	|	|	|
7+15	12.5457	37.01	| V Q	|	|	|	|
7+30	13.3539	39.11	| VQ	|	|	|	|
7+45	14.2338	42.59	| V Q	|	|	|	|
8+ 0	15.1902	46.29	| V Q|	|	|	|	|
8+15	16.3001	53.72	| V Q	|	|	|	|
8+30	17.4964	57.90	| V |Q	|	|	|	|
8+45	18.7734	61.81	| V | Q	|	|	|	|
9+ 0	20.1590	67.06	| V| Q	|	|	|	|
9+15	21.7219	75.64	| V| Q	|	|	|	|
9+30	23.4402	83.17	| V Q	|	|	|	|
9+45	25.2802	89.06	| V Q	|	|	|	|
10+ 0	27.2351	94.62	| | V Q	|	|	|	|
10+15	28.8073	76.09	| | V Q	|	|	|	|
10+30	30.1090	63.00	| |QV	|	|	|	|
10+45	31.6809	76.08	| | VQ	|	|	|	|
11+ 0	33.4603	86.12	| | V Q	|	|	|	|
11+15	35.2160	84.98	| | VQ	|	|	|	|
11+30	36.9368	83.28	| | Q	|	|	|	|
11+45	38.5319	77.20	| | Q V	|	|	|	|
12+ 0	40.1136	76.56	| | Q V	|	|	|	|
12+15	42.1632	99.20	| | Q|	|	|	|	|
12+30	44.5696	116.47	| | V Q	|	|	|	|
12+45	47.1922	126.93	| | V Q	|	|	|	|
13+ 0	49.9694	134.42	| | | V Q	|	|	|	|
13+15	53.1164	152.31	| | | V Q	|	|	|	|
13+30	56.4768	162.64	| | | V Q	|	|	|	|
13+45	59.1909	131.36	| | | V Q	|	|	|	|
14+ 0	61.4655	110.09	| | | Q V	|	|	|	|
14+15	63.9208	118.84	| | | Q V	|	|	|	|
14+30	66.4801	123.87	| | | Q V	|	|	|	|
14+45	69.0301	123.42	| | | Q V	|	|	|	|
15+ 0	71.5158	120.31	| | | Q | V	|	|	|	|
15+15	73.9034	115.56	| | | Q | V	|	|	|	|
15+30	76.1862	110.49	| | | Q | V	|	|	|	|
15+45	78.1774	96.38	| | Q| | V	|	|	|	|
16+ 0	80.0047	88.44	| | Q | V	|	|	|	|

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   16+15      80.9547     45.98  |        Q|         |         |     V   |
   16+30      81.3513     19.20  |  Q      |         |         |     V   |
   16+45      81.6136     12.69  | Q       |         |         |      V  |
   17+ 0      81.8476     11.33  | Q       |         |         |      V  |
   17+15      82.1641     15.32  |  Q      |         |         |      V  |
   17+30      82.5371     18.05  |  Q      |         |         |      V  |
   17+45      82.9194     18.50  |  Q      |         |         |      V  |
   18+ 0      83.2581     16.39  |  Q      |         |         |      V  |
   18+15      83.5686     15.03  |  Q      |         |         |      V  |
   18+30      83.8744     14.80  | Q       |         |         |       V |
   18+45      84.1367     12.69  | Q       |         |         |       V |
   19+ 0      84.3271      9.22  |Q        |         |         |       V |
   19+15      84.5282      9.73  |Q        |         |         |       V |
   19+30      84.7965     12.98  | Q       |         |         |       V |
   19+45      85.0542     12.47  | Q       |         |         |       V |
   20+ 0      85.2446      9.22  |Q        |         |         |       V |
   20+15      85.4457      9.73  |Q        |         |         |       V |
   20+30      85.6704     10.88  | Q       |         |         |       V |
   20+45      85.8998     11.10  | Q       |         |         |       V |
   21+ 0      86.0856      8.99  |Q        |         |         |        V|
   21+15      86.2867      9.73  |Q        |         |         |        V|
   21+30      86.4679      8.77  |Q        |         |         |        V|
   21+45      86.6690      9.73  |Q        |         |         |        V|
   22+ 0      86.8502      8.77  |Q        |         |         |        V|
   22+15      87.0513      9.73  |Q        |         |         |        V|
   22+30      87.2325      8.77  |Q        |         |         |        V|
   22+45      87.3900      7.63  |Q        |         |         |        V|
   23+ 0      87.5430      7.40  |Q        |         |         |        V|
   23+15      87.6959      7.40  |Q        |         |         |        V|
   23+30      87.8488      7.40  |Q        |         |         |        V|
   23+45      88.0017      7.40  |Q        |         |         |        V|
   24+ 0      88.1546      7.40  |Q        |         |         |        V|
   24+15      88.2204      3.19  Q         |         |         |        V|
   24+30      88.2297      0.45  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/30/12 File: SubB224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed B, Onsite B2
Proposed Condition
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =     230.50(Ac.)  =      0.360 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     230.50(Ac.)  =      0.360 Sq. Mi.
Length along longest watercourse =    3500.00(Ft.)
Length along longest watercourse measured to centroid =    1700.00(Ft.)
Length along longest watercourse =      0.663 Mi.
Length along longest watercourse measured to centroid =      0.322 Mi.
Difference in elevation =      70.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.083 Hr.
Lag time =     4.96 Min.
25% of lag time =     1.24 Min.
40% of lag time =     1.98 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      230.50           1.80                414.90

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      230.50           4.50               1037.25

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    4.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   230.500           85.00         0.750
 Total Area Entered =    230.50(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	302.705	56.956	132.309
2	0.500	605.409	36.980	85.905
3	0.750	908.114	6.064	14.087
		Sum = 100.000	Sum=	232.301

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.293
39	9.75	2.10	0.378	0.065	(0.113)	0.312

40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.559
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
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62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 230.5(Ac.)/[(In)/(Ft.)] = 69.8(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 16.606(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 3040168.0 Cubic Feet
Total soil loss = 723354.4 Cubic Feet

Peak flow rate of this hydrograph = 128.657(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+15	0.0689	3.33	Q				
0+30	0.2170	7.17	VQ				
0+45	0.3947	8.60	VQ				
1+ 0	0.6106	10.45	V Q				
1+15	0.8144	9.86	VQ				
1+30	0.9995	8.96	VQ				
1+45	1.1810	8.78	VQ				
2+ 0	1.3968	10.45	V Q				
2+15	1.6351	11.53	V Q				
2+30	1.8770	11.71	VQ				
2+45	2.1534	13.38	VQ				
3+ 0	2.4521	14.46	VQ				
3+15	2.7545	14.64	VQ				
3+30	3.0569	14.64	VQ				
3+45	3.3593	14.64	VQ				
4+ 0	3.6961	16.30	VQ				
4+15	4.0553	17.39	VQ				
4+30	4.4527	19.23	VQ				
4+45	4.8723	20.31	V Q				
5+ 0	5.3301	22.16	VQ				
5+15	5.7414	19.91	Q				
5+30	6.1461	19.59	Q				
5+45	6.6002	21.98	VQ				
6+ 0	7.0804	23.24	Q				
6+15	7.5986	25.08	VQ				
6+30	8.1393	26.17	VQ				
6+45	8.7180	28.01	VQ				
7+ 0	9.3192	29.09	Q				
7+15	9.9240	29.27	Q				
7+30	10.5632	30.94	Q				
7+45	11.2592	33.69	Q				
8+ 0	12.0158	36.62	VQ				
8+15	12.8938	42.50	VQ				
8+30	13.8401	45.80	V Q				
8+45	14.8503	48.89	VQ				
9+ 0	15.9463	53.05	VQ				
9+15	17.1826	59.84	V Q				
9+30	18.5419	65.79	V Q				
9+45	19.9974	70.45	V Q				
10+ 0	21.5439	74.85	V Q				
10+15	22.7875	60.19	QV				
10+30	23.8172	49.84	Q V				
10+45	25.0607	60.18	Q V				
11+ 0	26.4682	68.13	Q V				
11+15	27.8571	67.22	Q V				
11+30	29.2183	65.88	Q V				
11+45	30.4801	61.07	Q V				
12+ 0	31.7313	60.56	Q V				
12+15	33.3526	78.47	Q V				
12+30	35.2561	92.13	Q V				
12+45	37.3307	100.41	QV				
13+ 0	39.5276	106.33	QV				
13+15	42.0169	120.48	Q				
13+30	44.6751	128.66	Q				
13+45	46.8221	103.91	Q V				
14+ 0	48.6214	87.09	Q V				
14+15	50.5636	94.00	Q V				
14+30	52.5881	97.99	Q V				
14+45	54.6052	97.63	Q V				
15+ 0	56.5715	95.17	Q V				
15+15	58.4602	91.41	Q V				
15+30	60.2659	87.40	Q V				
15+45	61.8411	76.24	Q V				
16+ 0	63.2865	69.96	Q V				

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   16+15      64.0380     36.37  |      Q  |         |         |     V   |
   16+30      64.3517     15.18  |  Q      |         |         |     V   |
   16+45      64.5592     10.04  | Q       |         |         |      V  |
   17+ 0      64.7443      8.96  |Q        |         |         |      V  |
   17+15      64.9946     12.12  | Q       |         |         |      V  |
   17+30      65.2897     14.28  | Q       |         |         |      V  |
   17+45      65.5921     14.64  | Q       |         |         |      V  |
   18+ 0      65.8600     12.97  | Q       |         |         |      V  |
   18+15      66.1056     11.89  | Q       |         |         |      V  |
   18+30      66.3475     11.71  | Q       |         |         |       V |
   18+45      66.5550     10.04  | Q       |         |         |       V |
   19+ 0      66.7056      7.29  |Q        |         |         |       V |
   19+15      66.8647      7.70  |Q        |         |         |       V |
   19+30      67.0769     10.27  | Q       |         |         |       V |
   19+45      67.2807      9.86  |Q        |         |         |       V |
   20+ 0      67.4314      7.29  |Q        |         |         |       V |
   20+15      67.5905      7.70  |Q        |         |         |       V |
   20+30      67.7682      8.60  |Q        |         |         |       V |
   20+45      67.9497      8.78  |Q        |         |         |       V |
   21+ 0      68.0967      7.11  |Q        |         |         |        V|
   21+15      68.2557      7.70  |Q        |         |         |        V|
   21+30      68.3990      6.94  |Q        |         |         |        V|
   21+45      68.5581      7.70  |Q        |         |         |        V|
   22+ 0      68.7014      6.94  |Q        |         |         |        V|
   22+15      68.8605      7.70  |Q        |         |         |        V|
   22+30      69.0038      6.94  |Q        |         |         |        V|
   22+45      69.1285      6.03  |Q        |         |         |        V|
   23+ 0      69.2494      5.85  |Q        |         |         |        V|
   23+15      69.3704      5.85  |Q        |         |         |        V|
   23+30      69.4913      5.85  |Q        |         |         |        V|
   23+45      69.6123      5.85  |Q        |         |         |        V|
   24+ 0      69.7333      5.85  |Q        |         |         |        V|
   24+15      69.7853      2.52  Q         |         |         |        V|
   24+30      69.7927      0.36  Q         |         |         |         V
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/07/12 File: SUBB324100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed B, Onsite B3
Proposed Condition
100 Yr., 24 Hr.

--------------------------------------------------------------------
Drainage Area =     550.80(Ac.)  =      0.861 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     550.80(Ac.)  =      0.861 Sq. Mi.
Length along longest watercourse =   10000.00(Ft.)
Length along longest watercourse measured to centroid =    5000.00(Ft.)
Length along longest watercourse =      1.894 Mi.
Length along longest watercourse measured to centroid =      0.947 Mi.
Difference in elevation =     200.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.185 Hr.
Lag time =    11.13 Min.
25% of lag time =     2.78 Min.
40% of lag time =     4.45 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      550.80           1.80                 991.44

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      550.80           4.50                2478.60

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.89 %
Adjusted average point rain =    4.495(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   550.800           85.00         0.750
 Total Area Entered =    550.80(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	134.811	29.318	162.748
2	0.500	269.623	48.027	266.597
3	0.750	404.434	12.157	67.485
4	1.000	539.246	5.392	29.930
5	1.250	674.057	2.934	16.286
6	1.500	808.869	2.172	12.056
			Sum = 100.000	Sum= 555.103

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.138
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.198
34	8.50	1.50	0.270	0.070	(0.081)	0.199
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37	9.25	1.90	0.342	0.067	(	0.102)	0.274
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49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.467	0.056	(	0.140)	0.412
51	12.75	2.80	0.503	0.055	(	0.151)	0.449
52	13.00	2.90	0.521	0.054	(	0.156)	0.467
53	13.25	3.40	0.611	0.053	(	0.183)	0.558
54	13.50	3.40	0.611	0.052	(	0.183)	0.559
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.485	0.050	(	0.146)	0.436
58	14.50	2.60	0.467	0.049	(	0.140)	0.418
59	14.75	2.60	0.467	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.129)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.367
63	15.75	1.90	0.342	0.046	(	0.102)	0.296
64	16.00	1.90	0.342	0.045	(	0.102)	0.297
65	16.25	0.40	0.072	(	0.044)	0.022	0.050
66	16.50	0.40	0.072	(	0.044)	0.022	0.050
67	16.75	0.30	0.054	(	0.043)	0.016	0.038
68	17.00	0.30	0.054	(	0.042)	0.016	0.038
69	17.25	0.50	0.090	(	0.042)	0.027	0.063
70	17.50	0.50	0.090	(	0.041)	0.027	0.063
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73	18.25	0.40	0.072	(	0.039)	0.022	0.050
74	18.50	0.40	0.072	(	0.039)	0.022	0.050
75	18.75	0.30	0.054	(	0.038)	0.016	0.038
76	19.00	0.20	0.036	(	0.037)	0.011	0.025
77	19.25	0.30	0.054	(	0.037)	0.016	0.038
78	19.50	0.40	0.072	(	0.036)	0.022	0.050
79	19.75	0.30	0.054	(	0.036)	0.016	0.038
80	20.00	0.20	0.036	(	0.035)	0.011	0.025
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83	20.75	0.30	0.054	(	0.034)	0.016	0.038
84	21.00	0.20	0.036	(	0.034)	0.011	0.025
85	21.25	0.30	0.054	(	0.033)	0.016	0.038
86	21.50	0.20	0.036	(	0.033)	0.011	0.025
87	21.75	0.30	0.054	(	0.033)	0.016	0.038
88	22.00	0.20	0.036	(	0.032)	0.011	0.025
89	22.25	0.30	0.054	(	0.032)	0.016	0.038
90	22.50	0.20	0.036	(	0.032)	0.011	0.025
91	22.75	0.20	0.036	(	0.031)	0.011	0.025
92	23.00	0.20	0.036	(	0.031)	0.011	0.025
93	23.25	0.20	0.036	(	0.031)	0.011	0.025
94	23.50	0.20	0.036	(	0.031)	0.011	0.025
95	23.75	0.20	0.036	(	0.031)	0.011	0.025
96	24.00	0.20	0.036	(	0.030)	0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 550.8(Ac.)/[(In)/(Ft.)] = 166.7(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 39.670(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 7259628.2 Cubic Feet
Total soil loss = 1728010.6 Cubic Feet

Peak flow rate of this hydrograph = 296.377(CFS)

```
      ----------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

      ----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
-----------------------------------------------------------------------
  0+15       0.0847      4.10  Q         |         |         |         |
  0+30       0.3505     12.86  VQ        |         |         |         |
  0+45       0.7207     17.92  V Q       |         |         |         |
  1+ 0       1.1664     21.57  V Q       |         |         |         |
  1+15       1.6554     23.67  V  Q      |         |         |         |
  1+30       2.1031     21.67  V Q       |         |         |         |
  1+45       2.5442     21.35  V Q       |         |         |         |
  2+ 0       3.0241     23.23  V  Q      |         |         |         |
  2+15       3.5722     26.53  V  Q      |         |         |         |
  2+30       4.1348     27.23  V  Q      |         |         |         |
  2+45       4.7475     29.65  |V Q      |         |         |         |
  3+ 0       5.4337     33.22  |V  Q     |         |         |         |
  3+15       6.1407     34.22  |V  Q     |         |         |         |
  3+30       6.8555     34.60  |V  Q     |         |         |         |
  3+45       7.5745     34.80  |V  Q     |         |         |         |
  4+ 0       8.3390     37.00  | V Q     |         |         |         |
  4+15       9.1729     40.36  | V  Q    |         |         |         |
  4+30      10.0666     43.26  | V  Q    |         |         |         |
  4+45      11.0375     46.99  | V   Q   |         |         |         |
  5+ 0      12.0726     50.10  | V   Q   |         |         |         |
  5+15      13.1032     49.88  |  V  Q   |         |         |         |
  5+30      14.0593     46.27  |  V  Q   |         |         |         |
  5+45      15.1029     50.51  |  V  Q   |         |         |         |
  6+ 0      16.2220     54.17  |  V   Q  |         |         |         |
  6+15      17.4036     57.19  |   V  Q  |         |         |         |
  6+30      18.6602     60.82  |   V   Q |         |         |         |
  6+45      19.9841     64.08  |   V   Q |         |         |         |
  7+ 0      21.3883     67.96  |    V   Q|         |         |         |
  7+15      22.8143     69.02  |    V   Q|         |         |         |
  7+30      24.2936     71.60  |    V   Q|         |         |         |
  7+45      25.8888     77.21  |     V   Q         |         |         |
  8+ 0      27.6164     83.62  |     V   |Q        |         |         |
  8+15      29.5559     93.87  |      V  | Q       |         |         |
  8+30      31.7203    104.76  |      V  |  Q      |         |         |
  8+45      34.0176    111.19  |       V |   Q     |         |         |
  9+ 0      36.5136    120.81  |       V |     Q   |         |         |
  9+15      39.2803    133.91  |        V|      Q  |         |         |
  9+30      42.3613    149.12  |         V        Q|         |         |
  9+45      45.6803    160.64  |         V         |Q        |         |
 10+ 0      49.2277    171.69  |         |V        | Q       |         |
 10+15      52.5142    159.07  |         | V       |Q        |         |
 10+30      55.1691    128.50  |         |  V   Q  |         |         |
 10+45      57.9831    136.20  |         |  V    Q |         |         |
 11+ 0      61.2357    157.43  |         |   V     Q         |         |
 11+15      64.5257    159.24  |         |    V    |Q        |         |
 11+30      67.7511    156.11  |         |     V   Q         |         |
 11+45      70.8709    151.00  |         |      V  Q         |         |
 12+ 0      73.8743    145.37  |         |      V Q|         |         |
 12+15      77.3540    168.42  |         |       V | Q       |         |
 12+30      81.5960    205.31  |         |        V|      Q  |         |
 12+45      86.2424    224.89  |         |         V        Q|         |
 13+ 0      91.2571    242.71  |         |         |V        | Q       |
 13+15      96.7910    267.84  |         |         |  V      |    Q    |
 13+30     102.9145    296.38  |         |         |   V     |        Q|
 13+45     108.5350    272.03  |         |         |     V   |     Q   |
 14+ 0     113.1452    223.13  |         |         |      V Q|         |
 14+15     117.7652    223.61  |         |         |       VQ|         |
 14+30     122.6300    235.46  |         |         |        V|Q        |
 14+45     127.4383    232.72  |         |         |         VQ        |
 15+ 0     132.1648    228.76  |         |         |         QV        |
 15+15     136.7533    222.09  |         |         |        Q| V       |
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   15+30     141.1775    214.13  |         |         |       Q |  V      |
   15+45     145.2281    196.05  |         |         |     Q   |   V     |
   16+ 0     148.8483    175.22  |         |         |  Q      |    V    |
   16+15     151.5231    129.46  |         |      Q  |         |     V   |
   16+30     152.7866     61.15  |       Q |         |         |     V   |
   16+45     153.6362     41.12  |    Q    |         |         |     V   |
   17+ 0     154.2464     29.53  |  Q      |         |         |      V  |
   17+15     154.8409     28.78  |  Q      |         |         |      V  |
   17+30     155.5050     32.14  |   Q     |         |         |      V  |
   17+45     156.2000     33.64  |   Q     |         |         |      V  |
   18+ 0     156.8650     32.19  |   Q     |         |         |      V  |
   18+15     157.4692     29.24  |  Q      |         |         |      V  |
   18+30     158.0621     28.70  |  Q      |         |         |      V  |
   18+45     158.6048     26.27  |  Q      |         |         |       V |
   19+ 0     159.0316     20.66  | Q       |         |         |       V |
   19+15     159.4107     18.35  | Q       |         |         |       V |
   19+30     159.8762     22.53  |  Q      |         |         |       V |
   19+45     160.3742     24.10  |  Q      |         |         |       V |
   20+ 0     160.7784     19.57  | Q       |         |         |       V |
   20+15     161.1470     17.84  | Q       |         |         |       V |
   20+30     161.5670     20.33  | Q       |         |         |       V |
   20+45     161.9956     20.75  | Q       |         |         |       V |
   21+ 0     162.3823     18.72  | Q       |         |         |       V |
   21+15     162.7431     17.46  | Q       |         |         |        V|
   21+30     163.1165     18.07  | Q       |         |         |        V|
   21+45     163.4726     17.24  | Q       |         |         |        V|
   22+ 0     163.8418     17.87  | Q       |         |         |        V|
   22+15     164.1948     17.09  | Q       |         |         |        V|
   22+30     164.5639     17.87  | Q       |         |         |        V|
   22+45     164.8746     15.04  | Q       |         |         |        V|
   23+ 0     165.1744     14.51  |Q        |         |         |        V|
   23+15     165.4675     14.19  |Q        |         |         |        V|
   23+30     165.7595     14.13  |Q        |         |         |        V|
   23+45     166.0483     13.98  |Q        |         |         |        V|
   24+ 0     166.3372     13.98  |Q        |         |         |        V|
   24+15     166.5413      9.88  |Q        |         |         |        V|
   24+30     166.6068      3.17  Q         |         |         |        V|
   24+45     166.6371      1.47  Q         |         |         |        V|
   25+ 0     166.6519      0.71  Q         |         |         |        V|
   25+15     166.6581      0.30  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                          Study date: 05/04/12

     ---------------------------------------------------------------------


     Line C Routed Through Basins
     Proposed Condition
     100 Yr. 24 Hr.

     ---------------------------------------------------------------------


     Program License Serial Number 6097

     ---------------------------------------------------------------------
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: SUBC124100.rte
     ****************************HYDROGRAPH DATA****************************
                   Number of intervals =    98
                   Time interval =   15.0 (Min.)
                   Maximum/Peak flow rate =       63.005 (CFS)
                   Total volume =      34.195 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     **********************************************************************



     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station        1.000 to Point/Station        2.000
     **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
     ______________________________________________________________________
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: CoffsiteRT1.rte
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

     ---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       70.1     140.3     210.4     280.5
-----------------------------------------------------------------------
  0+15       0.3127      1.99  Q         |         |         |         |
  0+30       1.4256      4.97  Q         |         |         |         |
  0+45       2.4058      6.60  Q         |         |         |         |
  1+ 0       3.0103      8.12  qQ        |         |         |         |
  1+15       3.5184      8.30  qQ        |         |         |         |
  1+30       3.3678      7.71  qQ        |         |         |         |
  1+45       3.2450      7.51  qQ        |         |         |         |
  2+ 0       3.3616      8.47  qQ        |         |         |         |
  2+15       3.8212      9.44  qQ        |         |         |         |
  2+30       4.0653      9.76  qQ        |         |         |         |
  2+45       4.3182     10.85  qQ        |         |         |         |
  3+ 0       4.8383     11.88  qQ        |         |         |         |
  3+15       5.1039     12.22  qQ        |         |         |         |
  3+30       5.2086     12.32  qQ        |         |         |         |
  3+45       5.2566     12.37  qQ        |         |         |         |
  4+ 0       5.4317     13.39  qQ        |         |         |         |
  4+15       5.9169     14.38  q Q       |         |         |         |
  4+30       6.3284     15.71  q Q       |         |         |         |
  4+45       6.9075     16.79  q Q       |         |         |         |
  5+ 0       7.3590     18.16  |qQ       |         |         |         |
```

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 5+15       7.6396     17.27  |qQ       |         |         |         |
 5+30       7.1408     16.66  |qQ       |         |         |         |
 5+45       7.3927     18.12  |qQ       |         |         |         |
 6+ 0       7.9774     19.29  |qQ       |         |         |         |
 6+15       8.4167     20.64  |qQ       |         |         |         |
 6+30       9.0133     21.74  |q Q      |         |         |         |
 6+45       9.4722     23.12  |q Q      |         |         |         |
 7+ 0      10.0660     24.22  |q Q      |         |         |         |
 7+15      10.3675     24.59  |q Q      |         |         |         |
 7+30      10.6445     25.71  |q Q      |         |         |         |
 7+45      11.3321     27.75  |q Q      |         |         |         |
 8+ 0      12.2388     30.24  |q  Q     |         |         |         |
 8+15      13.3881     34.54  |q  Q     |         |         |         |
 8+30      14.7426     37.53  | q  Q    |         |         |         |
 8+45      15.7020     40.01  | q  Q    |         |         |         |
 9+ 0      19.0030     45.34  | q   Q   |         |         |         |
 9+15      28.9372     58.61  |   q   Q |         |         |         |
 9+30      44.6843     77.22  |     q   |Q        |         |         |
 9+45      59.1438     93.92  |       q |  Q      |         |         |
10+ 0      72.4913    109.40  |         q    Q    |         |         |
10+15      72.9216    102.34  |         q   Q     |         |         |
10+30      45.8094     70.34  |     q   Q         |         |         |
10+45      39.8403     69.75  |    q   Q|         |         |         |
11+ 0      59.6264     93.27  |       q |  Q      |         |         |
11+15      69.8425    102.90  |        q|   Q     |         |         |
11+30      70.9284    103.35  |         q   Q     |         |         |
11+45      69.0230     99.03  |        q|   Q     |         |         |
12+ 0      62.5061     92.36  |       q |  Q      |         |         |
12+15      74.8473    113.72  |         q     Q   |         |         |
12+30     112.3190    157.68  |         |     q   | Q       |         |
12+45     139.8034    189.11  |         |        q|     Q   |         |
13+ 0     162.2562    214.41  |         |         |  q      Q         |
13+15     185.7462    244.93  |         |         |     q   |   Q     |
13+30     217.4951    280.50  |         |         |         |q        Q
13+45     217.0923    267.48  |         |         |         q       Q |
14+ 0     172.2927    214.76  |         |         |   q     Q         |
14+15     155.3467    201.57  |         |         | q     Q |         |
14+30     164.7901    212.80  |         |         |  q      Q         |
14+45     167.3210    215.10  |         |         |  q      Q         |
15+ 0     167.2671    213.82  |         |         |  q      Q         |
15+15     162.7028    207.40  |         |         |  q     Q|         |
15+30     155.2268    197.97  |         |         | q     Q |         |
15+45     142.1249    179.31  |         |        q    Q    |         |
16+ 0     120.6734    154.92  |         |      q  | Q       |         |
16+15      95.8648    113.07  |         |  q  Q   |         |         |
16+30      47.0988     54.22  |     qQ  |         |         |         |
16+45      21.5515     26.40  |  Q      |         |         |         |
17+ 0      11.1021     15.44  |qQ       |         |         |         |
17+15       6.7458     12.70  qQ        |         |         |         |
17+30       5.8749     12.84  qQ        |         |         |         |
17+45       5.6274     12.74  qQ        |         |         |         |
18+ 0       5.2447     11.52  qQ        |         |         |         |
18+15       4.6373     10.40  qQ        |         |         |         |
18+30       4.3793     10.07  qQ        |         |         |         |
18+45       4.1353      8.98  qQ        |         |         |         |
19+ 0       3.4649      6.96  Q         |         |         |         |
19+15       2.8800      6.64  Q         |         |         |         |
19+30       3.1593      8.20  qQ        |         |         |         |
19+45       3.5856      8.36  qQ        |         |         |         |
20+ 0       3.2380      6.74  Q         |         |         |         |
20+15       2.7841      6.54  Q         |         |         |         |
20+30       2.9623      7.16  qQ        |         |         |         |
20+45       3.0875      7.36  qQ        |         |         |         |
21+ 0       2.9776      6.40  Q         |         |         |         |
21+15       2.6825      6.44  Q         |         |         |         |
21+30       2.7618      6.12  Q         |         |         |         |
21+45       2.5928      6.35  Q         |         |         |         |
22+ 0       2.7201      6.07  Q         |         |         |         |
22+15       2.5798      6.34  Q         |         |         |         |
22+30       2.7157      6.07  Q         |         |         |         |
22+45       2.4196      5.34  Q         |         |         |         |
```

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  23+ 0       2.2352      5.08  Q         |         |         |         |
  23+15       2.1683      5.01  Q         |         |         |         |
  23+30       2.1367      4.98  Q         |         |         |         |
  23+45       2.1245      4.97  Q         |         |         |         |
  24+ 0       2.1202      4.97  Q         |         |         |         |
  24+15       1.8051      2.97  Q         |         |         |         |
  24+30       0.8467      0.99  Q         |         |         |         |
  24+45       0.3444      0.34  Q         |         |         |         |
  25+ 0       0.1473      0.15  Q         |         |         |         |
  25+15       0.0597      0.06  Q         |         |         |         |
  25+30       0.0268      0.03  Q         |         |         |         |
  25+45       0.0136      0.01  Q         |         |         |         |
  26+ 0       0.0052      0.01  Q         |         |         |         |
  26+15       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   105
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      280.500 (CFS)
                     Total volume =     111.585 (Ac.Ft)
             Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      *************************************************************************

      -------------------------------------------------------------------

      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ____________________________________________________________________
      ******************** HYDROGRAPH INFORMATION **********************

                     From study/file name: CoffsiteRT2.rte
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
      -------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      -------------------------------------------------------------------
 Time(h+m) Add q(CFS)  Tot. Q   0       77.4     154.8     232.1     309.5
 -------------------------------------------------------------------------
   0+15       0.1410      2.14  Q         |         |         |         |
   0+30       0.3240      5.29  Q         |         |         |         |
   0+45       0.3957      7.00  Q         |         |         |         |
   1+ 0       0.4746      8.59  qQ        |         |         |         |
   1+15       0.4608      8.76  qQ        |         |         |         |
   1+30       0.4122      8.12  qQ        |         |         |         |
   1+45       0.4049      7.92  qQ        |         |         |         |
   2+ 0       0.4750      8.95  qQ        |         |         |         |
   2+15       0.5313      9.97  qQ        |         |         |         |
   2+30       0.5390     10.29  qQ        |         |         |         |
   2+45       0.6098     11.46  qQ        |         |         |         |
   3+ 0       0.6661     12.55  qQ        |         |         |         |
   3+15       0.6738     12.89  qQ        |         |         |         |
   3+30       0.6742     13.00  qQ        |         |         |         |
   3+45       0.6742     13.04  qQ        |         |         |         |
   4+ 0       0.7447     14.13  qQ        |         |         |         |
   4+15       0.8010     15.18  qQ        |         |         |         |
   4+30       0.8791     16.58  q Q       |         |         |         |
   4+45       0.9358     17.73  q Q       |         |         |         |
   5+ 0       1.0140     19.17  q Q       |         |         |         |
   5+15       0.9297     18.20  q Q       |         |         |         |
   5+30       0.8953     17.56  q Q       |         |         |         |
   5+45       1.0071     19.13  q Q       |         |         |         |
   6+ 0       1.0703     20.36  q Q       |         |         |         |
   6+15       1.1488     21.79  q Q       |         |         |         |
   6+30       1.2055     22.95  q Q       |         |         |         |
```

```
 6+45       1.2837     24.40  q  Q      |         |         |         |
 7+ 0       1.3403     25.56  q  Q      |         |         |         |
 7+15       1.3480     25.94  q  Q      |         |         |         |
 7+30       1.4189     27.13  q  Q      |         |         |         |
 7+45       1.5457     29.30  q  Q      |         |         |         |
 8+ 0       1.6801     31.92  q   Q     |         |         |         |
 8+15       1.8854     36.42  q   Q     |         |         |         |
 8+30       2.0061     39.54  q    Q    |         |         |         |
 8+45       2.0923     42.10  q    Q    |         |         |         |
 9+ 0       2.2198     47.56  q     Q   |         |         |         |
 9+15       3.4631     62.07  q       Q |         |         |         |
 9+30       5.3659     82.59  q         Q         |         |         |
 9+45       7.0632    100.98  q         |  Q      |         |         |
10+ 0       8.7086    118.10  |q        |    Q    |         |         |
10+15       5.5906    107.94  q         |  Q      |         |         |
10+30       2.4864     72.83  q        Q|         |         |         |
10+45       4.9883     74.74  q        Q|         |         |         |
11+ 0       7.5480    100.82  q         |  Q      |         |         |
11+15       7.4463    110.35  q         |   Q     |         |         |
11+30       7.1765    110.53  q         |   Q     |         |         |
11+45       5.9640    105.00  q         |  Q      |         |         |
12+ 0       5.8103     98.17  q         | Q       |         |         |
12+15      11.4212    125.14  |q        |     Q   |         |         |
12+30      16.3998    174.08  | q       |         | Q       |         |
12+45      19.1758    208.28  | q       |         |     Q   |         |
13+ 0      21.3684    235.77  | q       |         |       Q         |
13+15      25.8689    270.79  |  q      |         |         |   Q     |
13+30      29.0198    309.52  |  q      |         |         |       Q
13+45      21.9036    289.39  | q       |         |         |     Q   |
14+ 0      15.9775    230.74  | q       |         |       Q|        |
14+15      18.1944    219.76  | q       |         |      Q |        |
14+30      19.9382    232.74  | q       |         |        Q        |
14+45      19.9180    235.02  | q       |         |        Q        |
15+ 0      19.3840    233.20  | q       |         |        Q        |
15+15      18.3419    225.75  | q       |         |       Q|        |
15+30      17.2229    215.20  | q       |         |     Q  |        |
15+45      13.9821    193.29  |q        |         |   Q    |        |
16+ 0      11.8686    166.79  |q        |         |Q       |        |
16+15       5.8879    118.96  q         |    Q    |         |        |
16+30       1.2152     55.44  q      Q  |         |         |        |
16+45       0.5013     26.90  q  Q      |         |         |        |
17+ 0       0.4131     15.86  q Q       |         |         |        |
17+15       0.5459     13.24  qQ        |         |         |        |
17+30       0.6581     13.50  qQ        |         |         |        |
17+45       0.6734     13.41  qQ        |         |         |        |
18+ 0       0.6037     12.12  qQ        |         |         |        |
18+15       0.5474     10.95  qQ        |         |         |        |
18+30       0.5397     10.61  qQ        |         |         |        |
18+45       0.4689      9.45  qQ        |         |         |        |
19+ 0       0.3421      7.31  Q         |         |         |        |
19+15       0.3486      6.99  Q         |         |         |        |
19+30       0.4673      8.66  qQ        |         |         |        |
19+45       0.4604      8.82  qQ        |         |         |        |
20+ 0       0.3417      7.08  Q         |         |         |        |
20+15       0.3486      6.89  Q         |         |         |        |
20+30       0.3968      7.55  Q         |         |         |        |
20+45       0.4041      7.76  qQ        |         |         |        |
21+ 0       0.3340      6.74  Q         |         |         |        |
21+15       0.3482      6.79  Q         |         |         |        |
21+30       0.3263      6.44  Q         |         |         |        |
21+45       0.3479      6.70  Q         |         |         |        |
22+ 0       0.3263      6.40  Q         |         |         |        |
22+15       0.3479      6.69  Q         |         |         |        |
22+30       0.3263      6.40  Q         |         |         |        |
22+45       0.2774      5.61  Q         |         |         |        |
23+ 0       0.2701      5.35  Q         |         |         |        |
23+15       0.2697      5.28  Q         |         |         |        |
23+30       0.2697      5.25  Q         |         |         |        |
23+45       0.2697      5.24  Q         |         |         |        |
24+ 0       0.2697      5.24  Q         |         |         |        |
24+15       0.1287      3.10  Q         |         |         |        |
```

```
   24+30       0.0161      1.01  Q         |         |         |         |
   24+45       0.0005      0.34  Q         |         |         |         |
   25+ 0       0.0000      0.15  Q         |         |         |         |
   25+15       0.0000      0.06  Q         |         |         |         |
   25+30       0.0000      0.03  Q         |         |         |         |
   25+45       0.0000      0.01  Q         |         |         |         |
   26+ 0       0.0000      0.01  Q         |         |         |         |
   26+15       0.0000      0.00  Q         |         |         |         |
--------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   105
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      309.520 (CFS)
                       Total volume =     120.383 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ---------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        2.000 to Point/Station        3.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   4000.00 (Ft.)
        Elevation difference =   80.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  4000.00(Ft.)     Elevation difference =  80.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =    5.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =     84.097(CFS)
        Depth of flow =     1.110(Ft.)
        Average velocity =    12.404(Ft/s)
        Total flow rate =    84.097(CFS)
        Channel flow top width =    7.219(Ft.)
        Depth of flow in channel =   1.11(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   12.40(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =   84.097(CFS)
        Total capacity of improved channels =     84.097(CFS)
        Critical Depth in Channel =    1.81(Ft.)


        Channel evaluation using maximum flow rate of hydrograph
        Covered channel
        Flow(q) thru subarea =    309.520(CFS)
        Depth of flow =     2.329(Ft.)
        Average velocity =    18.137(Ft/s)
        Total flow rate =   309.520(CFS)
        Channel flow top width =    9.657(Ft.)
        Depth of flow in channel =   2.33(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =   18.14(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =  309.520(CFS)
        Total capacity of improved channels =    309.520(CFS)
        Critical Depth in Channel =    3.81(Ft.)
```

```
********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9143   Travel time =   3.68 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   3.3089
       dt(routing time-step) =   3.36 (min.),   c* =   0.9997

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       77.4     154.8     232.1     309.5
----------------------------------------------------------------------
  0+15       1.6569      2.14  O         |         |         |         |
  0+30       4.5834      5.29  O         |         |         |         |
  0+45       6.6143      7.00  O         |         |         |         |
  1+ 0       8.2357      8.59  |O        |         |         |         |
  1+15       8.7198      8.76  |O        |         |         |         |
  1+30       8.2630      8.12  |O        |         |         |         |
  1+45       7.9634      7.92  |O        |         |         |         |
  2+ 0       8.7152      8.95  |O        |         |         |         |
  2+15       9.7408      9.97  |O        |         |         |         |
  2+30      10.2221     10.29  |O        |         |         |         |
  2+45      11.1985     11.46  |O        |         |         |         |
  3+ 0      12.3018     12.55  |O        |         |         |         |
  3+15      12.8134     12.89  |O        |         |         |         |
  3+30      12.9726     13.00  |O        |         |         |         |
  3+45      13.0334     13.04  |O        |         |         |         |
  4+ 0      13.8871     14.13  |O        |         |         |         |
  4+15      14.9458     15.18  |O        |         |         |         |
  4+30      16.2699     16.58  | O       |         |         |         |
  4+45      17.4727     17.73  | O       |         |         |         |
  5+ 0      18.8490     19.17  | O       |         |         |         |
  5+15      18.4150     18.20  | O       |         |         |         |
  5+30      17.7012     17.56  | O       |         |         |         |
  5+45      18.7752     19.13  | O       |         |         |         |
  6+ 0      20.0808     20.36  | O       |         |         |         |
  6+15      21.4669     21.79  | O       |         |         |         |
  6+30      22.6896     22.95  | O       |         |         |         |
  6+45      24.0756     24.40  |  O      |         |         |         |
  7+ 0      25.3004     25.56  |  O      |         |         |         |
  7+15      25.8565     25.94  |  O      |         |         |         |
  7+30      26.8645     27.13  |  O      |         |         |         |
  7+45      28.8103     29.30  |  O      |         |         |         |
  8+ 0      31.3334     31.92  |   O     |         |         |         |
  8+15      35.4138     36.42  |   O     |         |         |         |
  8+30      38.8406     39.54  |    O    |         |         |         |
  8+45      41.5245     42.10  |    O    |         |         |         |
  9+ 0      46.3349     47.56  |    OI   |         |         |         |
  9+15      58.8185     62.07  |      OI |         |         |         |
  9+30      77.9843     82.59  |         O         |         |         |
  9+45      96.8525    100.98  |         | OI      |         |         |
 10+ 0     114.2623    118.10  |         |   OI    |         |         |
 10+15     110.2150    107.94  |         |  IO     |         |         |
 10+30      80.7034     72.83  |        IO         |         |         |
 10+45      74.3158     74.74  |        O|         |         |         |
 11+ 0      94.9723    100.82  |         | OI      |         |         |
 11+15     108.2085    110.35  |         |  OI     |         |         |
 11+30     110.4878    110.53  |         |   O     |         |         |
 11+45     106.2385    105.00  |         |  O      |         |         |
 12+ 0      99.6988     98.17  |         | O       |         |         |
 12+15     119.0915    125.14  |         |    OI   |         |         |
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   12+30     163.1004    174.08  |         |         |OI       |         |
   12+45     200.6072    208.28  |         |         |    OI   |         |
   13+ 0     229.6063    235.77  |         |         |        OI         |
   13+15     262.9382    270.79  |         |         |         |  OI     |
   13+30     300.8322    309.52  |         |         |         |       O I
   13+45     293.8987    289.39  |         |         |         |      O  |
   14+ 0     243.8962    230.74  |         |         |        I|O        |
   14+15     222.2302    219.76  |         |         |       O |         |
   14+30     229.8309    232.74  |         |         |        OI         |
   14+45     234.5062    235.02  |         |         |         O         |
   15+ 0     233.6105    233.20  |         |         |         O         |
   15+15     227.4190    225.75  |         |         |        O|         |
   15+30     217.5624    215.20  |         |         |      IO |         |
   15+45     198.2047    193.29  |         |         |   IO    |         |
   16+ 0     172.7333    166.79  |         |         |IO       |         |
   16+15     129.6863    118.96  |         |    IO   |         |         |
   16+30      69.6879     55.44  |      I O|         |         |         |
   16+45      33.3068     26.90  |  IO     |         |         |         |
   17+ 0      18.3351     15.86  | O       |         |         |         |
   17+15      13.8289     13.24  |O        |         |         |         |
   17+30      13.4434     13.50  |O        |         |         |         |
   17+45      13.4337     13.41  |O        |         |         |         |
   18+ 0      12.4108     12.12  |O        |         |         |         |
   18+15      11.2109     10.95  |O        |         |         |         |
   18+30      10.6856     10.61  |O        |         |         |         |
   18+45       9.7131      9.45  |O        |         |         |         |
   19+ 0       7.7880      7.31  IO        |         |         |         |
   19+15       7.0592      6.99  O         |         |         |         |
   19+30       8.2875      8.66  |O        |         |         |         |
   19+45       8.7872      8.82  |O        |         |         |         |
   20+ 0       7.4702      7.08  O         |         |         |         |
   20+15       6.9337      6.89  O         |         |         |         |
   20+30       7.4060      7.55  O         |         |         |         |
   20+45       7.7137      7.76  OI        |         |         |         |
   21+ 0       6.9676      6.74  O         |         |         |         |
   21+15       6.7782      6.79  O         |         |         |         |
   21+30       6.5204      6.44  O         |         |         |         |
   21+45       6.6419      6.70  O         |         |         |         |
   22+ 0       6.4679      6.40  O         |         |         |         |
   22+15       6.6225      6.69  O         |         |         |         |
   22+30       6.4616      6.40  O         |         |         |         |
   22+45       5.7901      5.61  O         |         |         |         |
   23+ 0       5.4099      5.35  O         |         |         |         |
   23+15       5.2984      5.28  O         |         |         |         |
   23+30       5.2588      5.25  O         |         |         |         |
   23+45       5.2422      5.24  O         |         |         |         |
   24+ 0       5.2362      5.24  O         |         |         |         |
   24+15       3.5765      3.10  O         |         |         |         |
   24+30       1.4764      1.01  O         |         |         |         |
   24+45       0.4937      0.34  O         |         |         |         |
   25+ 0       0.1917      0.15  O         |         |         |         |
   25+15       0.0794      0.06  O         |         |         |         |
   25+30       0.0342      0.03  O         |         |         |         |
   25+45       0.0166      0.01  O         |         |         |         |
   26+ 0       0.0071      0.01  O         |         |         |         |
   26+15       0.0012      0.00  O         |         |         |         |
   26+30       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   106
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      300.832 (CFS)
                       Total volume =     120.383 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: SUBC2RT.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

     --------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      103.3     206.7     310.0     413.3
-------------------------------------------------------------------------
  0+15       0.1486      1.81  Q         |         |         |         |
  0+30       0.6320      5.22  Q         |         |         |         |
  0+45       1.3473      7.96  Q         |         |         |         |
  1+ 0       2.1780     10.41  qQ        |         |         |         |
  1+15       3.0174     11.74  qQ        |         |         |         |
  1+30       3.7329     12.00  qQ        |         |         |         |
  1+45       4.3428     12.31  qQ        |         |         |         |
  2+ 0       4.9755     13.69  qQ        |         |         |         |
  2+15       5.6962     15.44  qQ        |         |         |         |
  2+30       6.4333     16.66  qQ        |         |         |         |
  2+45       7.2066     18.41  qQ        |         |         |         |
  3+ 0       8.0580     20.36  qQ        |         |         |         |
  3+15       8.9167     21.73  q Q       |         |         |         |
  3+30       9.7266     22.70  q Q       |         |         |         |
  3+45      10.4799     23.51  |qQ       |         |         |         |
  4+ 0      11.2572     25.14  |qQ       |         |         |         |
  4+15      12.1123     27.06  |qQ       |         |         |         |
  4+30      13.0510     29.32  |qQ       |         |         |         |
  4+45      14.0674     31.54  |q Q      |         |         |         |
  5+ 0      15.1560     34.01  |q Q      |         |         |         |
  5+15      16.1589     34.57  |q Q      |         |         |         |
  5+30      16.9707     34.67  |q Q      |         |         |         |
  5+45      17.8122     36.59  |q Q      |         |         |         |
  6+ 0      18.7716     38.85  |q Q      |         |         |         |
  6+15      19.8183     41.29  |q Q      |         |         |         |
  6+30      20.9353     43.62  | q Q     |         |         |         |
  6+45      22.1174     46.19  | q Q     |         |         |         |
  7+ 0      23.3603     48.66  | q Q     |         |         |         |
  7+15      24.5831     50.44  | q Q     |         |         |         |
  7+30      25.8082     52.67  | q  Q    |         |         |         |
  7+45      27.1565     55.97  | q  Q    |         |         |         |
  8+ 0      28.7007     60.03  | q  Q    |         |         |         |
  8+15      30.5967     66.01  | q   Q   |         |         |         |
  8+30      32.8439     71.68  |  q  Q   |         |         |         |
  8+45      35.9084     77.43  |  q   Q  |         |         |         |
  9+ 0      44.5957     90.93  |   q   Q |         |         |         |
  9+15      53.0018    111.82  |    q    Q         |         |         |
  9+30      61.5159    139.50  |    q    |  Q      |         |         |
  9+45      69.7948    166.65  |     q   |     Q   |         |         |
 10+ 0      77.6239    191.89  |      q  |       Q |         |         |
 10+15      82.0883    192.30  |      q  |       Q |         |         |
 10+30      81.4577    162.16  |      q  |    Q    |         |         |
 10+45      80.6889    155.00  |      q  |   Q     |         |         |
 11+ 0      82.9932    177.97  |       q |      Q  |         |         |
 11+15      86.0624    194.27  |       q |       Q |         |         |
 11+30      88.0982    198.59  |       q |        Q|         |         |
 11+45      88.6509    194.89  |       q |       Q |         |         |
 12+ 0      88.1725    187.87  |       q |       Q |         |         |
 12+15      90.4602    209.55  |       q |         Q         |         |
 12+30      97.3368    260.44  |        q|         |    Q    |         |
 12+45     101.7464    302.35  |        q|         |         Q|         |
 13+ 0     104.6023    334.21  |         q         |         | Q       |
 13+15     108.1679    371.11  |         q         |         |    Q    |
 13+30     112.5172    413.35  |         q         |         |         Q
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13+45     115.9357    409.83  |         |q        |         |        Q|
14+ 0     117.2825    361.18  |         |q        |         |   Q     |
14+15     117.9869    340.22  |         |q        |         | Q       |
14+30     119.1009    348.93  |         |q        |         |  Q      |
14+45     120.3370    354.84  |         |q        |         |   Q     |
15+ 0     121.3758    354.99  |         |q        |         |   Q     |
15+15     122.0684    349.49  |         |q        |         |  Q      |
15+30     122.3632    339.93  |         |q        |         | Q       |
15+45     121.9647    320.17  |         |q        |         Q         |
16+ 0     120.7975    293.53  |         |q        |       Q |         |
16+15     117.9307    247.62  |         |q        |  Q      |         |
16+30     112.7521    182.44  |         q      Q  |         |         |
16+45     106.6069    139.91  |         q  Q      |         |         |
17+ 0     100.5336    118.87  |        q|Q        |         |         |
17+15      81.6050     95.43  |      q Q|         |         |         |
17+30      66.6124     80.06  |     qQ  |         |         |         |
17+45      55.6225     69.06  |    qQ   |         |         |         |
18+ 0      47.0506     59.46  |   qQ    |         |         |         |
18+15      40.0602     51.27  |  qQ     |         |         |         |
18+30      34.8523     45.54  |  qQ     |         |         |         |
18+45      33.4889     43.20  |  qQ     |         |         |         |
19+ 0      32.0119     39.80  |  Q      |         |         |         |
19+15      30.5158     37.57  | qQ      |         |         |         |
19+30      29.2550     37.54  | qQ      |         |         |         |
19+45      28.1933     36.98  | qQ      |         |         |         |
20+ 0      27.0749     34.55  | qQ      |         |         |         |
20+15      25.9234     32.86  | qQ      |         |         |         |
20+30      24.9066     32.31  | qQ      |         |         |         |
20+45      24.0164     31.73  | qQ      |         |         |         |
21+ 0      23.1228     30.09  | Q       |         |         |         |
21+15      22.2361     29.01  | Q       |         |         |         |
21+30      21.4001     27.92  | Q       |         |         |         |
21+45      20.6225     27.26  |qQ       |         |         |         |
22+ 0      19.8992     26.37  |qQ       |         |         |         |
22+15      19.2263     25.85  |qQ       |         |         |         |
22+30      18.6004     25.06  |qQ       |         |         |         |
22+45      17.9417     23.73  |qQ       |         |         |         |
23+ 0      17.2734     22.68  |qQ       |         |         |         |
23+15      16.6406     21.94  |qQ       |         |         |         |
23+30      16.0520     21.31  |qQ       |         |         |         |
23+45      15.5044     20.75  |qQ       |         |         |         |
24+ 0      14.9951     20.23  |Q        |         |         |         |
24+15      14.3683     17.94  |Q        |         |         |         |
24+30      13.5210     15.00  |Q        |         |         |         |
24+45      12.5994     13.09  |Q        |         |         |         |
25+ 0      11.7200     11.91  |Q        |         |         |         |
25+15      10.9019     10.98  |Q        |         |         |         |
25+30      10.1409     10.18  Q         |         |         |         |
25+45       9.4331      9.45  Q         |         |         |         |
26+ 0       8.7747      8.78  Q         |         |         |         |
26+15       8.1622      8.16  Q         |         |         |         |
26+30       7.5925      7.59  Q         |         |         |         |
26+45       7.0625      7.06  Q         |         |         |         |
27+ 0       6.5695      6.57  Q         |         |         |         |
27+15       6.1110      6.11  Q         |         |         |         |
27+30       5.6844      5.68  Q         |         |         |         |
27+45       5.2877      5.29  Q         |         |         |         |
28+ 0       4.9186      4.92  Q         |         |         |         |
28+15       4.5753      4.58  Q         |         |         |         |
28+30       4.2559      4.26  Q         |         |         |         |
28+45       3.9589      3.96  Q         |         |         |         |
29+ 0       3.6825      3.68  Q         |         |         |         |
29+15       3.4255      3.43  Q         |         |         |         |
29+30       3.1864      3.19  Q         |         |         |         |
29+45       2.9640      2.96  Q         |         |         |         |
30+ 0       2.7571      2.76  Q         |         |         |         |
30+15       2.5646      2.56  Q         |         |         |         |
30+30       2.3856      2.39  Q         |         |         |         |
30+45       2.2191      2.22  Q         |         |         |         |
31+ 0       2.0642      2.06  Q         |         |         |         |
31+15       1.9201      1.92  Q         |         |         |         |
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31+30	1.7861	1.79	Q	|	|	|	|
31+45	1.6614	1.66	Q	|	|	|	|
32+ 0	1.5455	1.55	Q	|	|	|	|
32+15	1.4376	1.44	Q	|	|	|	|
32+30	1.3372	1.34	Q	|	|	|	|
32+45	1.2439	1.24	Q	|	|	|	|
33+ 0	1.1571	1.16	Q	|	|	|	|
33+15	1.0763	1.08	Q	|	|	|	|
33+30	1.0012	1.00	Q	|	|	|	|
33+45	0.9313	0.93	Q	|	|	|	|
34+ 0	0.8663	0.87	Q	|	|	|	|
34+15	0.8058	0.81	Q	|	|	|	|
34+30	0.7496	0.75	Q	|	|	|	|
34+45	0.6973	0.70	Q	|	|	|	|
35+ 0	0.6486	0.65	Q	|	|	|	|
35+15	0.6033	0.60	Q	|	|	|	|
35+30	0.5612	0.56	Q	|	|	|	|
35+45	0.5220	0.52	Q	|	|	|	|
36+ 0	0.4856	0.49	Q	|	|	|	|
36+15	0.4517	0.45	Q	|	|	|	|
36+30	0.4202	0.42	Q	|	|	|	|
36+45	0.3908	0.39	Q	|	|	|	|
37+ 0	0.3636	0.36	Q	|	|	|	|
37+15	0.3382	0.34	Q	|	|	|	|
37+30	0.3146	0.31	Q	|	|	|	|
37+45	0.2926	0.29	Q	|	|	|	|
38+ 0	0.2722	0.27	Q	|	|	|	|
38+15	0.2532	0.25	Q	|	|	|	|
38+30	0.2355	0.24	Q	|	|	|	|
38+45	0.2191	0.22	Q	|	|	|	|
39+ 0	0.2038	0.20	Q	|	|	|	|
39+15	0.1896	0.19	Q	|	|	|	|
39+30	0.1763	0.18	Q	|	|	|	|
39+45	0.1640	0.16	Q	|	|	|	|
40+ 0	0.1526	0.15	Q	|	|	|	|
40+15	0.1419	0.14	Q	|	|	|	|
40+30	0.1320	0.13	Q	|	|	|	|
40+45	0.1228	0.12	Q	|	|	|	|
41+ 0	0.1142	0.11	Q	|	|	|	|
41+15	0.1063	0.11	Q	|	|	|	|
41+30	0.0988	0.10	Q	|	|	|	|
41+45	0.0919	0.09	Q	|	|	|	|
42+ 0	0.0855	0.09	Q	|	|	|	|
42+15	0.0796	0.08	Q	|	|	|	|
42+30	0.0740	0.07	Q	|	|	|	|
42+45	0.0688	0.07	Q	|	|	|	|
43+ 0	0.0640	0.06	Q	|	|	|	|
43+15	0.0596	0.06	Q	|	|	|	|
43+30	0.0554	0.06	Q	|	|	|	|
43+45	0.0515	0.05	Q	|	|	|	|
44+ 0	0.0479	0.05	Q	|	|	|	|
44+15	0.0446	0.04	Q	|	|	|	|
44+30	0.0415	0.04	Q	|	|	|	|
44+45	0.0386	0.04	Q	|	|	|	|
45+ 0	0.0359	0.04	Q	|	|	|	|
45+15	0.0334	0.03	Q	|	|	|	|
45+30	0.0311	0.03	Q	|	|	|	|
45+45	0.0289	0.03	Q	|	|	|	|
46+ 0	0.0269	0.03	Q	|	|	|	|
46+15	0.0250	0.02	Q	|	|	|	|
46+30	0.0233	0.02	Q	|	|	|	|
46+45	0.0216	0.02	Q	|	|	|	|
47+ 0	0.0201	0.02	Q	|	|	|	|
47+15	0.0187	0.02	Q	|	|	|	|
47+30	0.0174	0.02	Q	|	|	|	|
47+45	0.0162	0.02	Q	|	|	|	|
48+ 0	0.0151	0.02	Q	|	|	|	|
48+15	0.0140	0.01	Q	|	|	|	|
48+30	0.0130	0.01	Q	|	|	|	|
48+45	0.0121	0.01	Q	|	|	|	|
49+ 0	0.0113	0.01	Q	|	|	|	|

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   49+15       0.0105      0.01  Q          |          |          |          |
   49+30       0.0098      0.01  Q          |          |          |          |
   49+45       0.0091      0.01  Q          |          |          |          |
   50+ 0       0.0084      0.01  Q          |          |          |          |
   50+15       0.0079      0.01  Q          |          |          |          |
   50+30       0.0073      0.01  Q          |          |          |          |
   50+45       0.0068      0.01  Q          |          |          |          |
   51+ 0       0.0063      0.01  Q          |          |          |          |
   51+15       0.0059      0.01  Q          |          |          |          |
   51+30       0.0055      0.01  Q          |          |          |          |
   51+45       0.0051      0.01  Q          |          |          |          |
   52+ 0       0.0047      0.00  Q          |          |          |          |
   52+15       0.0044      0.00  Q          |          |          |          |
   52+30       0.0041      0.00  Q          |          |          |          |
   52+45       0.0038      0.00  Q          |          |          |          |
   53+ 0       0.0035      0.00  Q          |          |          |          |
   53+15       0.0033      0.00  Q          |          |          |          |
   53+30       0.0031      0.00  Q          |          |          |          |
   53+45       0.0029      0.00  Q          |          |          |          |
   54+ 0       0.0027      0.00  Q          |          |          |          |
   54+15       0.0025      0.00  Q          |          |          |          |
   54+30       0.0023      0.00  Q          |          |          |          |
   54+45       0.0021      0.00  Q          |          |          |          |
   55+ 0       0.0020      0.00  Q          |          |          |          |
   55+15       0.0020      0.00  Q          |          |          |          |
   55+30       0.0019      0.00  Q          |          |          |          |
   55+45       0.0019      0.00  Q          |          |          |          |
   56+ 0       0.0018      0.00  Q          |          |          |          |
   56+15       0.0018      0.00  Q          |          |          |          |
   56+30       0.0018      0.00  Q          |          |          |          |
   56+45       0.0017      0.00  Q          |          |          |          |
   57+ 0       0.0017      0.00  Q          |          |          |          |
   57+15       0.0017      0.00  Q          |          |          |          |
   57+30       0.0016      0.00  Q          |          |          |          |
   57+45       0.0016      0.00  Q          |          |          |          |
   58+ 0       0.0016      0.00  Q          |          |          |          |
   58+15       0.0015      0.00  Q          |          |          |          |
   58+30       0.0015      0.00  Q          |          |          |          |
   58+45       0.0015      0.00  Q          |          |          |          |
   59+ 0       0.0014      0.00  Q          |          |          |          |
   59+15       0.0014      0.00  Q          |          |          |          |
   59+30       0.0014      0.00  Q          |          |          |          |
   59+45       0.0013      0.00  Q          |          |          |          |
   60+ 0       0.0013      0.00  Q          |          |          |          |
   60+15       0.0013      0.00  Q          |          |          |          |
   60+30       0.0013      0.00  Q          |          |          |          |
   60+45       0.0012      0.00  Q          |          |          |          |
   61+ 0       0.0012      0.00  Q          |          |          |          |
   61+15       0.0012      0.00  Q          |          |          |          |
   61+30       0.0012      0.00  Q          |          |          |          |
   61+45       0.0011      0.00  Q          |          |          |          |
   62+ 0       0.0011      0.00  Q          |          |          |          |
   62+15       0.0011      0.00  Q          |          |          |          |
   62+30       0.0011      0.00  Q          |          |          |          |
   62+45       0.0011      0.00  Q          |          |          |          |
   63+ 0       0.0010      0.00  Q          |          |          |          |
   63+15       0.0010      0.00  Q          |          |          |          |
   63+30       0.0010      0.00  Q          |          |          |          |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   254
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      413.349 (CFS)
                      Total volume =     219.015 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------
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Process from Point/Station        3.000 to Point/Station        4.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   3000.00 (Ft.)
Elevation difference =   50.00 (Ft.)
Slope of channel =  0.016667 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  3000.00(Ft.)     Elevation difference =  50.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    136.850(CFS)
Depth of flow =     1.550(Ft.)
Average velocity =    13.479(Ft/s)
Total flow rate =   136.850(CFS)
Channel flow top width =    8.100(Ft.)
Depth of flow in channel =   1.55(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   13.48(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  136.850(CFS)
Total capacity of improved channels =    136.850(CFS)
Critical Depth in Channel =    2.41(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    413.349(CFS)
Depth of flow =     2.864(Ft.)
Average velocity =    18.354(Ft/s)
Total flow rate =   413.349(CFS)
Channel flow top width =   10.728(Ft.)
Depth of flow in channel =   2.86(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   18.35(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  413.349(CFS)
Total capacity of improved channels =    413.349(CFS)
Critical Depth in Channel =    4.44(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9152   Travel time =   2.72 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   4.3441
       dt(routing time-step) =   2.49 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


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                 P R I N T  O F  S T O R M
              R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      103.3     206.7     310.0     413.3
```

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-----------------------------------------------------------------------
 0+15       1.5053      1.81  O         |         |         |         |
 0+30       4.6486      5.22  O         |         |         |         |
 0+45       7.5051      7.96  O         |         |         |         |
 1+ 0      10.0061     10.41  OI        |         |         |         |
 1+15      11.5172     11.74  |O        |         |         |         |
 1+30      11.9529     12.00  |O        |         |         |         |
 1+45      12.2546     12.31  |O        |         |         |         |
 2+ 0      13.4606     13.69  |O        |         |         |         |
 2+15      15.1467     15.44  |O        |         |         |         |
 2+30      16.4529     16.66  |O        |         |         |         |
 2+45      18.1142     18.41  |O        |         |         |         |
 3+ 0      20.0348     20.36  |O        |         |         |         |
 3+15      21.5023     21.73  | O       |         |         |         |
 3+30      22.5380     22.70  | O       |         |         |         |
 3+45      23.3779     23.51  | O       |         |         |         |
 4+ 0      24.8731     25.14  | O       |         |         |         |
 4+15      26.7399     27.06  | O       |         |         |         |
 4+30      28.9447     29.32  | O       |         |         |         |
 4+45      31.1711     31.54  |  O      |         |         |         |
 5+ 0      33.5953     34.01  |  O      |         |         |         |
 5+15      34.4793     34.57  |  O      |         |         |         |
 5+30      34.6555     34.67  |  O      |         |         |         |
 5+45      36.2690     36.59  |  O      |         |         |         |
 6+ 0      38.4758     38.85  |  O      |         |         |         |
 6+15      40.8808     41.29  |  O      |         |         |         |
 6+30      43.2359     43.62  |   O     |         |         |         |
 6+45      45.7661     46.19  |   O     |         |         |         |
 7+ 0      48.2505     48.66  |   O     |         |         |         |
 7+15      50.1439     50.44  |   O     |         |         |         |
 7+30      52.3015     52.67  |    O    |         |         |         |
 7+45      55.4191     55.97  |    O    |         |         |         |
 8+ 0      59.3579     60.03  |    O    |         |         |         |
 8+15      65.0170     66.01  |     O   |         |         |         |
 8+30      70.7412     71.68  |     O   |         |         |         |
 8+45      76.4773     77.43  |      O  |         |         |         |
 9+ 0      88.6867     90.93  |       O |         |         |         |
 9+15     108.3476    111.82  |         O         |         |         |
 9+30     134.8987    139.50  |         |  O      |         |         |
 9+45     162.1343    166.65  |         |    OI   |         |         |
10+ 0     187.6905    191.89  |         |       O |         |         |
10+15     192.2339    192.30  |         |       O |         |         |
10+30     167.1719    162.16  |         |    IO   |         |         |
10+45     156.1945    155.00  |         |   IO    |         |         |
11+ 0     174.1485    177.97  |         |     OI  |         |         |
11+15     191.5602    194.27  |         |       O |         |         |
11+30     197.8686    198.59  |         |        O|         |         |
11+45     195.5039    194.89  |         |       O |         |         |
12+ 0     189.0380    187.87  |         |       O |         |         |
12+15     205.9476    209.55  |         |        OI         |         |
12+30     251.9781    260.44  |         |         |   OI    |         |
12+45     295.3853    302.35  |         |         |       OI|         |
13+ 0     328.9129    334.21  |         |         |         |OI       |
13+15     364.9722    371.11  |         |         |         |    O    |
13+30     406.3268    413.35  |         |         |         |        OI
13+45     410.4185    409.83  |         |         |         |        O|
14+ 0     369.2671    361.18  |         |         |         |   IO    |
14+15     343.7019    340.22  |         |         |         | IO      |
14+30     347.4831    348.93  |         |         |         |  O      |
14+45     353.8605    354.84  |         |         |         |   O     |
15+ 0     354.9625    354.99  |         |         |         |   O     |
15+15     350.4015    349.49  |         |         |         |  O      |
15+30     341.5151    339.93  |         |         |         | IO      |
15+45     323.4536    320.17  |         |         |         IO        |
16+ 0     297.9592    293.53  |         |         |       O |         |
16+15     255.2497    247.62  |         |         |  IO     |         |
16+30     193.2751    182.44  |         |      IO |         |         |
16+45     146.9834    139.91  |         |  IO     |         |         |
17+ 0     122.3673    118.87  |         |O        |         |         |
17+15      99.3297     95.43  |        O|         |         |         |
17+30      82.6124     80.06  |      O  |         |         |         |
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17+45      70.8848     69.06  |     O    |         |         |         |
18+ 0      61.0564     59.46  |    O     |         |         |         |
18+15      52.6327     51.27  |   IO     |         |         |         |
18+30      46.4911     45.54  |   O      |         |         |         |
18+45      43.5903     43.20  |   O      |         |         |         |
19+ 0      40.3655     39.80  |  O       |         |         |         |
19+15      37.9449     37.57  |  O       |         |         |         |
19+30      37.5479     37.54  |  O       |         |         |         |
19+45      37.0740     36.98  |  O       |         |         |         |
20+ 0      34.9500     34.55  |  O       |         |         |         |
20+15      33.1378     32.86  |  O       |         |         |         |
20+30      32.4031     32.31  |  O       |         |         |         |
20+45      31.8269     31.73  |  O       |         |         |         |
21+ 0      30.3630     30.09  | O        |         |         |         |
21+15      29.1932     29.01  | O        |         |         |         |
21+30      28.1024     27.92  | O        |         |         |         |
21+45      27.3735     27.26  | O        |         |         |         |
22+ 0      26.5162     26.37  | O        |         |         |         |
22+15      25.9349     25.85  | O        |         |         |         |
22+30      25.1928     25.06  | O        |         |         |         |
22+45      23.9529     23.73  | O        |         |         |         |
23+ 0      22.8576     22.68  | O        |         |         |         |
23+15      22.0627     21.94  | O        |         |         |         |
23+30      21.4152     21.31  | O        |         |         |         |
23+45      20.8404     20.75  | O        |         |         |         |
24+ 0      20.3170     20.23  |O         |         |         |         |
24+15      18.3249     17.94  |O         |         |         |         |
24+30      15.4874     15.00  |O         |         |         |         |
24+45      13.4097     13.09  |O         |         |         |         |
25+ 0      12.1080     11.91  |O         |         |         |         |
25+15      11.1359     10.98  |O         |         |         |         |
25+30      10.3091     10.18  O          |         |         |         |
25+45       9.5703      9.45  O          |         |         |         |
26+ 0       8.8928      8.78  O          |         |         |         |
26+15       8.2662      8.16  O          |         |         |         |
26+30       7.6874      7.59  O          |         |         |         |
26+45       7.1506      7.06  O          |         |         |         |
27+ 0       6.6515      6.57  O          |         |         |         |
27+15       6.1872      6.11  O          |         |         |         |
27+30       5.7554      5.68  O          |         |         |         |
27+45       5.3536      5.29  O          |         |         |         |
28+ 0       4.9799      4.92  O          |         |         |         |
28+15       4.6323      4.58  O          |         |         |         |
28+30       4.3090      4.26  O          |         |         |         |
28+45       4.0082      3.96  O          |         |         |         |
29+ 0       3.7285      3.68  O          |         |         |         |
29+15       3.4682      3.43  O          |         |         |         |
29+30       3.2261      3.19  O          |         |         |         |
29+45       3.0009      2.96  O          |         |         |         |
30+ 0       2.7915      2.76  O          |         |         |         |
30+15       2.5966      2.56  O          |         |         |         |
30+30       2.4154      2.39  O          |         |         |         |
30+45       2.2468      2.22  O          |         |         |         |
31+ 0       2.0900      2.06  O          |         |         |         |
31+15       1.9441      1.92  O          |         |         |         |
31+30       1.8084      1.79  O          |         |         |         |
31+45       1.6822      1.66  O          |         |         |         |
32+ 0       1.5647      1.55  O          |         |         |         |
32+15       1.4555      1.44  O          |         |         |         |
32+30       1.3539      1.34  O          |         |         |         |
32+45       1.2594      1.24  O          |         |         |         |
33+ 0       1.1715      1.16  O          |         |         |         |
33+15       1.0897      1.08  O          |         |         |         |
33+30       1.0137      1.00  O          |         |         |         |
33+45       0.9429      0.93  O          |         |         |         |
34+ 0       0.8771      0.87  O          |         |         |         |
34+15       0.8159      0.81  O          |         |         |         |
34+30       0.7589      0.75  O          |         |         |         |
34+45       0.7060      0.70  O          |         |         |         |
35+ 0       0.6567      0.65  O          |         |         |         |
35+15       0.6109      0.60  O          |         |         |         |
```

35+30	0.5682	0.56	O	|	|	|	|
35+45	0.5286	0.52	O	|	|	|	|
36+ 0	0.4917	0.49	O	|	|	|	|
36+15	0.4573	0.45	O	|	|	|	|
36+30	0.4254	0.42	O	|	|	|	|
36+45	0.3957	0.39	O	|	|	|	|
37+ 0	0.3681	0.36	O	|	|	|	|
37+15	0.3424	0.34	O	|	|	|	|
37+30	0.3185	0.31	O	|	|	|	|
37+45	0.2963	0.29	O	|	|	|	|
38+ 0	0.2756	0.27	O	|	|	|	|
38+15	0.2564	0.25	O	|	|	|	|
38+30	0.2385	0.24	O	|	|	|	|
38+45	0.2218	0.22	O	|	|	|	|
39+ 0	0.2063	0.20	O	|	|	|	|
39+15	0.1919	0.19	O	|	|	|	|
39+30	0.1785	0.18	O	|	|	|	|
39+45	0.1661	0.16	O	|	|	|	|
40+ 0	0.1545	0.15	O	|	|	|	|
40+15	0.1437	0.14	O	|	|	|	|
40+30	0.1337	0.13	O	|	|	|	|
40+45	0.1243	0.12	O	|	|	|	|
41+ 0	0.1157	0.11	O	|	|	|	|
41+15	0.1076	0.11	O	|	|	|	|
41+30	0.1001	0.10	O	|	|	|	|
41+45	0.0931	0.09	O	|	|	|	|
42+ 0	0.0866	0.09	O	|	|	|	|
42+15	0.0806	0.08	O	|	|	|	|
42+30	0.0749	0.07	O	|	|	|	|
42+45	0.0697	0.07	O	|	|	|	|
43+ 0	0.0648	0.06	O	|	|	|	|
43+15	0.0603	0.06	O	|	|	|	|
43+30	0.0561	0.06	O	|	|	|	|
43+45	0.0522	0.05	O	|	|	|	|
44+ 0	0.0485	0.05	O	|	|	|	|
44+15	0.0452	0.04	O	|	|	|	|
44+30	0.0420	0.04	O	|	|	|	|
44+45	0.0391	0.04	O	|	|	|	|
45+ 0	0.0363	0.04	O	|	|	|	|
45+15	0.0338	0.03	O	|	|	|	|
45+30	0.0314	0.03	O	|	|	|	|
45+45	0.0293	0.03	O	|	|	|	|
46+ 0	0.0272	0.03	O	|	|	|	|
46+15	0.0253	0.02	O	|	|	|	|
46+30	0.0235	0.02	O	|	|	|	|
46+45	0.0219	0.02	O	|	|	|	|
47+ 0	0.0204	0.02	O	|	|	|	|
47+15	0.0189	0.02	O	|	|	|	|
47+30	0.0176	0.02	O	|	|	|	|
47+45	0.0164	0.02	O	|	|	|	|
48+ 0	0.0153	0.02	O	|	|	|	|
48+15	0.0142	0.01	O	|	|	|	|
48+30	0.0132	0.01	O	|	|	|	|
48+45	0.0123	0.01	O	|	|	|	|
49+ 0	0.0114	0.01	O	|	|	|	|
49+15	0.0106	0.01	O	|	|	|	|
49+30	0.0099	0.01	O	|	|	|	|
49+45	0.0092	0.01	O	|	|	|	|
50+ 0	0.0085	0.01	O	|	|	|	|
50+15	0.0080	0.01	O	|	|	|	|
50+30	0.0074	0.01	O	|	|	|	|
50+45	0.0069	0.01	O	|	|	|	|
51+ 0	0.0064	0.01	O	|	|	|	|
51+15	0.0060	0.01	O	|	|	|	|
51+30	0.0055	0.01	O	|	|	|	|
51+45	0.0052	0.01	O	|	|	|	|
52+ 0	0.0048	0.00	O	|	|	|	|
52+15	0.0045	0.00	O	|	|	|	|
52+30	0.0041	0.00	O	|	|	|	|
52+45	0.0039	0.00	O	|	|	|	|
53+ 0	0.0036	0.00	O	|	|	|	|

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53+15       0.0033      0.00  O         |         |         |         |
53+30       0.0031      0.00  O         |         |         |         |
53+45       0.0029      0.00  O         |         |         |         |
54+ 0       0.0027      0.00  O         |         |         |         |
54+15       0.0025      0.00  O         |         |         |         |
54+30       0.0023      0.00  O         |         |         |         |
54+45       0.0022      0.00  O         |         |         |         |
55+ 0       0.0020      0.00  O         |         |         |         |
55+15       0.0020      0.00  O         |         |         |         |
55+30       0.0019      0.00  O         |         |         |         |
55+45       0.0019      0.00  O         |         |         |         |
56+ 0       0.0018      0.00  O         |         |         |         |
56+15       0.0018      0.00  O         |         |         |         |
56+30       0.0018      0.00  O         |         |         |         |
56+45       0.0017      0.00  O         |         |         |         |
57+ 0       0.0017      0.00  O         |         |         |         |
57+15       0.0017      0.00  O         |         |         |         |
57+30       0.0016      0.00  O         |         |         |         |
57+45       0.0016      0.00  O         |         |         |         |
58+ 0       0.0016      0.00  O         |         |         |         |
58+15       0.0015      0.00  O         |         |         |         |
58+30       0.0015      0.00  O         |         |         |         |
58+45       0.0015      0.00  O         |         |         |         |
59+ 0       0.0014      0.00  O         |         |         |         |
59+15       0.0014      0.00  O         |         |         |         |
59+30       0.0014      0.00  O         |         |         |         |
59+45       0.0014      0.00  O         |         |         |         |
60+ 0       0.0013      0.00  O         |         |         |         |
60+15       0.0013      0.00  O         |         |         |         |
60+30       0.0013      0.00  O         |         |         |         |
60+45       0.0012      0.00  O         |         |         |         |
61+ 0       0.0012      0.00  O         |         |         |         |
61+15       0.0012      0.00  O         |         |         |         |
61+30       0.0012      0.00  O         |         |         |         |
61+45       0.0011      0.00  O         |         |         |         |
62+ 0       0.0011      0.00  O         |         |         |         |
62+15       0.0011      0.00  O         |         |         |         |
62+30       0.0011      0.00  O         |         |         |         |
62+45       0.0011      0.00  O         |         |         |         |
63+ 0       0.0010      0.00  O         |         |         |         |
63+15       0.0010      0.00  O         |         |         |         |
63+30       0.0010      0.00  O         |         |         |         |
63+45       0.0000      0.00  O         |         |         |         |
--------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   255
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      410.419 (CFS)
                       Total volume =     219.015 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        3.000 to Point/Station        4.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION **********************

                       From study/file name: SUBC324100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          P R I N T  O F  S T O R M
                       R u n o f f     H y d r o g r a p h
        ---------------------------------------------------------------------
                    Hydrograph in  15   Minute intervals (CFS)
```

```
      ----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      113.3     226.6     339.9     453.1
-----------------------------------------------------------------------
  0+15       1.2572      2.76  Q         |         |         |         |
  0+30       2.6468      7.30  Q         |         |         |         |
  0+45       3.1356     10.64  Q         |         |         |         |
  1+ 0       3.8183     13.82  qQ        |         |         |         |
  1+15       3.5702     15.09  qQ        |         |         |         |
  1+30       3.2438     15.20  qQ        |         |         |         |
  1+45       3.1897     15.44  qQ        |         |         |         |
  2+ 0       3.8183     17.28  qQ        |         |         |         |
  2+15       4.1988     19.35  qQ        |         |         |         |
  2+30       4.2529     20.71  qQ        |         |         |         |
  2+45       4.8815     23.00  q Q       |         |         |         |
  3+ 0       5.2620     25.30  q Q       |         |         |         |
  3+15       5.3162     26.82  q Q       |         |         |         |
  3+30       5.3162     27.85  q Q       |         |         |         |
  3+45       5.3162     28.69  q Q       |         |         |         |
  4+ 0       5.9448     30.82  q Q       |         |         |         |
  4+15       6.3253     33.07  q Q       |         |         |         |
  4+30       7.0080     35.95  q  Q      |         |         |         |
  4+45       7.3885     38.56  q  Q      |         |         |         |
  5+ 0       8.0712     41.67  q  Q      |         |         |         |
  5+15       7.1946     41.67  q  Q      |         |         |         |
  5+30       7.1163     41.77  q  Q      |         |         |         |
  5+45       8.0171     44.29  q  Q      |         |         |         |
  6+ 0       8.4518     46.93  q   Q     |         |         |         |
  6+15       9.1345     50.02  q   Q     |         |         |         |
  6+30       9.5150     52.75  q   Q     |         |         |         |
  6+45      10.1977     55.96  q   Q     |         |         |         |
  7+ 0      10.5782     58.83  q    Q    |         |         |         |
  7+15      10.6323     60.78  q    Q    |         |         |         |
  7+30      11.2609     63.56  q    Q    |         |         |         |
  7+45      12.2701     67.69  |q   Q    |         |         |         |
  8+ 0      13.3333     72.69  |q    Q   |         |         |         |
  8+15      15.5106     80.53  |q     Q  |         |         |         |
  8+30      16.6691     87.41  |q     Q  |         |         |         |
  8+45      17.7963     94.27  |q      Q |         |         |         |
  9+ 0      19.3206    108.01  |q       Q|         |         |         |
  9+15      21.8195    130.17  |q        |Q        |         |         |
  9+30      23.9632    158.86  | q       |   Q     |         |         |
  9+45      25.6398    187.77  | q       |     Q   |         |         |
 10+ 0      27.2384    214.93  | q       |       Q |         |         |
 10+15      21.6523    213.89  |q        |       Q |         |         |
 10+30      18.0026    185.17  |q        |     Q   |         |         |
 10+45      22.0288    178.22  |q        |    Q    |         |         |
 11+ 0      24.8233    198.97  | q       |      Q  |         |         |
 11+15      24.3877    215.95  | q       |        Q|         |         |
 11+30      23.9191    221.79  | q       |        Q|         |         |
 11+45      22.1200    217.62  |q        |        Q|         |         |
 12+ 0      22.0042    211.04  |q        |       Q |         |         |
 12+15      28.7517    234.70  | q       |         Q         |         |
 12+30      33.6039    285.58  | q       |         |    Q    |         |
 12+45      36.5556    331.94  |  q      |         |         Q|        |
 13+ 0      38.6881    367.60  |  q      |         |         | Q       |
 13+15      43.9456    408.92  |  q      |         |         |     Q   |
 13+30      46.8092    453.14  |   q     |         |         |         Q
 13+45      37.3853    447.80  |  q      |         |         |        Q|
 14+ 0      31.4724    400.74  | q       |         |         |    Q    |
 14+15      34.2796    377.98  |  q      |         |         |  Q      |
 14+30      35.6207    383.10  |  q      |         |         |  Q      |
 14+45      35.4503    389.31  |  q      |         |         |   Q     |
 15+ 0      34.5380    389.50  |  q      |         |         |   Q     |
 15+15      33.1585    383.56  | q       |         |         |  Q      |
 15+30      31.7007    373.22  | q       |         |         | Q       |
 15+45      27.5479    351.00  | q       |         |         Q         |
 16+ 0      25.3554    323.31  | q       |         |        Q |        |
 16+15      12.7610    268.01  |q        |         |  Q      |         |
 16+30       5.3128    198.59  q         |      Q  |         |         |
 16+45       3.6243    150.61  q         |  Q      |         |         |
 17+ 0       3.2438    125.61  q         |Q        |         |         |
```

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17+15       4.4469    103.78  q         Q|          |          |          |
17+30       5.2079     87.82  q       Q  |          |          |          |
17+45       5.3162     76.20  q      Q   |          |          |          |
18+ 0       4.6876     65.74  q    Q     |          |          |          |
18+15       4.3071     56.94  q    Q     |          |          |          |
18+30       4.2529     50.74  q   Q      |          |          |          |
18+45       3.6243     47.21  q   Q      |          |          |          |
19+ 0       2.6152     42.98  q  Q       |          |          |          |
19+15       2.8092     40.75  q  Q       |          |          |          |
19+30       3.7642     41.31  q  Q       |          |          |          |
19+45       3.5702     40.64  q  Q       |          |          |          |
20+ 0       2.6152     37.57  q  Q       |          |          |          |
20+15       2.8092     35.95  q  Q       |          |          |          |
20+30       3.1356     35.54  q  Q       |          |          |          |
20+45       3.1897     35.02  q  Q       |          |          |          |
21+ 0       2.5611     32.92  q Q        |          |          |          |
21+15       2.8092     32.00  q Q        |          |          |          |
21+30       2.5070     30.61  q Q        |          |          |          |
21+45       2.8092     30.18  q Q        |          |          |          |
22+ 0       2.5070     29.02  q Q        |          |          |          |
22+15       2.8092     28.74  q Q        |          |          |          |
22+30       2.5070     27.70  q Q        |          |          |          |
22+45       2.1806     26.13  q Q        |          |          |          |
23+ 0       2.1265     24.98  q Q        |          |          |          |
23+15       2.1265     24.19  q Q        |          |          |          |
23+30       2.1265     23.54  q Q        |          |          |          |
23+45       2.1265     22.97  q Q        |          |          |          |
24+ 0       2.1265     22.44  qQ         |          |          |          |
24+15       0.8693     19.19  qQ         |          |          |          |
24+30       0.1082     15.60  qQ         |          |          |          |
24+45       0.0000     13.41  qQ         |          |          |          |
25+ 0       0.0000     12.11  qQ         |          |          |          |
25+15       0.0000     11.14  Q          |          |          |          |
25+30       0.0000     10.31  Q          |          |          |          |
25+45       0.0000      9.57  Q          |          |          |          |
26+ 0       0.0000      8.89  Q          |          |          |          |
26+15       0.0000      8.27  Q          |          |          |          |
26+30       0.0000      7.69  Q          |          |          |          |
26+45       0.0000      7.15  Q          |          |          |          |
27+ 0       0.0000      6.65  Q          |          |          |          |
27+15       0.0000      6.19  Q          |          |          |          |
27+30       0.0000      5.76  Q          |          |          |          |
27+45       0.0000      5.35  Q          |          |          |          |
28+ 0       0.0000      4.98  Q          |          |          |          |
28+15       0.0000      4.63  Q          |          |          |          |
28+30       0.0000      4.31  Q          |          |          |          |
28+45       0.0000      4.01  Q          |          |          |          |
29+ 0       0.0000      3.73  Q          |          |          |          |
29+15       0.0000      3.47  Q          |          |          |          |
29+30       0.0000      3.23  Q          |          |          |          |
29+45       0.0000      3.00  Q          |          |          |          |
30+ 0       0.0000      2.79  Q          |          |          |          |
30+15       0.0000      2.60  Q          |          |          |          |
30+30       0.0000      2.42  Q          |          |          |          |
30+45       0.0000      2.25  Q          |          |          |          |
31+ 0       0.0000      2.09  Q          |          |          |          |
31+15       0.0000      1.94  Q          |          |          |          |
31+30       0.0000      1.81  Q          |          |          |          |
31+45       0.0000      1.68  Q          |          |          |          |
32+ 0       0.0000      1.56  Q          |          |          |          |
32+15       0.0000      1.46  Q          |          |          |          |
32+30       0.0000      1.35  Q          |          |          |          |
32+45       0.0000      1.26  Q          |          |          |          |
33+ 0       0.0000      1.17  Q          |          |          |          |
33+15       0.0000      1.09  Q          |          |          |          |
33+30       0.0000      1.01  Q          |          |          |          |
33+45       0.0000      0.94  Q          |          |          |          |
34+ 0       0.0000      0.88  Q          |          |          |          |
34+15       0.0000      0.82  Q          |          |          |          |
34+30       0.0000      0.76  Q          |          |          |          |
34+45       0.0000      0.71  Q          |          |          |          |
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35+ 0	0.0000	0.66	Q				
35+15	0.0000	0.61	Q				
35+30	0.0000	0.57	Q				
35+45	0.0000	0.53	Q				
36+ 0	0.0000	0.49	Q				
36+15	0.0000	0.46	Q				
36+30	0.0000	0.43	Q				
36+45	0.0000	0.40	Q				
37+ 0	0.0000	0.37	Q				
37+15	0.0000	0.34	Q				
37+30	0.0000	0.32	Q				
37+45	0.0000	0.30	Q				
38+ 0	0.0000	0.28	Q				
38+15	0.0000	0.26	Q				
38+30	0.0000	0.24	Q				
38+45	0.0000	0.22	Q				
39+ 0	0.0000	0.21	Q				
39+15	0.0000	0.19	Q				
39+30	0.0000	0.18	Q				
39+45	0.0000	0.17	Q				
40+ 0	0.0000	0.15	Q				
40+15	0.0000	0.14	Q				
40+30	0.0000	0.13	Q				
40+45	0.0000	0.12	Q				
41+ 0	0.0000	0.12	Q				
41+15	0.0000	0.11	Q				
41+30	0.0000	0.10	Q				
41+45	0.0000	0.09	Q				
42+ 0	0.0000	0.09	Q				
42+15	0.0000	0.08	Q				
42+30	0.0000	0.07	Q				
42+45	0.0000	0.07	Q				
43+ 0	0.0000	0.06	Q				
43+15	0.0000	0.06	Q				
43+30	0.0000	0.06	Q				
43+45	0.0000	0.05	Q				
44+ 0	0.0000	0.05	Q				
44+15	0.0000	0.05	Q				
44+30	0.0000	0.04	Q				
44+45	0.0000	0.04	Q				
45+ 0	0.0000	0.04	Q				
45+15	0.0000	0.03	Q				
45+30	0.0000	0.03	Q				
45+45	0.0000	0.03	Q				
46+ 0	0.0000	0.03	Q				
46+15	0.0000	0.03	Q				
46+30	0.0000	0.02	Q				
46+45	0.0000	0.02	Q				
47+ 0	0.0000	0.02	Q				
47+15	0.0000	0.02	Q				
47+30	0.0000	0.02	Q				
47+45	0.0000	0.02	Q				
48+ 0	0.0000	0.02	Q				
48+15	0.0000	0.01	Q				
48+30	0.0000	0.01	Q				
48+45	0.0000	0.01	Q				
49+ 0	0.0000	0.01	Q				
49+15	0.0000	0.01	Q				
49+30	0.0000	0.01	Q				
49+45	0.0000	0.01	Q				
50+ 0	0.0000	0.01	Q				
50+15	0.0000	0.01	Q				
50+30	0.0000	0.01	Q				
50+45	0.0000	0.01	Q				
51+ 0	0.0000	0.01	Q				
51+15	0.0000	0.01	Q				
51+30	0.0000	0.01	Q				
51+45	0.0000	0.01	Q				
52+ 0	0.0000	0.00	Q				
52+15	0.0000	0.00	Q				
52+30	0.0000	0.00	Q				

```
   52+45       0.0000      0.00  Q          |          |          |          |
   53+ 0       0.0000      0.00  Q          |          |          |          |
   53+15       0.0000      0.00  Q          |          |          |          |
   53+30       0.0000      0.00  Q          |          |          |          |
   53+45       0.0000      0.00  Q          |          |          |          |
   54+ 0       0.0000      0.00  Q          |          |          |          |
   54+15       0.0000      0.00  Q          |          |          |          |
   54+30       0.0000      0.00  Q          |          |          |          |
   54+45       0.0000      0.00  Q          |          |          |          |
   55+ 0       0.0000      0.00  Q          |          |          |          |
   55+15       0.0000      0.00  Q          |          |          |          |
   55+30       0.0000      0.00  Q          |          |          |          |
   55+45       0.0000      0.00  Q          |          |          |          |
   56+ 0       0.0000      0.00  Q          |          |          |          |
   56+15       0.0000      0.00  Q          |          |          |          |
   56+30       0.0000      0.00  Q          |          |          |          |
   56+45       0.0000      0.00  Q          |          |          |          |
   57+ 0       0.0000      0.00  Q          |          |          |          |
   57+15       0.0000      0.00  Q          |          |          |          |
   57+30       0.0000      0.00  Q          |          |          |          |
   57+45       0.0000      0.00  Q          |          |          |          |
   58+ 0       0.0000      0.00  Q          |          |          |          |
   58+15       0.0000      0.00  Q          |          |          |          |
   58+30       0.0000      0.00  Q          |          |          |          |
   58+45       0.0000      0.00  Q          |          |          |          |
   59+ 0       0.0000      0.00  Q          |          |          |          |
   59+15       0.0000      0.00  Q          |          |          |          |
   59+30       0.0000      0.00  Q          |          |          |          |
   59+45       0.0000      0.00  Q          |          |          |          |
   60+ 0       0.0000      0.00  Q          |          |          |          |
   60+15       0.0000      0.00  Q          |          |          |          |
   60+30       0.0000      0.00  Q          |          |          |          |
   60+45       0.0000      0.00  Q          |          |          |          |
   61+ 0       0.0000      0.00  Q          |          |          |          |
   61+15       0.0000      0.00  Q          |          |          |          |
   61+30       0.0000      0.00  Q          |          |          |          |
   61+45       0.0000      0.00  Q          |          |          |          |
   62+ 0       0.0000      0.00  Q          |          |          |          |
   62+15       0.0000      0.00  Q          |          |          |          |
   62+30       0.0000      0.00  Q          |          |          |          |
   62+45       0.0000      0.00  Q          |          |          |          |
   63+ 0       0.0000      0.00  Q          |          |          |          |
   63+15       0.0000      0.00  Q          |          |          |          |
   63+30       0.0000      0.00  Q          |          |          |          |
   63+45       0.0000      0.00  Q          |          |          |          |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   255
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      453.136 (CFS)
                       Total volume =     244.367 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        4.000 to Point/Station        5.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1300.00 (Ft.)
        Elevation difference =   30.00 (Ft.)
        Slope of channel =  0.023077 (Vert/Horiz)
        Channel type - Improved Channel
```

```
Channel length =  1300.00(Ft.)     Elevation difference =  30.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =    153.543(CFS)
Depth of flow =     1.508(Ft.)
Average velocity =    15.640(Ft/s)
Total flow rate =   153.543(CFS)
Channel flow top width =    8.017(Ft.)
Depth of flow in channel =   1.51(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   15.64(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  153.543(CFS)
Total capacity of improved channels =    153.543(CFS)
Critical Depth in Channel =    2.56(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    453.136(CFS)
Depth of flow =     2.757(Ft.)
Average velocity =    21.191(Ft/s)
Total flow rate =   453.136(CFS)
Channel flow top width =   10.513(Ft.)
Depth of flow in channel =   2.76(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   21.19(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  453.136(CFS)
Total capacity of improved channels =    453.136(CFS)
Critical Depth in Channel =    4.66(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9257   Travel time =   1.02 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  10.8985
       dt(routing time-step) =   0.95 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      113.3     226.6     339.9     453.1
----------------------------------------------------------------------
  0+15       2.5882      2.76  O         |         |         |         |
  0+30       7.0094      7.30  O         |         |         |         |
  0+45      10.4296     10.64  O         |         |         |         |
  1+ 0      13.6235     13.82  |O        |         |         |         |
  1+15      15.0077     15.09  |O        |         |         |         |
  1+30      15.1898     15.20  |O        |         |         |         |
  1+45      15.4286     15.44  |O        |         |         |         |
  2+ 0      17.1631     17.28  |O        |         |         |         |
  2+15      19.2151     19.35  |O        |         |         |         |
  2+30      20.6200     20.71  |O        |         |         |         |
  2+45      22.8513     23.00  | O       |         |         |         |
  3+ 0      25.1517     25.30  | O       |         |         |         |
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 3+15      26.7225     26.82  | O       |         |         |         |
 3+30      27.7888     27.85  | O       |         |         |         |
 3+45      28.6411     28.69  | O       |         |         |         |
 4+ 0      30.6839     30.82  | O       |         |         |         |
 4+15      32.9234     33.07  | O       |         |         |         |
 4+30      35.7705     35.95  |  O      |         |         |         |
 4+45      38.3952     38.56  |  O      |         |         |         |
 5+ 0      41.4705     41.67  |  O      |         |         |         |
 5+15      41.6733     41.67  |  O      |         |         |         |
 5+30      41.7656     41.77  |  O      |         |         |         |
 5+45      44.1274     44.29  |  O      |         |         |         |
 6+ 0      46.7609     46.93  |   O     |         |         |         |
 6+15      49.8204     50.02  |   O     |         |         |         |
 6+30      52.5782     52.75  |   O     |         |         |         |
 6+45      55.7611     55.96  |   O     |         |         |         |
 7+ 0      58.6479     58.83  |    O    |         |         |         |
 7+15      60.6534     60.78  |    O    |         |         |         |
 7+30      63.3866     63.56  |    O    |         |         |         |
 7+45      67.4288     67.69  |    O    |         |         |         |
 8+ 0      72.3755     72.69  |     O   |         |         |         |
 8+15      80.0330     80.53  |      O  |         |         |         |
 8+30      86.9761     87.41  |      O  |         |         |         |
 8+45      93.8406     94.27  |       O |         |         |         |
 9+ 0     107.1407    108.01  |        O|         |         |         |
 9+15     128.7687    130.17  |         |O        |         |         |
 9+30     157.0512    158.86  |         |  OI     |         |         |
 9+45     185.9498    187.77  |         |     O   |         |         |
10+ 0     213.2154    214.93  |         |       O |         |         |
10+15     213.9520    213.89  |         |       O |         |         |
10+30     186.9862    185.17  |         |     O   |         |         |
10+45     178.6618    178.22  |         |    O    |         |         |
11+ 0     197.6625    198.97  |         |      O  |         |         |
11+15     214.8767    215.95  |         |       OI|         |         |
11+30     221.4192    221.79  |         |        O|         |         |
11+45     217.8866    217.62  |         |        O|         |         |
12+ 0     211.4575    211.04  |         |       O |         |         |
12+15     233.2065    234.70  |         |         O         |         |
12+30     282.3712    285.58  |         |          |   OI   |         |
12+45     329.0156    331.94  |         |         |        O|         |
13+ 0     365.3509    367.60  |         |         |         | O       |
13+15     406.3107    408.92  |         |         |         |    OI   |
13+30     450.3458    453.14  |         |         |         |        OI
13+45     448.1403    447.80  |         |         |         |       O|
14+ 0     403.7093    400.74  |         |         |         |    O    |
14+15     379.4175    377.98  |         |         |         |  O      |
14+30     382.7806    383.10  |         |         |         |  O      |
14+45     388.9191    389.31  |         |         |         |   O     |
15+ 0     389.4885    389.50  |         |         |         |   O     |
15+15     383.9348    383.56  |         |         |         |  O      |
15+30     373.8685    373.22  |         |         |         | IO      |
15+45     352.4032    351.00  |         |         |        IO       |
16+ 0     325.0616    323.31  |         |         |       O |         |
16+15     271.5004    268.01  |         |         |  O      |         |
16+30     202.9685    198.59  |         |      O  |         |         |
16+45     153.6353    150.61  |         |  O      |         |         |
17+ 0     127.1885    125.61  |         |O        |         |         |
17+15     105.1544    103.78  |        O|         |         |         |
17+30      88.8271     87.82  |      O  |         |         |         |
17+45      76.9342     76.20  |     O   |         |         |         |
18+ 0      66.4038     65.74  |    O    |         |         |         |
18+15      57.4954     56.94  |    O    |         |         |         |
18+30      51.1349     50.74  |   O     |         |         |         |
18+45      47.4373     47.21  |   O     |         |         |         |
19+ 0      43.2479     42.98  |  O      |         |         |         |
19+15      40.8946     40.75  |  O      |         |         |         |
19+30      41.2768     41.31  |  O      |         |         |         |
19+45      40.6863     40.64  |  O      |         |         |         |
20+ 0      37.7596     37.57  |  O      |         |         |         |
20+15      36.0491     35.95  |  O      |         |         |         |
20+30      35.5645     35.54  |  O      |         |         |         |
20+45      35.0496     35.02  |  O      |         |         |         |
```

21+ 0	33.0561	32.92	| O	|	|	|	|
21+15	32.0606	32.00	| O	|	|	|	|
21+30	30.6973	30.61	| O	|	|	|	|
21+45	30.2096	30.18	| O	|	|	|	|
22+ 0	29.0964	29.02	| O	|	|	|	|
22+15	28.7617	28.74	| O	|	|	|	|
22+30	27.7657	27.70	| O	|	|	|	|
22+45	26.2324	26.13	| O	|	|	|	|
23+ 0	25.0566	24.98	| O	|	|	|	|
23+15	24.2393	24.19	| O	|	|	|	|
23+30	23.5825	23.54	| O	|	|	|	|
23+45	23.0032	22.97	| O	|	|	|	|
24+ 0	22.4765	22.44	|O	|	|	|	|
24+15	19.3992	19.19	|O	|	|	|	|
24+30	15.8227	15.60	|O	|	|	|	|
24+45	13.5476	13.41	|O	|	|	|	|
25+ 0	12.1902	12.11	|O	|	|	|	|
25+15	11.1973	11.14	O	|	|	|	|
25+30	10.3613	10.31	O	|	|	|	|
25+45	9.6169	9.57	O	|	|	|	|
26+ 0	8.9355	8.89	O	|	|	|	|
26+15	8.3057	8.27	O	|	|	|	|
26+30	7.7239	7.69	O	|	|	|	|
26+45	7.1845	7.15	O	|	|	|	|
27+ 0	6.6830	6.65	O	|	|	|	|
27+15	6.2165	6.19	O	|	|	|	|
27+30	5.7826	5.76	O	|	|	|	|
27+45	5.3790	5.35	O	|	|	|	|
28+ 0	5.0035	4.98	O	|	|	|	|
28+15	4.6543	4.63	O	|	|	|	|
28+30	4.3294	4.31	O	|	|	|	|
28+45	4.0272	4.01	O	|	|	|	|
29+ 0	3.7461	3.73	O	|	|	|	|
29+15	3.4846	3.47	O	|	|	|	|
29+30	3.2414	3.23	O	|	|	|	|
29+45	3.0152	3.00	O	|	|	|	|
30+ 0	2.8047	2.79	O	|	|	|	|
30+15	2.6089	2.60	O	|	|	|	|
30+30	2.4268	2.42	O	|	|	|	|
30+45	2.2574	2.25	O	|	|	|	|
31+ 0	2.0999	2.09	O	|	|	|	|
31+15	1.9533	1.94	O	|	|	|	|
31+30	1.8170	1.81	O	|	|	|	|
31+45	1.6901	1.68	O	|	|	|	|
32+ 0	1.5722	1.56	O	|	|	|	|
32+15	1.4624	1.46	O	|	|	|	|
32+30	1.3603	1.35	O	|	|	|	|
32+45	1.2654	1.26	O	|	|	|	|
33+ 0	1.1771	1.17	O	|	|	|	|
33+15	1.0949	1.09	O	|	|	|	|
33+30	1.0185	1.01	O	|	|	|	|
33+45	0.9474	0.94	O	|	|	|	|
34+ 0	0.8813	0.88	O	|	|	|	|
34+15	0.8198	0.82	O	|	|	|	|
34+30	0.7625	0.76	O	|	|	|	|
34+45	0.7093	0.71	O	|	|	|	|
35+ 0	0.6598	0.66	O	|	|	|	|
35+15	0.6137	0.61	O	|	|	|	|
35+30	0.5709	0.57	O	|	|	|	|
35+45	0.5311	0.53	O	|	|	|	|
36+ 0	0.4940	0.49	O	|	|	|	|
36+15	0.4595	0.46	O	|	|	|	|
36+30	0.4274	0.43	O	|	|	|	|
36+45	0.3976	0.40	O	|	|	|	|
37+ 0	0.3698	0.37	O	|	|	|	|
37+15	0.3440	0.34	O	|	|	|	|
37+30	0.3200	0.32	O	|	|	|	|
37+45	0.2977	0.30	O	|	|	|	|
38+ 0	0.2769	0.28	O	|	|	|	|
38+15	0.2576	0.26	O	|	|	|	|
38+30	0.2396	0.24	O	|	|	|	|

38+45	0.2229	0.22	O	|	|	|	|
39+ 0	0.2073	0.21	O	|	|	|	|
39+15	0.1928	0.19	O	|	|	|	|
39+30	0.1794	0.18	O	|	|	|	|
39+45	0.1669	0.17	O	|	|	|	|
40+ 0	0.1552	0.15	O	|	|	|	|
40+15	0.1444	0.14	O	|	|	|	|
40+30	0.1343	0.13	O	|	|	|	|
40+45	0.1249	0.12	O	|	|	|	|
41+ 0	0.1162	0.12	O	|	|	|	|
41+15	0.1081	0.11	O	|	|	|	|
41+30	0.1006	0.10	O	|	|	|	|
41+45	0.0935	0.09	O	|	|	|	|
42+ 0	0.0870	0.09	O	|	|	|	|
42+15	0.0809	0.08	O	|	|	|	|
42+30	0.0753	0.07	O	|	|	|	|
42+45	0.0700	0.07	O	|	|	|	|
43+ 0	0.0651	0.06	O	|	|	|	|
43+15	0.0606	0.06	O	|	|	|	|
43+30	0.0564	0.06	O	|	|	|	|
43+45	0.0524	0.05	O	|	|	|	|
44+ 0	0.0488	0.05	O	|	|	|	|
44+15	0.0454	0.05	O	|	|	|	|
44+30	0.0422	0.04	O	|	|	|	|
44+45	0.0393	0.04	O	|	|	|	|
45+ 0	0.0365	0.04	O	|	|	|	|
45+15	0.0340	0.03	O	|	|	|	|
45+30	0.0316	0.03	O	|	|	|	|
45+45	0.0294	0.03	O	|	|	|	|
46+ 0	0.0273	0.03	O	|	|	|	|
46+15	0.0254	0.03	O	|	|	|	|
46+30	0.0237	0.02	O	|	|	|	|
46+45	0.0220	0.02	O	|	|	|	|
47+ 0	0.0205	0.02	O	|	|	|	|
47+15	0.0190	0.02	O	|	|	|	|
47+30	0.0177	0.02	O	|	|	|	|
47+45	0.0165	0.02	O	|	|	|	|
48+ 0	0.0153	0.02	O	|	|	|	|
48+15	0.0143	0.01	O	|	|	|	|
48+30	0.0133	0.01	O	|	|	|	|
48+45	0.0123	0.01	O	|	|	|	|
49+ 0	0.0115	0.01	O	|	|	|	|
49+15	0.0107	0.01	O	|	|	|	|
49+30	0.0099	0.01	O	|	|	|	|
49+45	0.0092	0.01	O	|	|	|	|
50+ 0	0.0086	0.01	O	|	|	|	|
50+15	0.0080	0.01	O	|	|	|	|
50+30	0.0074	0.01	O	|	|	|	|
50+45	0.0069	0.01	O	|	|	|	|
51+ 0	0.0064	0.01	O	|	|	|	|
51+15	0.0060	0.01	O	|	|	|	|
51+30	0.0056	0.01	O	|	|	|	|
51+45	0.0052	0.01	O	|	|	|	|
52+ 0	0.0048	0.00	O	|	|	|	|
52+15	0.0045	0.00	O	|	|	|	|
52+30	0.0042	0.00	O	|	|	|	|
52+45	0.0039	0.00	O	|	|	|	|
53+ 0	0.0036	0.00	O	|	|	|	|
53+15	0.0034	0.00	O	|	|	|	|
53+30	0.0031	0.00	O	|	|	|	|
53+45	0.0029	0.00	O	|	|	|	|
54+ 0	0.0027	0.00	O	|	|	|	|
54+15	0.0025	0.00	O	|	|	|	|
54+30	0.0023	0.00	O	|	|	|	|
54+45	0.0022	0.00	O	|	|	|	|
55+ 0	0.0020	0.00	O	|	|	|	|
55+15	0.0020	0.00	O	|	|	|	|
55+30	0.0019	0.00	O	|	|	|	|
55+45	0.0019	0.00	O	|	|	|	|
56+ 0	0.0018	0.00	O	|	|	|	|
56+15	0.0018	0.00	O	|	|	|	|

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   56+30       0.0018      0.00  O         |         |         |         |
   56+45       0.0017      0.00  O         |         |         |         |
   57+ 0       0.0017      0.00  O         |         |         |         |
   57+15       0.0017      0.00  O         |         |         |         |
   57+30       0.0016      0.00  O         |         |         |         |
   57+45       0.0016      0.00  O         |         |         |         |
   58+ 0       0.0016      0.00  O         |         |         |         |
   58+15       0.0015      0.00  O         |         |         |         |
   58+30       0.0015      0.00  O         |         |         |         |
   58+45       0.0015      0.00  O         |         |         |         |
   59+ 0       0.0014      0.00  O         |         |         |         |
   59+15       0.0014      0.00  O         |         |         |         |
   59+30       0.0014      0.00  O         |         |         |         |
   59+45       0.0014      0.00  O         |         |         |         |
   60+ 0       0.0013      0.00  O         |         |         |         |
   60+15       0.0013      0.00  O         |         |         |         |
   60+30       0.0013      0.00  O         |         |         |         |
   60+45       0.0012      0.00  O         |         |         |         |
   61+ 0       0.0012      0.00  O         |         |         |         |
   61+15       0.0012      0.00  O         |         |         |         |
   61+30       0.0012      0.00  O         |         |         |         |
   61+45       0.0011      0.00  O         |         |         |         |
   62+ 0       0.0011      0.00  O         |         |         |         |
   62+15       0.0011      0.00  O         |         |         |         |
   62+30       0.0011      0.00  O         |         |         |         |
   62+45       0.0011      0.00  O         |         |         |         |
   63+ 0       0.0010      0.00  O         |         |         |         |
   63+15       0.0010      0.00  O         |         |         |         |
   63+30       0.0010      0.00  O         |         |         |         |
   63+45       0.0001      0.00  O         |         |         |         |
   64+ 0       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   256
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      450.346 (CFS)
                       Total volume =     244.367 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        -----------------------------------------------------------------

        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        4.000 to Point/Station        5.000
        **** RETARDING BASIN ROUTING ****
        ____________________________________________________________________

        User entry of depth-outflow-storage data
        ----------------------------------------------------------------
        Total number of inflow hydrograph intervals = 256
        Hydrograph time unit = 15.000 (Min.)
        Initial depth in storage basin =   0.00(Ft.)
        ----------------------------------------------------------------
        ----------------------------------------------------------------
        Initial basin depth =   0.00 (Ft.)
        Initial basin storage =      0.00 (Ac.Ft)
        Initial basin outflow =   0.00 (CFS)
        ---------------------------------------------------------------
        ----------------------------------------------------------------
        Depth vs. Storage and Depth vs. Discharge data:
         Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
             (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
        ---------------------------------------------------------------
          0.000      0.000      0.000      0.000        0.000
          1.000     30.000    150.000     28.450       31.550
          2.000     45.000    250.000     42.417       47.583
          4.000     55.000    500.000     49.835       60.165
```

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-----------------------------------------------------------------
                 Hydrograph Detention Basin Routing
-----------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
-----------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0     112.6  225.17  337.76  450.35 (Ft.)
 0.250    2.59    0.13      0.025  O       |       |       |       |     0.00
 0.500    7.01    0.59      0.117  O       |       |       |       |     0.00
 0.750   10.43    1.38      0.277  O       |       |       |       |     0.01
 1.000   13.62    2.43      0.486  O       |       |       |       |     0.02
 1.250   15.01    3.60      0.720  OI      |       |       |       |     0.02
 1.500   15.19    4.73      0.946  OI      |       |       |       |     0.03
 1.750   15.43    5.77      1.153  OI      |       |       |       |     0.04
 2.000   17.16    6.80      1.360  OI      |       |       |       |     0.05
 2.250   19.22    7.92      1.584  OI      |       |       |       |     0.05
 2.500   20.62    9.10      1.820  OI      |       |       |       |     0.06
 2.750   22.85   10.34      2.068  OI      |       |       |       |     0.07
 3.000   25.15   11.68      2.336  OI      |       |       |       |     0.08
 3.250   26.72   13.08      2.616  OI      |       |       |       |     0.09
 3.500   27.79   14.47      2.895  |O      |       |       |       |     0.10
 3.750   28.64   15.82      3.165  |OI     |       |       |       |     0.11
 4.000   30.68   17.18      3.437  |OI     |       |       |       |     0.11
 4.250   32.92   18.62      3.724  |OI     |       |       |       |     0.12
 4.500   35.77   20.16      4.033  |OI     |       |       |       |     0.13
 4.750   38.40   21.83      4.365  |OI     |       |       |       |     0.15
 5.000   41.47   23.61      4.721  |OI     |       |       |       |     0.16
 5.250   41.67   25.37      5.074  |OI     |       |       |       |     0.17
 5.500   41.77   26.98      5.395  |OI     |       |       |       |     0.18
 5.750   44.13   28.54      5.709  | OI    |       |       |       |     0.19
 6.000   46.76   30.20      6.041  | OI    |       |       |       |     0.20
 6.250   49.82   31.98      6.396  | OI    |       |       |       |     0.21
 6.500   52.58   33.87      6.774  | OI    |       |       |       |     0.23
 6.750   55.76   35.86      7.173  | OI    |       |       |       |     0.24
 7.000   58.65   37.96      7.592  | O I   |       |       |       |     0.25
 7.250   60.65   40.09      8.018  | O I   |       |       |       |     0.27
 7.500   63.39   42.24      8.449  |  OI   |       |       |       |     0.28
 7.750   67.43   44.52      8.904  |  OI   |       |       |       |     0.30
 8.000   72.38   47.01      9.403  |  O I  |       |       |       |     0.31
 8.250   80.03   49.88      9.976  |  O I  |       |       |       |     0.33
 8.500   86.98   53.18     10.637  |  O  I |       |       |       |     0.35
 8.750   93.84   56.84     11.368  |   O I |       |       |       |     0.38
 9.000  107.14   61.13     12.226  |   O  I|       |       |       |     0.41
 9.250  128.77   66.71     13.342  |   O   |I      |       |       |     0.44
 9.500  157.05   74.20     14.839  |    O  |  I    |       |       |     0.49
 9.750  185.95   83.75     16.751  |    O  |    I  |       |       |     0.56
10.000  213.22   95.13     19.026  |     O |      I|       |       |     0.63
10.250  213.95  106.77     21.354  |      O|      I|       |       |     0.71
10.500  186.99  115.97     23.194  |       O    I  |       |       |     0.77
10.750  178.66  122.54     24.508  |       O   I   |       |       |     0.82
11.000  197.66  128.99     25.797  |       |O    I |       |       |     0.86
11.250  214.88  136.58     27.315  |       |O     I|       |       |     0.91
11.500  221.42  144.59     28.918  |       | O    I|       |       |     0.96
11.750  217.89  152.58     30.386  |       | O    I|       |       |     1.03
12.000  211.46  160.58     31.587  |       |  O   I|       |       |     1.11
12.250  233.21  168.54     32.780  |       |  O    I       |       |     1.19
12.500  282.37  180.04     34.506  |       |   O   |   I   |       |     1.30
12.750  329.02  196.23     36.935  |       |    O  |      I|       |     1.46
13.000  365.35  215.68     39.852  |       |      O|       |I      |     1.66
13.250  406.31  237.61     43.141  |       |       O       |   I   |     1.88
13.500  450.35  288.82     46.553  |       |       |   O   |       I     2.31
13.750  448.14  354.68     49.187  |       |       |       |O     I|     2.84
14.000  403.71  383.92     50.357  |       |       |       |  OI   |     3.07
14.250  379.42  387.06     50.482  |       |       |       | IO    |     3.10
14.500  382.78  384.61     50.385  |       |       |       |  O    |     3.08
14.750  388.92  385.12     50.405  |       |       |       |  O    |     3.08
15.000  389.49  386.80     50.472  |       |       |       |  O    |     3.09
15.250  383.93  386.76     50.470  |       |       |       |  O    |     3.09
15.500  373.87  383.54     50.341  |       |       |       | IO    |     3.07
15.750  352.40  375.16     50.006  |       |       |       |IO     |     3.00
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16.000	325.06	360.21	49.408		2.88
16.250	271.50	334.79	48.391		2.68
16.500	202.97	294.74	46.790		2.36
16.750	153.64	249.04	44.856		1.99
17.000	127.19	235.04	42.756		1.85
17.250	105.15	219.72	40.458		1.70
17.500	88.83	203.91	38.086		1.54
17.750	76.93	188.31	35.747		1.38
18.000	66.40	173.28	33.492		1.23
18.250	57.50	158.93	31.340		1.09
18.500	51.13	146.53	29.307		0.98
18.750	47.44	136.98	27.396		0.91
19.000	43.25	127.98	25.596		0.85
19.250	40.89	119.54	23.908		0.80
19.500	41.28	111.83	22.367		0.75
19.750	40.69	104.87	20.975		0.70
20.000	37.76	98.42	19.685		0.66
20.250	36.05	92.38	18.476		0.62
20.500	35.56	86.82	17.365		0.58
20.750	35.05	81.76	16.353		0.55
21.000	33.06	77.08	15.415		0.51
21.250	32.06	72.70	14.541		0.48
21.500	30.70	68.64	13.729		0.46
21.750	30.21	64.89	12.978		0.43
22.000	29.10	61.43	12.286		0.41
22.250	28.76	58.24	11.648		0.39
22.500	27.77	55.29	11.059		0.37
22.750	26.23	52.51	10.503		0.35
23.000	25.06	49.87	9.975		0.33
23.250	24.24	47.40	9.479		0.32
23.500	23.58	45.09	9.018		0.30
23.750	23.00	42.95	8.590		0.29
24.000	22.48	40.96	8.193		0.27
24.250	19.40	39.00	7.799		0.26
24.500	15.82	36.90	7.379		0.25
24.750	13.55	34.71	6.943		0.23
25.000	12.19	32.57	6.514		0.22
25.250	11.20	30.52	6.103		0.20
25.500	10.36	28.58	5.716		0.19
25.750	9.62	26.75	5.350		0.18
26.000	8.94	25.04	5.007		0.17
26.250	8.31	23.42	4.685		0.16
26.500	7.72	21.91	4.382		0.15
26.750	7.18	20.49	4.098		0.14
27.000	6.68	19.16	3.832		0.13
27.250	6.22	17.91	3.582		0.12
27.500	5.78	16.74	3.348		0.11
27.750	5.38	15.64	3.129		0.10
28.000	5.00	14.62	2.923		0.10
28.250	4.65	13.66	2.731		0.09
28.500	4.33	12.76	2.551		0.09
28.750	4.03	11.91	2.383		0.08
29.000	3.75	11.12	2.225		0.07
29.250	3.48	10.39	2.077		0.07
29.500	3.24	9.70	1.939		0.06
29.750	3.02	9.05	1.810		0.06
30.000	2.80	8.45	1.690		0.06
30.250	2.61	7.88	1.577		0.05
30.500	2.43	7.36	1.471		0.05
30.750	2.26	6.86	1.373		0.05
31.000	2.10	6.40	1.281		0.04
31.250	1.95	5.97	1.195		0.04
31.500	1.82	5.57	1.114		0.04
31.750	1.69	5.20	1.039		0.03
32.000	1.57	4.85	0.969		0.03
32.250	1.46	4.52	0.904		0.03
32.500	1.36	4.21	0.843		0.03
32.750	1.27	3.93	0.786		0.03
33.000	1.18	3.66	0.733		0.02
33.250	1.09	3.42	0.683		0.02
33.500	1.02	3.18	0.637		0.02

33.750	0.95	2.97	0.593	O	|	|	|	|	0.02
34.000	0.88	2.77	0.553	O	|	|	|	|	0.02
34.250	0.82	2.58	0.516	O	|	|	|	|	0.02
34.500	0.76	2.40	0.480	O	|	|	|	|	0.02
34.750	0.71	2.24	0.448	O	|	|	|	|	0.01
35.000	0.66	2.09	0.417	O	|	|	|	|	0.01
35.250	0.61	1.94	0.389	O	|	|	|	|	0.01
35.500	0.57	1.81	0.362	O	|	|	|	|	0.01
35.750	0.53	1.69	0.337	O	|	|	|	|	0.01
36.000	0.49	1.57	0.314	O	|	|	|	|	0.01
36.250	0.46	1.46	0.293	O	|	|	|	|	0.01
36.500	0.43	1.36	0.273	O	|	|	|	|	0.01
36.750	0.40	1.27	0.254	O	|	|	|	|	0.01
37.000	0.37	1.18	0.237	O	|	|	|	|	0.01
37.250	0.34	1.10	0.220	O	|	|	|	|	0.01
37.500	0.32	1.03	0.205	O	|	|	|	|	0.01
37.750	0.30	0.96	0.191	O	|	|	|	|	0.01
38.000	0.28	0.89	0.178	O	|	|	|	|	0.01
38.250	0.26	0.83	0.166	O	|	|	|	|	0.01
38.500	0.24	0.77	0.154	O	|	|	|	|	0.01
38.750	0.22	0.72	0.144	O	|	|	|	|	0.00
39.000	0.21	0.67	0.134	O	|	|	|	|	0.00
39.250	0.19	0.62	0.125	O	|	|	|	|	0.00
39.500	0.18	0.58	0.116	O	|	|	|	|	0.00
39.750	0.17	0.54	0.108	O	|	|	|	|	0.00
40.000	0.16	0.50	0.101	O	|	|	|	|	0.00
40.250	0.14	0.47	0.094	O	|	|	|	|	0.00
40.500	0.13	0.44	0.087	O	|	|	|	|	0.00
40.750	0.12	0.41	0.081	O	|	|	|	|	0.00
41.000	0.12	0.38	0.076	O	|	|	|	|	0.00
41.250	0.11	0.35	0.070	O	|	|	|	|	0.00
41.500	0.10	0.33	0.066	O	|	|	|	|	0.00
41.750	0.09	0.30	0.061	O	|	|	|	|	0.00
42.000	0.09	0.28	0.057	O	|	|	|	|	0.00
42.250	0.08	0.26	0.053	O	|	|	|	|	0.00
42.500	0.08	0.25	0.049	O	|	|	|	|	0.00
42.750	0.07	0.23	0.046	O	|	|	|	|	0.00
43.000	0.07	0.21	0.043	O	|	|	|	|	0.00
43.250	0.06	0.20	0.040	O	|	|	|	|	0.00
43.500	0.06	0.18	0.037	O	|	|	|	|	0.00
43.750	0.05	0.17	0.034	O	|	|	|	|	0.00
44.000	0.05	0.16	0.032	O	|	|	|	|	0.00
44.250	0.05	0.15	0.030	O	|	|	|	|	0.00
44.500	0.04	0.14	0.028	O	|	|	|	|	0.00
44.750	0.04	0.13	0.026	O	|	|	|	|	0.00
45.000	0.04	0.12	0.024	O	|	|	|	|	0.00
45.250	0.03	0.11	0.022	O	|	|	|	|	0.00
45.500	0.03	0.10	0.021	O	|	|	|	|	0.00
45.750	0.03	0.10	0.019	O	|	|	|	|	0.00
46.000	0.03	0.09	0.018	O	|	|	|	|	0.00
46.250	0.03	0.08	0.017	O	|	|	|	|	0.00
46.500	0.02	0.08	0.016	O	|	|	|	|	0.00
46.750	0.02	0.07	0.014	O	|	|	|	|	0.00
47.000	0.02	0.07	0.013	O	|	|	|	|	0.00
47.250	0.02	0.06	0.013	O	|	|	|	|	0.00
47.500	0.02	0.06	0.012	O	|	|	|	|	0.00
47.750	0.02	0.05	0.011	O	|	|	|	|	0.00
48.000	0.02	0.05	0.010	O	|	|	|	|	0.00
48.250	0.01	0.05	0.009	O	|	|	|	|	0.00
48.500	0.01	0.04	0.009	O	|	|	|	|	0.00
48.750	0.01	0.04	0.008	O	|	|	|	|	0.00
49.000	0.01	0.04	0.008	O	|	|	|	|	0.00
49.250	0.01	0.04	0.007	O	|	|	|	|	0.00
49.500	0.01	0.03	0.007	O	|	|	|	|	0.00
49.750	0.01	0.03	0.006	O	|	|	|	|	0.00
50.000	0.01	0.03	0.006	O	|	|	|	|	0.00
50.250	0.01	0.03	0.005	O	|	|	|	|	0.00
50.500	0.01	0.02	0.005	O	|	|	|	|	0.00
50.750	0.01	0.02	0.005	O	|	|	|	|	0.00
51.000	0.01	0.02	0.004	O	|	|	|	|	0.00
51.250	0.01	0.02	0.004	O	|	|	|	|	0.00

51.500	0.01	0.02	0.004	O	|	|	|	|	0.00
51.750	0.01	0.02	0.003	O	|	|	|	|	0.00
52.000	0.00	0.02	0.003	O	|	|	|	|	0.00
52.250	0.00	0.01	0.003	O	|	|	|	|	0.00
52.500	0.00	0.01	0.003	O	|	|	|	|	0.00
52.750	0.00	0.01	0.003	O	|	|	|	|	0.00
53.000	0.00	0.01	0.002	O	|	|	|	|	0.00
53.250	0.00	0.01	0.002	O	|	|	|	|	0.00
53.500	0.00	0.01	0.002	O	|	|	|	|	0.00
53.750	0.00	0.01	0.002	O	|	|	|	|	0.00
54.000	0.00	0.01	0.002	O	|	|	|	|	0.00
54.250	0.00	0.01	0.002	O	|	|	|	|	0.00
54.500	0.00	0.01	0.002	O	|	|	|	|	0.00
54.750	0.00	0.01	0.001	O	|	|	|	|	0.00
55.000	0.00	0.01	0.001	O	|	|	|	|	0.00
55.250	0.00	0.01	0.001	O	|	|	|	|	0.00
55.500	0.00	0.01	0.001	O	|	|	|	|	0.00
55.750	0.00	0.01	0.001	O	|	|	|	|	0.00
56.000	0.00	0.01	0.001	O	|	|	|	|	0.00
56.250	0.00	0.00	0.001	O	|	|	|	|	0.00
56.500	0.00	0.00	0.001	O	|	|	|	|	0.00
56.750	0.00	0.00	0.001	O	|	|	|	|	0.00
57.000	0.00	0.00	0.001	O	|	|	|	|	0.00
57.250	0.00	0.00	0.001	O	|	|	|	|	0.00
57.500	0.00	0.00	0.001	O	|	|	|	|	0.00
57.750	0.00	0.00	0.001	O	|	|	|	|	0.00
58.000	0.00	0.00	0.001	O	|	|	|	|	0.00
58.250	0.00	0.00	0.001	O	|	|	|	|	0.00
58.500	0.00	0.00	0.001	O	|	|	|	|	0.00
58.750	0.00	0.00	0.001	O	|	|	|	|	0.00
59.000	0.00	0.00	0.001	O	|	|	|	|	0.00
59.250	0.00	0.00	0.000	O	|	|	|	|	0.00
59.500	0.00	0.00	0.000	O	|	|	|	|	0.00
59.750	0.00	0.00	0.000	O	|	|	|	|	0.00
60.000	0.00	0.00	0.000	O	|	|	|	|	0.00
60.250	0.00	0.00	0.000	O	|	|	|	|	0.00
60.500	0.00	0.00	0.000	O	|	|	|	|	0.00
60.750	0.00	0.00	0.000	O	|	|	|	|	0.00
61.000	0.00	0.00	0.000	O	|	|	|	|	0.00
61.250	0.00	0.00	0.000	O	|	|	|	|	0.00
61.500	0.00	0.00	0.000	O	|	|	|	|	0.00
61.750	0.00	0.00	0.000	O	|	|	|	|	0.00
62.000	0.00	0.00	0.000	O	|	|	|	|	0.00
62.250	0.00	0.00	0.000	O	|	|	|	|	0.00
62.500	0.00	0.00	0.000	O	|	|	|	|	0.00
62.750	0.00	0.00	0.000	O	|	|	|	|	0.00
63.000	0.00	0.00	0.000	O	|	|	|	|	0.00
63.250	0.00	0.00	0.000	O	|	|	|	|	0.00
63.500	0.00	0.00	0.000	O	|	|	|	|	0.00
63.750	0.00	0.00	0.000	O	|	|	|	|	0.00
64.000	0.00	0.00	0.000	O	|	|	|	|	0.00
64.250	0.00	0.00	0.000	O	|	|	|	|	0.00

```
****************************HYDROGRAPH DATA****************************
               Number of intervals =   257
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      387.060 (CFS)
               Total volume =     244.367 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
```

```
Current stream hydrograph saved in file LineC24hr.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/02/12

------------------------------------------------------------------


Line C, Offsite Subdrain Ara C1 and C21
Routed
100 Yr. 24 Hr.

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Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: OffsiteSubC124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =   104
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      154.262 (CFS)
               Total volume =      53.876 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   3000.00 (Ft.)
Elevation difference =   50.00 (Ft.)
Slope of channel =  0.016667 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  3000.00(Ft.)     Elevation difference =  50.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =     37.864(CFS)
Depth of flow =     0.732(Ft.)
Average velocity =     9.029(Ft/s)
Total flow rate =    37.864(CFS)
Channel flow top width =    6.463(Ft.)
Depth of flow in channel =   0.73(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.03(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   37.864(CFS)
Total capacity of improved channels =     37.864(CFS)
Critical Depth in Channel =    1.13(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    154.262(CFS)
```

```
Depth of flow =     1.660(Ft.)
Average velocity =    13.958(Ft/s)
Total flow rate =   154.262(CFS)
Channel flow top width =    8.319(Ft.)
Depth of flow in channel =   1.66(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   13.96(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  154.262(CFS)
Total capacity of improved channels =    154.262(CFS)
Critical Depth in Channel =    2.59(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8914   Travel time =   3.58 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   3.4649
       dt(routing time-step) =   3.19 (min.),   c* =   0.9995

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       38.6      77.1     115.7     154.3
----------------------------------------------------------------------
  0+15       0.1094      0.14  O         |         |         |         |
  0+30       0.7666      0.94  O         |         |         |         |
  0+45       1.4939      1.64  O         |         |         |         |
  1+ 0       1.9437      2.02  O         |         |         |         |
  1+15       2.3637      2.46  O         |         |         |         |
  1+30       2.3495      2.32  O         |         |         |         |
  1+45       2.2572      2.24  O         |         |         |         |
  2+ 0       2.2770      2.29  O         |         |         |         |
  2+15       2.5622      2.64  O         |         |         |         |
  2+30       2.7683      2.80  O         |         |         |         |
  2+45       2.9121      2.94  O         |         |         |         |
  3+ 0       3.2525      3.34  O         |         |         |         |
  3+15       3.4802      3.52  O         |         |         |         |
  3+30       3.5774      3.59  O         |         |         |         |
  3+45       3.6228      3.63  O         |         |         |         |
  4+ 0       3.6962      3.71  O         |         |         |         |
  4+15       4.0044      4.08  |O        |         |         |         |
  4+30       4.2763      4.33  |O        |         |         |         |
  4+45       4.6709      4.76  |O        |         |         |         |
  5+ 0       4.9801      5.04  |O        |         |         |         |
  5+15       5.2795      5.34  |O        |         |         |         |
  5+30       4.9925      4.90  |O        |         |         |         |
  5+45       5.0341      5.07  |O        |         |         |         |
  6+ 0       5.4162      5.51  |O        |         |         |         |
  6+15       5.7137      5.77  |O        |         |         |         |
  6+30       6.1231      6.22  |O        |         |         |         |
  6+45       6.4398      6.50  |O        |         |         |         |
  7+ 0       6.8491      6.94  |O        |         |         |         |
  7+15       7.1099      7.15  |O        |         |         |         |
  7+30       7.2778      7.31  |O        |         |         |         |
  7+45       7.6841      7.79  |OI       |         |         |         |
  8+ 0       8.2741      8.41  | O       |         |         |         |
  8+15       8.9977      9.16  | O       |         |         |         |
  8+30       9.9500     10.16  | O       |         |         |         |
  8+45      10.7217     10.87  | O       |         |         |         |
  9+ 0      12.6971     13.19  |  O      |         |         |         |
  9+15      18.3797     19.79  |   OI    |         |         |         |
```

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  9+30      28.5782     30.96  |      OI |         |         |         |
  9+45      38.7725     40.89  |         O         |         |         |
 10+ 0      48.1321     50.10  |         | O       |         |         |
 10+15      52.7600     53.48  |         |  O      |         |         |
 10+30      36.9223     32.43  |       IO|         |         |         |
 10+45      27.7966     26.54  |     IO  |         |         |         |
 11+ 0      38.6059     41.88  |         O         |         |         |
 11+15      47.5094     49.04  |         | O       |         |         |
 11+30      49.3816     49.48  |         | O       |         |         |
 11+45      49.1532     49.07  |         | O       |         |         |
 12+ 0      44.6375     43.44  |         |O        |         |         |
 12+15      48.2871     49.60  |         | O       |         |         |
 12+30      71.5374     77.48  |         |       O I         |         |
 12+45      91.9620     95.89  |         |         |  OI     |         |
 13+ 0     108.3583    111.74  |         |         |       O |         |
 13+15     123.4120    126.58  |         |         |         | O       |
 13+30     145.1984    150.25  |         |         |         |      OI |
 13+45     153.4039    154.26  |         |         |         |        OI
 14+ 0     127.1331    119.78  |         |         |         |IO       |
 14+15     109.6288    106.87  |         |         |      IO |         |
 14+30     113.3027    115.04  |         |         |        O|         |
 14+45     115.8559    116.08  |         |         |         O         |
 15+ 0     116.3861    116.47  |         |         |         O         |
 15+15     114.0718    113.42  |         |         |        O|         |
 15+30     109.2907    108.17  |         |         |       O |         |
 15+45     101.9897    100.31  |         |         |     O   |         |
 16+ 0      87.6168     84.17  |         |         |IO       |         |
 16+15      73.4692     70.57  |         |       IO|         |         |
 16+30      41.2727     33.33  |       I O         |         |         |
 16+45      19.4171     15.64  |   IO    |         |         |         |
 17+ 0       9.8297      8.25  | O       |         |         |         |
 17+15       5.5521      4.82  |O        |         |         |         |
 17+30       4.3346      4.20  |O        |         |         |         |
 17+45       4.0138      3.96  |O        |         |         |         |
 18+ 0       3.7179      3.65  O         |         |         |         |
 18+15       3.2821      3.18  O         |         |         |         |
 18+30       3.0621      3.03  O         |         |         |         |
 18+45       2.9273      2.90  O         |         |         |         |
 19+ 0       2.5382      2.44  O         |         |         |         |
 19+15       2.0666      1.97  O         |         |         |         |
 19+30       2.1126      2.15  O         |         |         |         |
 19+45       2.4358      2.51  O         |         |         |         |
 20+ 0       2.3241      2.27  O         |         |         |         |
 20+15       1.9733      1.89  O         |         |         |         |
 20+30       2.0173      2.05  O         |         |         |         |
 20+45       2.1147      2.13  O         |         |         |         |
 21+ 0       2.1017      2.09  O         |         |         |         |
 21+15       1.8792      1.82  O         |         |         |         |
 21+30       1.9211      1.95  O         |         |         |         |
 21+45       1.7970      1.76  O         |         |         |         |
 22+ 0       1.8821      1.92  O         |         |         |         |
 22+15       1.7840      1.75  O         |         |         |         |
 22+30       1.8777      1.91  O         |         |         |         |
 22+45       1.7255      1.67  O         |         |         |         |
 23+ 0       1.5742      1.55  O         |         |         |         |
 23+15       1.5121      1.50  O         |         |         |         |
 23+30       1.4831      1.48  O         |         |         |         |
 23+45       1.4709      1.47  O         |         |         |         |
 24+ 0       1.4667      1.47  O         |         |         |         |
 24+15       1.3549      1.32  O         |         |         |         |
 24+30       0.7506      0.59  O         |         |         |         |
 24+45       0.3242      0.25  O         |         |         |         |
 25+ 0       0.1420      0.11  O         |         |         |         |
 25+15       0.0597      0.05  O         |         |         |         |
 25+30       0.0268      0.02  O         |         |         |         |
 25+45       0.0136      0.01  O         |         |         |         |
 26+ 0       0.0052      0.00  O         |         |         |         |
 26+15       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   105
```

```
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      153.404 (CFS)
                Total volume =      53.876 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: OffsiteSubC2124100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       54.4     108.7     163.1     217.5
----------------------------------------------------------------------
  0+15       0.2033      0.31  Q         |         |         |         |
  0+30       0.6590      1.43  Q         |         |         |         |
  0+45       0.9120      2.41  Q         |         |         |         |
  1+ 0       1.0666      3.01  Q         |         |         |         |
  1+15       1.1547      3.52  Q         |         |         |         |
  1+30       1.0183      3.37  Q         |         |         |         |
  1+45       0.9878      3.25  Q         |         |         |         |
  2+ 0       1.0846      3.36  Q         |         |         |         |
  2+15       1.2590      3.82  Q         |         |         |         |
  2+30       1.2969      4.07  Q         |         |         |         |
  2+45       1.4061      4.32  Q         |         |         |         |
  3+ 0       1.5857      4.84  Q         |         |         |         |
  3+15       1.6237      5.10  Q         |         |         |         |
  3+30       1.6312      5.21  Q         |         |         |         |
  3+45       1.6338      5.26  Q         |         |         |         |
  4+ 0       1.7355      5.43  Q         |         |         |         |
  4+15       1.9125      5.92  qQ        |         |         |         |
  4+30       2.0521      6.33  qQ        |         |         |         |
  4+45       2.2366      6.91  qQ        |         |         |         |
  5+ 0       2.3789      7.36  qQ        |         |         |         |
  5+15       2.3601      7.64  qQ        |         |         |         |
  5+30       2.1483      7.14  qQ        |         |         |         |
  5+45       2.3585      7.39  qQ        |         |         |         |
  6+ 0       2.5612      7.98  qQ        |         |         |         |
  6+15       2.7030      8.42  qQ        |         |         |         |
  6+30       2.8902      9.01  qQ        |         |         |         |
  6+45       3.0324      9.47  qQ        |         |         |         |
  7+ 0       3.2169     10.07  qQ        |         |         |         |
  7+15       3.2575     10.37  qQ        |         |         |         |
  7+30       3.3667     10.64  qQ        |         |         |         |
  7+45       3.6480     11.33  q Q       |         |         |         |
  8+ 0       3.9647     12.24  q Q       |         |         |         |
  8+15       4.3904     13.39  q Q       |         |         |         |
  8+30       4.7926     14.74  q Q       |         |         |         |
  8+45       4.9803     15.70  q Q       |         |         |         |
  9+ 0       6.3059     19.00  |q Q      |         |         |         |
  9+15      10.5575     28.94  |q   Q    |         |         |         |
  9+30      16.1060     44.68  | q     Q |         |         |         |
  9+45      20.3713     59.14  |  q      Q         |         |         |
 10+ 0      24.3592     72.49  |   q     |  Q      |         |         |
 10+15      20.1616     72.92  |  q      |  Q      |         |         |
 10+30       8.8871     45.81  |q      Q |         |         |         |
 10+45      12.0437     39.84  | q    Q  |         |         |         |
```

```
  11+ 0      21.0205     59.63  |  q      Q         |         |         |
  11+15      22.3331     69.84  |   q     | Q       |         |         |
  11+30      21.5469     70.93  |  q      |  Q      |         |         |
  11+45      19.8698     69.02  |  q      | Q       |         |         |
  12+ 0      17.8686     62.51  |  q      |Q        |         |         |
  12+15      26.5603     74.85  |   q     |  Q      |         |         |
  12+30      40.7817    112.32  |      q  |         Q         |         |
  12+45      47.8414    139.80  |       q |         |    Q    |         |
  13+ 0      53.8979    162.26  |        q|         |        Q|         |
  13+15      62.3342    185.75  |         |q        |         |   Q     |
  13+30      72.2968    217.50  |         |  q      |         |        Q
  13+45      63.6884    217.09  |         |q        |         |       Q|
  14+ 0      45.1595    172.29  |       q |         |         |Q        |
  14+15      45.7179    155.35  |       q |         |       Q |         |
  14+30      51.4874    164.79  |        q|         |         Q         |
  14+45      51.4651    167.32  |        q|         |         Q         |
  15+ 0      50.8810    167.27  |        q|         |         Q         |
  15+15      48.6310    162.70  |       q |         |        Q|         |
  15+30      45.9361    155.23  |       q |         |       Q |         |
  15+45      40.1352    142.12  |      q  |         |     Q   |         |
  16+ 0      33.0565    120.67  |     q   |         | Q       |         |
  16+15      22.3956     95.86  |   q     |      Q  |         |         |
  16+30       5.8261     47.10  |q      Q |         |         |         |
  16+45       2.1344     21.55  q  Q     |         |         |         |
  17+ 0       1.2724     11.10  q Q      |         |         |         |
  17+15       1.1938      6.75  qQ       |         |         |         |
  17+30       1.5403      5.87  qQ       |         |         |         |
  17+45       1.6136      5.63  qQ       |         |         |         |
  18+ 0       1.5269      5.24  Q        |         |         |         |
  18+15       1.3552      4.64  Q        |         |         |         |
  18+30       1.3172      4.38  Q        |         |         |         |
  18+45       1.2080      4.14  Q        |         |         |         |
  19+ 0       0.9267      3.46  Q        |         |         |         |
  19+15       0.8134      2.88  Q        |         |         |         |
  19+30       1.0467      3.16  Q        |         |         |         |
  19+45       1.1498      3.59  Q        |         |         |         |
  20+ 0       0.9139      3.24  Q        |         |         |         |
  20+15       0.8108      2.78  Q        |         |         |         |
  20+30       0.9450      2.96  Q        |         |         |         |
  20+45       0.9728      3.09  Q        |         |         |         |
  21+ 0       0.8760      2.98  Q        |         |         |         |
  21+15       0.8033      2.68  Q        |         |         |         |
  21+30       0.8407      2.76  Q        |         |         |         |
  21+45       0.7958      2.59  Q        |         |         |         |
  22+ 0       0.8380      2.72  Q        |         |         |         |
  22+15       0.7958      2.58  Q        |         |         |         |
  22+30       0.8380      2.72  Q        |         |         |         |
  22+45       0.6941      2.42  Q        |         |         |         |
  23+ 0       0.6610      2.24  Q        |         |         |         |
  23+15       0.6562      2.17  Q        |         |         |         |
  23+30       0.6535      2.14  Q        |         |         |         |
  23+45       0.6535      2.12  Q        |         |         |         |
  24+ 0       0.6535      2.12  Q        |         |         |         |
  24+15       0.4502      1.81  Q        |         |         |         |
  24+30       0.0962      0.85  Q        |         |         |         |
  24+45       0.0202      0.34  Q        |         |         |         |
  25+ 0       0.0053      0.15  Q        |         |         |         |
  25+15       0.0000      0.06  Q        |         |         |         |
  25+30       0.0000      0.03  Q        |         |         |         |
  25+45       0.0000      0.01  Q        |         |         |         |
  26+ 0       0.0000      0.01  Q        |         |         |         |
  26+15       0.0000      0.00  Q        |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA****************************
                 Number of intervals =   105
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =      217.495 (CFS)
                 Total volume =      77.391 (Ac.Ft)
           Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
```

```
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file CoffsiteRT1.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/02/12

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Line C, Offsite Subdrain Area C41 and C51
Routed
100 Yr. 24 Hr.

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Program License Serial Number 6097

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******************** HYDROGRAPH INFORMATION **********************

               From study/file name: OffsiteSubC4124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    98
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       24.423 (CFS)
               Total volume =       7.411 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =    400.00 (Ft.)
Elevation difference =   10.00 (Ft.)
Slope of channel =  0.025000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   400.00(Ft.)     Elevation difference =  10.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      5.237(CFS)
Depth of flow =     0.198(Ft.)
Average velocity =     5.088(Ft/s)
Total flow rate =     5.237(CFS)
Channel flow top width =    5.396(Ft.)
Depth of flow in channel =   0.20(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.09(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    5.237(CFS)
Total capacity of improved channels =      5.237(CFS)
Critical Depth in Channel =    0.32(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     24.423(CFS)
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Depth of flow =     0.499(Ft.)
Average velocity =     8.897(Ft/s)
Total flow rate =    24.423(CFS)
Channel flow top width =    5.998(Ft.)
Depth of flow in channel =   0.50(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.90(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   24.423(CFS)
Total capacity of improved channels =     24.423(CFS)
Critical Depth in Channel =    0.85(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8396   Travel time =   0.75 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  16.2294
       dt(routing time-step) =   0.63 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


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                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        6.1      12.2      18.3      24.4
----------------------------------------------------------------------
  0+15       0.1128      0.12  O         |         |         |         |
  0+30       0.2683      0.27  O         |         |         |         |
  0+45       0.3292      0.33  O         |         |         |         |
  1+ 0       0.3916      0.39  O         |         |         |         |
  1+15       0.3849      0.38  O         |         |         |         |
  1+30       0.3411      0.34  O         |         |         |         |
  1+45       0.3355      0.34  O         |         |         |         |
  2+ 0       0.3918      0.39  O         |         |         |         |
  2+15       0.4413      0.44  O         |         |         |         |
  2+30       0.4470      0.45  O         |         |         |         |
  2+45       0.5036      0.51  O         |         |         |         |
  3+ 0       0.5531      0.56  O         |         |         |         |
  3+15       0.5588      0.56  O         |         |         |         |
  3+30       0.5590      0.56  O         |         |         |         |
  3+45       0.5590      0.56  O         |         |         |         |
  4+ 0       0.6154      0.62  |O        |         |         |         |
  4+15       0.6649      0.67  |O        |         |         |         |
  4+30       0.7270      0.73  |O        |         |         |         |
  4+45       0.7767      0.78  |O        |         |         |         |
  5+ 0       0.8388      0.84  |O        |         |         |         |
  5+15       0.7756      0.77  |O        |         |         |         |
  5+30       0.7387      0.74  |O        |         |         |         |
  5+45       0.8334      0.84  |O        |         |         |         |
  6+ 0       0.8883      0.89  |O        |         |         |         |
  6+15       0.9506      0.95  |O        |         |         |         |
  6+30       1.0003      1.00  |O        |         |         |         |
  6+45       1.0624      1.07  |O        |         |         |         |
  7+ 0       1.1120      1.11  |O        |         |         |         |
  7+15       1.1177      1.12  |O        |         |         |         |
  7+30       1.1743      1.18  |O        |         |         |         |
  7+45       1.2803      1.28  | O       |         |         |         |
  8+ 0       1.3919      1.40  | O       |         |         |         |
  8+15       1.5601      1.57  | O       |         |         |         |
  8+30       1.6650      1.67  | O       |         |         |         |
  8+45       1.7330      1.74  | O       |         |         |         |
  9+ 0       1.8392      1.84  |  O      |         |         |         |
  9+15       3.0211      3.07  |   OI    |         |         |         |
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  9+30       4.7029      4.77  |      O  |         |         |         |
  9+45       6.1057      6.16  |         O         |         |         |
 10+ 0       7.4649      7.52  |         | O       |         |         |
 10+15       4.8400      4.72  |      O  |         |         |         |
 10+30       2.0173      1.90  |  O      |         |         |         |
 10+45       4.2094      4.31  |     OI  |         |         |         |
 11+ 0       6.5306      6.63  |         O         |         |         |
 11+15       6.4376      6.43  |         O         |         |         |
 11+30       6.1752      6.16  |         O         |         |         |
 11+45       5.2135      5.17  |       O |         |         |         |
 12+ 0       5.0068      5.00  |       O |         |         |         |
 12+15       9.5558      9.76  |         |    O    |         |         |
 12+30      13.8560     14.04  |         |         | O       |         |
 12+45      16.0937     16.18  |         |         |     O   |         |
 13+ 0      17.9274     18.00  |         |         |        O|         |
 13+15      21.5675     21.72  |         |         |         |    O    |
 13+30      24.3095     24.42  |         |         |         |        OI
 13+45      18.5936     18.34  |         |         |         O         |
 14+ 0      13.3555     13.14  |         |         |O        |         |
 14+15      15.1833     15.27  |         |         |   OI    |         |
 14+30      16.7776     16.84  |         |         |      O  |         |
 14+45      16.7030     16.70  |         |         |      O  |         |
 15+ 0      16.2780     16.26  |         |         |     O   |         |
 15+15      15.4042     15.37  |         |         |    O    |         |
 15+30      14.4721     14.43  |         |         |  O      |         |
 15+45      11.8430     11.73  |         |        O|         |         |
 16+ 0       9.9822      9.91  |         |     O   |         |         |
 16+15       5.0985      4.89  |       O |         |         |         |
 16+30       0.9393      0.77  |O        |         |         |         |
 16+45       0.4041      0.39  O         |         |         |         |
 17+ 0       0.3412      0.34  O         |         |         |         |
 17+15       0.4484      0.45  O         |         |         |         |
 17+30       0.5472      0.55  O         |         |         |         |
 17+45       0.5586      0.56  O         |         |         |         |
 18+ 0       0.5025      0.50  O         |         |         |         |
 18+15       0.4530      0.45  O         |         |         |         |
 18+30       0.4473      0.45  O         |         |         |         |
 18+45       0.3907      0.39  O         |         |         |         |
 19+ 0       0.2848      0.28  O         |         |         |         |
 19+15       0.2860      0.29  O         |         |         |         |
 19+30       0.3861      0.39  O         |         |         |         |
 19+45       0.3847      0.38  O         |         |         |         |
 20+ 0       0.2847      0.28  O         |         |         |         |
 20+15       0.2860      0.29  O         |         |         |         |
 20+30       0.3297      0.33  O         |         |         |         |
 20+45       0.3352      0.34  O         |         |         |         |
 21+ 0       0.2790      0.28  O         |         |         |         |
 21+15       0.2859      0.29  O         |         |         |         |
 21+30       0.2733      0.27  O         |         |         |         |
 21+45       0.2857      0.29  O         |         |         |         |
 22+ 0       0.2733      0.27  O         |         |         |         |
 22+15       0.2857      0.29  O         |         |         |         |
 22+30       0.2733      0.27  O         |         |         |         |
 22+45       0.2293      0.23  O         |         |         |         |
 23+ 0       0.2237      0.22  O         |         |         |         |
 23+15       0.2236      0.22  O         |         |         |         |
 23+30       0.2236      0.22  O         |         |         |         |
 23+45       0.2236      0.22  O         |         |         |         |
 24+ 0       0.2236      0.22  O         |         |         |         |
 24+15       0.1107      0.11  O         |         |         |         |
 24+30       0.0117      0.01  O         |         |         |         |
 24+45       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                 Number of intervals =    99
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =       24.309 (CFS)
                 Total volume =       7.411 (Ac.Ft)
           Status of hydrographs being held in storage
                     Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
```

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        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
_____________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: OffsiteSubC5124100.rte
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                  R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0        7.3      14.6      21.9      29.1
---------------------------------------------------------------------
  0+15       0.0340      0.15  Q         |         |         |         |
  0+30       0.0631      0.33  Q         |         |         |         |
  0+45       0.0691      0.40  Q         |         |         |         |
  1+ 0       0.0861      0.48  Q         |         |         |         |
  1+15       0.0752      0.46  Q         |         |         |         |
  1+30       0.0691      0.41  Q         |         |         |         |
  1+45       0.0691      0.40  Q         |         |         |         |
  2+ 0       0.0861      0.48  Q         |         |         |         |
  2+15       0.0922      0.53  Q         |         |         |         |
  2+30       0.0922      0.54  Q         |         |         |         |
  2+45       0.1092      0.61  Q         |         |         |         |
  3+ 0       0.1152      0.67  Q         |         |         |         |
  3+15       0.1152      0.67  Q         |         |         |         |
  3+30       0.1152      0.67  Q         |         |         |         |
  3+45       0.1152      0.67  Q         |         |         |         |
  4+ 0       0.1322      0.75  qQ        |         |         |         |
  4+15       0.1383      0.80  qQ        |         |         |         |
  4+30       0.1553      0.88  qQ        |         |         |         |
  4+45       0.1613      0.94  qQ        |         |         |         |
  5+ 0       0.1783      1.02  qQ        |         |         |         |
  5+15       0.1504      0.93  qQ        |         |         |         |
  5+30       0.1553      0.89  qQ        |         |         |         |
  5+45       0.1783      1.01  qQ        |         |         |         |
  6+ 0       0.1844      1.07  qQ        |         |         |         |
  6+15       0.2014      1.15  qQ        |         |         |         |
  6+30       0.2074      1.21  qQ        |         |         |         |
  6+45       0.2244      1.29  qQ        |         |         |         |
  7+ 0       0.2305      1.34  qQ        |         |         |         |
  7+15       0.2305      1.35  qQ        |         |         |         |
  7+30       0.2475      1.42  qQ        |         |         |         |
  7+45       0.2705      1.55  q Q       |         |         |         |
  8+ 0       0.2936      1.69  q Q       |         |         |         |
  8+15       0.3336      1.89  q Q       |         |         |         |
  8+30       0.3457      2.01  q Q       |         |         |         |
  8+45       0.3627      2.10  q Q       |         |         |         |
  9+ 0       0.3858      2.22  q  Q      |         |         |         |
  9+15       0.4934      3.51  q   Q     |         |         |         |
  9+30       0.7399      5.44  |q     Q  |         |         |         |
  9+45       1.0248      7.13  |q       Q|         |         |         |
 10+ 0       1.3091      8.77  |q        | Q       |         |         |
 10+15       0.6184      5.46  q      Q  |         |         |         |
 10+30       0.3457      2.36  q  Q      |         |         |         |
 10+45       0.8878      5.10  |q    Q   |         |         |         |
 11+ 0       1.1190      7.65  |q        Q         |         |         |
 11+15       1.0003      7.44  |q        Q         |         |         |
 11+30       0.9904      7.17  |q       Q|         |         |         |
 11+45       0.7007      5.91  q       Q |         |         |         |
 12+ 0       0.7992      5.81  |q     Q  |         |         |         |
 12+15       2.0984     11.65  | q       |    Q    |         |         |
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   12+30       2.7407     16.60  |  q      |         | Q       |         |
   12+45       3.1891     19.28  |   q     |         |     Q   |         |
   13+ 0       3.5274     21.45  |   q     |         |        Q|         |
   13+15       4.4845     26.05  |     q   |         |         |    Q    |
   13+30       4.8335     29.14  |     q   |         |         |         Q
   13+45       3.0096     21.60  |   q     |         |        Q|         |
   14+ 0       2.3886     15.74  |  q      |         |Q        |         |
   14+15       3.1127     18.30  |   q     |         |    Q    |         |
   14+30       3.2288     20.01  |   q     |         |      Q  |         |
   14+45       3.2114     19.91  |   q     |         |      Q  |         |
   15+ 0       3.0840     19.36  |   q     |         |     Q   |         |
   15+15       2.8954     18.30  |  q      |         |    Q    |         |
   15+30       2.7062     17.18  |  q      |         |  Q      |         |
   15+45       2.0065     13.85  | q       |        Q|         |         |
   16+ 0       1.8042     11.79  | q       |     Q   |         |         |
   16+15       0.5447      5.64  q      Q  |         |         |         |
   16+30       0.0922      1.03  qQ        |         |         |         |
   16+45       0.0752      0.48  Q         |         |         |         |
   17+ 0       0.0691      0.41  Q         |         |         |         |
   17+15       0.1031      0.55  Q         |         |         |         |
   17+30       0.1152      0.66  Q         |         |         |         |
   17+45       0.1152      0.67  Q         |         |         |         |
   18+ 0       0.0983      0.60  Q         |         |         |         |
   18+15       0.0922      0.55  Q         |         |         |         |
   18+30       0.0922      0.54  Q         |         |         |         |
   18+45       0.0752      0.47  Q         |         |         |         |
   19+ 0       0.0522      0.34  Q         |         |         |         |
   19+15       0.0631      0.35  Q         |         |         |         |
   19+30       0.0861      0.47  Q         |         |         |         |
   19+45       0.0752      0.46  Q         |         |         |         |
   20+ 0       0.0522      0.34  Q         |         |         |         |
   20+15       0.0631      0.35  Q         |         |         |         |
   20+30       0.0691      0.40  Q         |         |         |         |
   20+45       0.0691      0.40  Q         |         |         |         |
   21+ 0       0.0522      0.33  Q         |         |         |         |
   21+15       0.0631      0.35  Q         |         |         |         |
   21+30       0.0522      0.33  Q         |         |         |         |
   21+45       0.0631      0.35  Q         |         |         |         |
   22+ 0       0.0522      0.33  Q         |         |         |         |
   22+15       0.0631      0.35  Q         |         |         |         |
   22+30       0.0522      0.33  Q         |         |         |         |
   22+45       0.0461      0.28  Q         |         |         |         |
   23+ 0       0.0461      0.27  Q         |         |         |         |
   23+15       0.0461      0.27  Q         |         |         |         |
   23+30       0.0461      0.27  Q         |         |         |         |
   23+45       0.0461      0.27  Q         |         |         |         |
   24+ 0       0.0461      0.27  Q         |         |         |         |
   24+15       0.0121      0.12  Q         |         |         |         |
   24+30       0.0000      0.01  Q         |         |         |         |
   24+45       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =    99
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =       29.143 (CFS)
                       Total volume =       8.797 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------


        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        1.000 to Point/Station        2.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ___________________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =    400.00 (Ft.)
```

```
Elevation difference =   10.00 (Ft.)
Slope of channel =  0.025000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =   400.00(Ft.)     Elevation difference =  10.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      6.213(CFS)
Depth of flow =     0.219(Ft.)
Average velocity =     5.424(Ft/s)
Total flow rate =     6.213(CFS)
Channel flow top width =    5.439(Ft.)
Depth of flow in channel =   0.22(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.42(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    6.213(CFS)
Total capacity of improved channels =      6.213(CFS)
Critical Depth in Channel =    0.36(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     29.143(CFS)
Depth of flow =     0.555(Ft.)
Average velocity =     9.457(Ft/s)
Total flow rate =    29.143(CFS)
Channel flow top width =    6.110(Ft.)
Depth of flow in channel =   0.55(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.46(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   29.143(CFS)
Total capacity of improved channels =     29.143(CFS)
Critical Depth in Channel =    0.95(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8476   Travel time =   0.70 (min.)
       dt*(unit time interval) =  15.00(min.),  e=  17.0687
       dt(routing time-step) =   0.60 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        7.3      14.6      21.9      29.1
----------------------------------------------------------------------
  0+15       0.1410      0.15  O         |         |         |         |
  0+30       0.3240      0.33  O         |         |         |         |
  0+45       0.3957      0.40  O         |         |         |         |
  1+ 0       0.4746      0.48  O         |         |         |         |
  1+15       0.4608      0.46  O         |         |         |         |
  1+30       0.4122      0.41  O         |         |         |         |
  1+45       0.4049      0.40  O         |         |         |         |
```

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 2+ 0       0.4750      0.48  O         |         |         |         |
 2+15       0.5313      0.53  O         |         |         |         |
 2+30       0.5390      0.54  O         |         |         |         |
 2+45       0.6098      0.61  O         |         |         |         |
 3+ 0       0.6661      0.67  O         |         |         |         |
 3+15       0.6738      0.67  O         |         |         |         |
 3+30       0.6742      0.67  O         |         |         |         |
 3+45       0.6742      0.67  O         |         |         |         |
 4+ 0       0.7447      0.75  |O        |         |         |         |
 4+15       0.8010      0.80  |O        |         |         |         |
 4+30       0.8791      0.88  |O        |         |         |         |
 4+45       0.9358      0.94  |O        |         |         |         |
 5+ 0       1.0140      1.02  |O        |         |         |         |
 5+15       0.9297      0.93  |O        |         |         |         |
 5+30       0.8953      0.89  |O        |         |         |         |
 5+45       1.0071      1.01  |O        |         |         |         |
 6+ 0       1.0703      1.07  |O        |         |         |         |
 6+15       1.1488      1.15  |O        |         |         |         |
 6+30       1.2055      1.21  |O        |         |         |         |
 6+45       1.2837      1.29  |O        |         |         |         |
 7+ 0       1.3403      1.34  |O        |         |         |         |
 7+15       1.3480      1.35  |O        |         |         |         |
 7+30       1.4189      1.42  |O        |         |         |         |
 7+45       1.5457      1.55  | O       |         |         |         |
 8+ 0       1.6801      1.69  | O       |         |         |         |
 8+15       1.8854      1.89  | O       |         |         |         |
 8+30       2.0061      2.01  | O       |         |         |         |
 8+45       2.0923      2.10  | O       |         |         |         |
 9+ 0       2.2198      2.22  |  O      |         |         |         |
 9+15       3.4631      3.51  |   O     |         |         |         |
 9+30       5.3659      5.44  |      O  |         |         |         |
 9+45       7.0632      7.13  |        O|         |         |         |
10+ 0       8.7086      8.77  |         |OI       |         |         |
10+15       5.5906      5.46  |      O  |         |         |         |
10+30       2.4864      2.36  |  O      |         |         |         |
10+45       4.9883      5.10  |     O   |         |         |         |
11+ 0       7.5480      7.65  |         O         |         |         |
11+15       7.4463      7.44  |         O         |         |         |
11+30       7.1765      7.17  |        O|         |         |         |
11+45       5.9640      5.91  |       O |         |         |         |
12+ 0       5.8103      5.81  |      O  |         |         |         |
12+15      11.4212     11.65  |         |    O    |         |         |
12+30      16.3998     16.60  |         |         | O       |         |
12+45      19.1758     19.28  |         |         |     O   |         |
13+ 0      21.3684     21.45  |         |         |        O|         |
13+15      25.8689     26.05  |         |         |         |    O    |
13+30      29.0198     29.14  |         |         |         |      OI
13+45      21.9036     21.60  |         |         |        IO         |
14+ 0      15.9775     15.74  |         |         |O        |         |
14+15      18.1944     18.30  |         |         |   OI    |         |
14+30      19.9382     20.01  |         |         |      O  |         |
14+45      19.9180     19.91  |         |         |      O  |         |
15+ 0      19.3840     19.36  |         |         |     O   |         |
15+15      18.3419     18.30  |         |         |    O    |         |
15+30      17.2229     17.18  |         |         |  O      |         |
15+45      13.9821     13.85  |         |        O|         |         |
16+ 0      11.8686     11.79  |         |     O   |         |         |
16+15       5.8879      5.64  |      IO |         |         |         |
16+30       1.2152      1.03  |O        |         |         |         |
16+45       0.5013      0.48  O         |         |         |         |
17+ 0       0.4131      0.41  O         |         |         |         |
17+15       0.5459      0.55  O         |         |         |         |
17+30       0.6581      0.66  O         |         |         |         |
17+45       0.6734      0.67  O         |         |         |         |
18+ 0       0.6037      0.60  O         |         |         |         |
18+15       0.5474      0.55  O         |         |         |         |
18+30       0.5397      0.54  O         |         |         |         |
18+45       0.4689      0.47  O         |         |         |         |
19+ 0       0.3421      0.34  O         |         |         |         |
19+15       0.3486      0.35  O         |         |         |         |
19+30       0.4673      0.47  O         |         |         |         |
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  19+45       0.4604      0.46  O         |         |         |         |
  20+ 0       0.3417      0.34  O         |         |         |         |
  20+15       0.3486      0.35  O         |         |         |         |
  20+30       0.3968      0.40  O         |         |         |         |
  20+45       0.4041      0.40  O         |         |         |         |
  21+ 0       0.3340      0.33  O         |         |         |         |
  21+15       0.3482      0.35  O         |         |         |         |
  21+30       0.3263      0.33  O         |         |         |         |
  21+45       0.3479      0.35  O         |         |         |         |
  22+ 0       0.3263      0.33  O         |         |         |         |
  22+15       0.3479      0.35  O         |         |         |         |
  22+30       0.3263      0.33  O         |         |         |         |
  22+45       0.2774      0.28  O         |         |         |         |
  23+ 0       0.2701      0.27  O         |         |         |         |
  23+15       0.2697      0.27  O         |         |         |         |
  23+30       0.2697      0.27  O         |         |         |         |
  23+45       0.2697      0.27  O         |         |         |         |
  24+ 0       0.2697      0.27  O         |         |         |         |
  24+15       0.1287      0.12  O         |         |         |         |
  24+30       0.0161      0.01  O         |         |         |         |
  24+45       0.0005      0.00  O         |         |         |         |
  25+ 0       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =   100
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       29.020 (CFS)
                    Total volume =       8.797 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

      ---------------------------------------------------------------------


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ______________________________________________________________________
      Current stream hydrograph saved in file CoffsiteRT2.rte
      ****************************HYDROGRAPH DATA***************************
                    Number of intervals =     0
                    Time interval =    0.0 (Min.)
                    Maximum/Peak flow rate =        0.000 (CFS)
                    Total volume =       0.000 (Ac.Ft)
            Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/02/12

      ----------------------------------------------------------------


      Line C, Routed Through Basin
      100 Yr. 24 Hr,
      Proposed Condition

      ----------------------------------------------------------------


      Program License Serial Number 6097

      ------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBC224100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =      180.938 (CFS)
                    Total volume =      98.633 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------
        0.000      0.000      0.000      0.000        0.000
        1.000      0.001      0.001      0.001        0.001
        2.000      0.002      0.002      0.002        0.002
        3.000     10.000     35.000      9.638       10.362
        4.000     15.000    100.000     13.967       16.033
        6.000     38.000    175.000     36.192       39.808
      ----------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      45.2   90.47  135.70  180.94 (Ft.)
 0.250    4.39    0.15      0.044  O       |       |       |       |     2.00
```

0.500	9.76	0.63	0.182	OI					2.02
0.750	11.99	1.35	0.386	O I					2.04
1.000	14.50	2.18	0.624	O I					2.06
1.250	13.90	3.02	0.863	O I					2.09
1.500	12.63	3.73	1.068	O I					2.11
1.750	12.31	4.34	1.242	O I					2.12
2.000	14.50	4.98	1.423	O I					2.14
2.250	16.10	5.70	1.629	OI					2.16
2.500	16.42	6.43	1.839	OI					2.18
2.750	18.61	7.21	2.060	O I					2.21
3.000	20.20	8.06	2.303	O I					2.23
3.250	20.52	8.92	2.549	O I					2.25
3.500	20.52	9.73	2.780	O I					2.28
3.750	20.52	10.48	2.995	O I					2.30
4.000	22.71	11.26	3.217	O I					2.32
4.250	24.30	12.11	3.462	O I					2.35
4.500	26.82	13.05	3.730	O I					2.37
4.750	28.41	14.07	4.020	O I					2.40
5.000	30.92	15.16	4.331	O I					2.43
5.250	28.13	16.16	4.618	O I					2.46
5.500	27.45	16.97	4.849	OI					2.48
5.750	30.60	17.81	5.090	O I					2.51
6.000	32.51	18.77	5.364	O I					2.54
6.250	35.02	19.82	5.663	O I					2.57
6.500	36.62	20.94	5.982	O I					2.60
6.750	39.13	22.12	6.320	O I					2.63
7.000	40.72	23.36	6.675	O I					2.67
7.250	41.04	24.58	7.024	O I					2.70
7.500	43.23	25.81	7.374	O I					2.74
7.750	47.02	27.16	7.759	O I					2.78
8.000	51.54	28.70	8.200	O I					2.82
8.250	60.19	30.60	8.742	O I					2.87
8.500	65.40	32.84	9.384	O I					2.94
8.750	69.74	35.91	10.070	O I					3.01
9.000	75.45	44.60	10.738	O I					3.15
9.250	84.74	53.00	11.385	O I					3.28
9.500	93.17	61.52	12.040	O I					3.41
9.750	99.78	69.79	12.677	O I					3.54
10.000	105.93	77.62	13.279	O I					3.66
10.250	87.02	82.09	13.622	OI					3.72
10.500	71.83	81.46	13.574	I O					3.71
10.750	84.59	80.69	13.515	O					3.70
11.000	96.25	82.99	13.692	O I					3.74
11.250	95.66	86.06	13.928	OI					3.79
11.500	93.66	88.10	14.084	OI					3.82
11.750	87.21	88.65	14.127	O					3.83
12.000	86.05	88.17	14.090	O					3.82
12.250	109.61	90.46	14.266	O I					3.85
12.500	129.39	97.34	14.795	O I					3.96
12.750	141.37	101.75	15.536	O I					4.05
13.000	149.76	104.60	16.411	O I					4.12
13.250	168.86	108.17	17.505	O I					4.22
13.500	180.94	112.52	18.839	O I					4.33
13.750	148.99	115.94	19.887	O I					4.42
14.000	124.20	117.28	20.300	OI					4.46
14.250	131.98	117.99	20.516	O I					4.48
14.500	138.18	119.10	20.858	O I					4.51
14.750	137.95	120.34	21.237	O I					4.54
15.000	134.59	121.38	21.555	O I					4.57
15.250	129.41	122.07	21.768	OI					4.59
15.500	123.77	122.36	21.858	O					4.60
15.750	108.73	121.96	21.736	I O					4.59
16.000	99.39	120.80	21.378	I O					4.55
16.250	54.24	117.93	20.499	I O					4.48
16.500	22.71	112.75	18.911	I O					4.34
16.750	14.22	106.61	17.026	I O					4.18
17.000	12.63	100.53	15.164	I O					4.01
17.250	16.70	81.61	13.585	I O					3.72
17.500	19.88	66.61	12.432	I O					3.49
17.750	20.52	55.62	11.586	I O					3.32
18.000	18.33	47.05	10.927	I O					3.19

18.250	16.73	40.06	10.389	| I O|	|	|	|	3.08
18.500	16.42	34.85	9.958	| I O |	|	|	|	3.00
18.750	14.22	33.49	9.568	| I O |	|	|	|	2.96
19.000	10.44	32.01	9.146	|I O |	|	|	|	2.91
19.250	10.72	30.52	8.719	|I O |	|	|	|	2.87
19.500	14.19	29.25	8.359	| I O |	|	|	|	2.84
19.750	13.90	28.19	8.056	| I O |	|	|	|	2.81
20.000	10.44	27.07	7.736	|I O |	|	|	|	2.77
20.250	10.72	25.92	7.407	|I O |	|	|	|	2.74
20.500	11.99	24.91	7.117	| I O |	|	|	|	2.71
20.750	12.31	24.02	6.862	| I O |	|	|	|	2.69
21.000	10.12	23.12	6.607	|I O |	|	|	|	2.66
21.250	10.72	22.24	6.354	|I O |	|	|	|	2.64
21.500	9.80	21.40	6.115	|I O |	|	|	|	2.61
21.750	10.72	20.62	5.893	|I O |	|	|	|	2.59
22.000	9.80	19.90	5.686	|I O |	|	|	|	2.57
22.250	10.72	19.23	5.494	|I O |	|	|	|	2.55
22.500	9.80	18.60	5.315	|I O |	|	|	|	2.53
22.750	8.53	17.94	5.127	|I O |	|	|	|	2.51
23.000	8.21	17.27	4.936	|I O |	|	|	|	2.49
23.250	8.21	16.64	4.755	|IO |	|	|	|	2.48
23.500	8.21	16.05	4.587	|IO |	|	|	|	2.46
23.750	8.21	15.50	4.431	|IO |	|	|	|	2.44
24.000	8.21	15.00	4.285	|IO |	|	|	|	2.43
24.250	3.82	14.37	4.106	I O |	|	|	|	2.41
24.500	0.64	13.52	3.864	I O |	|	|	|	2.39
24.750	0.00	12.60	3.601	I O |	|	|	|	2.36
25.000	0.00	11.72	3.350	I O |	|	|	|	2.33
25.250	0.00	10.90	3.116	IO |	|	|	|	2.31
25.500	0.00	10.14	2.898	IO |	|	|	|	2.29
25.750	0.00	9.43	2.696	IO |	|	|	|	2.27
26.000	0.00	8.77	2.508	IO |	|	|	|	2.25
26.250	0.00	8.16	2.333	IO |	|	|	|	2.23
26.500	0.00	7.59	2.170	IO |	|	|	|	2.22
26.750	0.00	7.06	2.019	IO |	|	|	|	2.20
27.000	0.00	6.57	1.878	IO |	|	|	|	2.19
27.250	0.00	6.11	1.747	IO |	|	|	|	2.17
27.500	0.00	5.68	1.625	IO |	|	|	|	2.16
27.750	0.00	5.29	1.512	O |	|	|	|	2.15
28.000	0.00	4.92	1.407	O |	|	|	|	2.14
28.250	0.00	4.58	1.308	O |	|	|	|	2.13
28.500	0.00	4.26	1.217	O |	|	|	|	2.12
28.750	0.00	3.96	1.132	O |	|	|	|	2.11
29.000	0.00	3.68	1.053	O |	|	|	|	2.11
29.250	0.00	3.43	0.980	O |	|	|	|	2.10
29.500	0.00	3.19	0.912	O |	|	|	|	2.09
29.750	0.00	2.96	0.848	O |	|	|	|	2.08
30.000	0.00	2.76	0.789	O |	|	|	|	2.08
30.250	0.00	2.56	0.734	O |	|	|	|	2.07
30.500	0.00	2.39	0.683	O |	|	|	|	2.07
30.750	0.00	2.22	0.635	O |	|	|	|	2.06
31.000	0.00	2.06	0.591	O |	|	|	|	2.06
31.250	0.00	1.92	0.550	O |	|	|	|	2.05
31.500	0.00	1.79	0.512	O |	|	|	|	2.05
31.750	0.00	1.66	0.476	O |	|	|	|	2.05
32.000	0.00	1.55	0.443	O |	|	|	|	2.04
32.250	0.00	1.44	0.412	O |	|	|	|	2.04
32.500	0.00	1.34	0.383	O |	|	|	|	2.04
32.750	0.00	1.24	0.357	O |	|	|	|	2.04
33.000	0.00	1.16	0.332	O |	|	|	|	2.03
33.250	0.00	1.08	0.309	O |	|	|	|	2.03
33.500	0.00	1.00	0.287	O |	|	|	|	2.03
33.750	0.00	0.93	0.267	O |	|	|	|	2.03
34.000	0.00	0.87	0.249	O |	|	|	|	2.02
34.250	0.00	0.81	0.232	O |	|	|	|	2.02
34.500	0.00	0.75	0.216	O |	|	|	|	2.02
34.750	0.00	0.70	0.201	O |	|	|	|	2.02
35.000	0.00	0.65	0.187	O |	|	|	|	2.02
35.250	0.00	0.60	0.174	O |	|	|	|	2.02
35.500	0.00	0.56	0.162	O |	|	|	|	2.02
35.750	0.00	0.52	0.151	O |	|	|	|	2.01

36.000	0.00	0.49	0.140	O	|	|	|	|	2.01
36.250	0.00	0.45	0.130	O	|	|	|	|	2.01
36.500	0.00	0.42	0.121	O	|	|	|	|	2.01
36.750	0.00	0.39	0.113	O	|	|	|	|	2.01
37.000	0.00	0.36	0.105	O	|	|	|	|	2.01
37.250	0.00	0.34	0.098	O	|	|	|	|	2.01
37.500	0.00	0.31	0.091	O	|	|	|	|	2.01
37.750	0.00	0.29	0.085	O	|	|	|	|	2.01
38.000	0.00	0.27	0.079	O	|	|	|	|	2.01
38.250	0.00	0.25	0.074	O	|	|	|	|	2.01
38.500	0.00	0.24	0.069	O	|	|	|	|	2.01
38.750	0.00	0.22	0.064	O	|	|	|	|	2.01
39.000	0.00	0.20	0.060	O	|	|	|	|	2.01
39.250	0.00	0.19	0.056	O	|	|	|	|	2.01
39.500	0.00	0.18	0.052	O	|	|	|	|	2.00
39.750	0.00	0.16	0.048	O	|	|	|	|	2.00
40.000	0.00	0.15	0.045	O	|	|	|	|	2.00
40.250	0.00	0.14	0.042	O	|	|	|	|	2.00
40.500	0.00	0.13	0.039	O	|	|	|	|	2.00
40.750	0.00	0.12	0.037	O	|	|	|	|	2.00
41.000	0.00	0.11	0.034	O	|	|	|	|	2.00
41.250	0.00	0.11	0.032	O	|	|	|	|	2.00
41.500	0.00	0.10	0.030	O	|	|	|	|	2.00
41.750	0.00	0.09	0.028	O	|	|	|	|	2.00
42.000	0.00	0.09	0.026	O	|	|	|	|	2.00
42.250	0.00	0.08	0.024	O	|	|	|	|	2.00
42.500	0.00	0.07	0.023	O	|	|	|	|	2.00
42.750	0.00	0.07	0.021	O	|	|	|	|	2.00
43.000	0.00	0.06	0.020	O	|	|	|	|	2.00
43.250	0.00	0.06	0.018	O	|	|	|	|	2.00
43.500	0.00	0.06	0.017	O	|	|	|	|	2.00
43.750	0.00	0.05	0.016	O	|	|	|	|	2.00
44.000	0.00	0.05	0.015	O	|	|	|	|	2.00
44.250	0.00	0.04	0.014	O	|	|	|	|	2.00
44.500	0.00	0.04	0.013	O	|	|	|	|	2.00
44.750	0.00	0.04	0.012	O	|	|	|	|	2.00
45.000	0.00	0.04	0.012	O	|	|	|	|	2.00
45.250	0.00	0.03	0.011	O	|	|	|	|	2.00
45.500	0.00	0.03	0.010	O	|	|	|	|	2.00
45.750	0.00	0.03	0.010	O	|	|	|	|	2.00
46.000	0.00	0.03	0.009	O	|	|	|	|	2.00
46.250	0.00	0.02	0.009	O	|	|	|	|	2.00
46.500	0.00	0.02	0.008	O	|	|	|	|	2.00
46.750	0.00	0.02	0.008	O	|	|	|	|	2.00
47.000	0.00	0.02	0.007	O	|	|	|	|	2.00
47.250	0.00	0.02	0.007	O	|	|	|	|	2.00
47.500	0.00	0.02	0.006	O	|	|	|	|	2.00
47.750	0.00	0.02	0.006	O	|	|	|	|	2.00
48.000	0.00	0.02	0.006	O	|	|	|	|	2.00
48.250	0.00	0.01	0.005	O	|	|	|	|	2.00
48.500	0.00	0.01	0.005	O	|	|	|	|	2.00
48.750	0.00	0.01	0.005	O	|	|	|	|	2.00
49.000	0.00	0.01	0.005	O	|	|	|	|	2.00
49.250	0.00	0.01	0.004	O	|	|	|	|	2.00
49.500	0.00	0.01	0.004	O	|	|	|	|	2.00
49.750	0.00	0.01	0.004	O	|	|	|	|	2.00
50.000	0.00	0.01	0.004	O	|	|	|	|	2.00
50.250	0.00	0.01	0.004	O	|	|	|	|	2.00
50.500	0.00	0.01	0.004	O	|	|	|	|	2.00
50.750	0.00	0.01	0.003	O	|	|	|	|	2.00
51.000	0.00	0.01	0.003	O	|	|	|	|	2.00
51.250	0.00	0.01	0.003	O	|	|	|	|	2.00
51.500	0.00	0.01	0.003	O	|	|	|	|	2.00
51.750	0.00	0.01	0.003	O	|	|	|	|	2.00
52.000	0.00	0.00	0.003	O	|	|	|	|	2.00
52.250	0.00	0.00	0.003	O	|	|	|	|	2.00
52.500	0.00	0.00	0.003	O	|	|	|	|	2.00
52.750	0.00	0.00	0.003	O	|	|	|	|	2.00
53.000	0.00	0.00	0.002	O	|	|	|	|	2.00
53.250	0.00	0.00	0.002	O	|	|	|	|	2.00
53.500	0.00	0.00	0.002	O	|	|	|	|	2.00

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53.750    0.00    0.00      0.002  O       |       |       |       |     2.00
54.000    0.00    0.00      0.002  O       |       |       |       |     2.00
54.250    0.00    0.00      0.002  O       |       |       |       |     2.00
54.500    0.00    0.00      0.002  O       |       |       |       |     2.00
54.750    0.00    0.00      0.002  O       |       |       |       |     2.00
55.000    0.00    0.00      0.002  O       |       |       |       |     2.00
55.250    0.00    0.00      0.002  O       |       |       |       |     1.96
55.500    0.00    0.00      0.002  O       |       |       |       |     1.92
55.750    0.00    0.00      0.002  O       |       |       |       |     1.88
56.000    0.00    0.00      0.002  O       |       |       |       |     1.84
56.250    0.00    0.00      0.002  O       |       |       |       |     1.80
56.500    0.00    0.00      0.002  O       |       |       |       |     1.76
56.750    0.00    0.00      0.002  O       |       |       |       |     1.73
57.000    0.00    0.00      0.002  O       |       |       |       |     1.69
57.250    0.00    0.00      0.002  O       |       |       |       |     1.66
57.500    0.00    0.00      0.002  O       |       |       |       |     1.62
57.750    0.00    0.00      0.002  O       |       |       |       |     1.59
58.000    0.00    0.00      0.002  O       |       |       |       |     1.56
58.250    0.00    0.00      0.002  O       |       |       |       |     1.53
58.500    0.00    0.00      0.001  O       |       |       |       |     1.49
58.750    0.00    0.00      0.001  O       |       |       |       |     1.46
59.000    0.00    0.00      0.001  O       |       |       |       |     1.43
59.250    0.00    0.00      0.001  O       |       |       |       |     1.40
59.500    0.00    0.00      0.001  O       |       |       |       |     1.38
59.750    0.00    0.00      0.001  O       |       |       |       |     1.35
60.000    0.00    0.00      0.001  O       |       |       |       |     1.32
60.250    0.00    0.00      0.001  O       |       |       |       |     1.29
60.500    0.00    0.00      0.001  O       |       |       |       |     1.27
60.750    0.00    0.00      0.001  O       |       |       |       |     1.24
61.000    0.00    0.00      0.001  O       |       |       |       |     1.22
61.250    0.00    0.00      0.001  O       |       |       |       |     1.19
61.500    0.00    0.00      0.001  O       |       |       |       |     1.17
61.750    0.00    0.00      0.001  O       |       |       |       |     1.14
62.000    0.00    0.00      0.001  O       |       |       |       |     1.12
62.250    0.00    0.00      0.001  O       |       |       |       |     1.10
62.500    0.00    0.00      0.001  O       |       |       |       |     1.07
62.750    0.00    0.00      0.001  O       |       |       |       |     1.05
63.000    0.00    0.00      0.001  O       |       |       |       |     1.03
63.250    0.00    0.00      0.001  O       |       |       |       |     1.01
63.500    0.00    0.00      0.001  O       |       |       |       |     0.99

****************************HYDROGRAPH DATA****************************
               Number of intervals =   254
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      122.363 (CFS)
               Total volume =      98.632 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBC2RT.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************
```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/02/12

      ----------------------------------------------------------------------


      Line C, Subdrain Area C3, Routed Through Basin
      100 Yr, 24 Hr.
      Proposed Conditions

      ----------------------------------------------------------------------


      Program License Serial Number 6097

      ----------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SUBC324100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    98
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       46.809 (CFS)
                    Total volume =      25.352 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        3.000 to Point/Station        4.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 98
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------------
      ----------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.002      0.002        0.002
         3.000     10.000     50.000      9.483       10.517
         4.000     20.000    150.000     18.450       21.550
         6.000     28.800    275.000     25.959       31.641
      ----------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                        Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      11.7   23.40   35.11   46.81 (Ft.)
 0.250    1.26    0.05      0.013  O       |       |       |       |     2.00
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 0.500    2.65    0.24      0.050  OI      |       |       |       |     2.00
 0.750    3.14    0.50      0.102  O I     |       |       |       |     2.01
 1.000    3.82    0.79      0.160  O I     |       |       |       |     2.02
 1.250    3.57    1.08      0.217  O I     |       |       |       |     2.02
 1.500    3.24    1.31      0.263  O I     |       |       |       |     2.03
 1.750    3.19    1.50      0.301  |OI     |       |       |       |     2.03
 2.000    3.82    1.69      0.340  |OI     |       |       |       |     2.03
 2.250    4.20    1.92      0.386  |OI     |       |       |       |     2.04
 2.500    4.25    2.15      0.431  |OI     |       |       |       |     2.04
 2.750    4.88    2.38      0.478  |O I    |       |       |       |     2.05
 3.000    5.26    2.65      0.531  |O I    |       |       |       |     2.05
 3.250    5.32    2.91      0.583  |O I    |       |       |       |     2.06
 3.500    5.32    3.14      0.630  | OI    |       |       |       |     2.06
 3.750    5.32    3.36      0.673  | OI    |       |       |       |     2.07
 4.000    5.94    3.58      0.718  | O I   |       |       |       |     2.07
 4.250    6.33    3.83      0.768  | O I   |       |       |       |     2.08
 4.500    7.01    4.11      0.824  | O I   |       |       |       |     2.08
 4.750    7.39    4.41      0.884  |  O I  |       |       |       |     2.09
 5.000    8.07    4.74      0.949  |  O I  |       |       |       |     2.09
 5.250    7.19    5.02      1.006  |  OI   |       |       |       |     2.10
 5.500    7.12    5.23      1.048  |  OI   |       |       |       |     2.10
 5.750    8.02    5.46      1.094  |  O I  |       |       |       |     2.11
 6.000    8.45    5.73      1.148  |  O I  |       |       |       |     2.11
 6.250    9.13    6.04      1.208  |   O I |       |       |       |     2.12
 6.500    9.51    6.36      1.273  |   O I |       |       |       |     2.13
 6.750   10.20    6.70      1.342  |   O I |       |       |       |     2.13
 7.000   10.58    7.06      1.414  |   O  I|       |       |       |     2.14
 7.250   10.63    7.41      1.484  |    O I|       |       |       |     2.15
 7.500   11.26    7.76      1.553  |    O I|       |       |       |     2.16
 7.750   12.27    8.15      1.632  |    O  I       |       |       |     2.16
 8.000   13.33    8.61      1.723  |    O  |I      |       |       |     2.17
 8.250   15.51    9.18      1.837  |     O | I     |       |       |     2.18
 8.500   16.67    9.86      1.973  |     O |  I    |       |       |     2.20
 8.750   17.80   10.58      2.118  |      O|   I   |       |       |     2.21
 9.000   19.32   11.37      2.275  |      O|    I  |       |       |     2.23
 9.250   21.82   12.27      2.456  |       O     I |       |       |     2.25
 9.500   23.96   13.31      2.664  |       |O      I       |       |     2.27
 9.750   25.64   14.44      2.890  |       |O      |I      |       |     2.29
10.000   27.24   15.62      3.125  |       | O     | I     |       |     2.31
10.250   21.65   16.49      3.299  |       |  O  I |       |       |     2.33
10.500   18.00   16.82      3.364  |       |  OI   |       |       |     2.34
10.750   22.03   17.13      3.427  |       |  O   I|       |       |     2.34
11.000   24.82   17.75      3.551  |       |   O   I       |       |     2.35
11.250   24.39   18.42      3.686  |       |   O   I       |       |     2.37
11.500   23.92   18.99      3.798  |       |   O   I       |       |     2.38
11.750   22.12   19.38      3.877  |       |    O I|       |       |     2.39
12.000   22.00   19.65      3.930  |       |    O I|       |       |     2.39
12.250   28.75   20.21      4.043  |       |    O  |  I    |       |     2.40
12.500   33.60   21.29      4.258  |       |     O |     I |       |     2.43
12.750   36.56   22.64      4.529  |       |      O|       I       |     2.45
13.000   38.69   24.11      4.824  |       |       O       | I     |     2.48
13.250   43.95   25.80      5.161  |       |       |O      |     I |     2.52
13.500   46.81   27.73      5.546  |       |       | O     |      I|     2.55
13.750   37.39   29.14      5.828  |       |       |  O    |I      |     2.58
14.000   31.47   29.66      5.932  |       |       |   OI  |       |     2.59
14.250   34.28   29.97      5.996  |       |       |   O  I|       |     2.60
14.500   35.62   30.46      6.093  |       |       |   O   I       |     2.61
14.750   35.45   30.96      6.193  |       |       |    O  I       |     2.62
15.000   34.54   31.36      6.272  |       |       |    O I|       |     2.63
15.250   33.16   31.60      6.321  |       |       |    OI |       |     2.63
15.500   31.70   31.68      6.337  |       |       |    O  |       |     2.63
15.750   27.55   31.48      6.297  |       |       | I  O  |       |     2.63
16.000   25.36   30.99      6.198  |       |       |I   O  |       |     2.62
16.250   12.76   29.82      5.964  |       I       |   O   |       |     2.60
16.500    5.31   27.77      5.555  |  I    |       | O     |       |     2.56
16.750    3.62   25.48      5.098  | I     |       |O      |       |     2.51
17.000    3.24   23.32      4.664  | I     |      O|       |       |     2.47
17.250    4.45   21.40      4.282  |  I    |     O |       |       |     2.43
17.500    5.21   19.78      3.956  |  I    |    O  |       |       |     2.40
17.750    5.32   18.35      3.671  |  I    |   O   |       |       |     2.37
18.000    4.69   17.04      3.409  |  I    |  O    |       |       |     2.34
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18.250    4.31   15.81      3.162  | I     | O     |       |       |     2.32
18.500    4.25   14.67      2.936  | I     | O     |       |       |     2.29
18.750    3.62   13.62      2.725  | I     |O      |       |       |     2.27
19.000    2.62   12.59      2.519  |I      O       |       |       |     2.25
19.250    2.81   11.62      2.325  |I     O|       |       |       |     2.23
19.500    3.76   10.80      2.161  | I    O|       |       |       |     2.22
19.750    3.57   10.10      2.021  | I   O |       |       |       |     2.20
20.000    2.62    9.41      1.883  |I    O |       |       |       |     2.19
20.250    2.81    8.75      1.752  |I   O  |       |       |       |     2.18
20.500    3.14    8.18      1.638  | I  O  |       |       |       |     2.16
20.750    3.19    7.69      1.540  | I  O  |       |       |       |     2.15
21.000    2.56    7.22      1.445  |I  O   |       |       |       |     2.14
21.250    2.81    6.77      1.356  |I  O   |       |       |       |     2.14
21.500    2.51    6.37      1.275  |I  O   |       |       |       |     2.13
21.750    2.81    6.00      1.202  |I  O   |       |       |       |     2.12
22.000    2.51    5.68      1.136  |I O    |       |       |       |     2.11
22.250    2.81    5.38      1.077  |I O    |       |       |       |     2.11
22.500    2.51    5.11      1.024  |I O    |       |       |       |     2.10
22.750    2.18    4.84      0.969  |I O    |       |       |       |     2.10
23.000    2.13    4.58      0.917  |I O    |       |       |       |     2.09
23.250    2.13    4.33      0.868  |IO     |       |       |       |     2.09
23.500    2.13    4.12      0.825  |IO     |       |       |       |     2.08
23.750    2.13    3.92      0.786  |IO     |       |       |       |     2.08
24.000    2.13    3.75      0.751  |IO     |       |       |       |     2.07
24.250    0.87    3.53      0.706  I O     |       |       |       |     2.07
24.500    0.11    3.23      0.647  I O     |       |       |       |     2.06
24.750    0.00    2.92      0.585  IO      |       |       |       |     2.06
25.000    0.00    2.63      0.527  IO      |       |       |       |     2.05
25.250    0.00    2.37      0.476  IO      |       |       |       |     2.05
25.500    0.00    2.14      0.429  IO      |       |       |       |     2.04
25.750    0.00    1.93      0.387  IO      |       |       |       |     2.04
26.000    0.00    1.74      0.349  IO      |       |       |       |     2.03
26.250    0.00    1.57      0.315  IO      |       |       |       |     2.03
26.500    0.00    1.41      0.284  O       |       |       |       |     2.03
26.750    0.00    1.27      0.256  O       |       |       |       |     2.03
27.000    0.00    1.15      0.231  O       |       |       |       |     2.02
27.250    0.00    1.04      0.209  O       |       |       |       |     2.02
27.500    0.00    0.93      0.188  O       |       |       |       |     2.02
27.750    0.00    0.84      0.170  O       |       |       |       |     2.02
28.000    0.00    0.76      0.154  O       |       |       |       |     2.02
28.250    0.00    0.69      0.139  O       |       |       |       |     2.01
28.500    0.00    0.62      0.125  O       |       |       |       |     2.01
28.750    0.00    0.56      0.113  O       |       |       |       |     2.01
29.000    0.00    0.50      0.102  O       |       |       |       |     2.01
29.250    0.00    0.45      0.092  O       |       |       |       |     2.01
29.500    0.00    0.41      0.083  O       |       |       |       |     2.01
29.750    0.00    0.37      0.075  O       |       |       |       |     2.01
30.000    0.00    0.33      0.068  O       |       |       |       |     2.01
30.250    0.00    0.30      0.062  O       |       |       |       |     2.01
30.500    0.00    0.27      0.056  O       |       |       |       |     2.01
30.750    0.00    0.24      0.050  O       |       |       |       |     2.00
31.000    0.00    0.22      0.046  O       |       |       |       |     2.00
31.250    0.00    0.20      0.041  O       |       |       |       |     2.00
31.500    0.00    0.18      0.037  O       |       |       |       |     2.00
31.750    0.00    0.16      0.034  O       |       |       |       |     2.00
32.000    0.00    0.15      0.031  O       |       |       |       |     2.00
32.250    0.00    0.13      0.028  O       |       |       |       |     2.00
32.500    0.00    0.12      0.025  O       |       |       |       |     2.00
32.750    0.00    0.11      0.023  O       |       |       |       |     2.00
33.000    0.00    0.10      0.021  O       |       |       |       |     2.00
33.250    0.00    0.09      0.019  O       |       |       |       |     2.00
33.500    0.00    0.08      0.017  O       |       |       |       |     2.00
33.750    0.00    0.07      0.016  O       |       |       |       |     2.00
34.000    0.00    0.06      0.014  O       |       |       |       |     2.00
34.250    0.00    0.06      0.013  O       |       |       |       |     2.00
34.500    0.00    0.05      0.012  O       |       |       |       |     2.00
34.750    0.00    0.05      0.011  O       |       |       |       |     2.00
35.000    0.00    0.04      0.010  O       |       |       |       |     2.00
35.250    0.00    0.04      0.009  O       |       |       |       |     2.00
35.500    0.00    0.03      0.008  O       |       |       |       |     2.00
35.750    0.00    0.03      0.008  O       |       |       |       |     2.00
```

36.000	0.00	0.03	0.007	O	|	|	|	|	2.00
36.250	0.00	0.03	0.007	O	|	|	|	|	2.00
36.500	0.00	0.02	0.006	O	|	|	|	|	2.00
36.750	0.00	0.02	0.006	O	|	|	|	|	2.00
37.000	0.00	0.02	0.005	O	|	|	|	|	2.00
37.250	0.00	0.02	0.005	O	|	|	|	|	2.00
37.500	0.00	0.01	0.005	O	|	|	|	|	2.00
37.750	0.00	0.01	0.004	O	|	|	|	|	2.00
38.000	0.00	0.01	0.004	O	|	|	|	|	2.00
38.250	0.00	0.01	0.004	O	|	|	|	|	2.00
38.500	0.00	0.01	0.004	O	|	|	|	|	2.00
38.750	0.00	0.01	0.003	O	|	|	|	|	2.00
39.000	0.00	0.01	0.003	O	|	|	|	|	2.00
39.250	0.00	0.01	0.003	O	|	|	|	|	2.00
39.500	0.00	0.01	0.003	O	|	|	|	|	2.00
39.750	0.00	0.01	0.003	O	|	|	|	|	2.00
40.000	0.00	0.01	0.003	O	|	|	|	|	2.00
40.250	0.00	0.00	0.003	O	|	|	|	|	2.00
40.500	0.00	0.00	0.002	O	|	|	|	|	2.00
40.750	0.00	0.00	0.002	O	|	|	|	|	2.00
41.000	0.00	0.00	0.002	O	|	|	|	|	2.00
41.250	0.00	0.00	0.002	O	|	|	|	|	2.00
41.500	0.00	0.00	0.002	O	|	|	|	|	2.00
41.750	0.00	0.00	0.002	O	|	|	|	|	2.00
42.000	0.00	0.00	0.002	O	|	|	|	|	2.00
42.250	0.00	0.00	0.002	O	|	|	|	|	2.00
42.500	0.00	0.00	0.002	O	|	|	|	|	1.98
42.750	0.00	0.00	0.002	O	|	|	|	|	1.94
43.000	0.00	0.00	0.002	O	|	|	|	|	1.90
43.250	0.00	0.00	0.002	O	|	|	|	|	1.86
43.500	0.00	0.00	0.002	O	|	|	|	|	1.82
43.750	0.00	0.00	0.002	O	|	|	|	|	1.78
44.000	0.00	0.00	0.002	O	|	|	|	|	1.75
44.250	0.00	0.00	0.002	O	|	|	|	|	1.71
44.500	0.00	0.00	0.002	O	|	|	|	|	1.68
44.750	0.00	0.00	0.002	O	|	|	|	|	1.64
45.000	0.00	0.00	0.002	O	|	|	|	|	1.61
45.250	0.00	0.00	0.002	O	|	|	|	|	1.57
45.500	0.00	0.00	0.002	O	|	|	|	|	1.54
45.750	0.00	0.00	0.002	O	|	|	|	|	1.51
46.000	0.00	0.00	0.001	O	|	|	|	|	1.48
46.250	0.00	0.00	0.001	O	|	|	|	|	1.45
46.500	0.00	0.00	0.001	O	|	|	|	|	1.42
46.750	0.00	0.00	0.001	O	|	|	|	|	1.39
47.000	0.00	0.00	0.001	O	|	|	|	|	1.36
47.250	0.00	0.00	0.001	O	|	|	|	|	1.33
47.500	0.00	0.00	0.001	O	|	|	|	|	1.31
47.750	0.00	0.00	0.001	O	|	|	|	|	1.28
48.000	0.00	0.00	0.001	O	|	|	|	|	1.25
48.250	0.00	0.00	0.001	O	|	|	|	|	1.23
48.500	0.00	0.00	0.001	O	|	|	|	|	1.20
48.750	0.00	0.00	0.001	O	|	|	|	|	1.18
49.000	0.00	0.00	0.001	O	|	|	|	|	1.16
49.250	0.00	0.00	0.001	O	|	|	|	|	1.13
49.500	0.00	0.00	0.001	O	|	|	|	|	1.11
49.750	0.00	0.00	0.001	O	|	|	|	|	1.09
50.000	0.00	0.00	0.001	O	|	|	|	|	1.06
50.250	0.00	0.00	0.001	O	|	|	|	|	1.04
50.500	0.00	0.00	0.001	O	|	|	|	|	1.02
50.750	0.00	0.00	0.001	O	|	|	|	|	1.00

```
****************************HYDROGRAPH DATA***************************
                Number of intervals =   203
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =       31.684 (CFS)
                Total volume =      25.351 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************
```

```
-------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBC3RT.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

---------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  05/02/12 File: SubC124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Line C
Offsite, Existing Condition
100 Yr. 24 Hr.

-------------------------------------------------------------------
Drainage Area =     403.10(Ac.)  =      0.630 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     403.10(Ac.)  =      0.630 Sq. Mi.
Length along longest watercourse =    9900.00(Ft.)
Length along longest watercourse measured to centroid =    5600.00(Ft.)
Length along longest watercourse =      1.875 Mi.
Length along longest watercourse measured to centroid =      1.061 Mi.
Difference in elevation =     700.00(Ft.)
Slope along watercourse =    373.3333 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.303 Hr.
Lag time =    18.21 Min.
25% of lag time =     4.55 Min.
40% of lag time =     7.28 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10           1.80                 725.58

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      403.10           4.50                1813.95

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    4.496(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.500           46.00         0.000
     5.400           66.00         0.000
```

13.200	77.00	0.000
376.000	83.00	0.000

Total Area Entered = 403.10(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.021	0.013
66.0	66.0	0.405	0.000	0.405	0.013	0.005
77.0	77.0	0.279	0.000	0.279	0.033	0.009
83.0	83.0	0.210	0.000	0.210	0.933	0.196
					Sum (F) =	0.223

Area averaged mean soil loss (F) (In/Hr) = 0.223
Minimum soil loss rate ((In/Hr)) = 0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	82.386	9.509	38.632
2	0.500	164.773	49.802	202.320
3	0.750	247.159	23.542	95.638
4	1.000	329.545	9.452	38.397
5	1.250	411.931	4.591	18.651
6	1.500	494.318	1.618	6.571
7	1.750	576.704	0.707	2.873
8	2.000	659.090	0.536	2.179
9	2.250	741.476	0.243	0.986
			Sum = 100.000	Sum= 406.249

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.394)	0.032	0.004
2	0.50	0.30	0.054	(0.390)	0.049	0.005
3	0.75	0.30	0.054	(0.385)	0.049	0.005
4	1.00	0.40	0.072	(0.380)	0.065	0.007
5	1.25	0.30	0.054	(0.376)	0.049	0.005
6	1.50	0.30	0.054	(0.371)	0.049	0.005
7	1.75	0.30	0.054	(0.367)	0.049	0.005
8	2.00	0.40	0.072	(0.363)	0.065	0.007
9	2.25	0.40	0.072	(0.358)	0.065	0.007
10	2.50	0.40	0.072	(0.354)	0.065	0.007
11	2.75	0.50	0.090	(0.350)	0.081	0.009
12	3.00	0.50	0.090	(0.345)	0.081	0.009
13	3.25	0.50	0.090	(0.341)	0.081	0.009
14	3.50	0.50	0.090	(0.337)	0.081	0.009
15	3.75	0.50	0.090	(0.333)	0.081	0.009
16	4.00	0.60	0.108	(0.328)	0.097	0.011
17	4.25	0.60	0.108	(0.324)	0.097	0.011
18	4.50	0.70	0.126	(0.320)	0.113	0.013
19	4.75	0.70	0.126	(0.316)	0.113	0.013
20	5.00	0.80	0.144	(0.312)	0.129	0.014
21	5.25	0.60	0.108	(0.308)	0.097	0.011
22	5.50	0.70	0.126	(0.304)	0.113	0.013
23	5.75	0.80	0.144	(0.300)	0.129	0.014
24	6.00	0.80	0.144	(0.296)	0.129	0.014
25	6.25	0.90	0.162	(0.292)	0.146	0.016
26	6.50	0.90	0.162	(0.288)	0.146	0.016
27	6.75	1.00	0.180	(0.284)	0.162	0.018

28	7.00	1.00	0.180	(	0.280)	0.162	0.018
29	7.25	1.00	0.180	(	0.277)	0.162	0.018
30	7.50	1.10	0.198	(	0.273)	0.178	0.020
31	7.75	1.20	0.216	(	0.269)	0.194	0.022
32	8.00	1.30	0.234	(	0.265)	0.210	0.023
33	8.25	1.50	0.270	(	0.262)	0.243	0.027
34	8.50	1.50	0.270	(	0.258)	0.243	0.027
35	8.75	1.60	0.288		0.254	(0.259)	0.033
36	9.00	1.70	0.306		0.251	(0.275)	0.055
37	9.25	1.90	0.342		0.247	(0.308)	0.094
38	9.50	2.00	0.360		0.244	(0.324)	0.116
39	9.75	2.10	0.378		0.240	(0.340)	0.137
40	10.00	2.20	0.396		0.237	(0.356)	0.159
41	10.25	1.50	0.270		0.233	(0.243)	0.036
42	10.50	1.50	0.270		0.230	(0.243)	0.040
43	10.75	2.00	0.360		0.227	(0.324)	0.133
44	11.00	2.00	0.360		0.223	(0.324)	0.136
45	11.25	1.90	0.342		0.220	(0.308)	0.122
46	11.50	1.90	0.342		0.217	(0.308)	0.125
47	11.75	1.70	0.306		0.214	(0.275)	0.092
48	12.00	1.80	0.324		0.210	(0.291)	0.113
49	12.25	2.50	0.450		0.207	(0.405)	0.242
50	12.50	2.60	0.468		0.204	(0.421)	0.263
51	12.75	2.80	0.504		0.201	(0.453)	0.303
52	13.00	2.90	0.522		0.198	(0.469)	0.324
53	13.25	3.40	0.612		0.195	(0.550)	0.416
54	13.50	3.40	0.612		0.192	(0.550)	0.419
55	13.75	2.30	0.414		0.189	(0.372)	0.224
56	14.00	2.30	0.414		0.186	(0.372)	0.227
57	14.25	2.70	0.486		0.183	(0.437)	0.302
58	14.50	2.60	0.468		0.181	(0.421)	0.287
59	14.75	2.60	0.468		0.178	(0.421)	0.290
60	15.00	2.50	0.450		0.175	(0.405)	0.274
61	15.25	2.40	0.432		0.173	(0.388)	0.259
62	15.50	2.30	0.414		0.170	(0.372)	0.244
63	15.75	1.90	0.342		0.167	(0.308)	0.174
64	16.00	1.90	0.342		0.165	(0.308)	0.177
65	16.25	0.40	0.072	(	0.162)	0.065	0.007
66	16.50	0.40	0.072	(	0.160)	0.065	0.007
67	16.75	0.30	0.054	(	0.157)	0.049	0.005
68	17.00	0.30	0.054	(	0.155)	0.049	0.005
69	17.25	0.50	0.090	(	0.153)	0.081	0.009
70	17.50	0.50	0.090	(	0.150)	0.081	0.009
71	17.75	0.50	0.090	(	0.148)	0.081	0.009
72	18.00	0.40	0.072	(	0.146)	0.065	0.007
73	18.25	0.40	0.072	(	0.144)	0.065	0.007
74	18.50	0.40	0.072	(	0.142)	0.065	0.007
75	18.75	0.30	0.054	(	0.140)	0.049	0.005
76	19.00	0.20	0.036	(	0.138)	0.032	0.004
77	19.25	0.30	0.054	(	0.136)	0.049	0.005
78	19.50	0.40	0.072	(	0.134)	0.065	0.007
79	19.75	0.30	0.054	(	0.132)	0.049	0.005
80	20.00	0.20	0.036	(	0.130)	0.032	0.004
81	20.25	0.30	0.054	(	0.128)	0.049	0.005
82	20.50	0.30	0.054	(	0.127)	0.049	0.005
83	20.75	0.30	0.054	(	0.125)	0.049	0.005
84	21.00	0.20	0.036	(	0.124)	0.032	0.004
85	21.25	0.30	0.054	(	0.122)	0.049	0.005
86	21.50	0.20	0.036	(	0.121)	0.032	0.004
87	21.75	0.30	0.054	(	0.119)	0.049	0.005
88	22.00	0.20	0.036	(	0.118)	0.032	0.004
89	22.25	0.30	0.054	(	0.117)	0.049	0.005
90	22.50	0.20	0.036	(	0.116)	0.032	0.004
91	22.75	0.20	0.036	(	0.115)	0.032	0.004
92	23.00	0.20	0.036	(	0.114)	0.032	0.004
93	23.25	0.20	0.036	(	0.113)	0.032	0.004
94	23.50	0.20	0.036	(	0.113)	0.032	0.004
95	23.75	0.20	0.036	(	0.112)	0.032	0.004
96	24.00	0.20	0.036	(	0.112)	0.032	0.004
		(Loss Rate Not Used)					
Sum =		100.0				Sum =	6.4

```
Flood volume = Effective rainfall      1.60(In)
 times area     403.1(Ac.)/[(In)/(Ft.)] =      53.9(Ac.Ft)
Total soil loss =      2.89(In)
Total soil loss =    97.167(Ac.Ft)
Total rainfall =      4.50(In)
Flood volume =     2346842.5 Cubic Feet
Total soil loss =     4232611.9 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =    154.262(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
               R u n o f f      H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------
  0+15       0.0029      0.14  Q         |         |         |         |
  0+30       0.0222      0.94  Q         |         |         |         |
  0+45       0.0562      1.64  Q         |         |         |         |
  1+ 0       0.0980      2.02  Q         |         |         |         |
  1+15       0.1488      2.46  Q         |         |         |         |
  1+30       0.1967      2.32  Q         |         |         |         |
  1+45       0.2430      2.24  Q         |         |         |         |
  2+ 0       0.2903      2.29  Q         |         |         |         |
  2+15       0.3447      2.64  Q         |         |         |         |
  2+30       0.4027      2.80  Q         |         |         |         |
  2+45       0.4635      2.94  Q         |         |         |         |
  3+ 0       0.5324      3.34  Q         |         |         |         |
  3+15       0.6051      3.52  Q         |         |         |         |
  3+30       0.6793      3.59  Q         |         |         |         |
  3+45       0.7544      3.63  Q         |         |         |         |
  4+ 0       0.8311      3.71  Q         |         |         |         |
  4+15       0.9155      4.08  Q         |         |         |         |
  4+30       1.0049      4.33  Q         |         |         |         |
  4+45       1.1033      4.76  Q         |         |         |         |
  5+ 0       1.2074      5.04  VQ        |         |         |         |
  5+15       1.3179      5.34  VQ        |         |         |         |
  5+30       1.4190      4.90  QV        |         |         |         |
  5+45       1.5238      5.07  |Q        |         |         |         |
  6+ 0       1.6376      5.51  |Q        |         |         |         |
  6+15       1.7568      5.77  |Q        |         |         |         |
  6+30       1.8853      6.22  |Q        |         |         |         |
  6+45       2.0196      6.50  |Q        |         |         |         |
  7+ 0       2.1631      6.94  |Q        |         |         |         |
  7+15       2.3109      7.15  |Q        |         |         |         |
  7+30       2.4620      7.31  |Q        |         |         |         |
  7+45       2.6228      7.79  |Q        |         |         |         |
  8+ 0       2.7965      8.41  |QV       |         |         |         |
  8+15       2.9857      9.16  |QV       |         |         |         |
  8+30       3.1958     10.16  | Q       |         |         |         |
  8+45       3.4204     10.87  | Q       |         |         |         |
  9+ 0       3.6930     13.19  | Q       |         |         |         |
  9+15       4.1018     19.79  |  Q      |         |         |         |
  9+30       4.7415     30.96  |  V  Q   |         |         |         |
  9+45       5.5863     40.89  |   V   Q |         |         |         |
 10+ 0       6.6214     50.10  |   V     Q         |         |         |
 10+15       7.7264     53.48  |    V    Q         |         |         |
 10+30       8.3965     32.43  |     Q   |         |         |         |
 10+45       8.9448     26.54  |    QV   |         |         |         |
 11+ 0       9.8100     41.88  |      VQ |         |         |         |
 11+15      10.8232     49.04  |       VQ|         |         |         |
 11+30      11.8454     49.48  |       VQ|         |         |         |
 11+45      12.8592     49.07  |        Q|         |         |         |
 12+ 0      13.7566     43.44  |       Q V         |         |         |
 12+15      14.7815     49.60  |        QV         |         |         |
 12+30      16.3824     77.48  |         | V  Q    |         |         |
 12+45      18.3636     95.89  |         |  V     Q|         |         |
 13+ 0      20.6722    111.74  |         |    V    | Q       |         |
```

```
  13+15      23.2875    126.58  |         |      V  |    Q    |         |
  13+30      26.3918    150.25  |         |        V|         Q         |
  13+45      29.5790    154.26  |         |         V        Q         |
  14+ 0      32.0538    119.78  |         |         |  Q      |         |
  14+15      34.2619    106.87  |         |         |Q   V    |         |
  14+30      36.6389    115.04  |         |         |  Q   V  |         |
  14+45      39.0371    116.08  |         |         |  Q    V |         |
  15+ 0      41.4435    116.47  |         |         |  Q      V         |
  15+15      43.7870    113.42  |         |         | Q       | V       |
  15+30      46.0219    108.17  |         |         |Q        |   V     |
  15+45      48.0945    100.31  |         |         Q         |    V    |
  16+ 0      49.8336     84.17  |         |     Q   |         |     V   |
  16+15      51.2916     70.57  |         |   Q     |         |       V |
  16+30      51.9803     33.33  |     Q   |         |         |       V |
  16+45      52.3034     15.64  |  Q      |         |         |       V |
  17+ 0      52.4739      8.25  |Q        |         |         |       V |
  17+15      52.5735      4.82  Q         |         |         |        V|
  17+30      52.6603      4.20  Q         |         |         |        V|
  17+45      52.7422      3.96  Q         |         |         |        V|
  18+ 0      52.8177      3.65  Q         |         |         |        V|
  18+15      52.8834      3.18  Q         |         |         |        V|
  18+30      52.9460      3.03  Q         |         |         |        V|
  18+45      53.0059      2.90  Q         |         |         |        V|
  19+ 0      53.0563      2.44  Q         |         |         |        V|
  19+15      53.0969      1.97  Q         |         |         |        V|
  19+30      53.1414      2.15  Q         |         |         |        V|
  19+45      53.1933      2.51  Q         |         |         |        V|
  20+ 0      53.2403      2.27  Q         |         |         |        V|
  20+15      53.2794      1.89  Q         |         |         |        V|
  20+30      53.3217      2.05  Q         |         |         |        V|
  20+45      53.3658      2.13  Q         |         |         |        V|
  21+ 0      53.4091      2.09  Q         |         |         |        V|
  21+15      53.4467      1.82  Q         |         |         |        V|
  21+30      53.4869      1.95  Q         |         |         |        V|
  21+45      53.5232      1.76  Q         |         |         |        V|
  22+ 0      53.5628      1.92  Q         |         |         |        V|
  22+15      53.5989      1.75  Q         |         |         |        V|
  22+30      53.6384      1.91  Q         |         |         |        V|
  22+45      53.6730      1.67  Q         |         |         |        V|
  23+ 0      53.7050      1.55  Q         |         |         |        V|
  23+15      53.7361      1.50  Q         |         |         |        V|
  23+30      53.7666      1.48  Q         |         |         |        V|
  23+45      53.7969      1.47  Q         |         |         |        V|
  24+ 0      53.8272      1.47  Q         |         |         |        V|
  24+15      53.8546      1.32  Q         |         |         |        V|
  24+30      53.8669      0.59  Q         |         |         |        V|
  24+45      53.8721      0.25  Q         |         |         |        V|
  25+ 0      53.8744      0.11  Q         |         |         |        V|
  25+15      53.8753      0.05  Q         |         |         |        V|
  25+30      53.8758      0.02  Q         |         |         |        V|
  25+45      53.8760      0.01  Q         |         |         |        V|
  26+ 0      53.8761      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  04/25/12 File: SubC2124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C21
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =     180.10(Ac.)  =      0.281 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     180.10(Ac.)  =      0.281 Sq. Mi.
Length along longest watercourse =    5800.00(Ft.)
Length along longest watercourse measured to centroid =    2200.00(Ft.)
Length along longest watercourse =      1.098 Mi.
Length along longest watercourse measured to centroid =      0.417 Mi.
Difference in elevation =     547.00(Ft.)
Slope along watercourse =    497.9586 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.164 Hr.
Lag time =     9.86 Min.
25% of lag time =     2.47 Min.
40% of lag time =     3.95 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      180.10           1.80                 324.18

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      180.10           4.50                 810.45

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    4.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    17.000           66.00         0.000
     1.300           77.00         0.000
```

```
   161.800          83.00         0.000
 Total Area Entered =    180.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       0.094      0.038
77.0  77.0      0.279     0.000        0.279       0.007      0.002
83.0  83.0      0.210     0.000        0.210       0.898      0.188
                                                  Sum (F) =   0.229
Area averaged mean soil loss (F) (In/Hr) =  0.229
Minimum soil loss rate ((In/Hr)) =  0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
-----------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
-----------------------------------------------------------------------
               Unit Hydrograph Data
-----------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------------
    1   0.250        152.073         31.114             56.474
    2   0.500        304.146         54.171             98.324
    3   0.750        456.220         11.618             21.087
    4   1.000        608.293          2.287              4.152
    5   1.250        760.366          0.810              1.471
                                Sum = 100.000   Sum=     181.507
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.404)	0.032	0.004
2	0.50	0.30	0.054	(0.399)	0.049	0.005
3	0.75	0.30	0.054	(0.395)	0.049	0.005
4	1.00	0.40	0.072	(0.390)	0.065	0.007
5	1.25	0.30	0.054	(0.385)	0.049	0.005
6	1.50	0.30	0.054	(0.381)	0.049	0.005
7	1.75	0.30	0.054	(0.376)	0.049	0.005
8	2.00	0.40	0.072	(0.372)	0.065	0.007
9	2.25	0.40	0.072	(0.367)	0.065	0.007
10	2.50	0.40	0.072	(0.363)	0.065	0.007
11	2.75	0.50	0.090	(0.358)	0.081	0.009
12	3.00	0.50	0.090	(0.354)	0.081	0.009
13	3.25	0.50	0.090	(0.350)	0.081	0.009
14	3.50	0.50	0.090	(0.345)	0.081	0.009
15	3.75	0.50	0.090	(0.341)	0.081	0.009
16	4.00	0.60	0.108	(0.337)	0.097	0.011
17	4.25	0.60	0.108	(0.332)	0.097	0.011
18	4.50	0.70	0.126	(0.328)	0.113	0.013
19	4.75	0.70	0.126	(0.324)	0.113	0.013
20	5.00	0.80	0.144	(0.320)	0.130	0.014
21	5.25	0.60	0.108	(0.316)	0.097	0.011
22	5.50	0.70	0.126	(0.311)	0.113	0.013
23	5.75	0.80	0.144	(0.307)	0.130	0.014
24	6.00	0.80	0.144	(0.303)	0.130	0.014
25	6.25	0.90	0.162	(0.299)	0.146	0.016
26	6.50	0.90	0.162	(0.295)	0.146	0.016
27	6.75	1.00	0.180	(0.291)	0.162	0.018
28	7.00	1.00	0.180	(0.287)	0.162	0.018
29	7.25	1.00	0.180	(0.283)	0.162	0.018
30	7.50	1.10	0.198	(0.280)	0.178	0.020
31	7.75	1.20	0.216	(0.276)	0.194	0.022
32	8.00	1.30	0.234	(0.272)	0.211	0.023
33	8.25	1.50	0.270	(0.268)	0.243	0.027

34	8.50	1.50	0.270	(	0.264)		0.243	0.027
35	8.75	1.60	0.288	(	0.261)		0.259	0.029
36	9.00	1.70	0.306		0.257	(	0.275)	0.049
37	9.25	1.90	0.342		0.253	(	0.308)	0.088
38	9.50	2.00	0.360		0.250	(	0.324)	0.110
39	9.75	2.10	0.378		0.246	(	0.340)	0.132
40	10.00	2.20	0.396		0.243	(	0.356)	0.153
41	10.25	1.50	0.270		0.239	(	0.243)	0.031
42	10.50	1.50	0.270		0.236	(	0.243)	0.034
43	10.75	2.00	0.360		0.232	(	0.324)	0.128
44	11.00	2.00	0.360		0.229	(	0.324)	0.131
45	11.25	1.90	0.342		0.226	(	0.308)	0.116
46	11.50	1.90	0.342		0.222	(	0.308)	0.120
47	11.75	1.70	0.306		0.219	(	0.275)	0.087
48	12.00	1.80	0.324		0.216	(	0.291)	0.108
49	12.25	2.50	0.450		0.212	(	0.405)	0.237
50	12.50	2.60	0.468		0.209	(	0.421)	0.259
51	12.75	2.80	0.504		0.206	(	0.453)	0.298
52	13.00	2.90	0.522		0.203	(	0.470)	0.319
53	13.25	3.40	0.612		0.200	(	0.551)	0.412
54	13.50	3.40	0.612		0.197	(	0.551)	0.415
55	13.75	2.30	0.414		0.194	(	0.372)	0.220
56	14.00	2.30	0.414		0.191	(	0.372)	0.223
57	14.25	2.70	0.486		0.188	(	0.437)	0.298
58	14.50	2.60	0.468		0.185	(	0.421)	0.283
59	14.75	2.60	0.468		0.182	(	0.421)	0.285
60	15.00	2.50	0.450		0.180	(	0.405)	0.270
61	15.25	2.40	0.432		0.177	(	0.389)	0.255
62	15.50	2.30	0.414		0.174	(	0.372)	0.240
63	15.75	1.90	0.342		0.171	(	0.308)	0.170
64	16.00	1.90	0.342		0.169	(	0.308)	0.173
65	16.25	0.40	0.072	(	0.166)		0.065	0.007
66	16.50	0.40	0.072	(	0.164)		0.065	0.007
67	16.75	0.30	0.054	(	0.161)		0.049	0.005
68	17.00	0.30	0.054	(	0.159)		0.049	0.005
69	17.25	0.50	0.090	(	0.156)		0.081	0.009
70	17.50	0.50	0.090	(	0.154)		0.081	0.009
71	17.75	0.50	0.090	(	0.152)		0.081	0.009
72	18.00	0.40	0.072	(	0.150)		0.065	0.007
73	18.25	0.40	0.072	(	0.147)		0.065	0.007
74	18.50	0.40	0.072	(	0.145)		0.065	0.007
75	18.75	0.30	0.054	(	0.143)		0.049	0.005
76	19.00	0.20	0.036	(	0.141)		0.032	0.004
77	19.25	0.30	0.054	(	0.139)		0.049	0.005
78	19.50	0.40	0.072	(	0.137)		0.065	0.007
79	19.75	0.30	0.054	(	0.135)		0.049	0.005
80	20.00	0.20	0.036	(	0.133)		0.032	0.004
81	20.25	0.30	0.054	(	0.132)		0.049	0.005
82	20.50	0.30	0.054	(	0.130)		0.049	0.005
83	20.75	0.30	0.054	(	0.128)		0.049	0.005
84	21.00	0.20	0.036	(	0.127)		0.032	0.004
85	21.25	0.30	0.054	(	0.125)		0.049	0.005
86	21.50	0.20	0.036	(	0.124)		0.032	0.004
87	21.75	0.30	0.054	(	0.122)		0.049	0.005
88	22.00	0.20	0.036	(	0.121)		0.032	0.004
89	22.25	0.30	0.054	(	0.120)		0.049	0.005
90	22.50	0.20	0.036	(	0.119)		0.032	0.004
91	22.75	0.20	0.036	(	0.118)		0.032	0.004
92	23.00	0.20	0.036	(	0.117)		0.032	0.004
93	23.25	0.20	0.036	(	0.116)		0.032	0.004
94	23.50	0.20	0.036	(	0.115)		0.032	0.004
95	23.75	0.20	0.036	(	0.115)		0.032	0.004
96	24.00	0.20	0.036	(	0.114)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.3

Flood volume = Effective rainfall 1.57(In)
times area 180.1(Ac.)/[(In)/(Ft.)] = 23.5(Ac.Ft)
Total soil loss = 2.93(In)
Total soil loss = 43.999(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1024294.3 Cubic Feet

```
Total soil loss =     1916604.3 Cubic Feet
-----------------------------------------------------------------------
 Peak flow rate of this hydrograph =     72.297(CFS)
-----------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f      H y d r o g r a p h
-----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       20.0      40.0      60.0      80.0
-----------------------------------------------------------------------
  0+15       0.0042      0.20  Q         |         |         |         |
  0+30       0.0178      0.66  Q         |         |         |         |
  0+45       0.0367      0.91  Q         |         |         |         |
  1+ 0       0.0587      1.07  Q         |         |         |         |
  1+15       0.0826      1.15  Q         |         |         |         |
  1+30       0.1036      1.02  Q         |         |         |         |
  1+45       0.1240      0.99  Q         |         |         |         |
  2+ 0       0.1464      1.08  Q         |         |         |         |
  2+15       0.1724      1.26  Q         |         |         |         |
  2+30       0.1992      1.30  Q         |         |         |         |
  2+45       0.2283      1.41  Q         |         |         |         |
  3+ 0       0.2610      1.59  Q         |         |         |         |
  3+15       0.2946      1.62  Q         |         |         |         |
  3+30       0.3283      1.63  Q         |         |         |         |
  3+45       0.3620      1.63  Q         |         |         |         |
  4+ 0       0.3979      1.74  Q         |         |         |         |
  4+15       0.4374      1.91  Q         |         |         |         |
  4+30       0.4798      2.05  VQ        |         |         |         |
  4+45       0.5260      2.24  VQ        |         |         |         |
  5+ 0       0.5752      2.38  VQ        |         |         |         |
  5+15       0.6239      2.36  |Q        |         |         |         |
  5+30       0.6683      2.15  |Q        |         |         |         |
  5+45       0.7171      2.36  |Q        |         |         |         |
  6+ 0       0.7700      2.56  |Q        |         |         |         |
  6+15       0.8258      2.70  |Q        |         |         |         |
  6+30       0.8855      2.89  |Q        |         |         |         |
  6+45       0.9482      3.03  |Q        |         |         |         |
  7+ 0       1.0147      3.22  |Q        |         |         |         |
  7+15       1.0820      3.26  |Q        |         |         |         |
  7+30       1.1515      3.37  |Q        |         |         |         |
  7+45       1.2269      3.65  |QV       |         |         |         |
  8+ 0       1.3088      3.96  |QV       |         |         |         |
  8+15       1.3995      4.39  | Q       |         |         |         |
  8+30       1.4985      4.79  | Q       |         |         |         |
  8+45       1.6014      4.98  | Q       |         |         |         |
  9+ 0       1.7317      6.31  | VQ      |         |         |         |
  9+15       1.9499     10.56  |  V Q    |         |         |         |
  9+30       2.2826     16.11  |  V    Q |         |         |         |
  9+45       2.7035     20.37  |   V     Q         |         |         |
 10+ 0       3.2068     24.36  |    V    | Q       |         |         |
 10+15       3.6234     20.16  |     V   Q         |         |         |
 10+30       3.8070      8.89  |   Q V   |         |         |         |
 10+45       4.0558     12.04  |     Q   |         |         |         |
 11+ 0       4.4901     21.02  |      V  Q         |         |         |
 11+15       4.9516     22.33  |       V |Q        |         |         |
 11+30       5.3967     21.55  |        VQ         |         |         |
 11+45       5.8073     19.87  |        Q|         |         |         |
 12+ 0       6.1765     17.87  |       Q V         |         |         |
 12+15       6.7252     26.56  |          V Q      |         |         |
 12+30       7.5678     40.78  |          | V       Q         |         |
 12+45       8.5563     47.84  |          |   V     |  Q      |         |
 13+ 0       9.6699     53.90  |          |     V   |     Q   |         |
 13+15      10.9578     62.33  |          |       V |         |Q        |
 13+30      12.4515     72.30  |          |         V         |     Q   |
 13+45      13.7674     63.69  |          |         |  V      |Q        |
 14+ 0      14.7004     45.16  |          |         | Q  V    |         |
 14+15      15.6450     45.72  |          |         | Q   V   |         |
 14+30      16.7088     51.49  |          |         |    Q  V |         |
```

```
  14+45      17.7721     51.47  |         |         |    Q    V         |
  15+ 0      18.8234     50.88  |         |         |    Q      V       |
  15+15      19.8282     48.63  |         |         |   Q     |  V      |
  15+30      20.7773     45.94  |         |         | Q       |    V    |
  15+45      21.6065     40.14  |         |         Q         |     V   |
  16+ 0      22.2895     33.06  |         |     Q   |         |      V  |
  16+15      22.7522     22.40  |         |Q        |         |       V |
  16+30      22.8726      5.83  | Q       |         |         |       V |
  16+45      22.9167      2.13  |Q        |         |         |       V |
  17+ 0      22.9430      1.27  Q         |         |         |        V|
  17+15      22.9676      1.19  Q         |         |         |        V|
  17+30      22.9995      1.54  Q         |         |         |        V|
  17+45      23.0328      1.61  Q         |         |         |        V|
  18+ 0      23.0643      1.53  Q         |         |         |        V|
  18+15      23.0923      1.36  Q         |         |         |        V|
  18+30      23.1195      1.32  Q         |         |         |        V|
  18+45      23.1445      1.21  Q         |         |         |        V|
  19+ 0      23.1637      0.93  Q         |         |         |        V|
  19+15      23.1805      0.81  Q         |         |         |        V|
  19+30      23.2021      1.05  Q         |         |         |        V|
  19+45      23.2258      1.15  Q         |         |         |        V|
  20+ 0      23.2447      0.91  Q         |         |         |        V|
  20+15      23.2615      0.81  Q         |         |         |        V|
  20+30      23.2810      0.94  Q         |         |         |        V|
  20+45      23.3011      0.97  Q         |         |         |        V|
  21+ 0      23.3192      0.88  Q         |         |         |        V|
  21+15      23.3358      0.80  Q         |         |         |        V|
  21+30      23.3532      0.84  Q         |         |         |        V|
  21+45      23.3696      0.80  Q         |         |         |        V|
  22+ 0      23.3869      0.84  Q         |         |         |        V|
  22+15      23.4034      0.80  Q         |         |         |        V|
  22+30      23.4207      0.84  Q         |         |         |        V|
  22+45      23.4350      0.69  Q         |         |         |        V|
  23+ 0      23.4487      0.66  Q         |         |         |        V|
  23+15      23.4622      0.66  Q         |         |         |        V|
  23+30      23.4757      0.65  Q         |         |         |        V|
  23+45      23.4892      0.65  Q         |         |         |        V|
  24+ 0      23.5027      0.65  Q         |         |         |        V|
  24+15      23.5120      0.45  Q         |         |         |        V|
  24+30      23.5140      0.10  Q         |         |         |        V|
  24+45      23.5145      0.02  Q         |         |         |        V|
  25+ 0      23.5146      0.01  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/25/12 File: SubC4124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C41
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      61.60(Ac.)  =      0.096 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      61.60(Ac.)  =      0.096 Sq. Mi.
Length along longest watercourse =    2300.00(Ft.)
Length along longest watercourse measured to centroid =    1340.00(Ft.)
Length along longest watercourse =      0.436 Mi.
Length along longest watercourse measured to centroid =      0.254 Mi.
Difference in elevation =     219.00(Ft.)
Slope along watercourse =    502.7478 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.096 Hr.
Lag time =     5.74 Min.
25% of lag time =     1.43 Min.
40% of lag time =     2.30 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       61.60           1.80                110.88

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       61.60           4.50                277.20

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     8.200           66.00         0.000
    11.300           77.00         0.000
```

```
    42.100          83.00         0.000
 Total Area Entered =     61.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
66.0  66.0      0.405     0.000        0.405       0.133      0.054
77.0  77.0      0.279     0.000        0.279       0.183      0.051
83.0  83.0      0.210     0.000        0.210       0.683      0.143
                                                  Sum (F) =   0.249
Area averaged mean soil loss (F) (In/Hr) =  0.249
Minimum soil loss rate ((In/Hr)) =  0.124
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        261.402         52.675             32.701
    2   0.500        522.805         43.927             27.270
    3   0.750        784.207          3.398              2.110
                                Sum = 100.000   Sum=      62.081
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.439)	0.032	0.004
2	0.50	0.30	0.054	(0.434)	0.049	0.005
3	0.75	0.30	0.054	(0.429)	0.049	0.005
4	1.00	0.40	0.072	(0.424)	0.065	0.007
5	1.25	0.30	0.054	(0.419)	0.049	0.005
6	1.50	0.30	0.054	(0.414)	0.049	0.005
7	1.75	0.30	0.054	(0.409)	0.049	0.005
8	2.00	0.40	0.072	(0.404)	0.065	0.007
9	2.25	0.40	0.072	(0.399)	0.065	0.007
10	2.50	0.40	0.072	(0.394)	0.065	0.007
11	2.75	0.50	0.090	(0.389)	0.081	0.009
12	3.00	0.50	0.090	(0.385)	0.081	0.009
13	3.25	0.50	0.090	(0.380)	0.081	0.009
14	3.50	0.50	0.090	(0.375)	0.081	0.009
15	3.75	0.50	0.090	(0.370)	0.081	0.009
16	4.00	0.60	0.108	(0.366)	0.097	0.011
17	4.25	0.60	0.108	(0.361)	0.097	0.011
18	4.50	0.70	0.126	(0.357)	0.113	0.013
19	4.75	0.70	0.126	(0.352)	0.113	0.013
20	5.00	0.80	0.144	(0.347)	0.130	0.014
21	5.25	0.60	0.108	(0.343)	0.097	0.011
22	5.50	0.70	0.126	(0.338)	0.113	0.013
23	5.75	0.80	0.144	(0.334)	0.130	0.014
24	6.00	0.80	0.144	(0.330)	0.130	0.014
25	6.25	0.90	0.162	(0.325)	0.146	0.016
26	6.50	0.90	0.162	(0.321)	0.146	0.016
27	6.75	1.00	0.180	(0.317)	0.162	0.018
28	7.00	1.00	0.180	(0.312)	0.162	0.018
29	7.25	1.00	0.180	(0.308)	0.162	0.018
30	7.50	1.10	0.198	(0.304)	0.178	0.020
31	7.75	1.20	0.216	(0.300)	0.194	0.022
32	8.00	1.30	0.234	(0.296)	0.211	0.023
33	8.25	1.50	0.270	(0.291)	0.243	0.027
34	8.50	1.50	0.270	(0.287)	0.243	0.027
35	8.75	1.60	0.288	(0.283)	0.259	0.029

36	9.00	1.70	0.306	(	0.279)	0.275	0.031
37	9.25	1.90	0.342		0.275	(0.308)	0.067
38	9.50	2.00	0.360		0.271	(0.324)	0.088
39	9.75	2.10	0.378		0.268	(0.340)	0.110
40	10.00	2.20	0.396		0.264	(0.356)	0.132
41	10.25	1.50	0.270	(	0.260)	0.243	0.027
42	10.50	1.50	0.270	(	0.256)	0.243	0.027
43	10.75	2.00	0.360		0.252	(0.324)	0.107
44	11.00	2.00	0.360		0.249	(0.324)	0.111
45	11.25	1.90	0.342		0.245	(0.308)	0.097
46	11.50	1.90	0.342		0.241	(0.308)	0.100
47	11.75	1.70	0.306		0.238	(0.275)	0.068
48	12.00	1.80	0.324		0.234	(0.292)	0.090
49	12.25	2.50	0.450		0.231	(0.405)	0.219
50	12.50	2.60	0.468		0.227	(0.421)	0.241
51	12.75	2.80	0.504		0.224	(0.454)	0.280
52	13.00	2.90	0.522		0.221	(0.470)	0.301
53	13.25	3.40	0.612		0.217	(0.551)	0.395
54	13.50	3.40	0.612		0.214	(0.551)	0.398
55	13.75	2.30	0.414		0.211	(0.373)	0.203
56	14.00	2.30	0.414		0.208	(0.373)	0.206
57	14.25	2.70	0.486		0.204	(0.437)	0.282
58	14.50	2.60	0.468		0.201	(0.421)	0.267
59	14.75	2.60	0.468		0.198	(0.421)	0.270
60	15.00	2.50	0.450		0.195	(0.405)	0.255
61	15.25	2.40	0.432		0.192	(0.389)	0.240
62	15.50	2.30	0.414		0.189	(0.373)	0.225
63	15.75	1.90	0.342		0.186	(0.308)	0.156
64	16.00	1.90	0.342		0.183	(0.308)	0.158
65	16.25	0.40	0.072	(	0.181)	0.065	0.007
66	16.50	0.40	0.072	(	0.178)	0.065	0.007
67	16.75	0.30	0.054	(	0.175)	0.049	0.005
68	17.00	0.30	0.054	(	0.173)	0.049	0.005
69	17.25	0.50	0.090	(	0.170)	0.081	0.009
70	17.50	0.50	0.090	(	0.167)	0.081	0.009
71	17.75	0.50	0.090	(	0.165)	0.081	0.009
72	18.00	0.40	0.072	(	0.162)	0.065	0.007
73	18.25	0.40	0.072	(	0.160)	0.065	0.007
74	18.50	0.40	0.072	(	0.158)	0.065	0.007
75	18.75	0.30	0.054	(	0.155)	0.049	0.005
76	19.00	0.20	0.036	(	0.153)	0.032	0.004
77	19.25	0.30	0.054	(	0.151)	0.049	0.005
78	19.50	0.40	0.072	(	0.149)	0.065	0.007
79	19.75	0.30	0.054	(	0.147)	0.049	0.005
80	20.00	0.20	0.036	(	0.145)	0.032	0.004
81	20.25	0.30	0.054	(	0.143)	0.049	0.005
82	20.50	0.30	0.054	(	0.141)	0.049	0.005
83	20.75	0.30	0.054	(	0.139)	0.049	0.005
84	21.00	0.20	0.036	(	0.138)	0.032	0.004
85	21.25	0.30	0.054	(	0.136)	0.049	0.005
86	21.50	0.20	0.036	(	0.135)	0.032	0.004
87	21.75	0.30	0.054	(	0.133)	0.049	0.005
88	22.00	0.20	0.036	(	0.132)	0.032	0.004
89	22.25	0.30	0.054	(	0.130)	0.049	0.005
90	22.50	0.20	0.036	(	0.129)	0.032	0.004
91	22.75	0.20	0.036	(	0.128)	0.032	0.004
92	23.00	0.20	0.036	(	0.127)	0.032	0.004
93	23.25	0.20	0.036	(	0.126)	0.032	0.004
94	23.50	0.20	0.036	(	0.125)	0.032	0.004
95	23.75	0.20	0.036	(	0.125)	0.032	0.004
96	24.00	0.20	0.036	(	0.124)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.8

Flood volume = Effective rainfall 1.44(In)
times area 61.6(Ac.)/[(In)/(Ft.)] = 7.4(Ac.Ft)
Total soil loss = 3.06(In)
Total soil loss = 15.686(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 322815.8 Cubic Feet
Total soil loss = 683299.1 Cubic Feet

Peak flow rate of this hydrograph = 24.423(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 7.5 15.0 22.5 30.0
0+15	0.0024	0.12	Q | | | |
0+30	0.0081	0.27	Q | | | |
0+45	0.0150	0.33	Q | | | |
1+ 0	0.0231	0.39	Q | | | |
1+15	0.0311	0.38	Q | | | |
1+30	0.0381	0.34	Q | | | |
1+45	0.0450	0.34	Q | | | |
2+ 0	0.0531	0.39	Q | | | |
2+15	0.0623	0.44	Q | | | |
2+30	0.0715	0.45	Q | | | |
2+45	0.0820	0.51	Q | | | |
3+ 0	0.0935	0.56	Q | | | |
3+15	0.1050	0.56	Q | | | |
3+30	0.1166	0.56	Q | | | |
3+45	0.1281	0.56	Q | | | |
4+ 0	0.1409	0.62	Q | | | |
4+15	0.1547	0.67	Q | | | |
4+30	0.1697	0.73	Q | | | |
4+45	0.1858	0.78	Q | | | |
5+ 0	0.2032	0.84	|Q | | | |
5+15	0.2192	0.77	|Q | | | |
5+30	0.2344	0.74	QV | | | |
5+45	0.2517	0.84	|Q | | | |
6+ 0	0.2701	0.89	|Q | | | |
6+15	0.2898	0.95	|Q | | | |
6+30	0.3105	1.00	|Q | | | |
6+45	0.3325	1.07	|Q | | | |
7+ 0	0.3555	1.11	|Q | | | |
7+15	0.3786	1.12	|QV | | | |
7+30	0.4029	1.18	|QV | | | |
7+45	0.4295	1.28	|QV | | | |
8+ 0	0.4583	1.40	|QV | | | |
8+15	0.4907	1.57	| Q | | | |
8+30	0.5252	1.67	| Q | | | |
8+45	0.5611	1.74	| QV | | | |
9+ 0	0.5992	1.84	| QV | | | |
9+15	0.6627	3.07	| VQ | | | |
9+30	0.7613	4.77	| V Q | | | |
9+45	0.8886	6.16	| V Q | | | |
10+ 0	1.0441	7.52	| V Q | | |
10+15	1.1416	4.72	| Q | | | |
10+30	1.1809	1.90	| Q V | | | |
10+45	1.2699	4.31	| QV | | | |
11+ 0	1.4069	6.63	| VQ | | | |
11+15	1.5397	6.43	| Q | | | |
11+30	1.6671	6.16	| Q | | | |
11+45	1.7739	5.17	| Q V| | | |
12+ 0	1.8772	5.00	| Q V | | |
12+15	2.0788	9.76	| V Q | | |
12+30	2.3688	14.04	| | V Q | | |
12+45	2.7031	16.18	| V |Q | |
13+ 0	3.0751	18.00	| V | Q | |
13+15	3.5239	21.72	| V| Q | |
13+30	4.0285	24.42	| V | Q |
13+45	4.4074	18.34	| | VQ | |
14+ 0	4.6789	13.14	| Q | V | |
14+15	4.9944	15.27	| Q V | |
14+30	5.3424	16.84	| | Q V | |
14+45	5.6874	16.70	| | Q V |
15+ 0	6.0234	16.26	| | |Q | V |

```
   15+15       6.3409     15.37  |         |         Q         |   V     |
   15+30       6.6391     14.43  |         |        Q|         |    V    |
   15+45       6.8814     11.73  |         |    Q    |         |      V  |
   16+ 0       7.0861      9.91  |         |  Q      |         |       V |
   16+15       7.1871      4.89  |     Q   |         |         |       V |
   16+30       7.2029      0.77  |Q        |         |         |       V |
   16+45       7.2109      0.39  Q         |         |         |       V |
   17+ 0       7.2179      0.34  Q         |         |         |       V |
   17+15       7.2273      0.45  Q         |         |         |        V|
   17+30       7.2387      0.55  Q         |         |         |        V|
   17+45       7.2502      0.56  Q         |         |         |        V|
   18+ 0       7.2606      0.50  Q         |         |         |        V|
   18+15       7.2699      0.45  Q         |         |         |        V|
   18+30       7.2791      0.45  Q         |         |         |        V|
   18+45       7.2871      0.39  Q         |         |         |        V|
   19+ 0       7.2929      0.28  Q         |         |         |        V|
   19+15       7.2988      0.29  Q         |         |         |        V|
   19+30       7.3069      0.39  Q         |         |         |        V|
   19+45       7.3148      0.38  Q         |         |         |        V|
   20+ 0       7.3206      0.28  Q         |         |         |        V|
   20+15       7.3266      0.29  Q         |         |         |        V|
   20+30       7.3334      0.33  Q         |         |         |        V|
   20+45       7.3403      0.34  Q         |         |         |        V|
   21+ 0       7.3460      0.28  Q         |         |         |        V|
   21+15       7.3520      0.29  Q         |         |         |        V|
   21+30       7.3576      0.27  Q         |         |         |        V|
   21+45       7.3635      0.29  Q         |         |         |        V|
   22+ 0       7.3691      0.27  Q         |         |         |        V|
   22+15       7.3751      0.29  Q         |         |         |        V|
   22+30       7.3807      0.27  Q         |         |         |        V|
   22+45       7.3854      0.23  Q         |         |         |        V|
   23+ 0       7.3900      0.22  Q         |         |         |        V|
   23+15       7.3946      0.22  Q         |         |         |        V|
   23+30       7.3992      0.22  Q         |         |         |        V|
   23+45       7.4039      0.22  Q         |         |         |        V|
   24+ 0       7.4085      0.22  Q         |         |         |        V|
   24+15       7.4107      0.11  Q         |         |         |        V|
   24+30       7.4108      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  04/25/12 File: SubC5124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed C, Stream 1, Existing Condition
Subarea C51
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      12.70(Ac.)  =      0.020 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      12.70(Ac.)  =      0.020 Sq. Mi.
Length along longest watercourse =    1160.00(Ft.)
Length along longest watercourse measured to centroid =     510.00(Ft.)
Length along longest watercourse =      0.220 Mi.
Length along longest watercourse measured to centroid =      0.097 Mi.
Difference in elevation =     129.00(Ft.)
Slope along watercourse =    587.1724 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.050 Hr.
Lag time =     2.98 Min.
25% of lag time =     0.74 Min.
40% of lag time =     1.19 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       12.70           1.80                 22.86

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       12.70           4.50                 57.15

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     4.000           66.00         0.000
     8.700           83.00         0.000
```

Total Area Entered = 12.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
66.0	66.0	0.405	0.000	0.405	0.315	0.128
83.0	83.0	0.210	0.000	0.210	0.685	0.144
					Sum (F) =	0.271

Area averaged mean soil loss (F) (In/Hr) = 0.271
Minimum soil loss rate ((In/Hr)) = 0.136
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	504.085	73.731	9.437
2	0.500	1008.171	26.269	3.362
			Sum = 100.000	Sum= 12.799

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.479)	0.032	0.004
2	0.50	0.30	0.054	(0.474)	0.049	0.005
3	0.75	0.30	0.054	(0.468)	0.049	0.005
4	1.00	0.40	0.072	(0.463)	0.065	0.007
5	1.25	0.30	0.054	(0.457)	0.049	0.005
6	1.50	0.30	0.054	(0.452)	0.049	0.005
7	1.75	0.30	0.054	(0.446)	0.049	0.005
8	2.00	0.40	0.072	(0.441)	0.065	0.007
9	2.25	0.40	0.072	(0.436)	0.065	0.007
10	2.50	0.40	0.072	(0.430)	0.065	0.007
11	2.75	0.50	0.090	(0.425)	0.081	0.009
12	3.00	0.50	0.090	(0.420)	0.081	0.009
13	3.25	0.50	0.090	(0.415)	0.081	0.009
14	3.50	0.50	0.090	(0.409)	0.081	0.009
15	3.75	0.50	0.090	(0.404)	0.081	0.009
16	4.00	0.60	0.108	(0.399)	0.097	0.011
17	4.25	0.60	0.108	(0.394)	0.097	0.011
18	4.50	0.70	0.126	(0.389)	0.113	0.013
19	4.75	0.70	0.126	(0.384)	0.113	0.013
20	5.00	0.80	0.144	(0.379)	0.130	0.014
21	5.25	0.60	0.108	(0.374)	0.097	0.011
22	5.50	0.70	0.126	(0.369)	0.113	0.013
23	5.75	0.80	0.144	(0.365)	0.130	0.014
24	6.00	0.80	0.144	(0.360)	0.130	0.014
25	6.25	0.90	0.162	(0.355)	0.146	0.016
26	6.50	0.90	0.162	(0.350)	0.146	0.016
27	6.75	1.00	0.180	(0.346)	0.162	0.018
28	7.00	1.00	0.180	(0.341)	0.162	0.018
29	7.25	1.00	0.180	(0.336)	0.162	0.018
30	7.50	1.10	0.198	(0.332)	0.178	0.020
31	7.75	1.20	0.216	(0.327)	0.194	0.022
32	8.00	1.30	0.234	(0.323)	0.211	0.023
33	8.25	1.50	0.270	(0.318)	0.243	0.027
34	8.50	1.50	0.270	(0.314)	0.243	0.027
35	8.75	1.60	0.288	(0.309)	0.259	0.029
36	9.00	1.70	0.306	(0.305)	0.275	0.031
37	9.25	1.90	0.342	0.301	(0.308)	0.041
38	9.50	2.00	0.360	0.296	(0.324)	0.064

39	9.75	2.10	0.378	0.292	(	0.340)	0.086
40	10.00	2.20	0.396	0.288	(	0.356)	0.108
41	10.25	1.50	0.270	(0.284)		0.243	0.027
42	10.50	1.50	0.270	(0.280)		0.243	0.027
43	10.75	2.00	0.360	0.276	(	0.324)	0.084
44	11.00	2.00	0.360	0.272	(	0.324)	0.088
45	11.25	1.90	0.342	0.268	(	0.308)	0.074
46	11.50	1.90	0.342	0.264	(	0.308)	0.078
47	11.75	1.70	0.306	0.260	(	0.275)	0.046
48	12.00	1.80	0.324	0.256	(	0.292)	0.068
49	12.25	2.50	0.450	0.252	(	0.405)	0.198
50	12.50	2.60	0.468	0.248	(	0.421)	0.220
51	12.75	2.80	0.504	0.245	(	0.454)	0.259
52	13.00	2.90	0.522	0.241	(	0.470)	0.281
53	13.25	3.40	0.612	0.237	(	0.551)	0.375
54	13.50	3.40	0.612	0.234	(	0.551)	0.378
55	13.75	2.30	0.414	0.230	(	0.373)	0.184
56	14.00	2.30	0.414	0.227	(	0.373)	0.187
57	14.25	2.70	0.486	0.223	(	0.437)	0.263
58	14.50	2.60	0.468	0.220	(	0.421)	0.248
59	14.75	2.60	0.468	0.216	(	0.421)	0.252
60	15.00	2.50	0.450	0.213	(	0.405)	0.237
61	15.25	2.40	0.432	0.210	(	0.389)	0.222
62	15.50	2.30	0.414	0.207	(	0.373)	0.207
63	15.75	1.90	0.342	0.203	(	0.308)	0.139
64	16.00	1.90	0.342	0.200	(	0.308)	0.142
65	16.25	0.40	0.072	(0.197)		0.065	0.007
66	16.50	0.40	0.072	(0.194)		0.065	0.007
67	16.75	0.30	0.054	(0.191)		0.049	0.005
68	17.00	0.30	0.054	(0.188)		0.049	0.005
69	17.25	0.50	0.090	(0.186)		0.081	0.009
70	17.50	0.50	0.090	(0.183)		0.081	0.009
71	17.75	0.50	0.090	(0.180)		0.081	0.009
72	18.00	0.40	0.072	(0.177)		0.065	0.007
73	18.25	0.40	0.072	(0.175)		0.065	0.007
74	18.50	0.40	0.072	(0.172)		0.065	0.007
75	18.75	0.30	0.054	(0.170)		0.049	0.005
76	19.00	0.20	0.036	(0.167)		0.032	0.004
77	19.25	0.30	0.054	(0.165)		0.049	0.005
78	19.50	0.40	0.072	(0.163)		0.065	0.007
79	19.75	0.30	0.054	(0.160)		0.049	0.005
80	20.00	0.20	0.036	(0.158)		0.032	0.004
81	20.25	0.30	0.054	(0.156)		0.049	0.005
82	20.50	0.30	0.054	(0.154)		0.049	0.005
83	20.75	0.30	0.054	(0.152)		0.049	0.005
84	21.00	0.20	0.036	(0.150)		0.032	0.004
85	21.25	0.30	0.054	(0.149)		0.049	0.005
86	21.50	0.20	0.036	(0.147)		0.032	0.004
87	21.75	0.30	0.054	(0.145)		0.049	0.005
88	22.00	0.20	0.036	(0.144)		0.032	0.004
89	22.25	0.30	0.054	(0.142)		0.049	0.005
90	22.50	0.20	0.036	(0.141)		0.032	0.004
91	22.75	0.20	0.036	(0.140)		0.032	0.004
92	23.00	0.20	0.036	(0.139)		0.032	0.004
93	23.25	0.20	0.036	(0.138)		0.032	0.004
94	23.50	0.20	0.036	(0.137)		0.032	0.004
95	23.75	0.20	0.036	(0.136)		0.032	0.004
96	24.00	0.20	0.036	(0.136)		0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.2

Flood volume = Effective rainfall 1.31(In)
times area 12.7(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 3.19(In)
Total soil loss = 3.376(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 60402.2 Cubic Feet
Total soil loss = 147047.2 Cubic Feet

Peak flow rate of this hydrograph = 4.833(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+15	0.0007	0.03	Q
0+30	0.0020	0.06	Q
0+45	0.0034	0.07	Q
1+ 0	0.0052	0.09	Q
1+15	0.0068	0.08	Q
1+30	0.0082	0.07	Q
1+45	0.0096	0.07	Q
2+ 0	0.0114	0.09	Q
2+15	0.0133	0.09	Q
2+30	0.0152	0.09	Q
2+45	0.0175	0.11	Q
3+ 0	0.0199	0.12	Q
3+15	0.0222	0.12	Q
3+30	0.0246	0.12	Q
3+45	0.0270	0.12	Q
4+ 0	0.0297	0.13	Q
4+15	0.0326	0.14	Q
4+30	0.0358	0.16	QV
4+45	0.0391	0.16	QV
5+ 0	0.0428	0.18	QV
5+15	0.0459	0.15	QV
5+30	0.0491	0.16	QV
5+45	0.0528	0.18	QV
6+ 0	0.0566	0.18	QV
6+15	0.0608	0.20	QV
6+30	0.0651	0.21	QV
6+45	0.0697	0.22	Q V
7+ 0	0.0745	0.23	Q V
7+15	0.0792	0.23	Q V
7+30	0.0843	0.25	Q V
7+45	0.0899	0.27	QV
8+ 0	0.0960	0.29	QV
8+15	0.1029	0.33	QV
8+30	0.1100	0.35	Q V
8+45	0.1175	0.36	Q V
9+ 0	0.1255	0.39	Q V
9+15	0.1357	0.49	Q V
9+30	0.1510	0.74	Q V
9+45	0.1722	1.02	Q
10+ 0	0.1992	1.31	Q
10+15	0.2120	0.62	Q V
10+30	0.2191	0.35	Q V
10+45	0.2375	0.89	Q V
11+ 0	0.2606	1.12	Q V
11+15	0.2813	1.00	Q V
11+30	0.3017	0.99	Q V
11+45	0.3162	0.70	Q V
12+ 0	0.3327	0.80	Q V
12+15	0.3761	2.10	Q V
12+30	0.4327	2.74	Q V
12+45	0.4986	3.19	Q V
13+ 0	0.5715	3.53	Q V
13+15	0.6641	4.48	Q V
13+30	0.7640	4.83	Q V
13+45	0.8262	3.01	Q V
14+ 0	0.8755	2.39	Q V
14+15	0.9398	3.11	Q V
14+30	1.0065	3.23	Q V
14+45	1.0729	3.21	Q V
15+ 0	1.1366	3.08	Q V
15+15	1.1964	2.90	Q V
15+30	1.2523	2.71	Q V
15+45	1.2938	2.01	Q V

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   16+ 0       1.3311      1.80  |      Q  |         |         |       V |
   16+15       1.3423      0.54  | Q       |         |         |       V |
   16+30       1.3442      0.09  Q         |         |         |       V |
   16+45       1.3458      0.08  Q         |         |         |       V |
   17+ 0       1.3472      0.07  Q         |         |         |       V |
   17+15       1.3493      0.10  Q         |         |         |       V |
   17+30       1.3517      0.12  Q         |         |         |       V |
   17+45       1.3541      0.12  Q         |         |         |        V|
   18+ 0       1.3561      0.10  Q         |         |         |        V|
   18+15       1.3580      0.09  Q         |         |         |        V|
   18+30       1.3599      0.09  Q         |         |         |        V|
   18+45       1.3615      0.08  Q         |         |         |        V|
   19+ 0       1.3626      0.05  Q         |         |         |        V|
   19+15       1.3639      0.06  Q         |         |         |        V|
   19+30       1.3657      0.09  Q         |         |         |        V|
   19+45       1.3672      0.08  Q         |         |         |        V|
   20+ 0       1.3683      0.05  Q         |         |         |        V|
   20+15       1.3696      0.06  Q         |         |         |        V|
   20+30       1.3710      0.07  Q         |         |         |        V|
   20+45       1.3725      0.07  Q         |         |         |        V|
   21+ 0       1.3735      0.05  Q         |         |         |        V|
   21+15       1.3748      0.06  Q         |         |         |        V|
   21+30       1.3759      0.05  Q         |         |         |        V|
   21+45       1.3772      0.06  Q         |         |         |        V|
   22+ 0       1.3783      0.05  Q         |         |         |        V|
   22+15       1.3796      0.06  Q         |         |         |        V|
   22+30       1.3807      0.05  Q         |         |         |        V|
   22+45       1.3816      0.05  Q         |         |         |        V|
   23+ 0       1.3826      0.05  Q         |         |         |        V|
   23+15       1.3835      0.05  Q         |         |         |        V|
   23+30       1.3845      0.05  Q         |         |         |        V|
   23+45       1.3854      0.05  Q         |         |         |        V|
   24+ 0       1.3864      0.05  Q         |         |         |        V|
   24+15       1.3866      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  05/02/12 File: SUBC124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed Cm Subdrain Area C1
Proposed Conditions
100 Yr, 24 Hr.

--------------------------------------------------------------------
Drainage Area =     105.00(Ac.)  =      0.164 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     105.00(Ac.)  =      0.164 Sq. Mi.
Length along longest watercourse =    3000.00(Ft.)
Length along longest watercourse measured to centroid =    1500.00(Ft.)
Length along longest watercourse =      0.568 Mi.
Length along longest watercourse measured to centroid =      0.284 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =     88.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.077 Hr.
Lag time =     4.61 Min.
25% of lag time =     1.15 Min.
40% of lag time =     1.85 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.00           1.80                 189.00

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.00           4.80                 504.00

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.800(In)

Point rain (area averaged) =    4.800(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.799(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   105.000           85.00         0.750
 Total Area Entered =    105.00(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	325.140	59.121	62.562
2	0.500	650.280	35.788	37.871
3	0.750	975.420	5.091	5.387
		Sum = 100.000	Sum=	105.820

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.038	(0.107)	0.012	0.027
2	0.50	0.30	0.058	(0.106)	0.017	0.040
3	0.75	0.30	0.058	(0.105)	0.017	0.040
4	1.00	0.40	0.077	(0.104)	0.023	0.054
5	1.25	0.30	0.058	(0.102)	0.017	0.040
6	1.50	0.30	0.058	(0.101)	0.017	0.040
7	1.75	0.30	0.058	(0.100)	0.017	0.040
8	2.00	0.40	0.077	(0.099)	0.023	0.054
9	2.25	0.40	0.077	(0.098)	0.023	0.054
10	2.50	0.40	0.077	(0.096)	0.023	0.054
11	2.75	0.50	0.096	(0.095)	0.029	0.067
12	3.00	0.50	0.096	(0.094)	0.029	0.067
13	3.25	0.50	0.096	(0.093)	0.029	0.067
14	3.50	0.50	0.096	(0.092)	0.029	0.067
15	3.75	0.50	0.096	(0.091)	0.029	0.067
16	4.00	0.60	0.115	(0.089)	0.035	0.081
17	4.25	0.60	0.115	(0.088)	0.035	0.081
18	4.50	0.70	0.134	(0.087)	0.040	0.094
19	4.75	0.70	0.134	(0.086)	0.040	0.094
20	5.00	0.80	0.154	(0.085)	0.046	0.107
21	5.25	0.60	0.115	(0.084)	0.035	0.081
22	5.50	0.70	0.134	(0.083)	0.040	0.094
23	5.75	0.80	0.154	(0.082)	0.046	0.107
24	6.00	0.80	0.154	(0.081)	0.046	0.107
25	6.25	0.90	0.173	(0.080)	0.052	0.121
26	6.50	0.90	0.173	(0.078)	0.052	0.121
27	6.75	1.00	0.192	(0.077)	0.058	0.134
28	7.00	1.00	0.192	(0.076)	0.058	0.134
29	7.25	1.00	0.192	(0.075)	0.058	0.134
30	7.50	1.10	0.211	(0.074)	0.063	0.148
31	7.75	1.20	0.230	(0.073)	0.069	0.161
32	8.00	1.30	0.250	0.072	(0.075)	0.177
33	8.25	1.50	0.288	0.071	(0.086)	0.217
34	8.50	1.50	0.288	0.070	(0.086)	0.218
35	8.75	1.60	0.307	0.069	(0.092)	0.238
36	9.00	1.70	0.326	0.068	(0.098)	0.258
37	9.25	1.90	0.365	0.067	(0.109)	0.297
38	9.50	2.00	0.384	0.066	(0.115)	0.318
39	9.75	2.10	0.403	0.065	(0.121)	0.338

40	10.00	2.20	0.422	0.064	(	0.127)	0.358
41	10.25	1.50	0.288	0.064	(	0.086)	0.224
42	10.50	1.50	0.288	0.063	(	0.086)	0.225
43	10.75	2.00	0.384	0.062	(	0.115)	0.322
44	11.00	2.00	0.384	0.061	(	0.115)	0.323
45	11.25	1.90	0.365	0.060	(	0.109)	0.305
46	11.50	1.90	0.365	0.059	(	0.109)	0.306
47	11.75	1.70	0.326	0.058	(	0.098)	0.268
48	12.00	1.80	0.346	0.057	(	0.104)	0.288
49	12.25	2.50	0.480	0.056	(	0.144)	0.423
50	12.50	2.60	0.499	0.056	(	0.150)	0.443
51	12.75	2.80	0.537	0.055	(	0.161)	0.483
52	13.00	2.90	0.557	0.054	(	0.167)	0.503
53	13.25	3.40	0.653	0.053	(	0.196)	0.600
54	13.50	3.40	0.653	0.052	(	0.196)	0.600
55	13.75	2.30	0.442	0.052	(	0.132)	0.390
56	14.00	2.30	0.442	0.051	(	0.132)	0.391
57	14.25	2.70	0.518	0.050	(	0.155)	0.468
58	14.50	2.60	0.499	0.049	(	0.150)	0.450
59	14.75	2.60	0.499	0.048	(	0.150)	0.451
60	15.00	2.50	0.480	0.048	(	0.144)	0.432
61	15.25	2.40	0.461	0.047	(	0.138)	0.414
62	15.50	2.30	0.442	0.046	(	0.132)	0.395
63	15.75	1.90	0.365	0.046	(	0.109)	0.319
64	16.00	1.90	0.365	0.045	(	0.109)	0.320
65	16.25	0.40	0.077	(0.044)		0.023	0.054
66	16.50	0.40	0.077	(0.044)		0.023	0.054
67	16.75	0.30	0.058	(0.043)		0.017	0.040
68	17.00	0.30	0.058	(0.042)		0.017	0.040
69	17.25	0.50	0.096	(0.042)		0.029	0.067
70	17.50	0.50	0.096	(0.041)		0.029	0.067
71	17.75	0.50	0.096	(0.040)		0.029	0.067
72	18.00	0.40	0.077	(0.040)		0.023	0.054
73	18.25	0.40	0.077	(0.039)		0.023	0.054
74	18.50	0.40	0.077	(0.039)		0.023	0.054
75	18.75	0.30	0.058	(0.038)		0.017	0.040
76	19.00	0.20	0.038	(0.037)		0.012	0.027
77	19.25	0.30	0.058	(0.037)		0.017	0.040
78	19.50	0.40	0.077	(0.036)		0.023	0.054
79	19.75	0.30	0.058	(0.036)		0.017	0.040
80	20.00	0.20	0.038	(0.035)		0.012	0.027
81	20.25	0.30	0.058	(0.035)		0.017	0.040
82	20.50	0.30	0.058	(0.035)		0.017	0.040
83	20.75	0.30	0.058	(0.034)		0.017	0.040
84	21.00	0.20	0.038	(0.034)		0.012	0.027
85	21.25	0.30	0.058	(0.033)		0.017	0.040
86	21.50	0.20	0.038	(0.033)		0.012	0.027
87	21.75	0.30	0.058	(0.033)		0.017	0.040
88	22.00	0.20	0.038	(0.032)		0.012	0.027
89	22.25	0.30	0.058	(0.032)		0.017	0.040
90	22.50	0.20	0.038	(0.032)		0.012	0.027
91	22.75	0.20	0.038	(0.031)		0.012	0.027
92	23.00	0.20	0.038	(0.031)		0.012	0.027
93	23.25	0.20	0.038	(0.031)		0.012	0.027
94	23.50	0.20	0.038	(0.031)		0.012	0.027
95	23.75	0.20	0.038	(0.031)		0.012	0.027
96	24.00	0.20	0.038	(0.030)		0.012	0.027

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.6

Flood volume = Effective rainfall 3.91(In)
times area 105.0(Ac.)/[(In)/(Ft.)] = 34.2(Ac.Ft)
Total soil loss = 0.89(In)
Total soil loss = 7.797(Ac.Ft)
Total rainfall = 4.80(In)
Flood volume = 1489521.1 Cubic Feet
Total soil loss = 339623.7 Cubic Feet

Peak flow rate of this hydrograph = 63.005(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 17.5 35.0 52.5 70.0
0+15	0.0348	1.68	Q | | | |
0+30	0.1079	3.54	V Q | | | |
0+45	0.1946	4.20	V Q | | | |
1+ 0	0.3002	5.11	V Q | | | |
1+15	0.3989	4.78	V Q | | | |
1+30	0.4886	4.34	V Q | | | |
1+45	0.5767	4.27	V Q | | | |
2+ 0	0.6823	5.11	V Q | | | |
2+15	0.7984	5.62	V Q | | | |
2+30	0.9160	5.69	V Q | | | |
2+45	1.0509	6.53	|V Q | | | |
3+ 0	1.1964	7.04	|V Q | | | |
3+15	1.3433	7.11	|V Q | | | |
3+30	1.4903	7.11	|V Q | | | |
3+45	1.6373	7.11	|V Q | | | |
4+ 0	1.8016	7.95	| V Q | | | |
4+15	1.9765	8.46	| V Q | | | |
4+30	2.1702	9.38	| V Q | | | |
4+45	2.3745	9.89	| V Q | | | |
5+ 0	2.5976	10.80	| V Q | | | |
5+15	2.7965	9.63	| V Q | | | |
5+30	2.9933	9.52	| V Q | | | |
5+45	3.2149	10.73	| V Q | | | |
6+ 0	3.4486	11.31	| V Q | | | |
6+15	3.7011	12.22	| V Q | | | |
6+30	3.9642	12.73	| V Q | | | |
6+45	4.2461	13.65	| V Q | | | |
7+ 0	4.5385	14.15	| V Q | | | |
7+15	4.8325	14.23	| V Q | | | |
7+30	5.1438	15.07	| V Q | | | |
7+45	5.4830	16.42	| V Q| | | |
8+ 0	5.8550	18.00	| V Q | | |
8+15	6.2920	21.15	| V | Q | | |
8+30	6.7628	22.79	| V | Q | | |
8+45	7.2650	24.30	| V | Q | | |
9+ 0	7.8092	26.34	| V| Q | | |
9+15	8.4222	29.67	| V| Q | | |
9+30	9.0945	32.54	| V Q | | |
9+45	9.8129	34.77	| V Q| | |
10+ 0	10.5754	36.90	| V |Q | |
10+15	11.1833	29.42	| V Q | | |
10+30	11.6902	24.53	| VQ | | |
10+45	12.3083	29.91	| V Q | | |
11+ 0	13.0034	33.65	| V Q| | |
11+15	13.6865	33.06	| V Q | | |
11+30	14.3564	32.42	| V Q | | |
11+45	14.9764	30.01	| Q | | |
12+ 0	15.5932	29.85	| QV | | |
12+15	16.3963	38.87	| V| Q | |
12+30	17.3335	45.36	| V Q | |
12+45	18.3521	49.30	| V Q | |
13+ 0	19.4296	52.15	| V Q| |
13+15	20.6523	59.18	| V | Q |
13+30	21.9541	63.00	| V | Q |
13+45	22.9952	50.39	| V Q | |
14+ 0	23.8727	42.47	| Q V | |
14+15	24.8277	46.22	| Q V| |
14+30	25.8197	48.01	| Q V |
14+45	26.8069	47.78	| Q V |
15+ 0	27.7687	46.55	| Q | V |
15+15	28.6923	44.70	| Q | V |
15+30	29.5755	42.75	| Q | V |
15+45	30.3438	37.18	| |Q | V |
16+ 0	31.0513	34.25	| | Q| | V |

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   16+15      31.4068     17.20  |         Q|         |         |     V   |
   16+30      31.5540      7.12  |    Q     |         |         |     V   |
   16+45      31.6542      4.85  | Q        |         |         |      V  |
   17+ 0      31.7439      4.34  | Q        |         |         |      V  |
   17+15      31.8668      5.95  |  Q       |         |         |      V  |
   17+30      32.0108      6.97  |  Q       |         |         |      V  |
   17+45      32.1577      7.11  |   Q      |         |         |      V  |
   18+ 0      32.2873      6.27  |  Q       |         |         |      V  |
   18+15      32.4064      5.76  |  Q       |         |         |      V  |
   18+30      32.5240      5.69  |  Q       |         |         |       V |
   18+45      32.6242      4.85  | Q        |         |         |       V |
   19+ 0      32.6965      3.50  |Q         |         |         |       V |
   19+15      32.7741      3.76  | Q        |         |         |       V |
   19+30      32.8782      5.04  | Q        |         |         |       V |
   19+45      32.9769      4.78  | Q        |         |         |       V |
   20+ 0      33.0492      3.50  |Q         |         |         |       V |
   20+15      33.1269      3.76  | Q        |         |         |       V |
   20+30      33.2136      4.20  | Q        |         |         |       V |
   20+45      33.3017      4.27  | Q        |         |         |       V |
   21+ 0      33.3725      3.43  |Q         |         |         |        V|
   21+15      33.4502      3.76  | Q        |         |         |        V|
   21+30      33.5195      3.35  |Q         |         |         |        V|
   21+45      33.5972      3.76  | Q        |         |         |        V|
   22+ 0      33.6665      3.35  |Q         |         |         |        V|
   22+15      33.7441      3.76  | Q        |         |         |        V|
   22+30      33.8135      3.35  |Q         |         |         |        V|
   22+45      33.8737      2.92  |Q         |         |         |        V|
   23+ 0      33.9325      2.85  |Q         |         |         |        V|
   23+15      33.9913      2.85  |Q         |         |         |        V|
   23+30      34.0501      2.85  |Q         |         |         |        V|
   23+45      34.1089      2.85  |Q         |         |         |        V|
   24+ 0      34.1677      2.85  |Q         |         |         |        V|
   24+15      34.1917      1.16  Q          |         |         |        V|
   24+30      34.1947      0.14  Q          |         |         |        V|
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       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  05/02/12 File: SUBC224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Subdrain Area C2
Proposed Conditions
100 Yr, 24 Hr.

-------------------------------------------------------------------
Drainage Area =     303.00(Ac.)  =      0.473 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     303.00(Ac.)  =      0.473 Sq. Mi.
Length along longest watercourse =    4000.00(Ft.)
Length along longest watercourse measured to centroid =    2000.00(Ft.)
Length along longest watercourse =      0.758 Mi.
Length along longest watercourse measured to centroid =      0.379 Mi.
Difference in elevation =      80.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.092 Hr.
Lag time =     5.55 Min.
25% of lag time =     1.39 Min.
40% of lag time =     2.22 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      303.00           1.80                545.40

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      303.00           4.80               1454.40

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.800(In)

Point rain (area averaged) =    4.800(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    4.797(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   303.000           85.00         0.750
 Total Area Entered =    303.00(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	270.496	53.435	163.172
2	0.500	540.992	38.815	118.527
3	0.750	811.489	7.750	23.667
			Sum = 100.000	Sum= 305.367

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.038	(0.107)	0.012	0.027
2	0.50	0.30	0.058	(0.106)	0.017	0.040
3	0.75	0.30	0.058	(0.105)	0.017	0.040
4	1.00	0.40	0.077	(0.104)	0.023	0.054
5	1.25	0.30	0.058	(0.102)	0.017	0.040
6	1.50	0.30	0.058	(0.101)	0.017	0.040
7	1.75	0.30	0.058	(0.100)	0.017	0.040
8	2.00	0.40	0.077	(0.099)	0.023	0.054
9	2.25	0.40	0.077	(0.098)	0.023	0.054
10	2.50	0.40	0.077	(0.096)	0.023	0.054
11	2.75	0.50	0.096	(0.095)	0.029	0.067
12	3.00	0.50	0.096	(0.094)	0.029	0.067
13	3.25	0.50	0.096	(0.093)	0.029	0.067
14	3.50	0.50	0.096	(0.092)	0.029	0.067
15	3.75	0.50	0.096	(0.091)	0.029	0.067
16	4.00	0.60	0.115	(0.089)	0.035	0.081
17	4.25	0.60	0.115	(0.088)	0.035	0.081
18	4.50	0.70	0.134	(0.087)	0.040	0.094
19	4.75	0.70	0.134	(0.086)	0.040	0.094
20	5.00	0.80	0.154	(0.085)	0.046	0.107
21	5.25	0.60	0.115	(0.084)	0.035	0.081
22	5.50	0.70	0.134	(0.083)	0.040	0.094
23	5.75	0.80	0.154	(0.082)	0.046	0.107
24	6.00	0.80	0.154	(0.081)	0.046	0.107
25	6.25	0.90	0.173	(0.080)	0.052	0.121
26	6.50	0.90	0.173	(0.078)	0.052	0.121
27	6.75	1.00	0.192	(0.077)	0.058	0.134
28	7.00	1.00	0.192	(0.076)	0.058	0.134
29	7.25	1.00	0.192	(0.075)	0.058	0.134
30	7.50	1.10	0.211	(0.074)	0.063	0.148
31	7.75	1.20	0.230	(0.073)	0.069	0.161
32	8.00	1.30	0.249	0.072	(0.075)	0.177
33	8.25	1.50	0.288	0.071	(0.086)	0.217
34	8.50	1.50	0.288	0.070	(0.086)	0.218
35	8.75	1.60	0.307	0.069	(0.092)	0.238
36	9.00	1.70	0.326	0.068	(0.098)	0.258
37	9.25	1.90	0.365	0.067	(0.109)	0.297
38	9.50	2.00	0.384	0.066	(0.115)	0.317
39	9.75	2.10	0.403	0.065	(0.121)	0.338

40	10.00	2.20	0.422	0.064	(	0.127)	0.358
41	10.25	1.50	0.288	0.064	(	0.086)	0.224
42	10.50	1.50	0.288	0.063	(	0.086)	0.225
43	10.75	2.00	0.384	0.062	(	0.115)	0.322
44	11.00	2.00	0.384	0.061	(	0.115)	0.323
45	11.25	1.90	0.365	0.060	(	0.109)	0.305
46	11.50	1.90	0.365	0.059	(	0.109)	0.306
47	11.75	1.70	0.326	0.058	(	0.098)	0.268
48	12.00	1.80	0.345	0.057	(	0.104)	0.288
49	12.25	2.50	0.480	0.056	(	0.144)	0.423
50	12.50	2.60	0.499	0.056	(	0.150)	0.443
51	12.75	2.80	0.537	0.055	(	0.161)	0.483
52	13.00	2.90	0.556	0.054	(	0.167)	0.503
53	13.25	3.40	0.652	0.053	(	0.196)	0.599
54	13.50	3.40	0.652	0.052	(	0.196)	0.600
55	13.75	2.30	0.441	0.052	(	0.132)	0.390
56	14.00	2.30	0.441	0.051	(	0.132)	0.391
57	14.25	2.70	0.518	0.050	(	0.155)	0.468
58	14.50	2.60	0.499	0.049	(	0.150)	0.450
59	14.75	2.60	0.499	0.048	(	0.150)	0.450
60	15.00	2.50	0.480	0.048	(	0.144)	0.432
61	15.25	2.40	0.461	0.047	(	0.138)	0.414
62	15.50	2.30	0.441	0.046	(	0.132)	0.395
63	15.75	1.90	0.365	0.046	(	0.109)	0.319
64	16.00	1.90	0.365	0.045	(	0.109)	0.320
65	16.25	0.40	0.077	(0.044)		0.023	0.054
66	16.50	0.40	0.077	(0.044)		0.023	0.054
67	16.75	0.30	0.058	(0.043)		0.017	0.040
68	17.00	0.30	0.058	(0.042)		0.017	0.040
69	17.25	0.50	0.096	(0.042)		0.029	0.067
70	17.50	0.50	0.096	(0.041)		0.029	0.067
71	17.75	0.50	0.096	(0.040)		0.029	0.067
72	18.00	0.40	0.077	(0.040)		0.023	0.054
73	18.25	0.40	0.077	(0.039)		0.023	0.054
74	18.50	0.40	0.077	(0.039)		0.023	0.054
75	18.75	0.30	0.058	(0.038)		0.017	0.040
76	19.00	0.20	0.038	(0.037)		0.012	0.027
77	19.25	0.30	0.058	(0.037)		0.017	0.040
78	19.50	0.40	0.077	(0.036)		0.023	0.054
79	19.75	0.30	0.058	(0.036)		0.017	0.040
80	20.00	0.20	0.038	(0.035)		0.012	0.027
81	20.25	0.30	0.058	(0.035)		0.017	0.040
82	20.50	0.30	0.058	(0.035)		0.017	0.040
83	20.75	0.30	0.058	(0.034)		0.017	0.040
84	21.00	0.20	0.038	(0.034)		0.012	0.027
85	21.25	0.30	0.058	(0.033)		0.017	0.040
86	21.50	0.20	0.038	(0.033)		0.012	0.027
87	21.75	0.30	0.058	(0.033)		0.017	0.040
88	22.00	0.20	0.038	(0.032)		0.012	0.027
89	22.25	0.30	0.058	(0.032)		0.017	0.040
90	22.50	0.20	0.038	(0.032)		0.012	0.027
91	22.75	0.20	0.038	(0.031)		0.012	0.027
92	23.00	0.20	0.038	(0.031)		0.012	0.027
93	23.25	0.20	0.038	(0.031)		0.012	0.027
94	23.50	0.20	0.038	(0.031)		0.012	0.027
95	23.75	0.20	0.038	(0.031)		0.012	0.027
96	24.00	0.20	0.038	(0.030)		0.012	0.027

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.6

Flood volume = Effective rainfall 3.91(In)
times area 303.0(Ac.)/[(In)/(Ft.)] = 98.6(Ac.Ft)
Total soil loss = 0.89(In)
Total soil loss = 22.495(Ac.Ft)
Total rainfall = 4.80(In)
Flood volume = 4296467.2 Cubic Feet
Total soil loss = 979880.4 Cubic Feet

Peak flow rate of this hydrograph = 180.938(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+15	0.0906	4.39	Q	|	|	|	|
0+30	0.2924	9.76	VQ	|	|	|	|
0+45	0.5402	11.99	V Q	|	|	|	|
1+ 0	0.8398	14.50	V Q	|	|	|	|
1+15	1.1271	13.90	V Q	|	|	|	|
1+30	1.3881	12.63	V Q	|	|	|	|
1+45	1.6424	12.31	V Q	|	|	|	|
2+ 0	1.9421	14.50	V Q	|	|	|	|
2+15	2.2747	16.10	V Q	|	|	|	|
2+30	2.6138	16.42	V Q	|	|	|	|
2+45	2.9983	18.61	|V Q	|	|	|	|
3+ 0	3.4157	20.20	|V Q	|	|	|	|
3+15	3.8396	20.52	|V Q	|	|	|	|
3+30	4.2636	20.52	|V Q	|	|	|	|
3+45	4.6875	20.52	|V Q	|	|	|	|
4+ 0	5.1568	22.71	| V Q	|	|	|	|
4+15	5.6590	24.30	| V Q	|	|	|	|
4+30	6.2130	26.82	| V Q	|	|	|	|
4+45	6.8000	28.41	| V Q	|	|	|	|
5+ 0	7.4388	30.92	| V Q	|	|	|	|
5+15	8.0199	28.13	| V Q	|	|	|	|
5+30	8.5871	27.45	| V Q	|	|	|	|
5+45	9.2194	30.60	| V Q	|	|	|	|
6+ 0	9.8911	32.51	| V Q	|	|	|	|
6+15	10.6148	35.02	| V Q	|	|	|	|
6+30	11.3713	36.62	| V Q	|	|	|	|
6+45	12.1797	39.13	| V Q	|	|	|	|
7+ 0	13.0210	40.72	| V Q |	|	|	|	|
7+15	13.8689	41.04	| V Q |	|	|	|	|
7+30	14.7621	43.23	| V Q |	|	|	|	|
7+45	15.7336	47.02	| V Q|	|	|	|	|
8+ 0	16.7985	51.54	| V Q	|	|	|	|
8+15	18.0420	60.19	| V | Q	|	|	|	|
8+30	19.3932	65.40	| V | Q	|	|	|	|
8+45	20.8341	69.74	| V | Q	|	|	|	|
9+ 0	22.3930	75.45	| V| Q	|	|	|	|
9+15	24.1438	84.74	| V| Q	|	|	|	|
9+30	26.0689	93.17	| V Q |	|	|	|	|
9+45	28.1305	99.78	| V Q|	|	|	|	|
10+ 0	30.3193	105.93	| V |Q	|	|	|	|
10+15	32.1172	87.02	| V Q |	|	|	|	|
10+30	33.6013	71.83	| VQ	|	|	|	|
10+45	35.3491	84.59	| V Q |	|	|	|	|
11+ 0	37.3377	96.25	| V Q|	|	|	|	|
11+15	39.3141	95.66	| V Q|	|	|	|	|
11+30	41.2492	93.66	| V Q |	|	|	|	|
11+45	43.0510	87.21	| Q |	|	|	|	|
12+ 0	44.8290	86.05	| QV |	|	|	|	|
12+15	47.0937	109.61	| V|Q	|	|	|	|
12+30	49.7670	129.39	| V Q	|	|	|	|
12+45	52.6879	141.37	| V Q |	|	|	|	|
13+ 0	55.7820	149.76	| V Q|	|	|	|	|
13+15	59.2708	168.86	| V | Q	|	|	|	|
13+30	63.0092	180.94	| V | Q	|	|	|	|
13+45	66.0876	148.99	| V Q|	|	|	|	|
14+ 0	68.6538	124.20	| Q V |	|	|	|	|
14+15	71.3806	131.98	| Q V |	|	|	|	|
14+30	74.2356	138.18	| Q V	|	|	|	|
14+45	77.0858	137.95	| Q V	|	|	|	|
15+ 0	79.8667	134.59	| Q | V	|	|	|	|
15+15	82.5405	129.41	| Q | V	|	|	|	|
15+30	85.0977	123.77	| Q | V	|	|	|	|
15+45	87.3442	108.73	| |Q | V	|	|	|	|
16+ 0	89.3976	99.39	| | Q| | V	|	|	|	|

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   16+15      90.5183     54.24  |         Q         |         |     V   |
   16+30      90.9876     22.71  |    Q      |         |         |     V   |
   16+45      91.2814     14.22  | Q         |         |         |      V  |
   17+ 0      91.5424     12.63  | Q         |         |         |      V  |
   17+15      91.8874     16.70  |  Q        |         |         |      V  |
   17+30      92.2982     19.88  |  Q        |         |         |      V  |
   17+45      92.7221     20.52  |   Q       |         |         |      V  |
   18+ 0      93.1008     18.33  |  Q        |         |         |      V  |
   18+15      93.4465     16.73  |  Q        |         |         |      V  |
   18+30      93.7857     16.42  |  Q        |         |         |       V |
   18+45      94.0795     14.22  | Q         |         |         |       V |
   19+ 0      94.2951     10.44  | Q         |         |         |       V |
   19+15      94.5166     10.72  | Q         |         |         |       V |
   19+30      94.8097     14.19  | Q         |         |         |       V |
   19+45      95.0970     13.90  | Q         |         |         |       V |
   20+ 0      95.3126     10.44  | Q         |         |         |       V |
   20+15      95.5341     10.72  | Q         |         |         |       V |
   20+30      95.7819     11.99  | Q         |         |         |       V |
   20+45      96.0362     12.31  | Q         |         |         |       V |
   21+ 0      96.2453     10.12  | Q         |         |         |        V|
   21+15      96.4668     10.72  | Q         |         |         |        V|
   21+30      96.6693      9.80  |Q          |         |         |        V|
   21+45      96.8907     10.72  | Q         |         |         |        V|
   22+ 0      97.0932      9.80  |Q          |         |         |        V|
   22+15      97.3147     10.72  | Q         |         |         |        V|
   22+30      97.5172      9.80  |Q          |         |         |        V|
   22+45      97.6933      8.53  |Q          |         |         |        V|
   23+ 0      97.8629      8.21  |Q          |         |         |        V|
   23+15      98.0325      8.21  |Q          |         |         |        V|
   23+30      98.2020      8.21  |Q          |         |         |        V|
   23+45      98.3716      8.21  |Q          |         |         |        V|
   24+ 0      98.5412      8.21  |Q          |         |         |        V|
   24+15      98.6202      3.82  Q           |         |         |        V|
   24+30      98.6333      0.64  Q           |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/02/12 File: SUBC324100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed C, Subdrain Area C3
Proposed Conditions
100 Yr, 24 Hr.

-------------------------------------------------------------------
Drainage Area =      83.70(Ac.)  =      0.131 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      83.70(Ac.)  =      0.131 Sq. Mi.
Length along longest watercourse =    3000.00(Ft.)
Length along longest watercourse measured to centroid =    1500.00(Ft.)
Length along longest watercourse =      0.568 Mi.
Length along longest watercourse measured to centroid =      0.284 Mi.
Difference in elevation =      50.00(Ft.)
Slope along watercourse =     88.0000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.077 Hr.
Lag time =     4.61 Min.
25% of lag time =     1.15 Min.
40% of lag time =     1.85 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       83.70           1.80                150.66

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       83.70           4.50                376.65

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    83.700           85.00         0.750
 Total Area Entered =     83.70(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	325.140	59.121	49.871
2	0.500	650.280	35.788	30.189
3	0.750	975.420	5.091	4.294
		Sum =	100.000	Sum= 84.354

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.313

40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 83.7(Ac.)/[(In)/(Ft.)] = 25.4(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 6.031(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1104313.5 Cubic Feet
Total soil loss = 262702.5 Cubic Feet

Peak flow rate of this hydrograph = 46.809(CFS)

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24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 12.5 25.0 37.5 50.0
0+15	0.0260	1.26	VQ | | | |
0+30	0.0807	2.65	V Q | | | |
0+45	0.1454	3.14	V Q | | | |
1+ 0	0.2243	3.82	V Q | | | |
1+15	0.2981	3.57	V Q | | | |
1+30	0.3651	3.24	V Q | | | |
1+45	0.4310	3.19	V Q | | | |
2+ 0	0.5099	3.82	V Q | | | |
2+15	0.5967	4.20	V Q | | | |
2+30	0.6845	4.25	V Q | | | |
2+45	0.7854	4.88	|V Q | | | |
3+ 0	0.8941	5.26	|V Q | | | |
3+15	1.0040	5.32	|V Q | | | |
3+30	1.1138	5.32	|V Q | | | |
3+45	1.2236	5.32	|V Q | | | |
4+ 0	1.3465	5.94	| V Q | | | |
4+15	1.4771	6.33	| V Q | | | |
4+30	1.6219	7.01	| V Q | | | |
4+45	1.7746	7.39	| V Q | | | |
5+ 0	1.9414	8.07	| V Q | | | |
5+15	2.0900	7.19	| V Q | | | |
5+30	2.2370	7.12	| V Q | | | |
5+45	2.4027	8.02	| V Q | | | |
6+ 0	2.5773	8.45	| V Q | | | |
6+15	2.7660	9.13	| V Q | | | |
6+30	2.9626	9.51	| V Q | | | |
6+45	3.1733	10.20	| V Q | | | |
7+ 0	3.3919	10.58	| V Q | | | |
7+15	3.6116	10.63	| V Q | | | |
7+30	3.8442	11.26	| V Q| | | |
7+45	4.0977	12.27	| V Q| | | |
8+ 0	4.3732	13.33	| V Q | | |
8+15	4.6937	15.51	| V | Q | | |
8+30	5.0381	16.67	| V | Q | | |
8+45	5.4058	17.80	| V | Q | | |
9+ 0	5.8050	19.32	| V| Q | | |
9+15	6.2558	21.82	| V| Q | | |
9+30	6.7509	23.96	| V Q| | |
9+45	7.2806	25.64	| V Q | |
10+ 0	7.8434	27.24	| V |Q | |
10+15	8.2908	21.65	| V Q | | |
10+30	8.6627	18.00	| VQ | | |
10+45	9.1179	22.03	| V Q | | |
11+ 0	9.6307	24.82	| V Q| | |
11+15	10.1346	24.39	| V Q| | |
11+30	10.6288	23.92	| V Q| | |
11+45	11.0858	22.12	| Q | | |
12+ 0	11.5405	22.00	| QV | | |
12+15	12.1345	28.75	| V| Q | |
12+30	12.8288	33.60	| V Q | |
12+45	13.5841	36.56	| V Q| |
13+ 0	14.3834	38.69	| | V Q |
13+15	15.2914	43.95	| | V | Q |
13+30	16.2585	46.81	| | V | Q |
13+45	17.0310	37.39	| | V Q| |
14+ 0	17.6812	31.47	| | Q V | |
14+15	18.3895	34.28	| | Q V| |
14+30	19.1254	35.62	| | Q V |
14+45	19.8579	35.45	| | Q V |
15+ 0	20.5715	34.54	| | Q | V |
15+15	21.2566	33.16	| | Q | V |
15+30	21.9115	31.70	| | Q | V |
15+45	22.4807	27.55	| | | Q | V |
16+ 0	23.0046	25.36	| | Q | V |

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   16+15      23.2682     12.76  |         Q         |         |     V   |
   16+30      23.3780      5.31  |   Q     |         |         |     V   |
   16+45      23.4529      3.62  | Q       |         |         |      V  |
   17+ 0      23.5199      3.24  | Q       |         |         |      V  |
   17+15      23.6118      4.45  |  Q      |         |         |      V  |
   17+30      23.7194      5.21  |   Q     |         |         |      V  |
   17+45      23.8292      5.32  |   Q     |         |         |      V  |
   18+ 0      23.9261      4.69  |  Q      |         |         |      V  |
   18+15      24.0151      4.31  |  Q      |         |         |      V  |
   18+30      24.1029      4.25  |  Q      |         |         |       V |
   18+45      24.1778      3.62  | Q       |         |         |       V |
   19+ 0      24.2319      2.62  | Q       |         |         |       V |
   19+15      24.2899      2.81  | Q       |         |         |       V |
   19+30      24.3677      3.76  |  Q      |         |         |       V |
   19+45      24.4414      3.57  | Q       |         |         |       V |
   20+ 0      24.4955      2.62  | Q       |         |         |       V |
   20+15      24.5535      2.81  | Q       |         |         |       V |
   20+30      24.6183      3.14  | Q       |         |         |       V |
   20+45      24.6842      3.19  | Q       |         |         |       V |
   21+ 0      24.7371      2.56  | Q       |         |         |        V|
   21+15      24.7951      2.81  | Q       |         |         |        V|
   21+30      24.8469      2.51  | Q       |         |         |        V|
   21+45      24.9050      2.81  | Q       |         |         |        V|
   22+ 0      24.9568      2.51  | Q       |         |         |        V|
   22+15      25.0148      2.81  | Q       |         |         |        V|
   22+30      25.0666      2.51  | Q       |         |         |        V|
   22+45      25.1117      2.18  |Q        |         |         |        V|
   23+ 0      25.1556      2.13  |Q        |         |         |        V|
   23+15      25.1995      2.13  |Q        |         |         |        V|
   23+30      25.2435      2.13  |Q        |         |         |        V|
   23+45      25.2874      2.13  |Q        |         |         |        V|
   24+ 0      25.3314      2.13  |Q        |         |         |        V|
   24+15      25.3493      0.87  Q         |         |         |        V|
   24+30      25.3515      0.11  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                          Study date: 05/07/12

     ---------------------------------------------------------------------


     Watershed D, Line D
     Proposed Condition
     100 Yr. 24 Hr.

     ---------------------------------------------------------------------


     Program License Serial Number 6097

     ---------------------------------------------------------------------
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: OffsiteD124100.rte
     ****************************HYDROGRAPH DATA***************************
                   Number of intervals =   106
                   Time interval =   15.0 (Min.)
                   Maximum/Peak flow rate =      156.763 (CFS)
                   Total volume =      53.095 (Ac.Ft)
            Status of hydrographs being held in storage
                       Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
     **********************************************************************



     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
     Process from Point/Station        0.000 to Point/Station        1.000
     **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
     ______________________________________________________________________
     ******************** HYDROGRAPH INFORMATION **********************

                   From study/file name: OffsiteD224100.rte
     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      P R I N T  O F  S T O R M
                   R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals (CFS)

     ---------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       52.3     104.7     157.0     209.4
-----------------------------------------------------------------------
  0+15       0.2272      0.33  Q         |         |         |         |
  0+30       0.6962      1.46  Q         |         |         |         |
  0+45       0.9425      2.51  Q         |         |         |         |
  1+ 0       1.1026      3.15  Q         |         |         |         |
  1+15       1.1763      3.68  Q         |         |         |         |
  1+30       1.0347      3.59  Q         |         |         |         |
  1+45       1.0065      3.46  Q         |         |         |         |
  2+ 0       1.1158      3.60  Q         |         |         |         |
  2+15       1.2917      4.07  Q         |         |         |         |
  2+30       1.3260      4.35  Q         |         |         |         |
  2+45       1.4457      4.61  Q         |         |         |         |
  3+ 0       1.6252      5.15  Q         |         |         |         |
  3+15       1.6595      5.46  qQ        |         |         |         |
  3+30       1.6656      5.57  qQ        |         |         |         |
  3+45       1.6674      5.62  qQ        |         |         |         |
  4+ 0       1.7810      5.82  qQ        |         |         |         |
  4+15       1.9587      6.32  qQ        |         |         |         |
  4+30       2.1066      6.78  qQ        |         |         |         |
  4+45       2.2904      7.36  qQ        |         |         |         |
  5+ 0       2.4401      7.87  qQ        |         |         |         |
```

```
 5+15       2.3966      8.14  qQ        |         |         |         |
 5+30       2.1910      7.70  qQ        |         |         |         |
 5+45       2.4198      7.91  qQ        |         |         |         |
 6+ 0       2.6213      8.55  qQ        |         |         |         |
 6+15       2.7717      9.03  qQ        |         |         |         |
 6+30       2.9573      9.62  qQ        |         |         |         |
 6+45       3.1070     10.14  qQ        |         |         |         |
 7+ 0       3.2908     10.75  q Q       |         |         |         |
 7+15       3.3269     11.10  q Q       |         |         |         |
 7+30       3.4466     11.40  q Q       |         |         |         |
 7+45       3.7397     12.12  q Q       |         |         |         |
 8+ 0       4.0653     13.09  q Q       |         |         |         |
 8+15       4.5106     14.30  q Q       |         |         |         |
 8+30       4.9081     15.71  q  Q      |         |         |         |
 8+45       5.0982     16.62  q  Q      |         |         |         |
 9+ 0       5.4035     17.57  |q Q      |         |         |         |
 9+15       5.8463     19.73  |q Q      |         |         |         |
 9+30       6.3556     27.19  |q   Q    |         |         |         |
 9+45       7.7419     37.90  |q     Q  |         |         |         |
10+ 0      10.9906     50.40  | q      Q|         |         |         |
10+15      10.4481     55.71  |q        Q         |         |         |
10+30       6.0471     39.06  |q     Q  |         |         |         |
10+45       6.9195     30.25  |q   Q    |         |         |         |
11+ 0       9.7500     42.54  |q      Q |         |         |         |
11+15       9.8051     51.41  |q       Q|         |         |         |
11+30       8.9195     51.44  |q       Q|         |         |         |
11+45       7.9384     50.09  |q       Q|         |         |         |
12+ 0       6.7130     44.96  |q      Q |         |         |         |
12+15      15.5197     56.95  | q       Q         |         |         |
12+30      29.8982     95.13  |    q    |       Q |         |         |
12+45      37.1163    125.21  |      q  |         |  Q      |         |
13+ 0      43.3460    148.54  |       q |         |       Q |         |
13+15      52.4319    174.42  |         q         |         |  Q      |
13+30      62.5449    208.10  |         |q        |         |       Q|
13+45      52.5954    209.36  |         q         |         |        Q
14+ 0      34.1015    165.05  |     q   |         |         |Q        |
14+15      35.6822    146.34  |     q   |         |      Q  |         |
14+30      41.6902    157.27  |      q  |         |         Q         |
14+45      41.7855    160.85  |      q  |         |         Q         |
15+ 0      41.2387    159.59  |      q  |         |         Q         |
15+15      39.0149    155.21  |      q  |         |        Q|         |
15+30      36.4092    148.13  |     q   |         |       Q |         |
15+45      30.3416    134.72  |    q    |         |    Q    |         |
16+ 0      23.4600    112.81  |   q     |        |Q        |         |
16+15      15.3237     89.76  | q       |      Q  |         |         |
16+30       4.0265     49.22  q        Q|         |         |         |
16+45       1.7109     23.89  q   Q     |         |         |         |
17+ 0       1.1551     14.13  q Q       |         |         |         |
17+15       1.2356      9.19  qQ        |         |         |         |
17+30       1.5848      7.38  qQ        |         |         |         |
17+45       1.6516      6.68  qQ        |         |         |         |
18+ 0       1.5502      6.09  qQ        |         |         |         |
18+15       1.3761      5.34  qQ        |         |         |         |
18+30       1.3418      4.84  Q         |         |         |         |
18+45       1.2221      4.47  Q         |         |         |         |
19+ 0       0.9290      3.78  Q         |         |         |         |
19+15       0.8307      3.16  Q         |         |         |         |
19+30       1.0816      3.42  Q         |         |         |         |
19+45       1.1720      3.86  Q         |         |         |         |
20+ 0       0.9193      3.51  Q         |         |         |         |
20+15       0.8289      3.02  Q         |         |         |         |
20+30       0.9679      3.18  Q         |         |         |         |
20+45       0.9943      3.34  Q         |         |         |         |
21+ 0       0.8850      3.20  Q         |         |         |         |
21+15       0.8228      2.90  Q         |         |         |         |
21+30       0.8525      2.95  Q         |         |         |         |
21+45       0.8167      2.83  Q         |         |         |         |
22+ 0       0.8507      2.91  Q         |         |         |         |
22+15       0.8167      2.80  Q         |         |         |         |
22+30       0.8507      2.90  Q         |         |         |         |
22+45       0.7030      2.63  Q         |         |         |         |
```

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   23+ 0       0.6731      2.41  Q         |         |         |         |
   23+15       0.6688      2.35  Q         |         |         |         |
   23+30       0.6670      2.31  Q         |         |         |         |
   23+45       0.6670      2.29  Q         |         |         |         |
   24+ 0       0.6670      2.28  Q         |         |         |         |
   24+15       0.4397      1.95  Q         |         |         |         |
   24+30       0.0844      0.98  Q         |         |         |         |
   24+45       0.0158      0.42  Q         |         |         |         |
   25+ 0       0.0036      0.22  Q         |         |         |         |
   25+15       0.0000      0.11  Q         |         |         |         |
   25+30       0.0000      0.05  Q         |         |         |         |
   25+45       0.0000      0.03  Q         |         |         |         |
   26+ 0       0.0000      0.02  Q         |         |         |         |
   26+15       0.0000      0.01  Q         |         |         |         |
   26+30       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   106
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      209.358 (CFS)
                      Total volume =      70.654 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        1.000 to Point/Station        2.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       ______________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   1500.00 (Ft.)
       Elevation difference =   30.00 (Ft.)
       Slope of channel =  0.020000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  1500.00(Ft.)     Elevation difference =  30.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =    5.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =    5.000(Ft.)
       Flow(q) thru subarea =     48.951(CFS)
       Depth of flow =     0.807(Ft.)
       Average velocity =    10.444(Ft/s)
       Total flow rate =    48.951(CFS)
       Channel flow top width =    6.614(Ft.)
       Depth of flow in channel =   0.81(Ft.)
       Total number of channels (same dimensions) = 1
       Flow Velocity =   10.44(Ft/s)
       Travel time  =    0.00 min.
       Individual channel flow =   48.951(CFS)
       Total capacity of improved channels =     48.951(CFS)
       Critical Depth in Channel =    1.31(Ft.)


       Channel evaluation using maximum flow rate of hydrograph
       Covered channel
       Flow(q) thru subarea =    209.358(CFS)
       Depth of flow =     1.873(Ft.)
       Average velocity =    16.260(Ft/s)
       Total flow rate =   209.358(CFS)
       Channel flow top width =    8.747(Ft.)
       Depth of flow in channel =   1.87(Ft.)
```

```
Total number of channels (same dimensions) = 1
Flow Velocity =   16.26(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  209.358(CFS)
Total capacity of improved channels =    209.358(CFS)
Critical Depth in Channel =    3.06(Ft.)


********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.9053   Travel time =   1.54 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   7.5172
       dt(routing time-step) =   1.39 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       52.3     104.7     157.0     209.4
----------------------------------------------------------------------
  0+15       0.3016      0.33  O         |         |         |         |
  0+30       1.3576      1.46  O         |         |         |         |
  0+45       2.4123      2.51  O         |         |         |         |
  1+ 0       3.0946      3.15  O         |         |         |         |
  1+15       3.6272      3.68  O         |         |         |         |
  1+30       3.5958      3.59  O         |         |         |         |
  1+45       3.4691      3.46  O         |         |         |         |
  2+ 0       3.5887      3.60  O         |         |         |         |
  2+15       4.0286      4.07  O         |         |         |         |
  2+30       4.3230      4.35  O         |         |         |         |
  2+45       4.5877      4.61  O         |         |         |         |
  3+ 0       5.0979      5.15  O         |         |         |         |
  3+15       5.4296      5.46  |O        |         |         |         |
  3+30       5.5571      5.57  |O        |         |         |         |
  3+45       5.6195      5.62  |O        |         |         |         |
  4+ 0       5.8053      5.82  |O        |         |         |         |
  4+15       6.2752      6.32  |O        |         |         |         |
  4+30       6.7348      6.78  |O        |         |         |         |
  4+45       7.3067      7.36  |O        |         |         |         |
  5+ 0       7.8196      7.87  |O        |         |         |         |
  5+15       8.1186      8.14  |O        |         |         |         |
  5+30       7.7372      7.70  |O        |         |         |         |
  5+45       7.8910      7.91  |O        |         |         |         |
  6+ 0       8.4900      8.55  |O        |         |         |         |
  6+15       8.9820      9.03  |O        |         |         |         |
  6+30       9.5648      9.62  |O        |         |         |         |
  6+45      10.0872     10.14  |O        |         |         |         |
  7+ 0      10.6935     10.75  | O       |         |         |         |
  7+15      11.0681     11.10  | O       |         |         |         |
  7+30      11.3703     11.40  | O       |         |         |         |
  7+45      12.0496     12.12  | O       |         |         |         |
  8+ 0      12.9960     13.09  | O       |         |         |         |
  8+15      14.1862     14.30  | O       |         |         |         |
  8+30      15.5750     15.71  | OI      |         |         |         |
  8+45      16.5377     16.62  |  O      |         |         |         |
  9+ 0      17.4778     17.57  |  O      |         |         |         |
  9+15      19.5296     19.73  |  O      |         |         |         |
  9+30      26.4943     27.19  |    O    |         |         |         |
  9+45      36.9097     37.90  |      O  |         |         |         |
 10+ 0      49.2388     50.40  |        O|         |         |         |
 10+15      55.2133     55.71  |         O         |         |         |
 10+30      40.6038     39.06  |      O  |         |         |         |
```

```
  10+45      31.0646     30.25  |    O    |         |         |         |
  11+ 0      41.4023     42.54  |      OI |         |         |         |
  11+15      50.5906     51.41  |        O|         |         |         |
  11+30      51.4412     51.44  |        O|         |         |         |
  11+45      50.2179     50.09  |        O|         |         |         |
  12+ 0      45.4347     44.96  |       O |         |         |         |
  12+15      55.8327     56.95  |         O         |         |         |
  12+30      91.5855     95.13  |         |      OI |         |         |
  12+45     122.4196    125.21  |         |         |  O      |         |
  13+ 0     146.3792    148.54  |         |         |      OI |         |
  13+15     172.0171    174.42  |         |         |         | OI      |
  13+30     204.9759    208.10  |         |         |         |        O|
  13+45     209.2417    209.36  |         |         |         |        OI
  14+ 0     169.1635    165.05  |         |         |         |IO       |
  14+15     148.0757    146.34  |         |         |      IO |         |
  14+30     156.2532    157.27  |         |         |        OI         |
  14+45     160.5202    160.85  |         |         |         O         |
  15+ 0     159.7086    159.59  |         |         |         O         |
  15+15     155.6205    155.21  |         |         |        O|         |
  15+30     148.7881    148.13  |         |         |       O |         |
  15+45     135.9669    134.72  |         |         |    O    |         |
  16+ 0     114.8407    112.81  |         |         |O        |         |
  16+15      91.9001     89.76  |         |      O  |         |         |
  16+30      52.9846     49.22  |         IO        |         |         |
  16+45      26.2446     23.89  |   IO    |         |         |         |
  17+ 0      15.0347     14.13  | O       |         |         |         |
  17+15       9.6494      9.19  |O        |         |         |         |
  17+30       7.5511      7.38  |O        |         |         |         |
  17+45       6.7413      6.68  |O        |         |         |         |
  18+ 0       6.1449      6.09  |O        |         |         |         |
  18+15       5.4062      5.34  |O        |         |         |         |
  18+30       4.8836      4.84  O         |         |         |         |
  18+45       4.5045      4.47  O         |         |         |         |
  19+ 0       3.8408      3.78  O         |         |         |         |
  19+15       3.2130      3.16  O         |         |         |         |
  19+30       3.3925      3.42  O         |         |         |         |
  19+45       3.8196      3.86  O         |         |         |         |
  20+ 0       3.5398      3.51  O         |         |         |         |
  20+15       3.0615      3.02  O         |         |         |         |
  20+30       3.1651      3.18  O         |         |         |         |
  20+45       3.3281      3.34  O         |         |         |         |
  21+ 0       3.2164      3.20  O         |         |         |         |
  21+15       2.9324      2.90  O         |         |         |         |
  21+30       2.9496      2.95  O         |         |         |         |
  21+45       2.8425      2.83  O         |         |         |         |
  22+ 0       2.9012      2.91  O         |         |         |         |
  22+15       2.8111      2.80  O         |         |         |         |
  22+30       2.8879      2.90  O         |         |         |         |
  22+45       2.6572      2.63  O         |         |         |         |
  23+ 0       2.4330      2.41  O         |         |         |         |
  23+15       2.3530      2.35  O         |         |         |         |
  23+30       2.3162      2.31  O         |         |         |         |
  23+45       2.2950      2.29  O         |         |         |         |
  24+ 0       2.2850      2.28  O         |         |         |         |
  24+15       1.9794      1.95  O         |         |         |         |
  24+30       1.0721      0.98  O         |         |         |         |
  24+45       0.4682      0.42  O         |         |         |         |
  25+ 0       0.2363      0.22  O         |         |         |         |
  25+15       0.1205      0.11  O         |         |         |         |
  25+30       0.0582      0.05  O         |         |         |         |
  25+45       0.0302      0.03  O         |         |         |         |
  26+ 0       0.0180      0.02  O         |         |         |         |
  26+15       0.0101      0.01  O         |         |         |         |
  26+30       0.0036      0.00  O         |         |         |         |
  26+45       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   107
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =      209.242 (CFS)
                     Total volume =      70.654 (Ac.Ft)
```

```
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
____________________________________________________________________
******************** HYDROGRAPH INFORMATION *********************

                From study/file name: SubD1Bsn.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       67.2     134.4     201.7     268.9
-------------------------------------------------------------------
  0+15       0.0678      0.37  Q         |         |         |         |
  0+30       0.2674      1.63  Q         |         |         |         |
  0+45       0.5306      2.94  Q         |         |         |         |
  1+ 0       0.8294      3.92  Q         |         |         |         |
  1+15       1.1266      4.75  Q         |         |         |         |
  1+30       1.3743      4.97  Q         |         |         |         |
  1+45       1.5978      5.07  Q         |         |         |         |
  2+ 0       1.8464      5.44  Q         |         |         |         |
  2+15       2.1313      6.16  Q         |         |         |         |
  2+30       2.4152      6.74  qQ        |         |         |         |
  2+45       2.7214      7.31  qQ        |         |         |         |
  3+ 0       3.0612      8.16  qQ        |         |         |         |
  3+15       3.3975      8.83  qQ        |         |         |         |
  3+30       3.7179      9.28  qQ        |         |         |         |
  3+45       4.0232      9.64  qQ        |         |         |         |
  4+ 0       4.3497     10.16  qQ        |         |         |         |
  4+15       4.7089     10.98  qQ        |         |         |         |
  4+30       5.0993     11.83  qQ        |         |         |         |
  4+45       5.5193     12.83  qQ        |         |         |         |
  5+ 0       5.9675     13.79  q Q       |         |         |         |
  5+15       6.3715     14.49  q Q       |         |         |         |
  5+30       6.7085     14.45  q Q       |         |         |         |
  5+45       7.0883     14.98  |qQ       |         |         |         |
  6+ 0       7.5107     16.00  |qQ       |         |         |         |
  6+15       7.9613     16.94  |qQ       |         |         |         |
  6+30       8.4387     18.00  |qQ       |         |         |         |
  6+45       8.9417     19.03  |qQ       |         |         |         |
  7+ 0       9.4690     20.16  |qQ       |         |         |         |
  7+15       9.9839     21.05  |q Q      |         |         |         |
  7+30      10.5102     21.88  |q Q      |         |         |         |
  7+45      11.0953     23.14  |q Q      |         |         |         |
  8+ 0      11.7490     24.74  |q Q      |         |         |         |
  8+15      12.5310     26.72  |q Q      |         |         |         |
  8+30      13.4245     29.00  |q  Q     |         |         |         |
  8+45      14.3679     30.91  | q Q     |         |         |         |
  9+ 0      15.3939     32.87  | q Q     |         |         |         |
  9+15      16.5670     36.10  | q  Q    |         |         |         |
  9+30      17.8982     44.39  | q   Q   |         |         |         |
  9+45      19.3290     56.24  | q     Q |         |         |         |
 10+ 0      20.8369     70.08  |  q      Q         |         |         |
 10+15      22.0116     77.22  |  q      |Q        |         |         |
 10+30      22.6754     63.28  |  q     Q|         |         |         |
 10+45      23.4447     54.51  |  q    Q |         |         |         |
 11+ 0      24.5278     65.93  |  q     Q|         |         |         |
 11+15      25.6049     76.20  |  q      |Q        |         |         |
 11+30      26.5695     78.01  |  q      |Q        |         |         |
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11+45      27.3759     77.59  |   q     |Q        |         |         |
12+ 0      28.0646     73.50  |   q     Q         |         |         |
12+15      29.1163     84.95  |   q     | Q       |         |         |
12+30      30.6740    122.26  |   q     |       Q |         |         |
12+45      32.4597    154.88  |   q     |         |  Q      |         |
13+ 0      34.3735    180.75  |    q    |         |     Q   |         |
13+15      42.8553    214.87  |     q   |         |         |Q        |
13+30      53.6999    258.68  |      q  |         |         |       Q |
13+45      59.6425    268.88  |       q |         |         |         Q
14+ 0      60.4116    229.58  |       q |         |         |   Q     |
14+15      61.0668    209.14  |        q|         |         |Q        |
14+30      62.7215    218.97  |        q|         |         | Q       |
14+45      64.0263    224.55  |        q|         |         |  Q      |
15+ 0      64.7057    224.41  |        q|         |         |  Q      |
15+15      64.6517    220.27  |        q|         |         | Q       |
15+30      63.9481    212.74  |        q|         |         |Q        |
15+45      61.9813    197.95  |        q|         |        Q|         |
16+ 0      59.0372    173.88  |       q |         |    Q    |         |
16+15      52.9446    144.84  |      q  |         |Q        |         |
16+30      43.5672     96.55  |     q   |   Q     |         |         |
16+45      35.0046     61.25  |    q   Q|         |         |         |
17+ 0      33.6536     48.69  |    q Q  |         |         |         |
17+15      32.4286     42.08  |   q Q   |         |         |         |
17+30      31.3573     38.91  |   qQ    |         |         |         |
17+45      30.3614     37.10  |   qQ    |         |         |         |
18+ 0      29.3768     35.52  |   qQ    |         |         |         |
18+15      28.3905     33.80  |   qQ    |         |         |         |
18+30      27.4382     32.32  |   Q     |         |         |         |
18+45      26.4951     31.00  |  qQ     |         |         |         |
19+ 0      25.5128     29.35  |  qQ     |         |         |         |
19+15      24.5519     27.76  |  qQ     |         |         |         |
19+30      23.7074     27.10  |  qQ     |         |         |         |
19+45      22.9275     26.75  |  Q      |         |         |         |
20+ 0      22.1132     25.65  |  Q      |         |         |         |
20+15      21.3123     24.37  |  Q      |         |         |         |
20+30      20.5847     23.75  |  Q      |         |         |         |
20+45      19.9038     23.23  | qQ      |         |         |         |
21+ 0      19.2194     22.44  | qQ      |         |         |         |
21+15      18.5547     21.49  | qQ      |         |         |         |
21+30      17.9213     20.87  | qQ      |         |         |         |
21+45      17.3178     20.16  | Q       |         |         |         |
22+ 0      16.7427     19.64  | Q       |         |         |         |
22+15      16.1946     19.01  | Q       |         |         |         |
22+30      15.6724     18.56  | Q       |         |         |         |
22+45      15.1391     17.80  | Q       |         |         |         |
23+ 0      14.6185     17.05  | Q       |         |         |         |
23+15      14.1224     16.48  | Q       |         |         |         |
23+30      13.6497     15.97  | Q       |         |         |         |
23+45      13.1992     15.49  |qQ       |         |         |         |
24+ 0      12.7700     15.05  |qQ       |         |         |         |
24+15      12.2898     14.27  |qQ       |         |         |         |
24+30      11.7361     12.81  |Q        |         |         |         |
24+45      11.1835     11.65  |Q        |         |         |         |
25+ 0      10.6570     10.89  |Q        |         |         |         |
25+15      10.1553     10.28  |Q        |         |         |         |
25+30       9.6772      9.74  |Q        |         |         |         |
25+45       9.2216      9.25  |Q        |         |         |         |
26+ 0       8.7874      8.81  |Q        |         |         |         |
26+15       8.3737      8.38  |Q        |         |         |         |
26+30       7.9795      7.98  |Q        |         |         |         |
26+45       7.6038      7.60  |Q        |         |         |         |
27+ 0       7.2459      7.25  |Q        |         |         |         |
27+15       6.9047      6.90  |Q        |         |         |         |
27+30       6.5797      6.58  Q         |         |         |         |
27+45       6.2699      6.27  Q         |         |         |         |
28+ 0       5.9747      5.97  Q         |         |         |         |
28+15       5.6934      5.69  Q         |         |         |         |
28+30       5.4254      5.43  Q         |         |         |         |
28+45       5.1700      5.17  Q         |         |         |         |
29+ 0       4.9266      4.93  Q         |         |         |         |
29+15       4.6946      4.69  Q         |         |         |         |
```

29+30	4.4736	4.47	Q				
29+45	4.2630	4.26	Q				
30+ 0	4.0623	4.06	Q				
30+15	3.8710	3.87	Q				
30+30	3.6888	3.69	Q				
30+45	3.5151	3.52	Q				
31+ 0	3.3496	3.35	Q				
31+15	3.1919	3.19	Q				
31+30	3.0417	3.04	Q				
31+45	2.8985	2.90	Q				
32+ 0	2.7620	2.76	Q				
32+15	2.6320	2.63	Q				
32+30	2.5081	2.51	Q				
32+45	2.3900	2.39	Q				
33+ 0	2.2775	2.28	Q				
33+15	2.1702	2.17	Q				
33+30	2.0681	2.07	Q				
33+45	1.9707	1.97	Q				
34+ 0	1.8779	1.88	Q				
34+15	1.7895	1.79	Q				
34+30	1.7053	1.71	Q				
34+45	1.6250	1.62	Q				
35+ 0	1.5485	1.55	Q				
35+15	1.4756	1.48	Q				
35+30	1.4061	1.41	Q				
35+45	1.3399	1.34	Q				
36+ 0	1.2768	1.28	Q				
36+15	1.2167	1.22	Q				
36+30	1.1594	1.16	Q				
36+45	1.1048	1.10	Q				
37+ 0	1.0528	1.05	Q				
37+15	1.0033	1.00	Q				
37+30	0.9560	0.96	Q				
37+45	0.9110	0.91	Q				
38+ 0	0.8681	0.87	Q				
38+15	0.8273	0.83	Q				
38+30	0.7883	0.79	Q				
38+45	0.7512	0.75	Q				
39+ 0	0.7158	0.72	Q				
39+15	0.6821	0.68	Q				
39+30	0.6500	0.65	Q				
39+45	0.6194	0.62	Q				
40+ 0	0.5903	0.59	Q				
40+15	0.5625	0.56	Q				
40+30	0.5360	0.54	Q				
40+45	0.5107	0.51	Q				
41+ 0	0.4867	0.49	Q				
41+15	0.4638	0.46	Q				
41+30	0.4420	0.44	Q				
41+45	0.4211	0.42	Q				
42+ 0	0.4013	0.40	Q				
42+15	0.3824	0.38	Q				
42+30	0.3644	0.36	Q				
42+45	0.3473	0.35	Q				
43+ 0	0.3309	0.33	Q				
43+15	0.3153	0.32	Q				
43+30	0.3005	0.30	Q				
43+45	0.2863	0.29	Q				
44+ 0	0.2729	0.27	Q				
44+15	0.2600	0.26	Q				
44+30	0.2478	0.25	Q				
44+45	0.2361	0.24	Q				
45+ 0	0.2250	0.22	Q				
45+15	0.2144	0.21	Q				
45+30	0.2043	0.20	Q				
45+45	0.1947	0.19	Q				
46+ 0	0.1855	0.19	Q				
46+15	0.1768	0.18	Q				
46+30	0.1685	0.17	Q				
46+45	0.1605	0.16	Q				
47+ 0	0.1530	0.15	Q				

47+15	0.1458	0.15	Q	|	|	|	|
47+30	0.1389	0.14	Q	|	|	|	|
47+45	0.1324	0.13	Q	|	|	|	|
48+ 0	0.1261	0.13	Q	|	|	|	|
48+15	0.1202	0.12	Q	|	|	|	|
48+30	0.1145	0.11	Q	|	|	|	|
48+45	0.1091	0.11	Q	|	|	|	|
49+ 0	0.1040	0.10	Q	|	|	|	|
49+15	0.0991	0.10	Q	|	|	|	|
49+30	0.0944	0.09	Q	|	|	|	|
49+45	0.0900	0.09	Q	|	|	|	|
50+ 0	0.0858	0.09	Q	|	|	|	|
50+15	0.0817	0.08	Q	|	|	|	|
50+30	0.0779	0.08	Q	|	|	|	|
50+45	0.0742	0.07	Q	|	|	|	|
51+ 0	0.0707	0.07	Q	|	|	|	|
51+15	0.0674	0.07	Q	|	|	|	|
51+30	0.0642	0.06	Q	|	|	|	|
51+45	0.0612	0.06	Q	|	|	|	|
52+ 0	0.0583	0.06	Q	|	|	|	|
52+15	0.0556	0.06	Q	|	|	|	|
52+30	0.0530	0.05	Q	|	|	|	|
52+45	0.0505	0.05	Q	|	|	|	|
53+ 0	0.0481	0.05	Q	|	|	|	|
53+15	0.0458	0.05	Q	|	|	|	|
53+30	0.0437	0.04	Q	|	|	|	|
53+45	0.0416	0.04	Q	|	|	|	|
54+ 0	0.0396	0.04	Q	|	|	|	|
54+15	0.0378	0.04	Q	|	|	|	|
54+30	0.0360	0.04	Q	|	|	|	|
54+45	0.0343	0.03	Q	|	|	|	|
55+ 0	0.0327	0.03	Q	|	|	|	|
55+15	0.0312	0.03	Q	|	|	|	|
55+30	0.0297	0.03	Q	|	|	|	|
55+45	0.0283	0.03	Q	|	|	|	|
56+ 0	0.0270	0.03	Q	|	|	|	|
56+15	0.0257	0.03	Q	|	|	|	|
56+30	0.0245	0.02	Q	|	|	|	|
56+45	0.0233	0.02	Q	|	|	|	|
57+ 0	0.0222	0.02	Q	|	|	|	|
57+15	0.0212	0.02	Q	|	|	|	|
57+30	0.0202	0.02	Q	|	|	|	|
57+45	0.0192	0.02	Q	|	|	|	|
58+ 0	0.0183	0.02	Q	|	|	|	|
58+15	0.0175	0.02	Q	|	|	|	|
58+30	0.0166	0.02	Q	|	|	|	|
58+45	0.0159	0.02	Q	|	|	|	|
59+ 0	0.0151	0.02	Q	|	|	|	|
59+15	0.0144	0.01	Q	|	|	|	|
59+30	0.0137	0.01	Q	|	|	|	|
59+45	0.0131	0.01	Q	|	|	|	|
60+ 0	0.0125	0.01	Q	|	|	|	|
60+15	0.0119	0.01	Q	|	|	|	|
60+30	0.0113	0.01	Q	|	|	|	|
60+45	0.0108	0.01	Q	|	|	|	|
61+ 0	0.0103	0.01	Q	|	|	|	|
61+15	0.0098	0.01	Q	|	|	|	|
61+30	0.0093	0.01	Q	|	|	|	|
61+45	0.0089	0.01	Q	|	|	|	|
62+ 0	0.0085	0.01	Q	|	|	|	|
62+15	0.0081	0.01	Q	|	|	|	|
62+30	0.0077	0.01	Q	|	|	|	|
62+45	0.0073	0.01	Q	|	|	|	|
63+ 0	0.0070	0.01	Q	|	|	|	|
63+15	0.0067	0.01	Q	|	|	|	|
63+30	0.0063	0.01	Q	|	|	|	|
63+45	0.0060	0.01	Q	|	|	|	|
64+ 0	0.0058	0.01	Q	|	|	|	|
64+15	0.0055	0.01	Q	|	|	|	|
64+30	0.0052	0.01	Q	|	|	|	|
64+45	0.0050	0.00	Q	|	|	|	|

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   65+ 0       0.0048      0.00  Q          |          |          |          |
   65+15       0.0045      0.00  Q          |          |          |          |
   65+30       0.0043      0.00  Q          |          |          |          |
   65+45       0.0041      0.00  Q          |          |          |          |
   66+ 0       0.0039      0.00  Q          |          |          |          |
   66+15       0.0037      0.00  Q          |          |          |          |
   66+30       0.0036      0.00  Q          |          |          |          |
   66+45       0.0034      0.00  Q          |          |          |          |
   67+ 0       0.0032      0.00  Q          |          |          |          |
   67+15       0.0031      0.00  Q          |          |          |          |
   67+30       0.0029      0.00  Q          |          |          |          |
   67+45       0.0028      0.00  Q          |          |          |          |
   68+ 0       0.0027      0.00  Q          |          |          |          |
   68+15       0.0025      0.00  Q          |          |          |          |
   68+30       0.0024      0.00  Q          |          |          |          |
   68+45       0.0023      0.00  Q          |          |          |          |
   69+ 0       0.0022      0.00  Q          |          |          |          |
   69+15       0.0021      0.00  Q          |          |          |          |
   69+30       0.0020      0.00  Q          |          |          |          |
   69+45       0.0019      0.00  Q          |          |          |          |
   70+ 0       0.0018      0.00  Q          |          |          |          |
   70+15       0.0017      0.00  Q          |          |          |          |
   70+30       0.0016      0.00  Q          |          |          |          |
   70+45       0.0016      0.00  Q          |          |          |          |
   71+ 0       0.0015      0.00  Q          |          |          |          |
   71+15       0.0014      0.00  Q          |          |          |          |
   71+30       0.0014      0.00  Q          |          |          |          |
   71+45       0.0013      0.00  Q          |          |          |          |
   72+ 0       0.0012      0.00  Q          |          |          |          |
   72+15       0.0012      0.00  Q          |          |          |          |
   72+30       0.0011      0.00  Q          |          |          |          |
   72+45       0.0011      0.00  Q          |          |          |          |
   73+ 0       0.0010      0.00  Q          |          |          |          |
   73+15       0.0010      0.00  Q          |          |          |          |
--------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   293
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      268.884 (CFS)
                      Total volume =     119.309 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ---------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** STREAM ROUTING SCS CONVEX METHOD ****
       _____________________________________________________________________
       HYDROGRAPH STREAM ROUTING DATA:
       Length of stream =   5750.00 (Ft.)
       Elevation difference =  115.00 (Ft.)
       Slope of channel =  0.020000 (Vert/Horiz)
       Channel type - Improved Channel


       Channel length =  5750.00(Ft.)     Elevation difference = 115.00(Ft.)
       Channel evaluation using mean flow rate of hydrograph
       Covered channel
       Channel base width  =    5.000(Ft.)
       Slope or 'Z' of left channel bank =   1.000
       Slope or 'Z' of right channel bank =   1.000
       Manning's 'N'    = 0.015
       Maximum depth of channel  =    5.000(Ft.)
       Flow(q) thru subarea =     70.828(CFS)
       Depth of flow =     1.004(Ft.)
       Average velocity =    11.756(Ft/s)
```

```
Total flow rate =    70.828(CFS)
Channel flow top width =    7.007(Ft.)
Depth of flow in channel =   1.00(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.76(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   70.828(CFS)
Total capacity of improved channels =     70.828(CFS)
Critical Depth in Channel =    1.64(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =    268.884(CFS)
Depth of flow =     2.154(Ft.)
Average velocity =    17.445(Ft/s)
Total flow rate =   268.884(CFS)
Channel flow top width =    9.309(Ft.)
Depth of flow in channel =   2.15(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   17.44(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  268.884(CFS)
Total capacity of improved channels =    268.884(CFS)
Critical Depth in Channel =    3.53(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.9112   Travel time =   5.49 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   2.3310
        dt(routing time-step) =   5.01 (min.),   c* =   0.9965

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       67.2     134.4     201.7     268.9
-----------------------------------------------------------------------
  0+15       0.2453      0.37  O         |         |         |         |
  0+30       1.2026      1.63  O         |         |         |         |
  0+45       2.4985      2.94  O         |         |         |         |
  1+ 0       3.5928      3.92  O         |         |         |         |
  1+15       4.4738      4.75  O         |         |         |         |
  1+30       4.8964      4.97  O         |         |         |         |
  1+45       5.0341      5.07  O         |         |         |         |
  2+ 0       5.3112      5.44  O         |         |         |         |
  2+15       5.9159      6.16  O         |         |         |         |
  2+30       6.5430      6.74  OI        |         |         |         |
  2+45       7.1166      7.31  |O        |         |         |         |
  3+ 0       7.8728      8.16  |O        |         |         |         |
  3+15       8.6016      8.83  |O        |         |         |         |
  3+30       9.1237      9.28  |O        |         |         |         |
  3+45       9.5186      9.64  |O        |         |         |         |
  4+ 0       9.9824     10.16  |O        |         |         |         |
  4+15      10.7049     10.98  |O        |         |         |         |
  4+30      11.5475     11.83  |O        |         |         |         |
  4+45      12.4916     12.83  |O        |         |         |         |
  5+ 0      13.4629     13.79  | O       |         |         |         |
  5+15      14.2528     14.49  | O       |         |         |         |
  5+30      14.4598     14.45  | O       |         |         |         |
  5+45      14.8000     14.98  | O       |         |         |         |
```

```
 6+ 0      15.6568     16.00  | O       |         |         |         |
 6+15      16.6253     16.94  | O       |         |         |         |
 6+30      17.6461     18.00  | O       |         |         |         |
 6+45      18.6830     19.03  | O       |         |         |         |
 7+ 0      19.7803     20.16  | O       |         |         |         |
 7+15      20.7517     21.05  |  O      |         |         |         |
 7+30      21.6010     21.88  |  O      |         |         |         |
 7+45      22.7190     23.14  |  O      |         |         |         |
 8+ 0      24.2057     24.74  |  O      |         |         |         |
 8+15      26.0524     26.72  |  O      |         |         |         |
 8+30      28.2301     29.00  |   O     |         |         |         |
 8+45      30.2623     30.91  |   O     |         |         |         |
 9+ 0      32.2087     32.87  |   O     |         |         |         |
 9+15      35.0105     36.10  |    O    |         |         |         |
 9+30      41.6006     44.39  |     O   |         |         |         |
 9+45      52.2476     56.24  |      OI |         |         |         |
10+ 0      65.4113     70.08  |        OI         |         |         |
10+15      74.8057     77.22  |         |O        |         |         |
10+30      67.9574     63.28  |        IO         |         |         |
10+45      57.4731     54.51  |       O |         |         |         |
11+ 0      62.1024     65.93  |        O|         |         |         |
11+15      72.7321     76.20  |         OI        |         |         |
11+30      77.3884     78.01  |         |O        |         |         |
11+45      77.7317     77.59  |         |O        |         |         |
12+ 0      74.8759     73.50  |         IO        |         |         |
12+15      81.1060     84.95  |         | O       |         |         |
12+30     109.7068    122.26  |         |     O I |         |         |
12+45     143.8722    154.88  |         |         |O I      |         |
13+ 0     172.0184    180.75  |         |         |    OI   |         |
13+15     203.3748    214.87  |         |         |         OI        |
13+30     243.9140    258.68  |         |         |         |     O I |
13+45     265.4012    268.88  |         |         |         |        OI
14+ 0     242.7735    229.58  |         |         |         |   I O   |
14+15     216.0560    209.14  |         |         |         |IO       |
14+30     215.6948    218.97  |         |         |         | O       |
14+45     222.6623    224.55  |         |         |         |  O      |
15+ 0     224.4520    224.41  |         |         |         |  O      |
15+15     221.6644    220.27  |         |         |         | O       |
15+30     215.2738    212.74  |         |         |         |IO       |
15+45     202.9270    197.95  |         |         |        IO         |
16+ 0     181.9848    173.88  |         |         |    I O  |         |
16+15     154.6307    144.84  |         |         |I O      |         |
16+30     112.8164     96.55  |         |   I O   |         |         |
16+45      73.1710     61.25  |        IO         |         |         |
17+ 0      52.9519     48.69  |      O  |         |         |         |
17+15      44.3146     42.08  |     O   |         |         |         |
17+30      39.9815     38.91  |    O    |         |         |         |
17+45      37.7134     37.10  |    O    |         |         |         |
18+ 0      36.0552     35.52  |    O    |         |         |         |
18+15      34.3783     33.80  |    O    |         |         |         |
18+30      32.8195     32.32  |   O     |         |         |         |
18+45      31.4458     31.00  |   O     |         |         |         |
19+ 0      29.9084     29.35  |   O     |         |         |         |
19+15      28.3007     27.76  |   O     |         |         |         |
19+30      27.3253     27.10  |   O     |         |         |         |
19+45      26.8664     26.75  |  O      |         |         |         |
20+ 0      26.0211     25.65  |  O      |         |         |         |
20+15      24.8050     24.37  |  O      |         |         |         |
20+30      23.9610     23.75  |  O      |         |         |         |
20+45      23.4067     23.23  |  O      |         |         |         |
21+ 0      22.7040     22.44  |  O      |         |         |         |
21+15      21.8069     21.49  |  O      |         |         |         |
21+30      21.0792     20.87  |  O      |         |         |         |
21+45      20.3998     20.16  | IO      |         |         |         |
22+ 0      19.8183     19.64  | O       |         |         |         |
22+15      19.2208     19.01  | O       |         |         |         |
22+30      18.7107     18.56  | O       |         |         |         |
22+45      18.0536     17.80  | O       |         |         |         |
23+ 0      17.3027     17.05  | O       |         |         |         |
23+15      16.6699     16.48  | O       |         |         |         |
23+30      16.1378     15.97  | O       |         |         |         |
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23+45      15.6534     15.49  | O       |         |         |         |
24+ 0      15.2032     15.05  | O       |         |         |         |
24+15      14.5338     14.27  | O       |         |         |         |
24+30      13.3001     12.81  |O        |         |         |         |
24+45      12.0421     11.65  |O        |         |         |         |
25+ 0      11.1496     10.89  |O        |         |         |         |
25+15      10.4842     10.28  |O        |         |         |         |
25+30       9.9177      9.74  |O        |         |         |         |
25+45       9.4150      9.25  |O        |         |         |         |
26+ 0       8.9560      8.81  |O        |         |         |         |
26+15       8.5261      8.38  |O        |         |         |         |
26+30       8.1183      7.98  |O        |         |         |         |
26+45       7.7318      7.60  |O        |         |         |         |
27+ 0       7.3666      7.25  |O        |         |         |         |
27+15       7.0198      6.90  |O        |         |         |         |
27+30       6.6893      6.58  O         |         |         |         |
27+45       6.3744      6.27  O         |         |         |         |
28+ 0       6.0743      5.97  O         |         |         |         |
28+15       5.7883      5.69  O         |         |         |         |
28+30       5.5158      5.43  O         |         |         |         |
28+45       5.2561      5.17  O         |         |         |         |
29+ 0       5.0087      4.93  O         |         |         |         |
29+15       4.7729      4.69  O         |         |         |         |
29+30       4.5481      4.47  O         |         |         |         |
29+45       4.3340      4.26  O         |         |         |         |
30+ 0       4.1300      4.06  O         |         |         |         |
30+15       3.9355      3.87  O         |         |         |         |
30+30       3.7503      3.69  O         |         |         |         |
30+45       3.5737      3.52  O         |         |         |         |
31+ 0       3.4055      3.35  O         |         |         |         |
31+15       3.2451      3.19  O         |         |         |         |
31+30       3.0923      3.04  O         |         |         |         |
31+45       2.9468      2.90  O         |         |         |         |
32+ 0       2.8080      2.76  O         |         |         |         |
32+15       2.6758      2.63  O         |         |         |         |
32+30       2.5499      2.51  O         |         |         |         |
32+45       2.4298      2.39  O         |         |         |         |
33+ 0       2.3154      2.28  O         |         |         |         |
33+15       2.2064      2.17  O         |         |         |         |
33+30       2.1025      2.07  O         |         |         |         |
33+45       2.0035      1.97  O         |         |         |         |
34+ 0       1.9092      1.88  O         |         |         |         |
34+15       1.8193      1.79  O         |         |         |         |
34+30       1.7337      1.71  O         |         |         |         |
34+45       1.6521      1.62  O         |         |         |         |
35+ 0       1.5743      1.55  O         |         |         |         |
35+15       1.5002      1.48  O         |         |         |         |
35+30       1.4295      1.41  O         |         |         |         |
35+45       1.3622      1.34  O         |         |         |         |
36+ 0       1.2981      1.28  O         |         |         |         |
36+15       1.2370      1.22  O         |         |         |         |
36+30       1.1788      1.16  O         |         |         |         |
36+45       1.1233      1.10  O         |         |         |         |
37+ 0       1.0704      1.05  O         |         |         |         |
37+15       1.0200      1.00  O         |         |         |         |
37+30       0.9720      0.96  O         |         |         |         |
37+45       0.9262      0.91  O         |         |         |         |
38+ 0       0.8826      0.87  O         |         |         |         |
38+15       0.8410      0.83  O         |         |         |         |
38+30       0.8014      0.79  O         |         |         |         |
38+45       0.7637      0.75  O         |         |         |         |
39+ 0       0.7278      0.72  O         |         |         |         |
39+15       0.6935      0.68  O         |         |         |         |
39+30       0.6608      0.65  O         |         |         |         |
39+45       0.6297      0.62  O         |         |         |         |
40+ 0       0.6001      0.59  O         |         |         |         |
40+15       0.5718      0.56  O         |         |         |         |
40+30       0.5449      0.54  O         |         |         |         |
40+45       0.5193      0.51  O         |         |         |         |
41+ 0       0.4948      0.49  O         |         |         |         |
41+15       0.4715      0.46  O         |         |         |         |
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41+30	0.4493	0.44	O	|	|	|	|
41+45	0.4282	0.42	O	|	|	|	|
42+ 0	0.4080	0.40	O	|	|	|	|
42+15	0.3888	0.38	O	|	|	|	|
42+30	0.3705	0.36	O	|	|	|	|
42+45	0.3531	0.35	O	|	|	|	|
43+ 0	0.3364	0.33	O	|	|	|	|
43+15	0.3206	0.32	O	|	|	|	|
43+30	0.3055	0.30	O	|	|	|	|
43+45	0.2911	0.29	O	|	|	|	|
44+ 0	0.2774	0.27	O	|	|	|	|
44+15	0.2643	0.26	O	|	|	|	|
44+30	0.2519	0.25	O	|	|	|	|
44+45	0.2400	0.24	O	|	|	|	|
45+ 0	0.2287	0.22	O	|	|	|	|
45+15	0.2180	0.21	O	|	|	|	|
45+30	0.2077	0.20	O	|	|	|	|
45+45	0.1979	0.19	O	|	|	|	|
46+ 0	0.1886	0.19	O	|	|	|	|
46+15	0.1797	0.18	O	|	|	|	|
46+30	0.1713	0.17	O	|	|	|	|
46+45	0.1632	0.16	O	|	|	|	|
47+ 0	0.1555	0.15	O	|	|	|	|
47+15	0.1482	0.15	O	|	|	|	|
47+30	0.1412	0.14	O	|	|	|	|
47+45	0.1346	0.13	O	|	|	|	|
48+ 0	0.1282	0.13	O	|	|	|	|
48+15	0.1222	0.12	O	|	|	|	|
48+30	0.1165	0.11	O	|	|	|	|
48+45	0.1110	0.11	O	|	|	|	|
49+ 0	0.1057	0.10	O	|	|	|	|
49+15	0.1008	0.10	O	|	|	|	|
49+30	0.0960	0.09	O	|	|	|	|
49+45	0.0915	0.09	O	|	|	|	|
50+ 0	0.0872	0.09	O	|	|	|	|
50+15	0.0831	0.08	O	|	|	|	|
50+30	0.0792	0.08	O	|	|	|	|
50+45	0.0754	0.07	O	|	|	|	|
51+ 0	0.0719	0.07	O	|	|	|	|
51+15	0.0685	0.07	O	|	|	|	|
51+30	0.0653	0.06	O	|	|	|	|
51+45	0.0622	0.06	O	|	|	|	|
52+ 0	0.0593	0.06	O	|	|	|	|
52+15	0.0565	0.06	O	|	|	|	|
52+30	0.0538	0.05	O	|	|	|	|
52+45	0.0513	0.05	O	|	|	|	|
53+ 0	0.0489	0.05	O	|	|	|	|
53+15	0.0466	0.05	O	|	|	|	|
53+30	0.0444	0.04	O	|	|	|	|
53+45	0.0423	0.04	O	|	|	|	|
54+ 0	0.0403	0.04	O	|	|	|	|
54+15	0.0384	0.04	O	|	|	|	|
54+30	0.0366	0.04	O	|	|	|	|
54+45	0.0349	0.03	O	|	|	|	|
55+ 0	0.0332	0.03	O	|	|	|	|
55+15	0.0317	0.03	O	|	|	|	|
55+30	0.0302	0.03	O	|	|	|	|
55+45	0.0288	0.03	O	|	|	|	|
56+ 0	0.0274	0.03	O	|	|	|	|
56+15	0.0261	0.03	O	|	|	|	|
56+30	0.0249	0.02	O	|	|	|	|
56+45	0.0237	0.02	O	|	|	|	|
57+ 0	0.0226	0.02	O	|	|	|	|
57+15	0.0215	0.02	O	|	|	|	|
57+30	0.0205	0.02	O	|	|	|	|
57+45	0.0196	0.02	O	|	|	|	|
58+ 0	0.0186	0.02	O	|	|	|	|
58+15	0.0178	0.02	O	|	|	|	|
58+30	0.0169	0.02	O	|	|	|	|
58+45	0.0161	0.02	O	|	|	|	|
59+ 0	0.0154	0.02	O	|	|	|	|

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   59+15       0.0146      0.01  O         |         |         |         |
   59+30       0.0140      0.01  O         |         |         |         |
   59+45       0.0133      0.01  O         |         |         |         |
   60+ 0       0.0127      0.01  O         |         |         |         |
   60+15       0.0121      0.01  O         |         |         |         |
   60+30       0.0115      0.01  O         |         |         |         |
   60+45       0.0110      0.01  O         |         |         |         |
   61+ 0       0.0104      0.01  O         |         |         |         |
   61+15       0.0100      0.01  O         |         |         |         |
   61+30       0.0095      0.01  O         |         |         |         |
   61+45       0.0090      0.01  O         |         |         |         |
   62+ 0       0.0086      0.01  O         |         |         |         |
   62+15       0.0082      0.01  O         |         |         |         |
   62+30       0.0078      0.01  O         |         |         |         |
   62+45       0.0075      0.01  O         |         |         |         |
   63+ 0       0.0071      0.01  O         |         |         |         |
   63+15       0.0068      0.01  O         |         |         |         |
   63+30       0.0064      0.01  O         |         |         |         |
   63+45       0.0061      0.01  O         |         |         |         |
   64+ 0       0.0059      0.01  O         |         |         |         |
   64+15       0.0056      0.01  O         |         |         |         |
   64+30       0.0053      0.01  O         |         |         |         |
   64+45       0.0051      0.00  O         |         |         |         |
   65+ 0       0.0048      0.00  O         |         |         |         |
   65+15       0.0046      0.00  O         |         |         |         |
   65+30       0.0044      0.00  O         |         |         |         |
   65+45       0.0042      0.00  O         |         |         |         |
   66+ 0       0.0040      0.00  O         |         |         |         |
   66+15       0.0038      0.00  O         |         |         |         |
   66+30       0.0036      0.00  O         |         |         |         |
   66+45       0.0034      0.00  O         |         |         |         |
   67+ 0       0.0033      0.00  O         |         |         |         |
   67+15       0.0031      0.00  O         |         |         |         |
   67+30       0.0030      0.00  O         |         |         |         |
   67+45       0.0028      0.00  O         |         |         |         |
   68+ 0       0.0027      0.00  O         |         |         |         |
   68+15       0.0026      0.00  O         |         |         |         |
   68+30       0.0025      0.00  O         |         |         |         |
   68+45       0.0023      0.00  O         |         |         |         |
   69+ 0       0.0022      0.00  O         |         |         |         |
   69+15       0.0021      0.00  O         |         |         |         |
   69+30       0.0020      0.00  O         |         |         |         |
   69+45       0.0019      0.00  O         |         |         |         |
   70+ 0       0.0018      0.00  O         |         |         |         |
   70+15       0.0018      0.00  O         |         |         |         |
   70+30       0.0017      0.00  O         |         |         |         |
   70+45       0.0016      0.00  O         |         |         |         |
   71+ 0       0.0015      0.00  O         |         |         |         |
   71+15       0.0014      0.00  O         |         |         |         |
   71+30       0.0014      0.00  O         |         |         |         |
   71+45       0.0013      0.00  O         |         |         |         |
   72+ 0       0.0013      0.00  O         |         |         |         |
   72+15       0.0012      0.00  O         |         |         |         |
   72+30       0.0011      0.00  O         |         |         |         |
   72+45       0.0011      0.00  O         |         |         |         |
   73+ 0       0.0010      0.00  O         |         |         |         |
   73+15       0.0010      0.00  O         |         |         |         |
   73+30       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   294
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      265.401 (CFS)
                      Total volume =     119.309 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **************************************************************************

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Process from Point/Station        2.000 to Point/Station        3.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                 From study/file name: SubD224100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                  R u n o f f     H y d r o g r a p h
--------------------------------------------------------------------
              Hydrograph in  15   Minute intervals (CFS)

--------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       80.5     161.0     241.5     322.0
----------------------------------------------------------------------
  0+15       1.3495      1.59  Q         |         |         |         |
  0+30       3.3341      4.54  Q         |         |         |         |
  0+45       4.2505      6.75  Q         |         |         |         |
  1+ 0       5.1814      8.77  qQ        |         |         |         |
  1+15       5.2242      9.70  qQ        |         |         |         |
  1+30       4.7000      9.60  qQ        |         |         |         |
  1+45       4.6320      9.67  qQ        |         |         |         |
  2+ 0       5.2441     10.56  qQ        |         |         |         |
  2+15       5.8990     11.81  qQ        |         |         |         |
  2+30       6.0297     12.57  qQ        |         |         |         |
  2+45       6.7672     13.88  qQ        |         |         |         |
  3+ 0       7.4221     15.29  qQ        |         |         |         |
  3+15       7.5528     16.15  q Q       |         |         |         |
  3+30       7.6155     16.74  q Q       |         |         |         |
  3+45       7.6155     17.13  q Q       |         |         |         |
  4+ 0       8.2903     18.27  |qQ       |         |         |         |
  4+15       8.9452     19.65  |qQ       |         |         |         |
  4+30       9.7507     21.30  |qQ       |         |         |         |
  4+45      10.4683     22.96  |qQ       |         |         |         |
  5+ 0      11.2738     24.74  |q Q      |         |         |         |
  5+15      10.6419     24.89  |q Q      |         |         |         |
  5+30      10.1375     24.60  |q Q      |         |         |         |
  5+45      11.2685     26.07  |q Q      |         |         |         |
  6+ 0      11.9287     27.59  |q Q      |         |         |         |
  6+15      12.7969     29.42  |q Q      |         |         |         |
  6+30      13.5145     31.16  |q Q      |         |         |         |
  6+45      14.3200     33.00  |q  Q     |         |         |         |
  7+ 0      15.0376     34.82  |q  Q     |         |         |         |
  7+15      15.1683     35.92  |q  Q     |         |         |         |
  7+30      15.9058     37.51  |q  Q     |         |         |         |
  7+45      17.2354     39.95  | q Q     |         |         |         |
  8+ 0      18.6958     42.90  | q  Q    |         |         |         |
  8+15      21.4145     47.47  | q  Q    |         |         |         |
  8+30      23.4765     51.71  | q   Q   |         |         |         |
  8+45      24.9699     55.23  |  q  Q   |         |         |         |
  9+ 0      27.1570     59.37  |  q   Q  |         |         |         |
  9+15      30.3249     65.34  |  q    Q |         |         |         |
  9+30      33.5530     75.15  |   q    Q|         |         |         |
  9+45      36.0311     88.28  |   q     Q         |         |         |
 10+ 0      38.4110    103.82  |   q     | Q       |         |         |
 10+15      32.9887    107.79  |   q     |  Q      |         |         |
 10+30      26.8279     94.79  |  q      |Q        |         |         |
 10+45      30.5413     88.01  |  q      Q         |         |         |
 11+ 0      34.7024     96.80  |   q     | Q       |         |         |
 11+15      34.7809    107.51  |   q     |  Q      |         |         |
 11+30      34.4009    111.79  |   q     |  Q      |         |         |
 11+45      32.3929    110.12  |   q     |  Q      |         |         |
 12+ 0      31.5015    106.38  |  q      |  Q      |         |         |
 12+15      38.9156    120.02  |   q     |   Q     |         |         |
 12+30      46.5394    156.25  |    q    |         Q|        |         |
 12+45      50.9015    194.77  |     q   |          |   Q     |         |
 13+ 0      54.6511    226.67  |     q   |          |       Q |         |
 13+15      60.9689    264.34  |      q  |          |         | Q       |
```

```
13+30      66.1111    310.03  |       q |         |         |       Q |
13+45      56.6279    322.03  |      q  |         |         |         Q
14+ 0      46.8798    289.65  |    q    |         |         |    Q    |
14+15      48.7761    264.83  |     q   |         |         | Q       |
14+30      50.6624    266.36  |     q   |         |         |  Q      |
14+45      50.5656    273.23  |     q   |         |         |  Q      |
15+ 0      49.8638    274.32  |     q   |         |         |   Q     |
15+15      47.9639    269.63  |    q    |         |         |  Q      |
15+30      45.9656    261.24  |    q    |         |         | Q       |
15+45      40.9844    243.91  |    q    |         |        Q        |
16+ 0      37.0508    219.04  |   q     |         |      Q  |         |
16+15      23.0484    177.68  | q       |         | Q       |         |
16+30       9.8763    122.69  |q        |    Q    |         |         |
16+45       6.6455     79.82  q        Q|         |         |         |
17+ 0       4.7627     57.71  q      Q  |         |         |         |
17+15       5.9815     50.30  q     Q   |         |         |         |
17+30       7.2287     47.21  q    Q    |         |         |         |
17+45       7.4901     45.20  q    Q    |         |         |         |
18+ 0       6.9407     43.00  q    Q    |         |         |         |
18+15       6.2858     40.66  q    Q    |         |         |         |
18+30       6.1551     38.97  q   Q     |         |         |         |
18+45       5.4176     36.86  q   Q     |         |         |         |
19+ 0       4.0879     34.00  q   Q     |         |         |         |
19+15       3.9771     32.28  q   Q     |         |         |         |
19+30       5.1134     32.44  q   Q     |         |         |         |
19+45       5.1615     32.03  q  Q      |         |         |         |
20+ 0       4.0252     30.05  q  Q      |         |         |         |
20+15       3.9771     28.78  q  Q      |         |         |         |
20+30       4.4386     28.40  q  Q      |         |         |         |
20+45       4.5066     27.91  q  Q      |         |         |         |
21+ 0       3.8945     26.60  q  Q      |         |         |         |
21+15       3.9144     25.72  q  Q      |         |         |         |
21+30       3.7638     24.84  q  Q      |         |         |         |
21+45       3.8517     24.25  q  Q      |         |         |         |
22+ 0       3.7638     23.58  q Q       |         |         |         |
22+15       3.8517     23.07  q Q       |         |         |         |
22+30       3.7638     22.47  q Q       |         |         |         |
22+45       3.1769     21.23  q Q       |         |         |         |
23+ 0       3.1089     20.41  q Q       |         |         |         |
23+15       3.0462     19.72  q Q       |         |         |         |
23+30       3.0462     19.18  q Q       |         |         |         |
23+45       3.0462     18.70  q Q       |         |         |         |
24+ 0       3.0462     18.25  q Q       |         |         |         |
24+15       1.6967     16.23  q Q       |         |         |         |
24+30       0.3868     13.69  qQ        |         |         |         |
24+45       0.1254     12.17  qQ        |         |         |         |
25+ 0       0.0000     11.15  qQ        |         |         |         |
25+15       0.0000     10.48  qQ        |         |         |         |
25+30       0.0000      9.92  qQ        |         |         |         |
25+45       0.0000      9.41  qQ        |         |         |         |
26+ 0       0.0000      8.96  qQ        |         |         |         |
26+15       0.0000      8.53  qQ        |         |         |         |
26+30       0.0000      8.12  qQ        |         |         |         |
26+45       0.0000      7.73  Q         |         |         |         |
27+ 0       0.0000      7.37  Q         |         |         |         |
27+15       0.0000      7.02  Q         |         |         |         |
27+30       0.0000      6.69  Q         |         |         |         |
27+45       0.0000      6.37  Q         |         |         |         |
28+ 0       0.0000      6.07  Q         |         |         |         |
28+15       0.0000      5.79  Q         |         |         |         |
28+30       0.0000      5.52  Q         |         |         |         |
28+45       0.0000      5.26  Q         |         |         |         |
29+ 0       0.0000      5.01  Q         |         |         |         |
29+15       0.0000      4.77  Q         |         |         |         |
29+30       0.0000      4.55  Q         |         |         |         |
29+45       0.0000      4.33  Q         |         |         |         |
30+ 0       0.0000      4.13  Q         |         |         |         |
30+15       0.0000      3.94  Q         |         |         |         |
30+30       0.0000      3.75  Q         |         |         |         |
30+45       0.0000      3.57  Q         |         |         |         |
31+ 0       0.0000      3.41  Q         |         |         |         |
```

31+15	0.0000	3.25	Q				
31+30	0.0000	3.09	Q				
31+45	0.0000	2.95	Q				
32+ 0	0.0000	2.81	Q				
32+15	0.0000	2.68	Q				
32+30	0.0000	2.55	Q				
32+45	0.0000	2.43	Q				
33+ 0	0.0000	2.32	Q				
33+15	0.0000	2.21	Q				
33+30	0.0000	2.10	Q				
33+45	0.0000	2.00	Q				
34+ 0	0.0000	1.91	Q				
34+15	0.0000	1.82	Q				
34+30	0.0000	1.73	Q				
34+45	0.0000	1.65	Q				
35+ 0	0.0000	1.57	Q				
35+15	0.0000	1.50	Q				
35+30	0.0000	1.43	Q				
35+45	0.0000	1.36	Q				
36+ 0	0.0000	1.30	Q				
36+15	0.0000	1.24	Q				
36+30	0.0000	1.18	Q				
36+45	0.0000	1.12	Q				
37+ 0	0.0000	1.07	Q				
37+15	0.0000	1.02	Q				
37+30	0.0000	0.97	Q				
37+45	0.0000	0.93	Q				
38+ 0	0.0000	0.88	Q				
38+15	0.0000	0.84	Q				
38+30	0.0000	0.80	Q				
38+45	0.0000	0.76	Q				
39+ 0	0.0000	0.73	Q				
39+15	0.0000	0.69	Q				
39+30	0.0000	0.66	Q				
39+45	0.0000	0.63	Q				
40+ 0	0.0000	0.60	Q				
40+15	0.0000	0.57	Q				
40+30	0.0000	0.54	Q				
40+45	0.0000	0.52	Q				
41+ 0	0.0000	0.49	Q				
41+15	0.0000	0.47	Q				
41+30	0.0000	0.45	Q				
41+45	0.0000	0.43	Q				
42+ 0	0.0000	0.41	Q				
42+15	0.0000	0.39	Q				
42+30	0.0000	0.37	Q				
42+45	0.0000	0.35	Q				
43+ 0	0.0000	0.34	Q				
43+15	0.0000	0.32	Q				
43+30	0.0000	0.31	Q				
43+45	0.0000	0.29	Q				
44+ 0	0.0000	0.28	Q				
44+15	0.0000	0.26	Q				
44+30	0.0000	0.25	Q				
44+45	0.0000	0.24	Q				
45+ 0	0.0000	0.23	Q				
45+15	0.0000	0.22	Q				
45+30	0.0000	0.21	Q				
45+45	0.0000	0.20	Q				
46+ 0	0.0000	0.19	Q				
46+15	0.0000	0.18	Q				
46+30	0.0000	0.17	Q				
46+45	0.0000	0.16	Q				
47+ 0	0.0000	0.16	Q				
47+15	0.0000	0.15	Q				
47+30	0.0000	0.14	Q				
47+45	0.0000	0.13	Q				
48+ 0	0.0000	0.13	Q				
48+15	0.0000	0.12	Q				
48+30	0.0000	0.12	Q				
48+45	0.0000	0.11	Q				

49+ 0	0.0000	0.11	Q				
49+15	0.0000	0.10	Q				
49+30	0.0000	0.10	Q				
49+45	0.0000	0.09	Q				
50+ 0	0.0000	0.09	Q				
50+15	0.0000	0.08	Q				
50+30	0.0000	0.08	Q				
50+45	0.0000	0.08	Q				
51+ 0	0.0000	0.07	Q				
51+15	0.0000	0.07	Q				
51+30	0.0000	0.07	Q				
51+45	0.0000	0.06	Q				
52+ 0	0.0000	0.06	Q				
52+15	0.0000	0.06	Q				
52+30	0.0000	0.05	Q				
52+45	0.0000	0.05	Q				
53+ 0	0.0000	0.05	Q				
53+15	0.0000	0.05	Q				
53+30	0.0000	0.04	Q				
53+45	0.0000	0.04	Q				
54+ 0	0.0000	0.04	Q				
54+15	0.0000	0.04	Q				
54+30	0.0000	0.04	Q				
54+45	0.0000	0.03	Q				
55+ 0	0.0000	0.03	Q				
55+15	0.0000	0.03	Q				
55+30	0.0000	0.03	Q				
55+45	0.0000	0.03	Q				
56+ 0	0.0000	0.03	Q				
56+15	0.0000	0.03	Q				
56+30	0.0000	0.02	Q				
56+45	0.0000	0.02	Q				
57+ 0	0.0000	0.02	Q				
57+15	0.0000	0.02	Q				
57+30	0.0000	0.02	Q				
57+45	0.0000	0.02	Q				
58+ 0	0.0000	0.02	Q				
58+15	0.0000	0.02	Q				
58+30	0.0000	0.02	Q				
58+45	0.0000	0.02	Q				
59+ 0	0.0000	0.02	Q				
59+15	0.0000	0.01	Q				
59+30	0.0000	0.01	Q				
59+45	0.0000	0.01	Q				
60+ 0	0.0000	0.01	Q				
60+15	0.0000	0.01	Q				
60+30	0.0000	0.01	Q				
60+45	0.0000	0.01	Q				
61+ 0	0.0000	0.01	Q				
61+15	0.0000	0.01	Q				
61+30	0.0000	0.01	Q				
61+45	0.0000	0.01	Q				
62+ 0	0.0000	0.01	Q				
62+15	0.0000	0.01	Q				
62+30	0.0000	0.01	Q				
62+45	0.0000	0.01	Q				
63+ 0	0.0000	0.01	Q				
63+15	0.0000	0.01	Q				
63+30	0.0000	0.01	Q				
63+45	0.0000	0.01	Q				
64+ 0	0.0000	0.01	Q				
64+15	0.0000	0.01	Q				
64+30	0.0000	0.01	Q				
64+45	0.0000	0.01	Q				
65+ 0	0.0000	0.00	Q				
65+15	0.0000	0.00	Q				
65+30	0.0000	0.00	Q				
65+45	0.0000	0.00	Q				
66+ 0	0.0000	0.00	Q				
66+15	0.0000	0.00	Q				
66+30	0.0000	0.00	Q				

```
   66+45       0.0000      0.00  Q         |         |         |         |
   67+ 0       0.0000      0.00  Q         |         |         |         |
   67+15       0.0000      0.00  Q         |         |         |         |
   67+30       0.0000      0.00  Q         |         |         |         |
   67+45       0.0000      0.00  Q         |         |         |         |
   68+ 0       0.0000      0.00  Q         |         |         |         |
   68+15       0.0000      0.00  Q         |         |         |         |
   68+30       0.0000      0.00  Q         |         |         |         |
   68+45       0.0000      0.00  Q         |         |         |         |
   69+ 0       0.0000      0.00  Q         |         |         |         |
   69+15       0.0000      0.00  Q         |         |         |         |
   69+30       0.0000      0.00  Q         |         |         |         |
   69+45       0.0000      0.00  Q         |         |         |         |
   70+ 0       0.0000      0.00  Q         |         |         |         |
   70+15       0.0000      0.00  Q         |         |         |         |
   70+30       0.0000      0.00  Q         |         |         |         |
   70+45       0.0000      0.00  Q         |         |         |         |
   71+ 0       0.0000      0.00  Q         |         |         |         |
   71+15       0.0000      0.00  Q         |         |         |         |
   71+30       0.0000      0.00  Q         |         |         |         |
   71+45       0.0000      0.00  Q         |         |         |         |
   72+ 0       0.0000      0.00  Q         |         |         |         |
   72+15       0.0000      0.00  Q         |         |         |         |
   72+30       0.0000      0.00  Q         |         |         |         |
   72+45       0.0000      0.00  Q         |         |         |         |
   73+ 0       0.0000      0.00  Q         |         |         |         |
   73+15       0.0000      0.00  Q         |         |         |         |
   73+30       0.0000      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   294
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      322.029 (CFS)
                       Total volume =     155.625 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        **********************************************************************

        ------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        2.000 to Point/Station        3.000
        **** RETARDING BASIN ROUTING ****
        ______________________________________________________________________

        User entry of depth-outflow-storage data
        ----------------------------------------------------------------
        Total number of inflow hydrograph intervals = 294
        Hydrograph time unit = 15.000 (Min.)
        Initial depth in storage basin =   0.00(Ft.)
        ----------------------------------------------------------------
        ----------------------------------------------------------------
        Initial basin depth =   0.00 (Ft.)
        Initial basin storage =      0.00 (Ac.Ft)
        Initial basin outflow =   0.00 (CFS)
        ----------------------------------------------------------------
        ----------------------------------------------------------------
        Depth vs. Storage and Depth vs. Discharge data:
         Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
             (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
        ----------------------------------------------------------------
           0.000      0.000      0.000      0.000        0.000
           1.000     10.000    100.000      8.967       11.033
           2.000     15.000    250.000     12.417       17.583
           4.000     25.000    300.000     21.901       28.099
        ----------------------------------------------------------------
                       Hydrograph Detention Basin Routing
        ----------------------------------------------------------------
```

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 80.5 161.01 241.52 322.03	Depth (Ft.)
0.250	1.59	0.15	0.015	O	0.00
0.500	4.54	0.70	0.070	O	0.01
0.750	6.75	1.62	0.162	O	0.02
1.000	8.77	2.77	0.277	O	0.03
1.250	9.70	3.98	0.398	O	0.04
1.500	9.60	5.04	0.504	O	0.05
1.750	9.67	5.90	0.590	O	0.06
2.000	10.56	6.69	0.669	OI	0.07
2.250	11.81	7.53	0.753	OI	0.08
2.500	12.57	8.41	0.841	OI	0.08
2.750	13.88	9.31	0.931	OI	0.09
3.000	15.29	10.30	1.030	|O	0.10
3.250	16.15	11.31	1.131	|O	0.11
3.500	16.74	12.27	1.227	|O	0.12
3.750	17.13	13.15	1.315	|O	0.13
4.000	18.27	14.00	1.400	|O	0.14
4.250	19.65	14.93	1.493	|O	0.15
4.500	21.30	15.97	1.597	|OI	0.16
4.750	22.96	17.12	1.712	|OI	0.17
5.000	24.74	18.38	1.838	|OI	0.18
5.250	24.89	19.59	1.959	|OI	0.20
5.500	24.60	20.55	2.055	| O	0.21
5.750	26.07	21.45	2.145	| O	0.21
6.000	27.59	22.46	2.246	| O	0.22
6.250	29.42	23.59	2.359	| O	0.24
6.500	31.16	24.84	2.484	| OI	0.25
6.750	33.00	26.20	2.620	| OI	0.26
7.000	34.82	27.64	2.764	| OI	0.28
7.250	35.92	29.09	2.909	| OI	0.29
7.500	37.51	30.52	3.052	| O	0.31
7.750	39.95	32.06	3.206	| O	0.32
8.000	42.90	33.81	3.381	| OI	0.34
8.250	47.47	35.94	3.594	| OI	0.36
8.500	51.71	38.50	3.850	| O I	0.38
8.750	55.23	41.30	4.130	| OI	0.41
9.000	59.37	44.30	4.430	| OI	0.44
9.250	65.34	47.68	4.768	| O I |	0.48
9.500	75.15	51.90	5.190	| O I|	0.52
9.750	88.28	57.49	5.749	| O I	0.57
10.000	103.82	64.71	6.471	| O | I	0.65
10.250	107.79	72.40	7.240	| O| I	0.72
10.500	94.79	77.81	7.781	| O|I	0.78
10.750	88.01	80.36	8.036	| OI	0.80
11.000	96.80	82.61	8.261	| OI	0.83
11.250	107.51	86.27	8.627	| O I	0.86
11.500	111.79	90.65	9.065	| |O I	0.91
11.750	110.12	94.45	9.445	| |OI	0.94
12.000	106.38	97.04	9.704	| |OI	0.97
12.250	120.02	100.16	10.005	| |O I	1.00
12.500	156.25	118.13	10.604	| | O I|	1.12
12.750	194.77	145.28	11.509	| | O | I	1.30
13.000	226.67	176.25	12.542	| | |O I |	1.51
13.250	264.34	209.02	13.634	| | | O | I	1.73
13.500	310.03	246.01	14.867	| | | O I |	1.97
13.750	322.03	256.05	16.210	| | | |O I	2.24
14.000	289.65	260.94	17.188	| | | |O I |	2.44
14.250	264.83	262.54	17.508	| | | | O |	2.50
14.500	266.36	262.84	17.568	| | | | O |	2.51
14.750	273.23	263.52	17.705	| | | | OI |	2.54
15.000	274.32	264.53	17.906	| | | | OI |	2.58
15.250	269.63	265.26	18.052	| | | | O |	2.61
15.500	261.24	265.28	18.056	| | | |IO |	2.61
15.750	243.91	264.03	17.806	| | | I O |	2.56
16.000	219.04	260.83	17.167	| | | I |O |	2.43
16.250	177.68	254.70	15.939	| | |I |O |	2.19
16.500	122.69	223.17	14.106	| | I | O | |	1.82

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16.750   79.82  165.48     12.183  |      I|       O       |       |     1.44
17.000   57.71  119.72     10.657  |    I  |  O    |       |       |     1.13
17.250   50.30   95.50      9.550  |   I   |O      |       |       |     0.95
17.500   47.21   86.74      8.674  |   I   O       |       |       |     0.87
17.750   45.20   79.15      7.915  |   I  O|       |       |       |     0.79
18.000   43.00   72.59      7.259  |   I  O|       |       |       |     0.73
18.250   40.66   66.83      6.683  |   I O |       |       |       |     0.67
18.500   38.97   61.77      6.177  |  I  O |       |       |       |     0.62
18.750   36.86   57.30      5.730  |  I O  |       |       |       |     0.57
19.000   34.00   53.21      5.321  |  I O  |       |       |       |     0.53
19.250   32.28   49.45      4.945  |  IO   |       |       |       |     0.49
19.500   32.44   46.25      4.625  |  IO   |       |       |       |     0.46
19.750   32.03   43.62      4.362  |  IO   |       |       |       |     0.44
20.000   30.05   41.27      4.127  | I O   |       |       |       |     0.41
20.250   28.78   39.05      3.905  | IO    |       |       |       |     0.39
20.500   28.40   37.09      3.709  | IO    |       |       |       |     0.37
20.750   27.91   35.42      3.542  | IO    |       |       |       |     0.35
21.000   26.60   33.89      3.389  | IO    |       |       |       |     0.34
21.250   25.72   32.44      3.244  | IO    |       |       |       |     0.32
21.500   24.84   31.10      3.110  | IO    |       |       |       |     0.31
21.750   24.25   29.87      2.987  | O     |       |       |       |     0.30
22.000   23.58   28.76      2.876  | O     |       |       |       |     0.29
22.250   23.07   27.74      2.774  | O     |       |       |       |     0.28
22.500   22.47   26.81      2.681  | O     |       |       |       |     0.27
22.750   21.23   25.88      2.588  | O     |       |       |       |     0.26
23.000   20.41   24.93      2.493  | O     |       |       |       |     0.25
23.250   19.72   24.02      2.402  |IO     |       |       |       |     0.24
23.500   19.18   23.17      2.317  |IO     |       |       |       |     0.23
23.750   18.70   22.37      2.237  |IO     |       |       |       |     0.22
24.000   18.25   21.64      2.164  |IO     |       |       |       |     0.22
24.250   16.23   20.82      2.082  |IO     |       |       |       |     0.21
24.500   13.69   19.72      1.972  |O      |       |       |       |     0.20
24.750   12.17   18.45      1.845  |O      |       |       |       |     0.18
25.000   11.15   17.18      1.718  |O      |       |       |       |     0.17
25.250   10.48   15.99      1.599  |O      |       |       |       |     0.16
25.500    9.92   14.90      1.490  IO      |       |       |       |     0.15
25.750    9.41   13.92      1.392  IO      |       |       |       |     0.14
26.000    8.96   13.04      1.304  IO      |       |       |       |     0.13
26.250    8.53   12.23      1.223  IO      |       |       |       |     0.12
26.500    8.12   11.50      1.150  IO      |       |       |       |     0.11
26.750    7.73   10.83      1.083  IO      |       |       |       |     0.11
27.000    7.37   10.22      1.022  IO      |       |       |       |     0.10
27.250    7.02    9.65      0.965  O       |       |       |       |     0.10
27.500    6.69    9.13      0.913  O       |       |       |       |     0.09
27.750    6.37    8.64      0.864  O       |       |       |       |     0.09
28.000    6.07    8.19      0.819  O       |       |       |       |     0.08
28.250    5.79    7.77      0.777  O       |       |       |       |     0.08
28.500    5.52    7.37      0.737  O       |       |       |       |     0.07
28.750    5.26    7.00      0.700  O       |       |       |       |     0.07
29.000    5.01    6.65      0.665  O       |       |       |       |     0.07
29.250    4.77    6.32      0.632  O       |       |       |       |     0.06
29.500    4.55    6.01      0.601  O       |       |       |       |     0.06
29.750    4.33    5.72      0.572  O       |       |       |       |     0.06
30.000    4.13    5.44      0.544  O       |       |       |       |     0.05
30.250    3.94    5.17      0.517  O       |       |       |       |     0.05
30.500    3.75    4.93      0.493  O       |       |       |       |     0.05
30.750    3.57    4.69      0.469  O       |       |       |       |     0.05
31.000    3.41    4.46      0.446  O       |       |       |       |     0.04
31.250    3.25    4.25      0.425  O       |       |       |       |     0.04
31.500    3.09    4.05      0.405  O       |       |       |       |     0.04
31.750    2.95    3.86      0.386  O       |       |       |       |     0.04
32.000    2.81    3.67      0.367  O       |       |       |       |     0.04
32.250    2.68    3.50      0.350  O       |       |       |       |     0.03
32.500    2.55    3.33      0.333  O       |       |       |       |     0.03
32.750    2.43    3.17      0.317  O       |       |       |       |     0.03
33.000    2.32    3.02      0.302  O       |       |       |       |     0.03
33.250    2.21    2.88      0.288  O       |       |       |       |     0.03
33.500    2.10    2.75      0.275  O       |       |       |       |     0.03
33.750    2.00    2.62      0.262  O       |       |       |       |     0.03
34.000    1.91    2.49      0.249  O       |       |       |       |     0.02
34.250    1.82    2.37      0.237  O       |       |       |       |     0.02
```

34.500	1.73	2.26	0.226	O	|	|	|	|	0.02
34.750	1.65	2.16	0.216	O	|	|	|	|	0.02
35.000	1.57	2.05	0.205	O	|	|	|	|	0.02
35.250	1.50	1.96	0.196	O	|	|	|	|	0.02
35.500	1.43	1.87	0.187	O	|	|	|	|	0.02
35.750	1.36	1.78	0.178	O	|	|	|	|	0.02
36.000	1.30	1.69	0.169	O	|	|	|	|	0.02
36.250	1.24	1.61	0.161	O	|	|	|	|	0.02
36.500	1.18	1.54	0.154	O	|	|	|	|	0.02
36.750	1.12	1.47	0.147	O	|	|	|	|	0.01
37.000	1.07	1.40	0.140	O	|	|	|	|	0.01
37.250	1.02	1.33	0.133	O	|	|	|	|	0.01
37.500	0.97	1.27	0.127	O	|	|	|	|	0.01
37.750	0.93	1.21	0.121	O	|	|	|	|	0.01
38.000	0.88	1.15	0.115	O	|	|	|	|	0.01
38.250	0.84	1.10	0.110	O	|	|	|	|	0.01
38.500	0.80	1.05	0.105	O	|	|	|	|	0.01
38.750	0.76	1.00	0.100	O	|	|	|	|	0.01
39.000	0.73	0.95	0.095	O	|	|	|	|	0.01
39.250	0.69	0.90	0.090	O	|	|	|	|	0.01
39.500	0.66	0.86	0.086	O	|	|	|	|	0.01
39.750	0.63	0.82	0.082	O	|	|	|	|	0.01
40.000	0.60	0.78	0.078	O	|	|	|	|	0.01
40.250	0.57	0.75	0.075	O	|	|	|	|	0.01
40.500	0.54	0.71	0.071	O	|	|	|	|	0.01
40.750	0.52	0.68	0.068	O	|	|	|	|	0.01
41.000	0.49	0.65	0.065	O	|	|	|	|	0.01
41.250	0.47	0.62	0.062	O	|	|	|	|	0.01
41.500	0.45	0.59	0.059	O	|	|	|	|	0.01
41.750	0.43	0.56	0.056	O	|	|	|	|	0.01
42.000	0.41	0.53	0.053	O	|	|	|	|	0.01
42.250	0.39	0.51	0.051	O	|	|	|	|	0.01
42.500	0.37	0.48	0.048	O	|	|	|	|	0.00
42.750	0.35	0.46	0.046	O	|	|	|	|	0.00
43.000	0.34	0.44	0.044	O	|	|	|	|	0.00
43.250	0.32	0.42	0.042	O	|	|	|	|	0.00
43.500	0.31	0.40	0.040	O	|	|	|	|	0.00
43.750	0.29	0.38	0.038	O	|	|	|	|	0.00
44.000	0.28	0.36	0.036	O	|	|	|	|	0.00
44.250	0.26	0.34	0.034	O	|	|	|	|	0.00
44.500	0.25	0.33	0.033	O	|	|	|	|	0.00
44.750	0.24	0.31	0.031	O	|	|	|	|	0.00
45.000	0.23	0.30	0.030	O	|	|	|	|	0.00
45.250	0.22	0.28	0.028	O	|	|	|	|	0.00
45.500	0.21	0.27	0.027	O	|	|	|	|	0.00
45.750	0.20	0.26	0.026	O	|	|	|	|	0.00
46.000	0.19	0.25	0.025	O	|	|	|	|	0.00
46.250	0.18	0.23	0.023	O	|	|	|	|	0.00
46.500	0.17	0.22	0.022	O	|	|	|	|	0.00
46.750	0.16	0.21	0.021	O	|	|	|	|	0.00
47.000	0.16	0.20	0.020	O	|	|	|	|	0.00
47.250	0.15	0.19	0.019	O	|	|	|	|	0.00
47.500	0.14	0.18	0.018	O	|	|	|	|	0.00
47.750	0.13	0.18	0.018	O	|	|	|	|	0.00
48.000	0.13	0.17	0.017	O	|	|	|	|	0.00
48.250	0.12	0.16	0.016	O	|	|	|	|	0.00
48.500	0.12	0.15	0.015	O	|	|	|	|	0.00
48.750	0.11	0.14	0.014	O	|	|	|	|	0.00
49.000	0.11	0.14	0.014	O	|	|	|	|	0.00
49.250	0.10	0.13	0.013	O	|	|	|	|	0.00
49.500	0.10	0.13	0.013	O	|	|	|	|	0.00
49.750	0.09	0.12	0.012	O	|	|	|	|	0.00
50.000	0.09	0.11	0.011	O	|	|	|	|	0.00
50.250	0.08	0.11	0.011	O	|	|	|	|	0.00
50.500	0.08	0.10	0.010	O	|	|	|	|	0.00
50.750	0.08	0.10	0.010	O	|	|	|	|	0.00
51.000	0.07	0.09	0.009	O	|	|	|	|	0.00
51.250	0.07	0.09	0.009	O	|	|	|	|	0.00
51.500	0.07	0.09	0.009	O	|	|	|	|	0.00
51.750	0.06	0.08	0.008	O	|	|	|	|	0.00
52.000	0.06	0.08	0.008	O	|	|	|	|	0.00

52.250	0.06	0.07	0.007	O	|	|	|	|	0.00
52.500	0.05	0.07	0.007	O	|	|	|	|	0.00
52.750	0.05	0.07	0.007	O	|	|	|	|	0.00
53.000	0.05	0.06	0.006	O	|	|	|	|	0.00
53.250	0.05	0.06	0.006	O	|	|	|	|	0.00
53.500	0.04	0.06	0.006	O	|	|	|	|	0.00
53.750	0.04	0.06	0.006	O	|	|	|	|	0.00
54.000	0.04	0.05	0.005	O	|	|	|	|	0.00
54.250	0.04	0.05	0.005	O	|	|	|	|	0.00
54.500	0.04	0.05	0.005	O	|	|	|	|	0.00
54.750	0.03	0.05	0.005	O	|	|	|	|	0.00
55.000	0.03	0.04	0.004	O	|	|	|	|	0.00
55.250	0.03	0.04	0.004	O	|	|	|	|	0.00
55.500	0.03	0.04	0.004	O	|	|	|	|	0.00
55.750	0.03	0.04	0.004	O	|	|	|	|	0.00
56.000	0.03	0.04	0.004	O	|	|	|	|	0.00
56.250	0.03	0.03	0.003	O	|	|	|	|	0.00
56.500	0.02	0.03	0.003	O	|	|	|	|	0.00
56.750	0.02	0.03	0.003	O	|	|	|	|	0.00
57.000	0.02	0.03	0.003	O	|	|	|	|	0.00
57.250	0.02	0.03	0.003	O	|	|	|	|	0.00
57.500	0.02	0.03	0.003	O	|	|	|	|	0.00
57.750	0.02	0.03	0.003	O	|	|	|	|	0.00
58.000	0.02	0.02	0.002	O	|	|	|	|	0.00
58.250	0.02	0.02	0.002	O	|	|	|	|	0.00
58.500	0.02	0.02	0.002	O	|	|	|	|	0.00
58.750	0.02	0.02	0.002	O	|	|	|	|	0.00
59.000	0.02	0.02	0.002	O	|	|	|	|	0.00
59.250	0.01	0.02	0.002	O	|	|	|	|	0.00
59.500	0.01	0.02	0.002	O	|	|	|	|	0.00
59.750	0.01	0.02	0.002	O	|	|	|	|	0.00
60.000	0.01	0.02	0.002	O	|	|	|	|	0.00
60.250	0.01	0.02	0.002	O	|	|	|	|	0.00
60.500	0.01	0.02	0.002	O	|	|	|	|	0.00
60.750	0.01	0.01	0.001	O	|	|	|	|	0.00
61.000	0.01	0.01	0.001	O	|	|	|	|	0.00
61.250	0.01	0.01	0.001	O	|	|	|	|	0.00
61.500	0.01	0.01	0.001	O	|	|	|	|	0.00
61.750	0.01	0.01	0.001	O	|	|	|	|	0.00
62.000	0.01	0.01	0.001	O	|	|	|	|	0.00
62.250	0.01	0.01	0.001	O	|	|	|	|	0.00
62.500	0.01	0.01	0.001	O	|	|	|	|	0.00
62.750	0.01	0.01	0.001	O	|	|	|	|	0.00
63.000	0.01	0.01	0.001	O	|	|	|	|	0.00
63.250	0.01	0.01	0.001	O	|	|	|	|	0.00
63.500	0.01	0.01	0.001	O	|	|	|	|	0.00
63.750	0.01	0.01	0.001	O	|	|	|	|	0.00
64.000	0.01	0.01	0.001	O	|	|	|	|	0.00
64.250	0.01	0.01	0.001	O	|	|	|	|	0.00
64.500	0.01	0.01	0.001	O	|	|	|	|	0.00
64.750	0.01	0.01	0.001	O	|	|	|	|	0.00
65.000	0.00	0.01	0.001	O	|	|	|	|	0.00
65.250	0.00	0.01	0.001	O	|	|	|	|	0.00
65.500	0.00	0.01	0.001	O	|	|	|	|	0.00
65.750	0.00	0.01	0.001	O	|	|	|	|	0.00
66.000	0.00	0.01	0.001	O	|	|	|	|	0.00
66.250	0.00	0.00	0.000	O	|	|	|	|	0.00
66.500	0.00	0.00	0.000	O	|	|	|	|	0.00
66.750	0.00	0.00	0.000	O	|	|	|	|	0.00
67.000	0.00	0.00	0.000	O	|	|	|	|	0.00
67.250	0.00	0.00	0.000	O	|	|	|	|	0.00
67.500	0.00	0.00	0.000	O	|	|	|	|	0.00
67.750	0.00	0.00	0.000	O	|	|	|	|	0.00
68.000	0.00	0.00	0.000	O	|	|	|	|	0.00
68.250	0.00	0.00	0.000	O	|	|	|	|	0.00
68.500	0.00	0.00	0.000	O	|	|	|	|	0.00
68.750	0.00	0.00	0.000	O	|	|	|	|	0.00
69.000	0.00	0.00	0.000	O	|	|	|	|	0.00
69.250	0.00	0.00	0.000	O	|	|	|	|	0.00
69.500	0.00	0.00	0.000	O	|	|	|	|	0.00
69.750	0.00	0.00	0.000	O	|	|	|	|	0.00

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70.000    0.00    0.00      0.000  O       |       |       |       |     0.00
70.250    0.00    0.00      0.000  O       |       |       |       |     0.00
70.500    0.00    0.00      0.000  O       |       |       |       |     0.00
70.750    0.00    0.00      0.000  O       |       |       |       |     0.00
71.000    0.00    0.00      0.000  O       |       |       |       |     0.00
71.250    0.00    0.00      0.000  O       |       |       |       |     0.00
71.500    0.00    0.00      0.000  O       |       |       |       |     0.00
71.750    0.00    0.00      0.000  O       |       |       |       |     0.00
72.000    0.00    0.00      0.000  O       |       |       |       |     0.00
72.250    0.00    0.00      0.000  O       |       |       |       |     0.00
72.500    0.00    0.00      0.000  O       |       |       |       |     0.00
72.750    0.00    0.00      0.000  O       |       |       |       |     0.00
73.000    0.00    0.00      0.000  O       |       |       |       |     0.00
73.250    0.00    0.00      0.000  O       |       |       |       |     0.00
73.500    0.00    0.00      0.000  O       |       |       |       |     0.00
73.750    0.00    0.00      0.000  O       |       |       |       |     0.00

****************************HYDROGRAPH DATA****************************
               Number of intervals =   295
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      265.279 (CFS)
               Total volume =     155.625 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        3.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file LineD24hr.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
***********************************************************************

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/30/12

      ---------------------------------------------------------------------


      Watershed D, Basin D1
      Proposed Condition
      100-year, 24-hour

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubD124100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    97
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       90.608 (CFS)
                    Total volume =      48.656 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 97
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000     15.000     35.000     14.638       15.362
         4.000     20.000    100.000     18.967       21.033
         6.000     29.500    175.000     27.692       31.308
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      22.7   45.30   67.96   90.61 (Ft.)
 0.250    3.02    0.07      0.031  OI      |       |       |       |     2.00
```

0.500	5.59	0.27	0.116	OI	2.01
0.750	6.12	0.53	0.229	O I	2.02
1.000	7.63	0.83	0.357	O I	2.02
1.250	6.65	1.13	0.484	O I	2.03
1.500	6.12	1.37	0.590	O I	2.04
1.750	6.12	1.60	0.686	O I	2.05
2.000	7.63	1.85	0.793	O I	2.05
2.250	8.16	2.13	0.915	O I	2.06
2.500	8.16	2.42	1.037	O I	2.07
2.750	9.67	2.72	1.168	O I	2.08
3.000	10.20	3.06	1.313	O I	2.09
3.250	10.20	3.40	1.457	O I	2.10
3.500	10.20	3.72	1.595	O I	2.11
3.750	10.20	4.02	1.726	O I	2.11
4.000	11.71	4.35	1.866	O I	2.12
4.250	12.24	4.71	2.019	O I	2.13
4.500	13.76	5.10	2.187	O I	2.15
4.750	14.28	5.52	2.367	O I	2.16
5.000	15.80	5.97	2.559	O I	2.17
5.250	13.30	6.37	2.732	O I	2.18
5.500	13.76	6.71	2.876	O I	2.19
5.750	15.80	7.09	3.039	O I	2.20
6.000	16.33	7.51	3.220	O I	2.21
6.250	17.84	7.96	3.413	O I	2.23
6.500	18.37	8.44	3.618	O I	2.24
6.750	19.88	8.94	3.833	O I	2.26
7.000	20.41	9.47	4.059	O I	2.27
7.250	20.41	9.98	4.280	O I	2.29
7.500	21.92	10.51	4.505	O I	2.30
7.750	23.96	11.10	4.756	O I	2.32
8.000	26.00	11.75	5.036	O I	2.34
8.250	30.72	12.53	5.371	O I	2.36
8.500	32.30	13.42	5.754	O I	2.38
8.750	34.62	14.37	6.159	O I	2.41
9.000	37.70	15.39	6.598	O I	2.44
9.250	42.93	16.57	7.101	O I	2.47
9.500	46.75	17.90	7.671	O I	2.51
9.750	49.82	19.33	8.285	O I	2.55
10.000	52.89	20.84	8.931	O I	2.60
10.250	38.68	22.01	9.434	O I	2.63
10.500	33.54	22.68	9.719	O I	2.65
10.750	44.49	23.44	10.048	O I	2.67
11.000	48.41	24.53	10.512	O I	2.70
11.250	46.40	25.60	10.974	O I	2.73
11.500	45.79	26.57	11.387	O I	2.76
11.750	41.61	27.38	11.733	O I	2.78
12.000	42.40	28.06	12.028	O I	2.80
12.250	58.41	29.12	12.479	O I	2.83
12.500	66.00	30.67	13.146	O I	2.88
12.750	71.21	32.46	13.911	O I	2.93
13.000	75.01	34.37	14.732	O I	2.98
13.250	86.70	42.86	15.604	O I	3.12
13.500	90.61	53.70	16.438	O I	3.29
13.750	66.98	59.64	16.896	O I	3.38
14.000	58.80	60.41	16.955	O I	3.39
14.250	67.56	61.07	17.005	O I	3.40
14.500	68.55	62.72	17.132	O I	3.43
14.750	67.91	64.03	17.233	O I	3.45
15.000	65.88	64.71	17.285	O I	3.46
15.250	63.08	64.65	17.281	O I	3.46
15.500	60.28	63.95	17.227	O I	3.45
15.750	51.00	61.98	17.075	O I	3.42
16.000	48.09	59.04	16.849	O I	3.37
16.250	18.52	52.94	16.380	O I	3.28
16.500	8.16	43.57	15.659	O I	3.13
16.750	6.65	35.00	15.000	O I	3.00
17.000	6.12	33.65	14.423	O I	2.96
17.250	9.15	32.43	13.898	O I	2.93
17.500	10.20	31.36	13.439	O I	2.90
17.750	10.20	30.36	13.012	O I	2.87
18.000	8.69	29.38	12.590	O I	2.84

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18.250    8.16   28.39     12.168  | I     | O     |       |       |     2.81
18.500    8.16   27.44     11.760  | I     |O      |       |       |     2.78
18.750    6.65   26.50     11.355  | I     |O      |       |       |     2.76
19.000    4.61   25.51     10.935  |I      |O      |       |       |     2.73
19.250    5.59   24.55     10.523  |I      O       |       |       |     2.70
19.500    7.63   23.71     10.161  | I     O       |       |       |     2.68
19.750    6.65   22.93      9.827  | I     O       |       |       |     2.66
20.000    4.61   22.11      9.478  |I     O|       |       |       |     2.63
20.250    5.59   21.31      9.134  |I     O|       |       |       |     2.61
20.500    6.12   20.58      8.823  | I    O|       |       |       |     2.59
20.750    6.12   19.90      8.531  | I    O|       |       |       |     2.57
21.000    4.61   19.22      8.238  |I    O |       |       |       |     2.55
21.250    5.59   18.55      7.953  |I    O |       |       |       |     2.53
21.500    4.61   17.92      7.681  |I    O |       |       |       |     2.51
21.750    5.59   17.32      7.423  |I    O |       |       |       |     2.49
22.000    4.61   16.74      7.176  |I   O  |       |       |       |     2.48
22.250    5.59   16.19      6.941  |I   O  |       |       |       |     2.46
22.500    4.61   15.67      6.718  |I   O  |       |       |       |     2.45
22.750    4.08   15.14      6.489  |I   O  |       |       |       |     2.43
23.000    4.08   14.62      6.266  |I   O  |       |       |       |     2.42
23.250    4.08   14.12      6.053  |I  O   |       |       |       |     2.40
23.500    4.08   13.65      5.851  |I  O   |       |       |       |     2.39
23.750    4.08   13.20      5.658  |I  O   |       |       |       |     2.38
24.000    4.08   12.77      5.474  |I  O   |       |       |       |     2.36
24.250    1.06   12.29      5.268  I   O   |       |       |       |     2.35
24.500    0.00   11.74      5.031  I   O   |       |       |       |     2.34
24.750    0.00   11.18      4.794  I  O    |       |       |       |     2.32
25.000    0.00   10.66      4.568  I  O    |       |       |       |     2.30
25.250    0.00   10.16      4.353  I  O    |       |       |       |     2.29
25.500    0.00    9.68      4.149  I  O    |       |       |       |     2.28
25.750    0.00    9.22      3.953  I  O    |       |       |       |     2.26
26.000    0.00    8.79      3.767  I  O    |       |       |       |     2.25
26.250    0.00    8.37      3.590  I O     |       |       |       |     2.24
26.500    0.00    7.98      3.421  I O     |       |       |       |     2.23
26.750    0.00    7.60      3.260  I O     |       |       |       |     2.22
27.000    0.00    7.25      3.107  I O     |       |       |       |     2.21
27.250    0.00    6.90      2.960  I O     |       |       |       |     2.20
27.500    0.00    6.58      2.821  I O     |       |       |       |     2.19
27.750    0.00    6.27      2.688  I O     |       |       |       |     2.18
28.000    0.00    5.97      2.562  I O     |       |       |       |     2.17
28.250    0.00    5.69      2.441  I O     |       |       |       |     2.16
28.500    0.00    5.43      2.326  IO      |       |       |       |     2.15
28.750    0.00    5.17      2.217  IO      |       |       |       |     2.15
29.000    0.00    4.93      2.113  IO      |       |       |       |     2.14
29.250    0.00    4.69      2.013  IO      |       |       |       |     2.13
29.500    0.00    4.47      1.919  IO      |       |       |       |     2.13
29.750    0.00    4.26      1.828  IO      |       |       |       |     2.12
30.000    0.00    4.06      1.742  IO      |       |       |       |     2.12
30.250    0.00    3.87      1.660  IO      |       |       |       |     2.11
30.500    0.00    3.69      1.582  IO      |       |       |       |     2.11
30.750    0.00    3.52      1.508  IO      |       |       |       |     2.10
31.000    0.00    3.35      1.437  IO      |       |       |       |     2.10
31.250    0.00    3.19      1.369  IO      |       |       |       |     2.09
31.500    0.00    3.04      1.305  IO      |       |       |       |     2.09
31.750    0.00    2.90      1.244  IO      |       |       |       |     2.08
32.000    0.00    2.76      1.185  O       |       |       |       |     2.08
32.250    0.00    2.63      1.129  O       |       |       |       |     2.08
32.500    0.00    2.51      1.076  O       |       |       |       |     2.07
32.750    0.00    2.39      1.026  O       |       |       |       |     2.07
33.000    0.00    2.28      0.978  O       |       |       |       |     2.07
33.250    0.00    2.17      0.932  O       |       |       |       |     2.06
33.500    0.00    2.07      0.888  O       |       |       |       |     2.06
33.750    0.00    1.97      0.846  O       |       |       |       |     2.06
34.000    0.00    1.88      0.806  O       |       |       |       |     2.05
34.250    0.00    1.79      0.768  O       |       |       |       |     2.05
34.500    0.00    1.71      0.732  O       |       |       |       |     2.05
34.750    0.00    1.62      0.698  O       |       |       |       |     2.05
35.000    0.00    1.55      0.665  O       |       |       |       |     2.04
35.250    0.00    1.48      0.634  O       |       |       |       |     2.04
35.500    0.00    1.41      0.604  O       |       |       |       |     2.04
35.750    0.00    1.34      0.576  O       |       |       |       |     2.04
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36.000	0.00	1.28	0.549	O	|	|	|	|	2.04
36.250	0.00	1.22	0.523	O	|	|	|	|	2.03
36.500	0.00	1.16	0.498	O	|	|	|	|	2.03
36.750	0.00	1.10	0.475	O	|	|	|	|	2.03
37.000	0.00	1.05	0.453	O	|	|	|	|	2.03
37.250	0.00	1.00	0.431	O	|	|	|	|	2.03
37.500	0.00	0.96	0.411	O	|	|	|	|	2.03
37.750	0.00	0.91	0.392	O	|	|	|	|	2.03
38.000	0.00	0.87	0.374	O	|	|	|	|	2.02
38.250	0.00	0.83	0.356	O	|	|	|	|	2.02
38.500	0.00	0.79	0.339	O	|	|	|	|	2.02
38.750	0.00	0.75	0.323	O	|	|	|	|	2.02
39.000	0.00	0.72	0.308	O	|	|	|	|	2.02
39.250	0.00	0.68	0.294	O	|	|	|	|	2.02
39.500	0.00	0.65	0.280	O	|	|	|	|	2.02
39.750	0.00	0.62	0.267	O	|	|	|	|	2.02
40.000	0.00	0.59	0.255	O	|	|	|	|	2.02
40.250	0.00	0.56	0.243	O	|	|	|	|	2.02
40.500	0.00	0.54	0.231	O	|	|	|	|	2.02
40.750	0.00	0.51	0.220	O	|	|	|	|	2.01
41.000	0.00	0.49	0.210	O	|	|	|	|	2.01
41.250	0.00	0.46	0.200	O	|	|	|	|	2.01
41.500	0.00	0.44	0.191	O	|	|	|	|	2.01
41.750	0.00	0.42	0.182	O	|	|	|	|	2.01
42.000	0.00	0.40	0.174	O	|	|	|	|	2.01
42.250	0.00	0.38	0.165	O	|	|	|	|	2.01
42.500	0.00	0.36	0.158	O	|	|	|	|	2.01
42.750	0.00	0.35	0.150	O	|	|	|	|	2.01
43.000	0.00	0.33	0.143	O	|	|	|	|	2.01
43.250	0.00	0.32	0.137	O	|	|	|	|	2.01
43.500	0.00	0.30	0.130	O	|	|	|	|	2.01
43.750	0.00	0.29	0.124	O	|	|	|	|	2.01
44.000	0.00	0.27	0.119	O	|	|	|	|	2.01
44.250	0.00	0.26	0.113	O	|	|	|	|	2.01
44.500	0.00	0.25	0.108	O	|	|	|	|	2.01
44.750	0.00	0.24	0.103	O	|	|	|	|	2.01
45.000	0.00	0.22	0.098	O	|	|	|	|	2.01
45.250	0.00	0.21	0.093	O	|	|	|	|	2.01
45.500	0.00	0.20	0.089	O	|	|	|	|	2.01
45.750	0.00	0.19	0.085	O	|	|	|	|	2.01
46.000	0.00	0.19	0.081	O	|	|	|	|	2.01
46.250	0.00	0.18	0.077	O	|	|	|	|	2.01
46.500	0.00	0.17	0.074	O	|	|	|	|	2.00
46.750	0.00	0.16	0.070	O	|	|	|	|	2.00
47.000	0.00	0.15	0.067	O	|	|	|	|	2.00
47.250	0.00	0.15	0.064	O	|	|	|	|	2.00
47.500	0.00	0.14	0.061	O	|	|	|	|	2.00
47.750	0.00	0.13	0.058	O	|	|	|	|	2.00
48.000	0.00	0.13	0.056	O	|	|	|	|	2.00
48.250	0.00	0.12	0.053	O	|	|	|	|	2.00
48.500	0.00	0.11	0.051	O	|	|	|	|	2.00
48.750	0.00	0.11	0.048	O	|	|	|	|	2.00
49.000	0.00	0.10	0.046	O	|	|	|	|	2.00
49.250	0.00	0.10	0.044	O	|	|	|	|	2.00
49.500	0.00	0.09	0.042	O	|	|	|	|	2.00
49.750	0.00	0.09	0.040	O	|	|	|	|	2.00
50.000	0.00	0.09	0.038	O	|	|	|	|	2.00
50.250	0.00	0.08	0.037	O	|	|	|	|	2.00
50.500	0.00	0.08	0.035	O	|	|	|	|	2.00
50.750	0.00	0.07	0.033	O	|	|	|	|	2.00
51.000	0.00	0.07	0.032	O	|	|	|	|	2.00
51.250	0.00	0.07	0.030	O	|	|	|	|	2.00
51.500	0.00	0.06	0.029	O	|	|	|	|	2.00
51.750	0.00	0.06	0.028	O	|	|	|	|	2.00
52.000	0.00	0.06	0.027	O	|	|	|	|	2.00
52.250	0.00	0.06	0.025	O	|	|	|	|	2.00
52.500	0.00	0.05	0.024	O	|	|	|	|	2.00
52.750	0.00	0.05	0.023	O	|	|	|	|	2.00
53.000	0.00	0.05	0.022	O	|	|	|	|	2.00
53.250	0.00	0.05	0.021	O	|	|	|	|	2.00
53.500	0.00	0.04	0.020	O	|	|	|	|	2.00

53.750	0.00	0.04	0.019	O	|	|	|	|	2.00
54.000	0.00	0.04	0.019	O	|	|	|	|	2.00
54.250	0.00	0.04	0.018	O	|	|	|	|	2.00
54.500	0.00	0.04	0.017	O	|	|	|	|	2.00
54.750	0.00	0.03	0.016	O	|	|	|	|	2.00
55.000	0.00	0.03	0.016	O	|	|	|	|	2.00
55.250	0.00	0.03	0.015	O	|	|	|	|	2.00
55.500	0.00	0.03	0.014	O	|	|	|	|	2.00
55.750	0.00	0.03	0.014	O	|	|	|	|	2.00
56.000	0.00	0.03	0.013	O	|	|	|	|	2.00
56.250	0.00	0.03	0.013	O	|	|	|	|	2.00
56.500	0.00	0.02	0.012	O	|	|	|	|	2.00
56.750	0.00	0.02	0.012	O	|	|	|	|	2.00
57.000	0.00	0.02	0.011	O	|	|	|	|	2.00
57.250	0.00	0.02	0.011	O	|	|	|	|	2.00
57.500	0.00	0.02	0.010	O	|	|	|	|	2.00
57.750	0.00	0.02	0.010	O	|	|	|	|	2.00
58.000	0.00	0.02	0.009	O	|	|	|	|	2.00
58.250	0.00	0.02	0.009	O	|	|	|	|	2.00
58.500	0.00	0.02	0.009	O	|	|	|	|	2.00
58.750	0.00	0.02	0.008	O	|	|	|	|	2.00
59.000	0.00	0.02	0.008	O	|	|	|	|	2.00
59.250	0.00	0.01	0.008	O	|	|	|	|	2.00
59.500	0.00	0.01	0.007	O	|	|	|	|	2.00
59.750	0.00	0.01	0.007	O	|	|	|	|	2.00
60.000	0.00	0.01	0.007	O	|	|	|	|	2.00
60.250	0.00	0.01	0.007	O	|	|	|	|	2.00
60.500	0.00	0.01	0.006	O	|	|	|	|	2.00
60.750	0.00	0.01	0.006	O	|	|	|	|	2.00
61.000	0.00	0.01	0.006	O	|	|	|	|	2.00
61.250	0.00	0.01	0.006	O	|	|	|	|	2.00
61.500	0.00	0.01	0.006	O	|	|	|	|	2.00
61.750	0.00	0.01	0.005	O	|	|	|	|	2.00
62.000	0.00	0.01	0.005	O	|	|	|	|	2.00
62.250	0.00	0.01	0.005	O	|	|	|	|	2.00
62.500	0.00	0.01	0.005	O	|	|	|	|	2.00
62.750	0.00	0.01	0.005	O	|	|	|	|	2.00
63.000	0.00	0.01	0.005	O	|	|	|	|	2.00
63.250	0.00	0.01	0.004	O	|	|	|	|	2.00
63.500	0.00	0.01	0.004	O	|	|	|	|	2.00
63.750	0.00	0.01	0.004	O	|	|	|	|	2.00
64.000	0.00	0.01	0.004	O	|	|	|	|	2.00
64.250	0.00	0.01	0.004	O	|	|	|	|	2.00
64.500	0.00	0.01	0.004	O	|	|	|	|	2.00
64.750	0.00	0.00	0.004	O	|	|	|	|	2.00
65.000	0.00	0.00	0.004	O	|	|	|	|	2.00
65.250	0.00	0.00	0.004	O	|	|	|	|	2.00
65.500	0.00	0.00	0.003	O	|	|	|	|	2.00
65.750	0.00	0.00	0.003	O	|	|	|	|	2.00
66.000	0.00	0.00	0.003	O	|	|	|	|	2.00
66.250	0.00	0.00	0.003	O	|	|	|	|	2.00
66.500	0.00	0.00	0.003	O	|	|	|	|	2.00
66.750	0.00	0.00	0.003	O	|	|	|	|	2.00
67.000	0.00	0.00	0.003	O	|	|	|	|	2.00
67.250	0.00	0.00	0.003	O	|	|	|	|	2.00
67.500	0.00	0.00	0.003	O	|	|	|	|	2.00
67.750	0.00	0.00	0.003	O	|	|	|	|	2.00
68.000	0.00	0.00	0.003	O	|	|	|	|	2.00
68.250	0.00	0.00	0.003	O	|	|	|	|	2.00
68.500	0.00	0.00	0.003	O	|	|	|	|	2.00
68.750	0.00	0.00	0.003	O	|	|	|	|	2.00
69.000	0.00	0.00	0.003	O	|	|	|	|	2.00
69.250	0.00	0.00	0.002	O	|	|	|	|	2.00
69.500	0.00	0.00	0.002	O	|	|	|	|	2.00
69.750	0.00	0.00	0.002	O	|	|	|	|	2.00
70.000	0.00	0.00	0.002	O	|	|	|	|	2.00
70.250	0.00	0.00	0.002	O	|	|	|	|	2.00
70.500	0.00	0.00	0.002	O	|	|	|	|	2.00
70.750	0.00	0.00	0.002	O	|	|	|	|	2.00
71.000	0.00	0.00	0.002	O	|	|	|	|	2.00
71.250	0.00	0.00	0.002	O	|	|	|	|	2.00

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71.500    0.00    0.00      0.002  O       |       |       |       |     2.00
71.750    0.00    0.00      0.002  O       |       |       |       |     2.00
72.000    0.00    0.00      0.002  O       |       |       |       |     2.00
72.250    0.00    0.00      0.002  O       |       |       |       |     2.00
72.500    0.00    0.00      0.002  O       |       |       |       |     2.00
72.750    0.00    0.00      0.002  O       |       |       |       |     2.00
73.000    0.00    0.00      0.002  O       |       |       |       |     2.00
73.250    0.00    0.00      0.002  O       |       |       |       |     1.99

       Remaining water in basin =    0.00 (Ac.Ft)

       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   293
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       64.706 (CFS)
                      Total volume =      48.655 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *********************************************************************

       -------------------------------------------------------------------


       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        1.000 to Point/Station        2.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ____________________________________________________________________
       Current stream hydrograph saved in file SubD1Bsn.rte
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *********************************************************************

       -------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 05/07/12

      ---------------------------------------------------------------------


      Watershed D, Basin D3
      Proposed Condition
      100 Yr. 24 Hr.

      ---------------------------------------------------------------------


      Program License Serial Number 6097

      ---------------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubD324100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    97
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       59.389 (CFS)
                    Total volume =      31.892 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ---------------------------------------------------------------------
      Total number of inflow hydrograph intervals = 97
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ---------------------------------------------------------------------
      ---------------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ---------------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000     10.000     50.000      9.483       10.517
         4.000     20.000    150.000     18.450       21.550
         6.000     28.800    300.000     25.701       31.899
      ---------------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      14.8   29.69   44.54   59.39 (Ft.)
 0.250    1.95    0.09      0.019  OI      |       |       |       |     2.00
```

```
 0.500    3.65    0.35      0.073  OI      |       |       |       |     2.01
 0.750    4.01    0.70      0.141  O I     |       |       |       |     2.01
 1.000    4.99    1.07      0.216  O I     |       |       |       |     2.02
 1.250    4.37    1.42      0.287  O I     |       |       |       |     2.03
 1.500    4.01    1.70      0.341  O I     |       |       |       |     2.03
 1.750    4.01    1.92      0.387  |OI     |       |       |       |     2.04
 2.000    4.99    2.18      0.437  |OI     |       |       |       |     2.04
 2.250    5.35    2.47      0.496  |OI     |       |       |       |     2.05
 2.500    5.35    2.75      0.553  |OI     |       |       |       |     2.06
 2.750    6.33    3.06      0.613  |O I    |       |       |       |     2.06
 3.000    6.69    3.40      0.681  |O I    |       |       |       |     2.07
 3.250    6.69    3.72      0.746  | OI    |       |       |       |     2.07
 3.500    6.69    4.01      0.804  | OI    |       |       |       |     2.08
 3.750    6.69    4.27      0.856  | OI    |       |       |       |     2.09
 4.000    7.66    4.56      0.913  | O I   |       |       |       |     2.09
 4.250    8.03    4.88      0.978  | O I   |       |       |       |     2.10
 4.500    9.00    5.24      1.049  | O I   |       |       |       |     2.10
 4.750    9.36    5.63      1.127  |  O I  |       |       |       |     2.11
 5.000   10.34    6.04      1.210  |  O I  |       |       |       |     2.12
 5.250    8.75    6.39      1.279  |  OI   |       |       |       |     2.13
 5.500    9.00    6.63      1.328  |  OI   |       |       |       |     2.13
 5.750   10.34    6.93      1.387  |  O I  |       |       |       |     2.14
 6.000   10.70    7.28      1.458  |  O I  |       |       |       |     2.15
 6.250   11.68    7.67      1.535  |   O I |       |       |       |     2.15
 6.500   12.04    8.08      1.617  |   O I |       |       |       |     2.16
 6.750   13.01    8.51      1.704  |   O  I|       |       |       |     2.17
 7.000   13.38    8.97      1.796  |   O  I|       |       |       |     2.18
 7.250   13.38    9.41      1.883  |    O I|       |       |       |     2.19
 7.500   14.35    9.84      1.970  |    O I|       |       |       |     2.20
 7.750   15.69   10.35      2.072  |    O  I       |       |       |     2.21
 8.000   17.03   10.94      2.190  |    O  |I      |       |       |     2.22
 8.250   20.09   11.69      2.340  |     O | I     |       |       |     2.23
 8.500   21.17   12.57      2.515  |     O |  I    |       |       |     2.25
 8.750   22.67   13.49      2.699  |      O|   I   |       |       |     2.27
 9.000   24.69   14.49      2.899  |      O|    I  |       |       |     2.29
 9.250   28.09   15.66      3.133  |       O      I|       |       |     2.31
 9.500   30.62   17.00      3.402  |       |O      I       |       |     2.34
 9.750   32.63   18.44      3.689  |       |O      |I      |       |     2.37
10.000   34.65   19.93      3.988  |       | O     | I     |       |     2.40
10.250   25.51   20.93      4.187  |       |  O I  |       |       |     2.42
10.500   21.98   21.21      4.243  |       |  O    |       |       |     2.42
10.750   29.05   21.63      4.327  |       |  O   I|       |       |     2.43
11.000   31.73   22.49      4.499  |       |   O   |I      |       |     2.45
11.250   30.43   23.34      4.668  |       |   O   I       |       |     2.47
11.500   30.01   24.01      4.803  |       |   O   I       |       |     2.48
11.750   27.32   24.47      4.895  |       |    OI |       |       |     2.49
12.000   27.77   24.77      4.955  |       |    OI |       |       |     2.50
12.250   38.13   25.57      5.116  |       |    O  |   I   |       |     2.51
12.500   43.24   27.06      5.413  |       |     O |      I|       |     2.54
12.750   46.63   28.82      5.764  |       |      O|       |I      |     2.58
13.000   49.14   30.69      6.138  |       |       O       | I     |     2.61
13.250   56.72   32.87      6.575  |       |       |O      |     I |     2.66
13.500   59.39   35.35      7.070  |       |       |  O    |      I|     2.71
13.750   44.15   36.96      7.393  |       |       |  O   I|       |     2.74
14.000   38.54   37.39      7.479  |       |       |   O   |       |     2.75
14.250   44.19   37.78      7.557  |       |       |   O  I|       |     2.76
14.500   44.95   38.45      7.690  |       |       |   O   I       |     2.77
14.750   44.51   39.07      7.814  |       |       |    O I|       |     2.78
15.000   43.20   39.54      7.908  |       |       |    O I|       |     2.79
15.250   41.37   39.81      7.962  |       |       |    OI |       |     2.80
15.500   39.53   39.87      7.974  |       |       |    O  |       |     2.80
15.750   33.52   39.54      7.909  |       |       | I  O  |       |     2.79
16.000   31.52   38.85      7.771  |       |       I   O   |       |     2.78
16.250   12.44   37.19      7.439  |     I |       |   O   |       |     2.74
16.500    5.35   34.41      6.883  | I     |       | O     |       |     2.69
16.750    4.37   31.51      6.303  | I     |       O       |       |     2.63
17.000    4.01   28.83      5.766  | I     |      O|       |       |     2.58
17.250    5.96   26.48      5.298  |  I    |     O |       |       |     2.53
17.500    6.69   24.50      4.902  |  I    |    O  |       |       |     2.49
17.750    6.69   22.75      4.552  |  I    |   O   |       |       |     2.46
18.000    5.71   21.13      4.227  |  I    |  O    |       |       |     2.42
```

18.250	5.35	19.60	3.920	| I | O	|	|	|	2.39
18.500	5.35	18.20	3.640	| I |O	|	|	|	2.36
18.750	4.37	16.89	3.378	| I |O	|	|	|	2.34
19.000	3.04	15.59	3.119	|I O	|	|	|	2.31
19.250	3.65	14.39	2.879	|I O|	|	|	|	2.29
19.500	4.99	13.40	2.681	| I O|	|	|	|	2.27
19.750	4.37	12.54	2.510	| I O |	|	|	|	2.25
20.000	3.04	11.67	2.336	|I O |	|	|	|	2.23
20.250	3.65	10.86	2.172	|I O |	|	|	|	2.22
20.500	4.01	10.17	2.034	| I O |	|	|	|	2.20
20.750	4.01	9.56	1.914	| I O |	|	|	|	2.19
21.000	3.04	8.97	1.795	|I O |	|	|	|	2.18
21.250	3.65	8.42	1.685	|I O |	|	|	|	2.17
21.500	3.04	7.92	1.585	|I O |	|	|	|	2.16
21.750	3.65	7.47	1.495	|I O |	|	|	|	2.15
22.000	3.04	7.06	1.414	|I O |	|	|	|	2.14
22.250	3.65	6.70	1.341	|I O |	|	|	|	2.13
22.500	3.04	6.37	1.275	|I O |	|	|	|	2.13
22.750	2.68	6.02	1.206	|I O |	|	|	|	2.12
23.000	2.68	5.69	1.140	|I O |	|	|	|	2.11
23.250	2.68	5.40	1.081	|IO |	|	|	|	2.11
23.500	2.68	5.13	1.028	|IO |	|	|	|	2.10
23.750	2.68	4.89	0.979	|IO |	|	|	|	2.10
24.000	2.68	4.67	0.936	|IO |	|	|	|	2.09
24.250	0.72	4.38	0.877	I O |	|	|	|	2.09
24.500	0.00	3.98	0.799	I O |	|	|	|	2.08
24.750	0.00	3.59	0.720	IO |	|	|	|	2.07
25.000	0.00	3.24	0.650	IO |	|	|	|	2.06
25.250	0.00	2.92	0.586	IO |	|	|	|	2.06
25.500	0.00	2.63	0.529	IO |	|	|	|	2.05
25.750	0.00	2.38	0.477	IO |	|	|	|	2.05
26.000	0.00	2.14	0.430	IO |	|	|	|	2.04
26.250	0.00	1.93	0.388	IO |	|	|	|	2.04
26.500	0.00	1.74	0.350	O |	|	|	|	2.03
26.750	0.00	1.57	0.316	O |	|	|	|	2.03
27.000	0.00	1.42	0.285	O |	|	|	|	2.03
27.250	0.00	1.28	0.257	O |	|	|	|	2.03
27.500	0.00	1.15	0.232	O |	|	|	|	2.02
27.750	0.00	1.04	0.210	O |	|	|	|	2.02
28.000	0.00	0.94	0.189	O |	|	|	|	2.02
28.250	0.00	0.84	0.171	O |	|	|	|	2.02
28.500	0.00	0.76	0.154	O |	|	|	|	2.02
28.750	0.00	0.69	0.139	O |	|	|	|	2.01
29.000	0.00	0.62	0.126	O |	|	|	|	2.01
29.250	0.00	0.56	0.113	O |	|	|	|	2.01
29.500	0.00	0.50	0.103	O |	|	|	|	2.01
29.750	0.00	0.45	0.093	O |	|	|	|	2.01
30.000	0.00	0.41	0.084	O |	|	|	|	2.01
30.250	0.00	0.37	0.076	O |	|	|	|	2.01
30.500	0.00	0.33	0.068	O |	|	|	|	2.01
30.750	0.00	0.30	0.062	O |	|	|	|	2.01
31.000	0.00	0.27	0.056	O |	|	|	|	2.01
31.250	0.00	0.24	0.051	O |	|	|	|	2.00
31.500	0.00	0.22	0.046	O |	|	|	|	2.00
31.750	0.00	0.20	0.042	O |	|	|	|	2.00
32.000	0.00	0.18	0.038	O |	|	|	|	2.00
32.250	0.00	0.16	0.034	O |	|	|	|	2.00
32.500	0.00	0.15	0.031	O |	|	|	|	2.00
32.750	0.00	0.13	0.028	O |	|	|	|	2.00
33.000	0.00	0.12	0.025	O |	|	|	|	2.00
33.250	0.00	0.11	0.023	O |	|	|	|	2.00
33.500	0.00	0.10	0.021	O |	|	|	|	2.00
33.750	0.00	0.09	0.019	O |	|	|	|	2.00
34.000	0.00	0.08	0.017	O |	|	|	|	2.00
34.250	0.00	0.07	0.016	O |	|	|	|	2.00
34.500	0.00	0.06	0.015	O |	|	|	|	2.00
34.750	0.00	0.06	0.013	O |	|	|	|	2.00
35.000	0.00	0.05	0.012	O |	|	|	|	2.00
35.250	0.00	0.05	0.011	O |	|	|	|	2.00
35.500	0.00	0.04	0.010	O |	|	|	|	2.00
35.750	0.00	0.04	0.009	O |	|	|	|	2.00

```
36.000    0.00    0.03      0.009  O       |       |       |       |     2.00
36.250    0.00    0.03      0.008  O       |       |       |       |     2.00
36.500    0.00    0.03      0.007  O       |       |       |       |     2.00
36.750    0.00    0.03      0.007  O       |       |       |       |     2.00
37.000    0.00    0.02      0.006  O       |       |       |       |     2.00
37.250    0.00    0.02      0.006  O       |       |       |       |     2.00
37.500    0.00    0.02      0.005  O       |       |       |       |     2.00
37.750    0.00    0.02      0.005  O       |       |       |       |     2.00
38.000    0.00    0.01      0.005  O       |       |       |       |     2.00
38.250    0.00    0.01      0.004  O       |       |       |       |     2.00
38.500    0.00    0.01      0.004  O       |       |       |       |     2.00
38.750    0.00    0.01      0.004  O       |       |       |       |     2.00
39.000    0.00    0.01      0.004  O       |       |       |       |     2.00
39.250    0.00    0.01      0.004  O       |       |       |       |     2.00
39.500    0.00    0.01      0.003  O       |       |       |       |     2.00
39.750    0.00    0.01      0.003  O       |       |       |       |     2.00
40.000    0.00    0.01      0.003  O       |       |       |       |     2.00
40.250    0.00    0.01      0.003  O       |       |       |       |     2.00
40.500    0.00    0.01      0.003  O       |       |       |       |     2.00
40.750    0.00    0.00      0.003  O       |       |       |       |     2.00
41.000    0.00    0.00      0.003  O       |       |       |       |     2.00
41.250    0.00    0.00      0.003  O       |       |       |       |     2.00
41.500    0.00    0.00      0.003  O       |       |       |       |     2.00
41.750    0.00    0.00      0.002  O       |       |       |       |     2.00
42.000    0.00    0.00      0.002  O       |       |       |       |     2.00
42.250    0.00    0.00      0.002  O       |       |       |       |     2.00
42.500    0.00    0.00      0.002  O       |       |       |       |     2.00
42.750    0.00    0.00      0.002  O       |       |       |       |     2.00
43.000    0.00    0.00      0.002  O       |       |       |       |     2.00
43.250    0.00    0.00      0.002  O       |       |       |       |     2.00
43.500    0.00    0.00      0.002  O       |       |       |       |     2.00
43.750    0.00    0.00      0.002  O       |       |       |       |     2.00
44.000    0.00    0.00      0.002  O       |       |       |       |     2.00
44.250    0.00    0.00      0.002  O       |       |       |       |     2.00
44.500    0.00    0.00      0.002  O       |       |       |       |     2.00
44.750    0.00    0.00      0.002  O       |       |       |       |     1.98

Remaining water in basin =    0.00 (Ac.Ft)

****************************HYDROGRAPH DATA****************************
               Number of intervals =   179
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =       39.870 (CFS)
               Total volume =      31.890 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SubD3Bsn.rte
****************************HYDROGRAPH DATA****************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/27/12 File: OffsiteD124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed D, Offsite D1
Proposed Condition
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     443.50(Ac.)  =      0.693 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     443.50(Ac.)  =      0.693 Sq. Mi.
Length along longest watercourse =   13900.00(Ft.)
Length along longest watercourse measured to centroid =    6600.00(Ft.)
Length along longest watercourse =      2.633 Mi.
Length along longest watercourse measured to centroid =      1.250 Mi.
Difference in elevation =     857.00(Ft.)
Slope along watercourse =    325.5367 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.377 Hr.
Lag time =    22.63 Min.
25% of lag time =     5.66 Min.
40% of lag time =     9.05 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      443.50           1.80                 798.30

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      443.50           4.50                1995.75

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.91 %
Adjusted average point rain =    4.496(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    35.200           46.00         0.000
    16.200           66.00         0.000
```

3.900	77.00	0.000
388.200	83.00	0.000

Total Area Entered = 443.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.079	0.049
66.0	66.0	0.405	0.000	0.405	0.037	0.015
77.0	77.0	0.279	0.000	0.279	0.009	0.002
83.0	83.0	0.210	0.000	0.210	0.875	0.184
					Sum (F) =	0.249

Area averaged mean soil loss (F) (In/Hr) = 0.249
Minimum soil loss rate ((In/Hr)) = 0.125
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	66.287	6.542	29.242
2	0.500	132.575	37.826	169.068
3	0.750	198.862	30.871	137.982
4	1.000	265.150	11.436	51.115
5	1.250	331.437	6.452	28.840
6	1.500	397.724	3.588	16.038
7	1.750	464.012	1.551	6.933
8	2.000	530.299	0.677	3.026
9	2.250	596.587	0.470	2.099
10	2.500	662.874	0.403	1.800
11	2.750	729.161	0.184	0.822
			Sum = 100.000	Sum= 446.965

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.440)	0.032	0.004
2	0.50	0.30	0.054	(0.435)	0.049	0.005
3	0.75	0.30	0.054	(0.430)	0.049	0.005
4	1.00	0.40	0.072	(0.425)	0.065	0.007
5	1.25	0.30	0.054	(0.420)	0.049	0.005
6	1.50	0.30	0.054	(0.415)	0.049	0.005
7	1.75	0.30	0.054	(0.410)	0.049	0.005
8	2.00	0.40	0.072	(0.405)	0.065	0.007
9	2.25	0.40	0.072	(0.400)	0.065	0.007
10	2.50	0.40	0.072	(0.396)	0.065	0.007
11	2.75	0.50	0.090	(0.391)	0.081	0.009
12	3.00	0.50	0.090	(0.386)	0.081	0.009
13	3.25	0.50	0.090	(0.381)	0.081	0.009
14	3.50	0.50	0.090	(0.376)	0.081	0.009
15	3.75	0.50	0.090	(0.372)	0.081	0.009
16	4.00	0.60	0.108	(0.367)	0.097	0.011
17	4.25	0.60	0.108	(0.362)	0.097	0.011
18	4.50	0.70	0.126	(0.358)	0.113	0.013
19	4.75	0.70	0.126	(0.353)	0.113	0.013
20	5.00	0.80	0.144	(0.349)	0.129	0.014
21	5.25	0.60	0.108	(0.344)	0.097	0.011
22	5.50	0.70	0.126	(0.340)	0.113	0.013
23	5.75	0.80	0.144	(0.335)	0.129	0.014
24	6.00	0.80	0.144	(0.331)	0.129	0.014
25	6.25	0.90	0.162	(0.326)	0.146	0.016

26	6.50	0.90	0.162	(0.322)	0.146	0.016
27	6.75	1.00	0.180	(0.318)	0.162	0.018
28	7.00	1.00	0.180	(0.313)	0.162	0.018
29	7.25	1.00	0.180	(0.309)	0.162	0.018
30	7.50	1.10	0.198	(0.305)	0.178	0.020
31	7.75	1.20	0.216	(0.301)	0.194	0.022
32	8.00	1.30	0.234	(0.297)	0.210	0.023
33	8.25	1.50	0.270	(0.292)	0.243	0.027
34	8.50	1.50	0.270	(0.288)	0.243	0.027
35	8.75	1.60	0.288	(0.284)	0.259	0.029
36	9.00	1.70	0.306	(0.280)	0.275	0.031
37	9.25	1.90	0.342	0.276	(0.308)	0.065
38	9.50	2.00	0.360	0.272	(0.324)	0.087
39	9.75	2.10	0.378	0.269	(0.340)	0.109
40	10.00	2.20	0.396	0.265	(0.356)	0.131
41	10.25	1.50	0.270	(0.261)	0.243	0.027
42	10.50	1.50	0.270	(0.257)	0.243	0.027
43	10.75	2.00	0.360	0.253	(0.324)	0.106
44	11.00	2.00	0.360	0.250	(0.324)	0.110
45	11.25	1.90	0.342	0.246	(0.308)	0.096
46	11.50	1.90	0.342	0.242	(0.308)	0.099
47	11.75	1.70	0.306	0.239	(0.275)	0.067
48	12.00	1.80	0.324	0.235	(0.291)	0.089
49	12.25	2.50	0.450	0.232	(0.405)	0.218
50	12.50	2.60	0.468	0.228	(0.421)	0.239
51	12.75	2.80	0.504	0.225	(0.453)	0.279
52	13.00	2.90	0.522	0.221	(0.469)	0.300
53	13.25	3.40	0.611	0.218	(0.550)	0.393
54	13.50	3.40	0.611	0.215	(0.550)	0.397
55	13.75	2.30	0.414	0.211	(0.372)	0.202
56	14.00	2.30	0.414	0.208	(0.372)	0.205
57	14.25	2.70	0.486	0.205	(0.437)	0.281
58	14.50	2.60	0.468	0.202	(0.421)	0.266
59	14.75	2.60	0.468	0.199	(0.421)	0.269
60	15.00	2.50	0.450	0.196	(0.405)	0.254
61	15.25	2.40	0.432	0.193	(0.388)	0.239
62	15.50	2.30	0.414	0.190	(0.372)	0.224
63	15.75	1.90	0.342	0.187	(0.308)	0.155
64	16.00	1.90	0.342	0.184	(0.308)	0.158
65	16.25	0.40	0.072	(0.181)	0.065	0.007
66	16.50	0.40	0.072	(0.179)	0.065	0.007
67	16.75	0.30	0.054	(0.176)	0.049	0.005
68	17.00	0.30	0.054	(0.173)	0.049	0.005
69	17.25	0.50	0.090	(0.171)	0.081	0.009
70	17.50	0.50	0.090	(0.168)	0.081	0.009
71	17.75	0.50	0.090	(0.165)	0.081	0.009
72	18.00	0.40	0.072	(0.163)	0.065	0.007
73	18.25	0.40	0.072	(0.161)	0.065	0.007
74	18.50	0.40	0.072	(0.158)	0.065	0.007
75	18.75	0.30	0.054	(0.156)	0.049	0.005
76	19.00	0.20	0.036	(0.154)	0.032	0.004
77	19.25	0.30	0.054	(0.152)	0.049	0.005
78	19.50	0.40	0.072	(0.150)	0.065	0.007
79	19.75	0.30	0.054	(0.147)	0.049	0.005
80	20.00	0.20	0.036	(0.145)	0.032	0.004
81	20.25	0.30	0.054	(0.144)	0.049	0.005
82	20.50	0.30	0.054	(0.142)	0.049	0.005
83	20.75	0.30	0.054	(0.140)	0.049	0.005
84	21.00	0.20	0.036	(0.138)	0.032	0.004
85	21.25	0.30	0.054	(0.137)	0.049	0.005
86	21.50	0.20	0.036	(0.135)	0.032	0.004
87	21.75	0.30	0.054	(0.134)	0.049	0.005
88	22.00	0.20	0.036	(0.132)	0.032	0.004
89	22.25	0.30	0.054	(0.131)	0.049	0.005
90	22.50	0.20	0.036	(0.130)	0.032	0.004
91	22.75	0.20	0.036	(0.128)	0.032	0.004
92	23.00	0.20	0.036	(0.127)	0.032	0.004
93	23.25	0.20	0.036	(0.127)	0.032	0.004
94	23.50	0.20	0.036	(0.126)	0.032	0.004
95	23.75	0.20	0.036	(0.125)	0.032	0.004
96	24.00	0.20	0.036	(0.125)	0.032	0.004

```
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =     5.7
      Flood volume = Effective rainfall      1.44(In)
       times area     443.5(Ac.)/[(In)/(Ft.)] =      53.1(Ac.Ft)
      Total soil loss =      3.06(In)
      Total soil loss =   113.073(Ac.Ft)
      Total rainfall =      4.50(In)
      Flood volume =     2312836.3 Cubic Feet
      Total soil loss =     4925460.9 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    156.763(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------------
  0+15       0.0022      0.11  Q         |         |         |         |
  0+30       0.0180      0.77  Q         |         |         |         |
  0+45       0.0504      1.57  Q         |         |         |         |
  1+ 0       0.0928      2.05  Q         |         |         |         |
  1+15       0.1444      2.50  Q         |         |         |         |
  1+30       0.1972      2.55  Q         |         |         |         |
  1+45       0.2478      2.45  Q         |         |         |         |
  2+ 0       0.2992      2.49  Q         |         |         |         |
  2+15       0.3566      2.78  Q         |         |         |         |
  2+30       0.4191      3.02  Q         |         |         |         |
  2+45       0.4845      3.17  Q         |         |         |         |
  3+ 0       0.5573      3.52  Q         |         |         |         |
  3+15       0.6358      3.80  Q         |         |         |         |
  3+30       0.7164      3.90  Q         |         |         |         |
  3+45       0.7981      3.96  Q         |         |         |         |
  4+ 0       0.8817      4.04  Q         |         |         |         |
  4+15       0.9718      4.36  Q         |         |         |         |
  4+30       1.0683      4.67  Q         |         |         |         |
  4+45       1.1731      5.07  VQ        |         |         |         |
  5+ 0       1.2852      5.43  VQ        |         |         |         |
  5+15       1.4039      5.75   Q        |         |         |         |
  5+30       1.5177      5.50  |Q        |         |         |         |
  5+45       1.6311      5.49  |Q        |         |         |         |
  6+ 0       1.7536      5.93  |Q        |         |         |         |
  6+15       1.8828      6.25  |Q        |         |         |         |
  6+30       2.0205      6.66  |Q        |         |         |         |
  6+45       2.1657      7.03  |Q        |         |         |         |
  7+ 0       2.3198      7.46  |Q        |         |         |         |
  7+15       2.4804      7.77  |Q        |         |         |         |
  7+30       2.6447      7.95  |Q        |         |         |         |
  7+45       2.8178      8.38  |QV       |         |         |         |
  8+ 0       3.0042      9.02  |QV       |         |         |         |
  8+15       3.2064      9.79  |QV       |         |         |         |
  8+30       3.4295     10.80  | Q       |         |         |         |
  8+45       3.6676     11.52  | Q       |         |         |         |
  9+ 0       3.9189     12.16  | Q       |         |         |         |
  9+15       4.2057     13.88  | QV      |         |         |         |
  9+30       4.6361     20.83  |  VQ     |         |         |         |
  9+45       5.2593     30.16  |  V  Q   |         |         |         |
 10+ 0       6.0735     39.41  |   V  Q  |         |         |         |
 10+15       7.0086     45.26  |    V   Q|         |         |         |
 10+30       7.6907     33.01  |    VQ   |         |         |         |
 10+45       8.1726     23.33  |   Q V   |         |         |         |
 11+ 0       8.8502     32.79  |     Q   |         |         |         |
 11+15       9.7099     41.61  |      VQ |         |         |         |
 11+30      10.5885     42.52  |      VQ |         |         |         |
 11+45      11.4594     42.15  |       Q |         |         |         |
 12+ 0      12.2496     38.25  |      Q V|         |         |         |
 12+15      13.1055     41.43  |       QV|         |         |         |
 12+30      14.4532     65.23  |         V  Q      |         |         |
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  12+45      16.2734     88.09  |         | V    Q  |         |         |
  13+ 0      18.4469    105.20  |         |  V      |Q        |         |
  13+15      20.9673    121.99  |         |    V    |   Q     |         |
  13+30      23.9747    145.56  |         |       V |        Q|         |
  13+45      27.2136    156.76  |         |         V         |Q        |
  14+ 0      29.9192    130.95  |         |         | V   Q   |         |
  14+15      32.2055    110.66  |         |         | Q V     |         |
  14+30      34.5934    115.58  |         |         |  Q  V   |         |
  14+45      37.0535    119.07  |         |         |  Q   V  |         |
  15+ 0      39.4988    118.35  |         |         |  Q     V|         |
  15+15      41.8996    116.20  |         |         |  Q       V        |
  15+30      44.2079    111.72  |         |         | Q       |  V      |
  15+45      46.3645    104.38  |         |         Q         |   V     |
  16+ 0      48.2105     89.35  |         |      Q  |         |     V   |
  16+15      49.7485     74.44  |         |   Q     |         |      V  |
  16+30      50.6823     45.20  |        Q|         |         |       V |
  16+45      51.1406     22.18  |   Q     |         |         |       V |
  17+ 0      51.4087     12.97  | Q       |         |         |       V |
  17+15      51.5731      7.96  |Q        |         |         |       V |
  17+30      51.6929      5.80  |Q        |         |         |       V |
  17+45      51.7967      5.02  |Q        |         |         |        V|
  18+ 0      51.8905      4.54  Q         |         |         |        V|
  18+15      51.9723      3.96  Q         |         |         |        V|
  18+30      52.0445      3.50  Q         |         |         |        V|
  18+45      52.1116      3.25  Q         |         |         |        V|
  19+ 0      52.1705      2.85  Q         |         |         |        V|
  19+15      52.2185      2.32  Q         |         |         |        V|
  19+30      52.2667      2.34  Q         |         |         |        V|
  19+45      52.3223      2.69  Q         |         |         |        V|
  20+ 0      52.3758      2.59  Q         |         |         |        V|
  20+15      52.4210      2.19  Q         |         |         |        V|
  20+30      52.4667      2.21  Q         |         |         |        V|
  20+45      52.5152      2.35  Q         |         |         |        V|
  21+ 0      52.5631      2.32  Q         |         |         |        V|
  21+15      52.6061      2.08  Q         |         |         |        V|
  21+30      52.6495      2.10  Q         |         |         |        V|
  21+45      52.6912      2.01  Q         |         |         |        V|
  22+ 0      52.7337      2.06  Q         |         |         |        V|
  22+15      52.7747      1.98  Q         |         |         |        V|
  22+30      52.8169      2.05  Q         |         |         |        V|
  22+45      52.8568      1.93  Q         |         |         |        V|
  23+ 0      52.8928      1.74  Q         |         |         |        V|
  23+15      52.9274      1.68  Q         |         |         |        V|
  23+30      52.9614      1.65  Q         |         |         |        V|
  23+45      52.9950      1.63  Q         |         |         |        V|
  24+ 0      53.0284      1.62  Q         |         |         |        V|
  24+15      53.0596      1.51  Q         |         |         |        V|
  24+30      53.0782      0.90  Q         |         |         |        V|
  24+45      53.0864      0.40  Q         |         |         |        V|
  25+ 0      53.0909      0.21  Q         |         |         |        V|
  25+15      53.0931      0.11  Q         |         |         |        V|
  25+30      53.0942      0.05  Q         |         |         |        V|
  25+45      53.0948      0.03  Q         |         |         |        V|
  26+ 0      53.0952      0.02  Q         |         |         |        V|
  26+15      53.0954      0.01  Q         |         |         |        V|
  26+30      53.0954      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/27/12 File: OffsiteD224100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed D, Offsite D2
Proposed Condition
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     183.80(Ac.)  =      0.287 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     183.80(Ac.)  =      0.287 Sq. Mi.
Length along longest watercourse =    4950.00(Ft.)
Length along longest watercourse measured to centroid =    2120.00(Ft.)
Length along longest watercourse =      0.938 Mi.
Length along longest watercourse measured to centroid =      0.402 Mi.
Difference in elevation =     461.00(Ft.)
Slope along watercourse =    491.7333 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.153 Hr.
Lag time =     9.18 Min.
25% of lag time =     2.29 Min.
40% of lag time =     3.67 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      183.80           1.80                 330.84

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      183.80           4.50                 827.10

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    4.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    22.800           46.00         0.000
    35.900           66.00         0.000
```

8.300	77.00	0.000
116.800	83.00	0.000

Total Area Entered = 183.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.124	0.076
66.0	66.0	0.405	0.000	0.405	0.195	0.079
77.0	77.0	0.279	0.000	0.279	0.045	0.013
83.0	83.0	0.210	0.000	0.210	0.635	0.133
					Sum (F) =	0.301

Area averaged mean soil loss (F) (In/Hr) = 0.301
Minimum soil loss rate ((In/Hr)) = 0.150
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	163.411	34.070	63.110
2	0.500	326.821	53.280	98.693
3	0.750	490.232	10.282	19.046
4	1.000	653.643	1.829	3.388
5	1.250	817.053	0.539	0.999
			Sum = 100.000	Sum= 185.236

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.531)	0.032	0.004
2	0.50	0.30	0.054	(0.525)	0.049	0.005
3	0.75	0.30	0.054	(0.519)	0.049	0.005
4	1.00	0.40	0.072	(0.513)	0.065	0.007
5	1.25	0.30	0.054	(0.507)	0.049	0.005
6	1.50	0.30	0.054	(0.501)	0.049	0.005
7	1.75	0.30	0.054	(0.495)	0.049	0.005
8	2.00	0.40	0.072	(0.489)	0.065	0.007
9	2.25	0.40	0.072	(0.483)	0.065	0.007
10	2.50	0.40	0.072	(0.477)	0.065	0.007
11	2.75	0.50	0.090	(0.471)	0.081	0.009
12	3.00	0.50	0.090	(0.466)	0.081	0.009
13	3.25	0.50	0.090	(0.460)	0.081	0.009
14	3.50	0.50	0.090	(0.454)	0.081	0.009
15	3.75	0.50	0.090	(0.448)	0.081	0.009
16	4.00	0.60	0.108	(0.443)	0.097	0.011
17	4.25	0.60	0.108	(0.437)	0.097	0.011
18	4.50	0.70	0.126	(0.432)	0.113	0.013
19	4.75	0.70	0.126	(0.426)	0.113	0.013
20	5.00	0.80	0.144	(0.421)	0.130	0.014
21	5.25	0.60	0.108	(0.415)	0.097	0.011
22	5.50	0.70	0.126	(0.410)	0.113	0.013
23	5.75	0.80	0.144	(0.404)	0.130	0.014
24	6.00	0.80	0.144	(0.399)	0.130	0.014
25	6.25	0.90	0.162	(0.394)	0.146	0.016
26	6.50	0.90	0.162	(0.388)	0.146	0.016
27	6.75	1.00	0.180	(0.383)	0.162	0.018
28	7.00	1.00	0.180	(0.378)	0.162	0.018
29	7.25	1.00	0.180	(0.373)	0.162	0.018
30	7.50	1.10	0.198	(0.368)	0.178	0.020
31	7.75	1.20	0.216	(0.363)	0.194	0.022

32	8.00	1.30	0.234	(	0.358)	0.211	0.023
33	8.25	1.50	0.270	(	0.353)	0.243	0.027
34	8.50	1.50	0.270	(	0.348)	0.243	0.027
35	8.75	1.60	0.288	(	0.343)	0.259	0.029
36	9.00	1.70	0.306	(	0.338)	0.275	0.031
37	9.25	1.90	0.342	(	0.333)	0.308	0.034
38	9.50	2.00	0.360	(	0.329)	0.324	0.036
39	9.75	2.10	0.378		0.324	(0.340)	0.054
40	10.00	2.20	0.396		0.319	(0.356)	0.077
41	10.25	1.50	0.270	(	0.315)	0.243	0.027
42	10.50	1.50	0.270	(	0.310)	0.243	0.027
43	10.75	2.00	0.360		0.306	(0.324)	0.054
44	11.00	2.00	0.360		0.301	(0.324)	0.059
45	11.25	1.90	0.342		0.297	(0.308)	0.045
46	11.50	1.90	0.342		0.292	(0.308)	0.050
47	11.75	1.70	0.306	(	0.288)	0.275	0.031
48	12.00	1.80	0.324		0.284	(0.291)	0.040
49	12.25	2.50	0.450		0.279	(0.405)	0.170
50	12.50	2.60	0.468		0.275	(0.421)	0.193
51	12.75	2.80	0.504		0.271	(0.453)	0.233
52	13.00	2.90	0.522		0.267	(0.470)	0.255
53	13.25	3.40	0.612		0.263	(0.551)	0.349
54	13.50	3.40	0.612		0.259	(0.551)	0.353
55	13.75	2.30	0.414		0.255	(0.372)	0.159
56	14.00	2.30	0.414		0.251	(0.372)	0.163
57	14.25	2.70	0.486		0.247	(0.437)	0.238
58	14.50	2.60	0.468		0.244	(0.421)	0.224
59	14.75	2.60	0.468		0.240	(0.421)	0.228
60	15.00	2.50	0.450		0.236	(0.405)	0.214
61	15.25	2.40	0.432		0.233	(0.389)	0.199
62	15.50	2.30	0.414		0.229	(0.372)	0.185
63	15.75	1.90	0.342		0.226	(0.308)	0.116
64	16.00	1.90	0.342		0.222	(0.308)	0.120
65	16.25	0.40	0.072	(	0.219)	0.065	0.007
66	16.50	0.40	0.072	(	0.215)	0.065	0.007
67	16.75	0.30	0.054	(	0.212)	0.049	0.005
68	17.00	0.30	0.054	(	0.209)	0.049	0.005
69	17.25	0.50	0.090	(	0.206)	0.081	0.009
70	17.50	0.50	0.090	(	0.203)	0.081	0.009
71	17.75	0.50	0.090	(	0.200)	0.081	0.009
72	18.00	0.40	0.072	(	0.197)	0.065	0.007
73	18.25	0.40	0.072	(	0.194)	0.065	0.007
74	18.50	0.40	0.072	(	0.191)	0.065	0.007
75	18.75	0.30	0.054	(	0.188)	0.049	0.005
76	19.00	0.20	0.036	(	0.186)	0.032	0.004
77	19.25	0.30	0.054	(	0.183)	0.049	0.005
78	19.50	0.40	0.072	(	0.180)	0.065	0.007
79	19.75	0.30	0.054	(	0.178)	0.049	0.005
80	20.00	0.20	0.036	(	0.176)	0.032	0.004
81	20.25	0.30	0.054	(	0.173)	0.049	0.005
82	20.50	0.30	0.054	(	0.171)	0.049	0.005
83	20.75	0.30	0.054	(	0.169)	0.049	0.005
84	21.00	0.20	0.036	(	0.167)	0.032	0.004
85	21.25	0.30	0.054	(	0.165)	0.049	0.005
86	21.50	0.20	0.036	(	0.163)	0.032	0.004
87	21.75	0.30	0.054	(	0.161)	0.049	0.005
88	22.00	0.20	0.036	(	0.159)	0.032	0.004
89	22.25	0.30	0.054	(	0.158)	0.049	0.005
90	22.50	0.20	0.036	(	0.156)	0.032	0.004
91	22.75	0.20	0.036	(	0.155)	0.032	0.004
92	23.00	0.20	0.036	(	0.154)	0.032	0.004
93	23.25	0.20	0.036	(	0.153)	0.032	0.004
94	23.50	0.20	0.036	(	0.152)	0.032	0.004
95	23.75	0.20	0.036	(	0.151)	0.032	0.004
96	24.00	0.20	0.036	(	0.151)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.6

Flood volume = Effective rainfall 1.15(In)
times area 183.8(Ac.)/[(In)/(Ft.)] = 17.6(Ac.Ft)
Total soil loss = 3.35(In)
Total soil loss = 51.341(Ac.Ft)

```
Total rainfall =      4.50(In)
Flood volume =      764866.3 Cubic Feet
Total soil loss =     2236428.9 Cubic Feet
-------------------------------------------------------------------
 Peak flow rate of this hydrograph =     62.545(CFS)
-------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

-------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
-------------------------------------------------------------------
  0+15       0.0047      0.23  Q         |         |         |         |
  0+30       0.0191      0.70  Q         |         |         |         |
  0+45       0.0386      0.94  Q         |         |         |         |
  1+ 0       0.0613      1.10  Q         |         |         |         |
  1+15       0.0856      1.18  Q         |         |         |         |
  1+30       0.1070      1.03  Q         |         |         |         |
  1+45       0.1278      1.01  Q         |         |         |         |
  2+ 0       0.1509      1.12  Q         |         |         |         |
  2+15       0.1776      1.29  Q         |         |         |         |
  2+30       0.2050      1.33  Q         |         |         |         |
  2+45       0.2348      1.45  Q         |         |         |         |
  3+ 0       0.2684      1.63  Q         |         |         |         |
  3+15       0.3027      1.66  Q         |         |         |         |
  3+30       0.3371      1.67  Q         |         |         |         |
  3+45       0.3715      1.67  Q         |         |         |         |
  4+ 0       0.4083      1.78  VQ        |         |         |         |
  4+15       0.4488      1.96   Q        |         |         |         |
  4+30       0.4923      2.11  |Q        |         |         |         |
  4+45       0.5397      2.29  |Q        |         |         |         |
  5+ 0       0.5901      2.44  |Q        |         |         |         |
  5+15       0.6396      2.40  |Q        |         |         |         |
  5+30       0.6849      2.19  |Q        |         |         |         |
  5+45       0.7349      2.42  |Q        |         |         |         |
  6+ 0       0.7890      2.62  |Q        |         |         |         |
  6+15       0.8463      2.77  |Q        |         |         |         |
  6+30       0.9074      2.96  |QV       |         |         |         |
  6+45       0.9716      3.11  |QV       |         |         |         |
  7+ 0       1.0396      3.29  |QV       |         |         |         |
  7+15       1.1083      3.33  |QV       |         |         |         |
  7+30       1.1795      3.45  |QV       |         |         |         |
  7+45       1.2568      3.74  | Q       |         |         |         |
  8+ 0       1.3408      4.07  | QV      |         |         |         |
  8+15       1.4340      4.51  | QV      |         |         |         |
  8+30       1.5354      4.91  | QV      |         |         |         |
  8+45       1.6407      5.10  | QV      |         |         |         |
  9+ 0       1.7524      5.40  |  Q      |         |         |         |
  9+15       1.8731      5.85  |  QV     |         |         |         |
  9+30       2.0045      6.36  |  QV     |         |         |         |
  9+45       2.1644      7.74  |   Q     |         |         |         |
 10+ 0       2.3915     10.99  |    VQ   |         |         |         |
 10+15       2.6074     10.45  |    Q    |         |         |         |
 10+30       2.7323      6.05  |  Q  V   |         |         |         |
 10+45       2.8753      6.92  |  Q  V   |         |         |         |
 11+ 0       3.0767      9.75  |    Q V  |         |         |         |
 11+15       3.2793      9.81  |    Q V  |         |         |         |
 11+30       3.4636      8.92  |    Q V  |         |         |         |
 11+45       3.6276      7.94  |   Q   V |         |         |         |
 12+ 0       3.7663      6.71  |  Q    V |         |         |         |
 12+15       4.0870     15.52  |       QV|         |         |         |
 12+30       4.7047     29.90  |         V      Q  |         |         |
 12+45       5.4716     37.12  |         | V       |Q        |         |
 13+ 0       6.3671     43.35  |         |   V     |   Q     |         |
 13+15       7.4504     52.43  |         |     V   |         Q|         |
 13+30       8.7427     62.54  |         |        V|         |    Q    |
 13+45       9.8294     52.60  |         |           V       Q         |
 14+ 0      10.5339     34.10  |         |        Q|  V      |         |
```

```
   14+15      11.2712     35.68  |         |         Q    V    |         |
   14+30      12.1325     41.69  |         |         |  Q   V  |         |
   14+45      12.9959     41.79  |         |         |  Q     V|         |
   15+ 0      13.8479     41.24  |         |         |  Q       V        |
   15+15      14.6540     39.01  |         |         | Q       |  V      |
   15+30      15.4063     36.41  |         |         Q         |    V    |
   15+45      16.0332     30.34  |         |      Q  |         |     V   |
   16+ 0      16.5179     23.46  |         |  Q      |         |      V  |
   16+15      16.8345     15.32  |       Q |         |         |       V |
   16+30      16.9177      4.03  | Q       |         |         |       V |
   16+45      16.9530      1.71  Q         |         |         |       V |
   17+ 0      16.9769      1.16  Q         |         |         |       V |
   17+15      17.0024      1.24  Q         |         |         |       V |
   17+30      17.0352      1.58  Q         |         |         |       V |
   17+45      17.0693      1.65  Q         |         |         |       V |
   18+ 0      17.1013      1.55  Q         |         |         |       V |
   18+15      17.1297      1.38  Q         |         |         |        V|
   18+30      17.1575      1.34  Q         |         |         |        V|
   18+45      17.1827      1.22  Q         |         |         |        V|
   19+ 0      17.2019      0.93  Q         |         |         |        V|
   19+15      17.2191      0.83  Q         |         |         |        V|
   19+30      17.2414      1.08  Q         |         |         |        V|
   19+45      17.2656      1.17  Q         |         |         |        V|
   20+ 0      17.2846      0.92  Q         |         |         |        V|
   20+15      17.3018      0.83  Q         |         |         |        V|
   20+30      17.3218      0.97  Q         |         |         |        V|
   20+45      17.3423      0.99  Q         |         |         |        V|
   21+ 0      17.3606      0.89  Q         |         |         |        V|
   21+15      17.3776      0.82  Q         |         |         |        V|
   21+30      17.3952      0.85  Q         |         |         |        V|
   21+45      17.4121      0.82  Q         |         |         |        V|
   22+ 0      17.4296      0.85  Q         |         |         |        V|
   22+15      17.4465      0.82  Q         |         |         |        V|
   22+30      17.4641      0.85  Q         |         |         |        V|
   22+45      17.4786      0.70  Q         |         |         |        V|
   23+ 0      17.4925      0.67  Q         |         |         |        V|
   23+15      17.5063      0.67  Q         |         |         |        V|
   23+30      17.5201      0.67  Q         |         |         |        V|
   23+45      17.5339      0.67  Q         |         |         |        V|
   24+ 0      17.5477      0.67  Q         |         |         |        V|
   24+15      17.5568      0.44  Q         |         |         |        V|
   24+30      17.5585      0.08  Q         |         |         |        V|
   24+45      17.5588      0.02  Q         |         |         |        V|
   25+ 0      17.5589      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  04/30/12 File: SubD124100.out


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----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed D, Onsite D1
Proposed Condition
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =     160.67(Ac.)  =      0.251 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     160.67(Ac.)  =      0.251 Sq. Mi.
Length along longest watercourse =    1500.00(Ft.)
Length along longest watercourse measured to centroid =     750.00(Ft.)
Length along longest watercourse =      0.284 Mi.
Length along longest watercourse measured to centroid =      0.142 Mi.
Difference in elevation =      30.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.044 Hr.
Lag time =     2.63 Min.
25% of lag time =     0.66 Min.
40% of lag time =     1.05 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      160.67           1.80                 289.21

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      160.67           4.50                 723.01

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   160.670           85.00         0.750
 Total Area Entered =    160.67(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	570.030	74.072	119.942
2	0.500	1140.059	25.928	41.983
		Sum = 100.000	Sum=	161.925

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.312
40	10.00	2.20	0.396	0.064	(0.119)	0.331

41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.559
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 160.7(Ac.)/[(In)/(Ft.)] = 48.7(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 11.576(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 2119474.4 Cubic Feet
Total soil loss = 504246.4 Cubic Feet

Peak flow rate of this hydrograph = 90.608(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 25.0 50.0 75.0 100.0
0+15	0.0625	3.02	VQ | | | |
0+30	0.1780	5.59	V Q | | | |
0+45	0.3045	6.12	V Q | | | |
1+ 0	0.4622	7.63	V Q | | | |
1+15	0.5996	6.65	V Q | | | |
1+30	0.7261	6.12	V Q | | | |
1+45	0.8526	6.12	V Q | | | |
2+ 0	1.0103	7.63	V Q | | | |
2+15	1.1790	8.16	V Q | | | |
2+30	1.3476	8.16	|V Q | | | |
2+45	1.5475	9.67	|V Q | | | |
3+ 0	1.7583	10.20	|V Q | | | |
3+15	1.9691	10.20	|V Q | | | |
3+30	2.1800	10.20	|V Q | | | |
3+45	2.3908	10.20	|V Q | | | |
4+ 0	2.6328	11.71	| V Q | | | |
4+15	2.8858	12.24	| V Q | | | |
4+30	3.1700	13.76	| V Q | | | |
4+45	3.4651	14.28	| V Q | | | |
5+ 0	3.7915	15.80	| V Q | | | |
5+15	4.0663	13.30	| V Q | | | |
5+30	4.3506	13.76	| V Q | | | |
5+45	4.6769	15.80	| V Q | | | |
6+ 0	5.0142	16.33	| V Q | | | |
6+15	5.3828	17.84	| V Q | | | |
6+30	5.7622	18.37	| V Q | | | |
6+45	6.1729	19.88	| V Q | | | |
7+ 0	6.5945	20.41	| V Q | | | |
7+15	7.0162	20.41	| V Q | | | |
7+30	7.4690	21.92	| V Q | | | |
7+45	7.9640	23.96	| V Q| | | |
8+ 0	8.5012	26.00	| V Q | | | |
8+15	9.1359	30.72	| V | Q | | |
8+30	9.8033	32.30	| V | Q | | |
8+45	10.5187	34.62	| V | Q | | |
9+ 0	11.2975	37.70	| V| Q | | |
9+15	12.1845	42.93	| V Q | | |
9+30	13.1505	46.75	| V Q | | |
9+45	14.1799	49.82	| |V Q| | |
10+ 0	15.2727	52.89	| | V |Q | |
10+15	16.0720	38.68	| | V Q | | |
10+30	16.7650	33.54	| | Q | | |
10+45	17.6841	44.49	| | V Q | | |
11+ 0	18.6844	48.41	| | V Q| | |
11+15	19.6431	46.40	| | V Q | | |
11+30	20.5891	45.79	| | V Q | | |
11+45	21.4488	41.61	| | QV | | |
12+ 0	22.3248	42.40	| | Q V | | |
12+15	23.5316	58.41	| | V| Q | |
12+30	24.8952	66.00	| | V Q | |
12+45	26.3664	71.21	| | V Q | |
13+ 0	27.9163	75.01	| | | V Q |
13+15	29.7075	86.70	| | | V | Q |
13+30	31.5796	90.61	| | | V | Q |
13+45	32.9636	66.98	| | | QV | |
14+ 0	34.1784	58.80	| | | Q V | |
14+15	35.5743	67.56	| | | Q V| |
14+30	36.9905	68.55	| | | Q V |
14+45	38.3938	67.91	| | | Q V |
15+ 0	39.7548	65.88	| | | Q | V |
15+15	41.0581	63.08	| | | Q | V |
15+30	42.3036	60.28	| | | Q | V |
15+45	43.3574	51.00	| | Q | V |
16+ 0	44.3510	48.09	| | Q| | V |
16+15	44.7337	18.52	| Q | | | V |

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   16+30      44.9024      8.16  |  Q      |         |         |     V   |
   16+45      45.0398      6.65  | Q       |         |         |      V  |
   17+ 0      45.1663      6.12  | Q       |         |         |      V  |
   17+15      45.3553      9.15  |  Q      |         |         |      V  |
   17+30      45.5661     10.20  |   Q     |         |         |      V  |
   17+45      45.7769     10.20  |   Q     |         |         |      V  |
   18+ 0      45.9565      8.69  |  Q      |         |         |      V  |
   18+15      46.1251      8.16  |  Q      |         |         |      V  |
   18+30      46.2938      8.16  |  Q      |         |         |       V |
   18+45      46.4312      6.65  | Q       |         |         |       V |
   19+ 0      46.5264      4.61  |Q        |         |         |       V |
   19+15      46.6420      5.59  | Q       |         |         |       V |
   19+30      46.7997      7.63  |  Q      |         |         |       V |
   19+45      46.9371      6.65  | Q       |         |         |       V |
   20+ 0      47.0324      4.61  |Q        |         |         |       V |
   20+15      47.1479      5.59  | Q       |         |         |       V |
   20+30      47.2744      6.12  | Q       |         |         |       V |
   20+45      47.4009      6.12  | Q       |         |         |       V |
   21+ 0      47.4962      4.61  |Q        |         |         |        V|
   21+15      47.6117      5.59  | Q       |         |         |        V|
   21+30      47.7070      4.61  |Q        |         |         |        V|
   21+45      47.8226      5.59  | Q       |         |         |        V|
   22+ 0      47.9178      4.61  |Q        |         |         |        V|
   22+15      48.0334      5.59  | Q       |         |         |        V|
   22+30      48.1286      4.61  |Q        |         |         |        V|
   22+45      48.2129      4.08  |Q        |         |         |        V|
   23+ 0      48.2973      4.08  |Q        |         |         |        V|
   23+15      48.3816      4.08  |Q        |         |         |        V|
   23+30      48.4659      4.08  |Q        |         |         |        V|
   23+45      48.5502      4.08  |Q        |         |         |        V|
   24+ 0      48.6346      4.08  |Q        |         |         |        V|
   24+15      48.6564      1.06  Q         |         |         |         V
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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/30/12 File: SubD224100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed D, Onsite D2
Proposed Condition
100-year, 24-hour

-------------------------------------------------------------------
Drainage Area =     119.91(Ac.)  =      0.187 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     119.91(Ac.)  =      0.187 Sq. Mi.
Length along longest watercourse =    5750.00(Ft.)
Length along longest watercourse measured to centroid =    2875.00(Ft.)
Length along longest watercourse =      1.089 Mi.
Length along longest watercourse measured to centroid =      0.545 Mi.
Difference in elevation =     115.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.122 Hr.
Lag time =     7.31 Min.
25% of lag time =     1.83 Min.
40% of lag time =     2.92 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      119.91           1.80                 215.84

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      119.91           4.50                 539.60

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   119.910           85.00         0.750
 Total Area Entered =    119.91(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	205.295	44.302	53.537
2	0.500	410.591	43.000	51.964
3	0.750	615.886	8.582	10.371
4	1.000	821.182	4.117	4.975
			Sum = 100.000	Sum= 120.847

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294

39	9.75	2.10	0.378	0.065	(	0.113)	0.312
40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 119.9(Ac.)/[(In)/(Ft.)] = 36.3(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 8.640(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1581931.7 Cubic Feet
Total soil loss = 376339.4 Cubic Feet

Peak flow rate of this hydrograph = 66.111(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 17.5 35.0 52.5 70.0
0+15	0.0279	1.35	Q | | | |
0+30	0.0968	3.33	VQ | | | |
0+45	0.1846	4.25	V Q | | | |
1+ 0	0.2916	5.18	V Q | | | |
1+15	0.3996	5.22	V Q | | | |
1+30	0.4967	4.70	V Q | | | |
1+45	0.5924	4.63	V Q | | | |
2+ 0	0.7007	5.24	V Q | | | |
2+15	0.8226	5.90	V Q | | | |
2+30	0.9472	6.03	V Q | | | |
2+45	1.0870	6.77	|V Q | | | |
3+ 0	1.2404	7.42	|V Q | | | |
3+15	1.3964	7.55	|V Q | | | |
3+30	1.5538	7.62	|V Q | | | |
3+45	1.7111	7.62	|V Q | | | |
4+ 0	1.8824	8.29	| V Q | | | |
4+15	2.0672	8.95	| V Q | | | |
4+30	2.2687	9.75	| V Q | | | |
4+45	2.4850	10.47	| V Q | | | |
5+ 0	2.7179	11.27	| V Q | | | |
5+15	2.9378	10.64	| V Q | | | |
5+30	3.1472	10.14	| V Q | | | |
5+45	3.3800	11.27	| V Q | | | |
6+ 0	3.6265	11.93	| V Q | | | |
6+15	3.8909	12.80	| V Q | | | |
6+30	4.1701	13.51	| V Q | | | |
6+45	4.4660	14.32	| V Q | | | |
7+ 0	4.7767	15.04	| V Q | | | |
7+15	5.0901	15.17	| V Q | | | |
7+30	5.4187	15.91	| V Q| | | |
7+45	5.7748	17.24	| V Q| | | |
8+ 0	6.1611	18.70	| V Q | | |
8+15	6.6035	21.41	| V | Q | | |
8+30	7.0886	23.48	| V | Q | | |
8+45	7.6045	24.97	| V | Q | | |
9+ 0	8.1656	27.16	| V | Q | | |
9+15	8.7921	30.32	| V| Q | | |
9+30	9.4854	33.55	| V Q| | |
9+45	10.2298	36.03	| V Q | |
10+ 0	11.0234	38.41	| | V |Q | |
10+15	11.7050	32.99	| | V Q | | |
10+30	12.2593	26.83	| | V Q | | |
10+45	12.8903	30.54	| | V Q | | |
11+ 0	13.6073	34.70	| | V Q| | |
11+15	14.3259	34.78	| | V Q| | |
11+30	15.0367	34.40	| | V Q| | |
11+45	15.7060	32.39	| | VQ | | |
12+ 0	16.3568	31.50	| | Q | | |
12+15	17.1609	38.92	| | V | Q | |
12+30	18.1224	46.54	| | V| Q | |
12+45	19.1741	50.90	| | V Q| |
13+ 0	20.3033	54.65	| | | V |Q |
13+15	21.5630	60.97	| | | V | Q |
13+30	22.9289	66.11	| | | V | Q |
13+45	24.0989	56.63	| | | V | Q |
14+ 0	25.0675	46.88	| | | QV | |
14+15	26.0753	48.78	| | | QV | |
14+30	27.1220	50.66	| | | QV| |
14+45	28.1667	50.57	| | | Q V |
15+ 0	29.1970	49.86	| | | Q | V |
15+15	30.1880	47.96	| | | Q | V |
15+30	31.1377	45.97	| | | Q | V |
15+45	31.9845	40.98	| | | Q | V |

```
  16+ 0      32.7500     37.05  |         |         |Q        |     V   |
  16+15      33.2262     23.05  |         |  Q      |         |     V   |
  16+30      33.4302      9.88  |    Q    |         |         |     V   |
  16+45      33.5675      6.65  |  Q      |         |         |     V   |
  17+ 0      33.6659      4.76  | Q       |         |         |      V  |
  17+15      33.7895      5.98  |  Q      |         |         |      V  |
  17+30      33.9389      7.23  |   Q     |         |         |      V  |
  17+45      34.0936      7.49  |   Q     |         |         |      V  |
  18+ 0      34.2370      6.94  |  Q      |         |         |      V  |
  18+15      34.3669      6.29  |  Q      |         |         |      V  |
  18+30      34.4941      6.16  |  Q      |         |         |      V  |
  18+45      34.6060      5.42  |  Q      |         |         |       V |
  19+ 0      34.6905      4.09  | Q       |         |         |       V |
  19+15      34.7727      3.98  | Q       |         |         |       V |
  19+30      34.8783      5.11  | Q       |         |         |       V |
  19+45      34.9849      5.16  | Q       |         |         |       V |
  20+ 0      35.0681      4.03  | Q       |         |         |       V |
  20+15      35.1503      3.98  | Q       |         |         |       V |
  20+30      35.2420      4.44  | Q       |         |         |       V |
  20+45      35.3351      4.51  | Q       |         |         |       V |
  21+ 0      35.4156      3.89  | Q       |         |         |        V|
  21+15      35.4964      3.91  | Q       |         |         |        V|
  21+30      35.5742      3.76  | Q       |         |         |        V|
  21+45      35.6538      3.85  | Q       |         |         |        V|
  22+ 0      35.7315      3.76  | Q       |         |         |        V|
  22+15      35.8111      3.85  | Q       |         |         |        V|
  22+30      35.8889      3.76  | Q       |         |         |        V|
  22+45      35.9545      3.18  |Q        |         |         |        V|
  23+ 0      36.0188      3.11  |Q        |         |         |        V|
  23+15      36.0817      3.05  |Q        |         |         |        V|
  23+30      36.1446      3.05  |Q        |         |         |        V|
  23+45      36.2076      3.05  |Q        |         |         |        V|
  24+ 0      36.2705      3.05  |Q        |         |         |        V|
  24+15      36.3056      1.70  Q         |         |         |        V|
  24+30      36.3136      0.39  Q         |         |         |        V|
  24+45      36.3162      0.13  Q         |         |         |         V
-----------------------------------------------------------------------
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       U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/07/12 File: SUBD324100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed D, Onsite D3
Proposed Condition
100 Yr. 24 Hr.

-------------------------------------------------------------------
Drainage Area =     105.30(Ac.)  =      0.165 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     105.30(Ac.)  =      0.165 Sq. Mi.
Length along longest watercourse =    1600.00(Ft.)
Length along longest watercourse measured to centroid =     800.00(Ft.)
Length along longest watercourse =      0.303 Mi.
Length along longest watercourse measured to centroid =      0.152 Mi.
Difference in elevation =      32.00(Ft.)
Slope along watercourse =    105.6000 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.046 Hr.
Lag time =     2.76 Min.
25% of lag time =     0.69 Min.
40% of lag time =     1.11 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.30           1.80                 189.54

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      105.30           4.50                 473.85

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   105.300           85.00         0.750
 Total Area Entered =    105.30(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	542.745	72.919	77.384
2	0.500	1085.490	27.081	28.739
		Sum = 100.000	Sum=	106.123

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.312
40	10.00	2.20	0.396	0.064	(0.119)	0.331

41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.63(In)
times area 105.3(Ac.)/[(In)/(Ft.)] = 31.9(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 7.587(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 1389231.6 Cubic Feet
Total soil loss = 330490.1 Cubic Feet

Peak flow rate of this hydrograph = 59.389(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 15.0 30.0 45.0 60.0
0+15	0.0403	1.95	VQ | | | |
0+30	0.1157	3.65	V Q | | | |
0+45	0.1986	4.01	V Q | | | |
1+ 0	0.3017	4.99	V Q | | | |
1+15	0.3921	4.37	V Q | | | |
1+30	0.4750	4.01	V Q | | | |
1+45	0.5579	4.01	V Q | | | |
2+ 0	0.6610	4.99	V Q | | | |
2+15	0.7715	5.35	V Q | | | |
2+30	0.8820	5.35	|V Q | | | |
2+45	1.0127	6.33	|V Q | | | |
3+ 0	1.1509	6.69	|V Q | | | |
3+15	1.2891	6.69	|V Q | | | |
3+30	1.4273	6.69	|V Q | | | |
3+45	1.5654	6.69	|V Q | | | |
4+ 0	1.7238	7.66	| V Q | | | |
4+15	1.8896	8.03	| V Q | | | |
4+30	2.0756	9.00	| V Q | | | |
4+45	2.2690	9.36	| V Q | | | |
5+ 0	2.4826	10.34	| V Q | | | |
5+15	2.6634	8.75	| V Q | | | |
5+30	2.8493	9.00	| V Q | | | |
5+45	3.0629	10.34	| V Q | | | |
6+ 0	3.2840	10.70	| V Q | | | |
6+15	3.5253	11.68	| V Q | | | |
6+30	3.7740	12.04	| V Q | | | |
6+45	4.0429	13.01	| V Q | | | |
7+ 0	4.3192	13.38	| V Q | | | |
7+15	4.5956	13.38	| V Q | | | |
7+30	4.8921	14.35	| V Q| | | |
7+45	5.2162	15.69	| V Q | | |
8+ 0	5.5680	17.03	| V |Q | | |
8+15	5.9831	20.09	| V | Q | | |
8+30	6.4206	21.17	| V | Q | | |
8+45	6.8890	22.67	| V | Q | | |
9+ 0	7.3990	24.69	| V| Q | | |
9+15	7.9795	28.09	| V Q | | |
9+30	8.6122	30.62	| V Q | |
9+45	9.2864	32.63	| |V |Q | |
10+ 0	10.0023	34.65	| | V | Q | |
10+15	10.5293	25.51	| | V Q | | |
10+30	10.9835	21.98	| | VQ | | |
10+45	11.5837	29.05	| | V Q| | |
11+ 0	12.2393	31.73	| | V |Q | |
11+15	12.8682	30.43	| | V Q | |
11+30	13.4882	30.01	| | V Q | |
11+45	14.0526	27.32	| | VQ | | |
12+ 0	14.6263	27.77	| | Q | | |
12+15	15.4141	38.13	| | V| Q | |
12+30	16.3074	43.24	| | V Q | |
12+45	17.2708	46.63	| | V |Q |
13+ 0	18.2862	49.14	| | | V | Q |
13+15	19.4580	56.72	| | | V | Q |
13+30	20.6851	59.39	| | | V | Q|
13+45	21.5972	44.15	| | | V Q| |
14+ 0	22.3934	38.54	| | | Q V | |
14+15	23.3065	44.19	| | | Q| |
14+30	24.2353	44.95	| | | QV |
14+45	25.1550	44.51	| | | Q V |
15+ 0	26.0476	43.20	| | | Q | V |
15+15	26.9023	41.37	| | | Q | V |
15+30	27.7191	39.53	| | | Q | V |
15+45	28.4116	33.52	| | | Q | V |
16+ 0	29.0629	31.52	| | |Q | V |
16+15	29.3200	12.44	| Q | | | V |

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  16+30      29.4305      5.35  |  Q      |         |         |     V   |
  16+45      29.5209      4.37  | Q       |         |         |      V  |
  17+ 0      29.6038      4.01  | Q       |         |         |      V  |
  17+15      29.7270      5.96  |  Q      |         |         |      V  |
  17+30      29.8652      6.69  |   Q     |         |         |      V  |
  17+45      30.0034      6.69  |   Q     |         |         |      V  |
  18+ 0      30.1214      5.71  |  Q      |         |         |      V  |
  18+15      30.2319      5.35  |  Q      |         |         |      V  |
  18+30      30.3425      5.35  |  Q      |         |         |       V |
  18+45      30.4329      4.37  | Q       |         |         |       V |
  19+ 0      30.4956      3.04  | Q       |         |         |       V |
  19+15      30.5710      3.65  | Q       |         |         |       V |
  19+30      30.6741      4.99  |  Q      |         |         |       V |
  19+45      30.7645      4.37  | Q       |         |         |       V |
  20+ 0      30.8273      3.04  | Q       |         |         |       V |
  20+15      30.9027      3.65  | Q       |         |         |       V |
  20+30      30.9856      4.01  | Q       |         |         |       V |
  20+45      31.0685      4.01  | Q       |         |         |       V |
  21+ 0      31.1312      3.04  | Q       |         |         |        V|
  21+15      31.2067      3.65  | Q       |         |         |        V|
  21+30      31.2694      3.04  | Q       |         |         |        V|
  21+45      31.3448      3.65  | Q       |         |         |        V|
  22+ 0      31.4076      3.04  | Q       |         |         |        V|
  22+15      31.4830      3.65  | Q       |         |         |        V|
  22+30      31.5458      3.04  | Q       |         |         |        V|
  22+45      31.6010      2.68  |Q        |         |         |        V|
  23+ 0      31.6563      2.68  |Q        |         |         |        V|
  23+15      31.7116      2.68  |Q        |         |         |        V|
  23+30      31.7669      2.68  |Q        |         |         |        V|
  23+45      31.8221      2.68  |Q        |         |         |        V|
  24+ 0      31.8774      2.68  |Q        |         |         |        V|
  24+15      31.8924      0.72  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/07/12

------------------------------------------------------------------


Watershed E, Routed
Proposed Conditions
100 Yr. 24 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubE124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =   108
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      575.561 (CFS)
               Total volume =     202.681 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       71.000 to Point/Station       72.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1070.00 (Ft.)
Elevation difference =   51.00 (Ft.)
Slope of channel =  0.047664 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1070.00(Ft.)     Elevation difference =  51.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    139.636(CFS)
Depth of flow =     0.761(Ft.)
Average velocity =     8.525(Ft/s)
Total flow rate =   139.636(CFS)
Channel flow top width =   23.044(Ft.)
Depth of flow in channel =   0.76(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    8.52(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  139.636(CFS)
Total capacity of improved channels =    139.636(CFS)
Critical Depth in Channel =    1.11(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    575.561(CFS)
Depth of flow =     1.747(Ft.)
Average velocity =    14.019(Ft/s)
```

```
Total flow rate =   575.561(CFS)
Channel flow top width =   26.990(Ft.)
Depth of flow in channel =   1.75(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   14.02(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  575.561(CFS)
Total capacity of improved channels =    575.561(CFS)
Critical Depth in Channel =    2.69(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8919   Travel time =   1.27 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   9.1478
        dt(routing time-step) =   1.13 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      143.9     287.8     431.7     575.6
----------------------------------------------------------------------
  0+15       0.2756      0.30  O         |         |         |         |
  0+30       1.9168      2.05  O         |         |         |         |
  0+45       4.7825      5.01  O         |         |         |         |
  1+ 0       6.8696      7.02  O         |         |         |         |
  1+15       8.4113      8.52  O         |         |         |         |
  1+30       9.2583      9.32  O         |         |         |         |
  1+45       8.9806      8.95  O         |         |         |         |
  2+ 0       9.0983      9.11  O         |         |         |         |
  2+15       9.8484      9.91  O         |         |         |         |
  2+30      10.8944     10.98  O         |         |         |         |
  2+45      11.4715     11.51  O         |         |         |         |
  3+ 0      12.4673     12.55  O         |         |         |         |
  3+15      13.6856     13.78  O         |         |         |         |
  3+30      14.2267     14.26  O         |         |         |         |
  3+45      14.5116     14.53  |O        |         |         |         |
  4+ 0      14.8166     14.84  |O        |         |         |         |
  4+15      15.6690     15.74  |O        |         |         |         |
  4+30      16.9223     17.02  |O        |         |         |         |
  4+45      18.1499     18.24  |O        |         |         |         |
  5+ 0      19.6037     19.72  |O        |         |         |         |
  5+15      20.6888     20.77  |O        |         |         |         |
  5+30      20.7210     20.72  |O        |         |         |         |
  5+45      20.1448     20.10  |O        |         |         |         |
  6+ 0      21.4144     21.52  |O        |         |         |         |
  6+15      22.7849     22.89  |O        |         |         |         |
  6+30      24.0467     24.14  |O        |         |         |         |
  6+45      25.5195     25.63  |O        |         |         |         |
  7+ 0      26.9027     27.01  |O        |         |         |         |
  7+15      28.3198     28.43  |O        |         |         |         |
  7+30      29.1113     29.17  | O       |         |         |         |
  7+45      30.3526     30.45  | O       |         |         |         |
  8+ 0      32.5093     32.68  | O       |         |         |         |
  8+15      35.1637     35.37  | O       |         |         |         |
  8+30      38.4844     38.74  | O       |         |         |         |
  8+45      41.6114     41.85  | O       |         |         |         |
  9+ 0      44.1133     44.30  |  O      |         |         |         |
  9+15      50.9313     51.47  |  O      |         |         |         |
  9+30      72.8673     74.62  |    O    |         |         |         |
  9+45     108.7062    111.50  |      O  |         |         |         |
```

```
10+ 0     143.0730    145.66  |        OI         |         |         |
10+15     167.7000    169.50  |         |O        |         |         |
10+30     145.8407    143.90  |         O         |         |         |
10+45      99.2566     95.60  |     O   |         |         |         |
11+ 0     115.0222    116.61  |      OI |         |         |         |
11+15     155.3946    158.57  |         OI        |         |         |
11+30     166.1709    166.79  |         |O        |         |         |
11+45     164.7787    164.61  |         |O        |         |         |
12+ 0     156.9223    156.29  |         O         |         |         |
12+15     159.5662    159.83  |         |O        |         |         |
12+30     220.9635    225.97  |         |    O    |         |         |
12+45     309.9514    316.82  |         |         |OI       |         |
13+ 0     372.8097    377.39  |         |         |    OI   |         |
13+15     434.9324    439.64  |         |         |         O         |
13+30     510.6529    516.46  |         |         |         |    O    |
13+45     571.0909    575.56  |         |         |         |        OI
14+ 0     525.5470    521.45  |         |         |         |     O   |
14+15     437.2259    430.33  |         |         |        IO         |
14+30     432.5354    432.72  |         |         |         O         |
14+45     452.3819    453.99  |         |         |         |O        |
15+ 0     450.4061    450.11  |         |         |         |O        |
15+15     443.4736    442.93  |         |         |         O         |
15+30     428.4353    427.25  |         |         |        O|         |
15+45     405.8701    404.12  |         |         |       O |         |
16+ 0     363.1036    359.75  |         |         |    O    |         |
16+15     304.3178    299.78  |         |         IO        |         |
16+30     219.2740    212.69  |         |   IO    |         |         |
16+45     116.6089    108.75  |      IO |         |         |         |
17+ 0      70.7578     67.65  |   O     |         |         |         |
17+15      45.3220     43.50  |  O      |         |         |         |
17+30      31.2925     30.29  | O       |         |         |         |
17+45      24.2496     23.76  |O        |         |         |         |
18+ 0      20.0857     19.79  |O        |         |         |         |
18+15      17.3661     17.17  |O        |         |         |         |
18+30      15.0226     14.85  |O        |         |         |         |
18+45      13.3997     13.28  O         |         |         |         |
19+ 0      11.5875     11.45  O         |         |         |         |
19+15       9.3934      9.23  O         |         |         |         |
19+30       8.6785      8.63  O         |         |         |         |
19+45       9.6347      9.72  O         |         |         |         |
20+ 0       9.8534      9.86  O         |         |         |         |
20+15       8.6233      8.52  O         |         |         |         |
20+30       8.1135      8.08  O         |         |         |         |
20+45       8.6488      8.70  O         |         |         |         |
21+ 0       8.6651      8.66  O         |         |         |         |
21+15       8.0920      8.05  O         |         |         |         |
21+30       7.6750      7.64  O         |         |         |         |
21+45       7.7075      7.71  O         |         |         |         |
22+ 0       7.4981      7.48  O         |         |         |         |
22+15       7.5936      7.60  O         |         |         |         |
22+30       7.4130      7.40  O         |         |         |         |
22+45       7.4056      7.41  O         |         |         |         |
23+ 0       6.6431      6.58  O         |         |         |         |
23+15       6.3431      6.32  O         |         |         |         |
23+30       6.1896      6.18  O         |         |         |         |
23+45       6.0939      6.09  O         |         |         |         |
24+ 0       6.0345      6.03  O         |         |         |         |
24+15       5.7267      5.70  O         |         |         |         |
24+30       4.2085      4.09  O         |         |         |         |
24+45       2.0884      1.92  O         |         |         |         |
25+ 0       1.1885      1.13  O         |         |         |         |
25+15       0.7026      0.67  O         |         |         |         |
25+30       0.3973      0.38  O         |         |         |         |
25+45       0.2143      0.20  O         |         |         |         |
26+ 0       0.1203      0.11  O         |         |         |         |
26+15       0.0786      0.08  O         |         |         |         |
26+30       0.0513      0.05  O         |         |         |         |
26+45       0.0275      0.03  O         |         |         |         |
27+ 0       0.0100      0.01  O         |         |         |         |
27+15       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
```

```
****************************HYDROGRAPH DATA***************************
                Number of intervals =   109
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      571.091 (CFS)
                Total volume =     202.681 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       71.000 to Point/Station       72.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: SUBE21RT.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0      210.9     421.7     632.6     843.4
-------------------------------------------------------------------
  0+15       0.1397      0.42  Q         |         |         |         |
  0+30       1.0292      2.95  Q         |         |         |         |
  0+45       2.3840      7.17  Q         |         |         |         |
  1+ 0       3.3571     10.23  Q         |         |         |         |
  1+15       4.1324     12.54  Q         |         |         |         |
  1+30       4.4349     13.69  Q         |         |         |         |
  1+45       4.3144     13.30  Q         |         |         |         |
  2+ 0       4.3442     13.44  Q         |         |         |         |
  2+15       4.7406     14.59  Q         |         |         |         |
  2+30       5.2045     16.10  Q         |         |         |         |
  2+45       5.4848     16.96  Q         |         |         |         |
  3+ 0       6.0072     18.47  Q         |         |         |         |
  3+15       6.5456     20.23  Q         |         |         |         |
  3+30       6.7955     21.02  Q         |         |         |         |
  3+45       6.9179     21.43  qQ        |         |         |         |
  4+ 0       7.0590     21.88  qQ        |         |         |         |
  4+15       7.5105     23.18  qQ        |         |         |         |
  4+30       8.0724     24.99  qQ        |         |         |         |
  4+45       8.7083     26.86  qQ        |         |         |         |
  5+ 0       9.3671     28.97  qQ        |         |         |         |
  5+15       9.9224     30.61  qQ        |         |         |         |
  5+30       9.7929     30.51  qQ        |         |         |         |
  5+45       9.6235     29.77  qQ        |         |         |         |
  6+ 0      10.2286     31.64  qQ        |         |         |         |
  6+15      10.8529     33.64  qQ        |         |         |         |
  6+30      11.5066     35.55  qQ        |         |         |         |
  6+45      12.1760     37.70  qQ        |         |         |         |
  7+ 0      12.8854     39.79  qQ        |         |         |         |
  7+15      13.5105     41.83  qQ        |         |         |         |
  7+30      13.8764     42.99  q Q       |         |         |         |
  7+45      14.5091     44.86  q Q       |         |         |         |
  8+ 0      15.5478     48.06  q Q       |         |         |         |
  8+15      16.8357     52.00  q Q       |         |         |         |
  8+30      18.4770     56.96  q Q       |         |         |         |
  8+45      19.8953     61.51  q Q       |         |         |         |
  9+ 0      21.0252     65.14  q  Q      |         |         |         |
  9+15      23.7814     74.71  |q Q      |         |         |         |
  9+30      34.5086    107.38  |q   Q    |         |         |         |
  9+45      51.1352    159.84  | q    Q  |         |         |         |
 10+ 0      67.6466    210.72  |  q     Q|         |         |         |
 10+15      79.2858    246.99  |  q      |Q        |         |         |
```

```
  10+30      65.7212    211.56  |  q       Q         |         |         |
  10+45      46.0135    145.27  | q   Q   |          |         |         |
  11+ 0      55.1315    170.15  | q     Q |          |         |         |
  11+15      72.3587    227.75  |  q       Q         |         |         |
  11+30      77.1391    243.31  |  q       |Q        |         |         |
  11+45      76.7757    241.55  |  q       |Q        |         |         |
  12+ 0      72.0652    228.99  |  q       Q         |         |         |
  12+15      74.4721    234.04  |  q       |Q        |         |         |
  12+30     106.7092    327.67  |    q     |    Q    |         |         |
  12+45     147.6859    457.64  |      q   |         |Q        |         |
  13+ 0     178.8551    551.66  |       q  |         |     Q   |         |
  13+15     208.4432    643.38  |        q|          |         Q         |
  13+30     246.3504    757.00  |         |q         |         |    Q    |
  13+45     272.3382    843.43  |         | q        |         |         Q
  14+ 0     244.3287    769.88  |         |q         |         |     Q   |
  14+15     205.2363    642.46  |        q|          |         Q         |
  14+30     204.1618    636.70  |        q|          |         Q         |
  14+45     211.8496    664.23  |         q          |         |Q        |
  15+ 0     211.4899    661.90  |         q          |         |Q        |
  15+15     208.0183    651.49  |        q|          |         Q         |
  15+30     201.1307    629.57  |        q|          |        Q|         |
  15+45     189.8225    595.69  |        q|          |       Q |         |
  16+ 0     167.4137    530.52  |      q  |          |    Q    |         |
  16+15     140.4753    444.79  |     q   |          |Q        |         |
  16+30      96.1561    315.43  |   q     |   Q      |         |         |
  16+45      51.0300    167.64  | q    Q  |          |         |         |
  17+ 0      29.4746    100.23  |q  Q     |          |         |         |
  17+15      18.2460     63.57  q  Q      |          |         |         |
  17+30      12.6185     43.91  q Q       |          |         |         |
  17+45      10.0027     34.25  qQ        |          |         |         |
  18+ 0       8.7333     28.82  qQ        |          |         |         |
  18+15       7.6107     24.98  qQ        |          |         |         |
  18+30       6.6326     21.66  qQ        |          |         |         |
  18+45       6.0011     19.40  Q         |          |         |         |
  19+ 0       5.2357     16.82  Q         |          |         |         |
  19+15       4.3459     13.74  Q         |          |         |         |
  19+30       4.1122     12.79  Q         |          |         |         |
  19+45       4.5935     14.23  Q         |          |         |         |
  20+ 0       4.6232     14.48  Q         |          |         |         |
  20+15       4.0297     12.65  Q         |          |         |         |
  20+30       3.8712     11.98  Q         |          |         |         |
  20+45       4.0935     12.74  Q         |          |         |         |
  21+ 0       4.1000     12.77  Q         |          |         |         |
  21+15       3.7814     11.87  Q         |          |         |         |
  21+30       3.6708     11.35  Q         |          |         |         |
  21+45       3.6087     11.32  Q         |          |         |         |
  22+ 0       3.5890     11.09  Q         |          |         |         |
  22+15       3.5507     11.14  Q         |          |         |         |
  22+30       3.5527     10.97  Q         |          |         |         |
  22+45       3.4675     10.87  Q         |          |         |         |
  23+ 0       3.1388      9.78  Q         |          |         |         |
  23+15       2.9911      9.33  Q         |          |         |         |
  23+30       2.9189      9.11  Q         |          |         |         |
  23+45       2.8789      8.97  Q         |          |         |         |
  24+ 0       2.8535      8.89  Q         |          |         |         |
  24+15       2.7035      8.43  Q         |          |         |         |
  24+30       1.8792      6.09  Q         |          |         |         |
  24+45       0.9307      3.02  Q         |          |         |         |
  25+ 0       0.4971      1.69  Q         |          |         |         |
  25+15       0.2753      0.98  Q         |          |         |         |
  25+30       0.1450      0.54  Q         |          |         |         |
  25+45       0.0736      0.29  Q         |          |         |         |
  26+ 0       0.0437      0.16  Q         |          |         |         |
  26+15       0.0272      0.11  Q         |          |         |         |
  26+30       0.0147      0.07  Q         |          |         |         |
  26+45       0.0052      0.03  Q         |          |         |         |
  27+ 0       0.0000      0.01  Q         |          |         |         |
  27+15       0.0000      0.00  Q         |          |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   109
```

```
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      843.429 (CFS)
               Total volume =     297.715 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       72.000 to Point/Station       73.000
**** STREAM ROUTING SCS CONVEX METHOD ****
_____________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   2900.00 (Ft.)
Elevation difference =   53.00 (Ft.)
Slope of channel =  0.018276 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  2900.00(Ft.)     Elevation difference =  53.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =    204.942(CFS)
Depth of flow =     1.266(Ft.)
Average velocity =     7.185(Ft/s)
Total flow rate =   204.942(CFS)
Channel flow top width =   25.064(Ft.)
Depth of flow in channel =   1.27(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    7.19(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  204.942(CFS)
Total capacity of improved channels =    204.942(CFS)
Critical Depth in Channel =    1.41(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    843.429(CFS)
Depth of flow =     2.859(Ft.)
Average velocity =    11.472(Ft/s)
Total flow rate =   843.429(CFS)
Channel flow top width =   31.435(Ft.)
Depth of flow in channel =   2.86(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   11.47(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  843.429(CFS)
Total capacity of improved channels =    843.429(CFS)
Critical Depth in Channel =    3.38(Ft.)


********************** SCS CONVEX CHANNEL ROUTING *********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8709   Travel time =   4.21 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   3.0587
        dt(routing time-step) =   3.67 (min.),   c* =   0.9981

Output hydrograph delayed by 0  unit time increments
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                  R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
              Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0      210.9     421.7     632.6     843.4
----------------------------------------------------------------------
  0+15       0.3131      0.42  O         |         |         |         |
  0+30       2.3231      2.95  O         |         |         |         |
  0+45       6.1268      7.17  O         |         |         |         |
  1+ 0       9.4718     10.23  O         |         |         |         |
  1+15      11.9721     12.54  O         |         |         |         |
  1+30      13.4093     13.69  O         |         |         |         |
  1+45      13.3925     13.30  O         |         |         |         |
  2+ 0      13.4063     13.44  O         |         |         |         |
  2+15      14.3068     14.59  O         |         |         |         |
  2+30      15.7268     16.10  O         |         |         |         |
  2+45      16.7446     16.96  O         |         |         |         |
  3+ 0      18.1005     18.47  O         |         |         |         |
  3+15      19.7982     20.23  O         |         |         |         |
  3+30      20.8267     21.02  O         |         |         |         |
  3+45      21.3289     21.43  |O        |         |         |         |
  4+ 0      21.7657     21.88  |O        |         |         |         |
  4+15      22.8585     23.18  |O        |         |         |         |
  4+30      24.5475     24.99  |O        |         |         |         |
  4+45      26.3988     26.86  |O        |         |         |         |
  5+ 0      28.4501     28.97  |O        |         |         |         |
  5+15      30.2066     30.61  |O        |         |         |         |
  5+30      30.5371     30.51  |O        |         |         |         |
  5+45      29.9518     29.77  |O        |         |         |         |
  6+ 0      31.1821     31.64  |O        |         |         |         |
  6+15      33.1461     33.64  |O        |         |         |         |
  6+30      35.0811     35.55  |O        |         |         |         |
  6+45      37.1675     37.70  |O        |         |         |         |
  7+ 0      39.2722     39.79  |O        |         |         |         |
  7+15      41.3268     41.83  |O        |         |         |         |
  7+30      42.7020     42.99  | O       |         |         |         |
  7+45      44.4001     44.86  | O       |         |         |         |
  8+ 0      47.2700     48.06  | O       |         |         |         |
  8+15      51.0279     52.00  | O       |         |         |         |
  8+30      55.7386     56.96  | O       |         |         |         |
  8+45      60.3860     61.51  | O       |         |         |         |
  9+ 0      64.2427     65.14  |  O      |         |         |         |
  9+15      72.3552     74.71  |  O      |         |         |         |
  9+30      99.3343    107.38  |   OI    |         |         |         |
  9+45     146.9164    159.84  |     OI  |         |         |         |
 10+ 0     198.1759    210.72  |        O|         |         |         |
 10+15     238.0383    246.99  |         |O        |         |         |
 10+30     220.2613    211.56  |         O         |         |         |
 10+45     161.5984    145.27  |     IO  |         |         |         |
 11+ 0     164.0620    170.15  |      OI |         |         |         |
 11+15     213.5688    227.75  |         O         |         |         |
 11+30     239.4551    243.31  |         |O        |         |         |
 11+45     241.9790    241.55  |         |O        |         |         |
 12+ 0     232.0806    228.99  |         IO        |         |         |
 12+15     232.8014    234.04  |         |O        |         |         |
 12+30     304.6307    327.67  |         |   OI    |         |         |
 12+45     425.6144    457.64  |         |         OI        |         |
 13+ 0     528.4674    551.66  |         |         |    OI   |         |
 13+15     620.7650    643.38  |         |         |       OI          |
 13+30     729.0010    757.00  |         |         |         |   OI    |
 13+45     822.1098    843.43  |         |         |         |       O I
 14+ 0     787.9336    769.88  |         |         |         |     IO  |
 14+15     673.8480    642.46  |         |         |         IO        |
 14+30     638.1756    636.70  |         |         |         O         |
 14+45     657.4592    664.23  |         |         |         |O        |
 15+ 0     662.4578    661.90  |         |         |         |O        |
 15+15     654.0531    651.49  |         |         |         IO        |
 15+30     634.9659    629.57  |         |         |        IO         |
```

```
   15+45     604.0378    595.69  |         |         |       O |         |
   16+ 0     546.5702    530.52  |         |         |    O    |         |
   16+15     465.9169    444.79  |         |         |IO       |         |
   16+30     347.3013    315.43  |         |   I O   |         |         |
   16+45     204.0650    167.64  |       I O|         |         |         |
   17+ 0     116.8879    100.23  |   IO    |         |         |         |
   17+15      72.6214     63.57  |  O      |         |         |         |
   17+30      48.7651     43.91  | O       |         |         |         |
   17+45      36.6382     34.25  |O        |         |         |         |
   18+ 0      30.1605     28.82  |O        |         |         |         |
   18+15      25.9248     24.98  |O        |         |         |         |
   18+30      22.4743     21.66  |O        |         |         |         |
   18+45      19.9571     19.40  O         |         |         |         |
   19+ 0      17.4585     16.82  O         |         |         |         |
   19+15      14.4993     13.74  O         |         |         |         |
   19+30      13.0255     12.79  O         |         |         |         |
   19+45      13.8749     14.23  O         |         |         |         |
   20+ 0      14.4149     14.48  O         |         |         |         |
   20+15      13.1016     12.65  O         |         |         |         |
   20+30      12.1500     11.98  O         |         |         |         |
   20+45      12.5562     12.74  O         |         |         |         |
   21+ 0      12.7592     12.77  O         |         |         |         |
   21+15      12.0928     11.87  O         |         |         |         |
   21+30      11.4760     11.35  O         |         |         |         |
   21+45      11.3237     11.32  O         |         |         |         |
   22+ 0      11.1435     11.09  O         |         |         |         |
   22+15      11.1303     11.14  O         |         |         |         |
   22+30      11.0096     10.97  O         |         |         |         |
   22+45      10.8960     10.87  O         |         |         |         |
   23+ 0      10.0504      9.78  O         |         |         |         |
   23+15       9.4448      9.33  O         |         |         |         |
   23+30       9.1642      9.11  O         |         |         |         |
   23+45       9.0063      8.97  O         |         |         |         |
   24+ 0       8.9089      8.89  O         |         |         |         |
   24+15       8.5429      8.43  O         |         |         |         |
   24+30       6.6643      6.09  O         |         |         |         |
   24+45       3.7753      3.02  O         |         |         |         |
   25+ 0       2.0152      1.69  O         |         |         |         |
   25+15       1.1527      0.98  O         |         |         |         |
   25+30       0.6498      0.54  O         |         |         |         |
   25+45       0.3506      0.29  O         |         |         |         |
   26+ 0       0.1946      0.16  O         |         |         |         |
   26+15       0.1202      0.11  O         |         |         |         |
   26+30       0.0758      0.07  O         |         |         |         |
   26+45       0.0409      0.03  O         |         |         |         |
   27+ 0       0.0156      0.01  O         |         |         |         |
   27+15       0.0025      0.00  O         |         |         |         |
   27+30       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   110
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =      822.110 (CFS)
                       Total volume =     297.715 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       72.000 to Point/Station       73.000
        **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
        ______________________________________________________________________
        ******************** HYDROGRAPH INFORMATION *********************

                       From study/file name: SubE324100.rte
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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P R I N T O F S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals (CFS)

Time(h+m)	Add q(CFS)	Tot. Q	0 207.7 415.3 623.0 830.6
0+15	0.1383	0.45	Q
0+30	0.4419	2.77	Q
0+45	0.6083	6.74	Q
1+ 0	0.7114	10.18	Q
1+15	0.7674	12.74	Q
1+30	0.6763	14.09	Q
1+45	0.6564	14.05	Q
2+ 0	0.7225	14.13	Q
2+15	0.8381	15.14	Q
2+30	0.8627	16.59	Q
2+45	0.9365	17.68	Q
3+ 0	1.0554	19.16	Q
3+15	1.0799	20.88	qQ
3+30	1.0846	21.91	qQ
3+45	1.0862	22.42	qQ
4+ 0	1.1554	22.92	qQ
4+15	1.2726	24.13	qQ
4+30	1.3663	25.91	qQ
4+45	1.4883	27.89	qQ
5+ 0	1.5836	30.03	qQ
5+15	1.5672	31.77	qQ
5+30	1.4280	31.97	qQ
5+45	1.5700	31.52	qQ
6+ 0	1.7040	32.89	qQ
6+15	1.7992	34.95	qQ
6+30	1.9228	37.00	qQ
6+45	2.0181	39.19	qQ
7+ 0	2.1400	41.41	qQ
7+15	2.1662	43.49	q Q
7+30	2.2400	44.94	q Q
7+45	2.4280	46.83	q Q
8+ 0	2.6390	49.91	q Q
8+15	2.9772	54.01	q Q
8+30	3.3386	59.08	q Q
8+45	3.5265	63.91	q Q
9+ 0	3.8238	68.07	q Q
9+15	4.2451	76.60	q Q
9+30	4.7373	104.07	q Q
9+45	5.0992	152.02	q Q
10+ 0	5.4326	203.61	q Q
10+15	4.9711	243.01	q Q
10+30	3.8588	224.12	q Q
10+45	4.1322	165.73	q Q
11+ 0	4.9407	169.00	q Q
11+15	5.0167	218.59	q Q
11+30	4.8981	244.35	q Q
11+45	4.6922	246.67	q Q
12+ 0	4.4644	236.54	q Q
12+15	5.2659	238.07	q Q
12+30	6.5734	311.20	q Q
12+45	7.2006	432.82	q Q
13+ 0	7.7331	536.20	q Q
13+15	8.5017	629.27	q Q
13+30	9.4039	738.40	q Q
13+45	8.5177	830.63	q Q
14+ 0	6.7249	794.66	q Q
14+15	6.7594	680.61	q Q
14+30	7.2700	645.45	q Q
14+45	7.2306	664.69	q Q
15+ 0	7.1365	669.59	q Q
15+15	6.8855	660.94	q Q
15+30	6.5944	641.56	q Q
15+45	6.0023	610.04	q Q

```
  16+ 0       5.3005    551.87  q         |         |     Q   |         |
  16+15       3.8052    469.72  q         |         | Q       |         |
  16+30       1.4819    348.78  q         |     Q   |         |         |
  16+45       0.9233    204.99  q        Q|         |         |         |
  17+ 0       0.7141    117.60  q    Q    |         |         |         |
  17+15       0.7964     73.42  q  Q      |         |         |         |
  17+30       1.0261     49.79  q Q       |         |         |         |
  17+45       1.0736     37.71  qQ        |         |         |         |
  18+ 0       1.0139     31.17  qQ        |         |         |         |
  18+15       0.8998     26.82  qQ        |         |         |         |
  18+30       0.8753     23.35  qQ        |         |         |         |
  18+45       0.8014     20.76  Q         |         |         |         |
  19+ 0       0.6134     18.07  Q         |         |         |         |
  19+15       0.5408     15.04  Q         |         |         |         |
  19+30       0.6980     13.72  Q         |         |         |         |
  19+45       0.7643     14.64  Q         |         |         |         |
  20+ 0       0.6055     15.02  Q         |         |         |         |
  20+15       0.5392     13.64  Q         |         |         |         |
  20+30       0.6288     12.78  Q         |         |         |         |
  20+45       0.6470     13.20  Q         |         |         |         |
  21+ 0       0.5810     13.34  Q         |         |         |         |
  21+15       0.5345     12.63  Q         |         |         |         |
  21+30       0.5580     12.03  Q         |         |         |         |
  21+45       0.5298     11.85  Q         |         |         |         |
  22+ 0       0.5564     11.70  Q         |         |         |         |
  22+15       0.5298     11.66  Q         |         |         |         |
  22+30       0.5564     11.57  Q         |         |         |         |
  22+45       0.4607     11.36  Q         |         |         |         |
  23+ 0       0.4392     10.49  Q         |         |         |         |
  23+15       0.4361      9.88  Q         |         |         |         |
  23+30       0.4345      9.60  Q         |         |         |         |
  23+45       0.4345      9.44  Q         |         |         |         |
  24+ 0       0.4345      9.34  Q         |         |         |         |
  24+15       0.2962      8.84  Q         |         |         |         |
  24+30       0.0617      6.73  Q         |         |         |         |
  24+45       0.0126      3.79  Q         |         |         |         |
  25+ 0       0.0032      2.02  Q         |         |         |         |
  25+15       0.0000      1.15  Q         |         |         |         |
  25+30       0.0000      0.65  Q         |         |         |         |
  25+45       0.0000      0.35  Q         |         |         |         |
  26+ 0       0.0000      0.19  Q         |         |         |         |
  26+15       0.0000      0.12  Q         |         |         |         |
  26+30       0.0000      0.08  Q         |         |         |         |
  26+45       0.0000      0.04  Q         |         |         |         |
  27+ 0       0.0000      0.02  Q         |         |         |         |
  27+15       0.0000      0.00  Q         |         |         |         |
  27+30       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   110
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      830.627 (CFS)
                      Total volume =     302.895 (Ac.Ft)
               Status of hydrographs being held in storage
                          Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ----------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station       72.000 to Point/Station       73.000
        **** STORE OR DELETE CURRENT HYDROGRAPH ****
        ______________________________________________________________________
        Current stream hydrograph saved in file WSE24hr.rte
        ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
```

```
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 05/07/12

------------------------------------------------------------------


Watershed E, Subdrain Area E21 routed to Node 72
Proposed Condition
100 Yr, 24 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: SubE2124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =   107
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =      275.722 (CFS)
               Total volume =      95.034 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      721.000 to Point/Station       72.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1390.00 (Ft.)
Elevation difference =   39.00 (Ft.)
Slope of channel =  0.028058 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1390.00(Ft.)     Elevation difference =  39.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Channel base width  =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.030
Maximum depth of channel  =   10.000(Ft.)
Flow(q) thru subarea =     64.850(CFS)
Depth of flow =     0.565(Ft.)
Average velocity =     5.433(Ft/s)
Total flow rate =    64.850(CFS)
Channel flow top width =   22.260(Ft.)
Depth of flow in channel =   0.56(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.43(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   64.850(CFS)
Total capacity of improved channels =     64.850(CFS)
Critical Depth in Channel =    0.67(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Flow(q) thru subarea =    275.722(CFS)
Depth of flow =     1.328(Ft.)
Average velocity =     9.161(Ft/s)
```

```
Total flow rate =   275.722(CFS)
Channel flow top width =   25.314(Ft.)
Depth of flow in channel =   1.33(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    9.16(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =  275.722(CFS)
Total capacity of improved channels =    275.722(CFS)
Critical Depth in Channel =    1.70(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
          where c* = 1 - (1-c)^e and dt = c(length)/velocity
          c(v/v+1.7) =   0.8435   Travel time =   2.53 (min.)
        dt*(unit time interval) =  15.00(min.),  e=   5.0216
        dt(routing time-step) =   2.13 (min.),   c* =   0.9999

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    P R I N T  O F  S T O R M
                 R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       68.9     137.9     206.8     275.7
----------------------------------------------------------------------
  0+15       0.1397      0.16  O         |         |         |         |
  0+30       1.0292      1.17  O         |         |         |         |
  0+45       2.3840      2.58  O         |         |         |         |
  1+ 0       3.3571      3.49  O         |         |         |         |
  1+15       4.1324      4.24  O         |         |         |         |
  1+30       4.4349      4.47  O         |         |         |         |
  1+45       4.3144      4.29  O         |         |         |         |
  2+ 0       4.3442      4.35  O         |         |         |         |
  2+15       4.7406      4.80  O         |         |         |         |
  2+30       5.2045      5.27  O         |         |         |         |
  2+45       5.4848      5.52  O         |         |         |         |
  3+ 0       6.0072      6.09  O         |         |         |         |
  3+15       6.5456      6.62  O         |         |         |         |
  3+30       6.7955      6.82  O         |         |         |         |
  3+45       6.9179      6.93  |O        |         |         |         |
  4+ 0       7.0590      7.08  |O        |         |         |         |
  4+15       7.5105      7.58  |O        |         |         |         |
  4+30       8.0724      8.15  |O        |         |         |         |
  4+45       8.7083      8.80  |O        |         |         |         |
  5+ 0       9.3671      9.46  |O        |         |         |         |
  5+15       9.9224     10.00  |O        |         |         |         |
  5+30       9.7929      9.76  |O        |         |         |         |
  5+45       9.6235      9.60  |O        |         |         |         |
  6+ 0      10.2286     10.33  |O        |         |         |         |
  6+15      10.8529     10.94  |O        |         |         |         |
  6+30      11.5066     11.60  |O        |         |         |         |
  6+45      12.1760     12.27  |O        |         |         |         |
  7+ 0      12.8854     12.99  |O        |         |         |         |
  7+15      13.5105     13.60  |O        |         |         |         |
  7+30      13.8764     13.92  | O       |         |         |         |
  7+45      14.5091     14.61  | O       |         |         |         |
  8+ 0      15.5478     15.70  | O       |         |         |         |
  8+15      16.8357     17.02  | O       |         |         |         |
  8+30      18.4770     18.72  | O       |         |         |         |
  8+45      19.8953     20.09  | O       |         |         |         |
  9+ 0      21.0252     21.18  |  O      |         |         |         |
  9+15      23.7814     24.21  |  O      |         |         |         |
  9+30      34.5086     36.22  |    O    |         |         |         |
  9+45      51.1352     53.61  |      O  |         |         |         |
```

```
10+ 0      67.6466     69.98  |        OI         |         |         |
10+15      79.2858     80.83  |         |O        |         |         |
10+30      65.7212     63.22  |        O|         |         |         |
10+45      46.0135     43.16  |     O   |         |         |         |
11+ 0      55.1315     57.12  |      OI |         |         |         |
11+15      72.3587     74.89  |         O         |         |         |
11+30      77.1391     77.51  |         |O        |         |         |
11+45      76.7757     76.65  |         |O        |         |         |
12+ 0      72.0652     71.30  |         O         |         |         |
12+15      74.4721     75.00  |         O         |         |         |
12+30     106.7092    111.97  |         |    OI   |         |         |
12+45     147.6859    153.61  |         |         |OI       |         |
13+ 0     178.8551    183.04  |         |         |    OI   |         |
13+15     208.4432    212.66  |         |         |         O         |
13+30     246.3504    251.94  |         |         |         |    OI   |
13+45     272.3382    275.72  |         |         |         |        OI
14+ 0     244.3287    239.12  |         |         |         |   IO    |
14+15     205.2363    199.61  |         |         |       IO|         |
14+30     204.1618    204.92  |         |         |        O|         |
14+45     211.8496    213.00  |         |         |         O         |
15+ 0     211.4899    211.24  |         |         |         O         |
15+15     208.0183    207.48  |         |         |         O         |
15+30     201.1307    200.08  |         |         |        O|         |
15+45     189.8225    188.12  |         |         |      O  |         |
16+ 0     167.4137    163.98  |         |         |  IO     |         |
16+15     140.4753    136.58  |         |        IO         |         |
16+30      96.1561     89.45  |         | IO      |         |         |
16+45      51.0300     44.66  |     IO  |         |         |         |
17+ 0      29.4746     26.96  |  IO     |         |         |         |
17+15      18.2460     16.80  | O       |         |         |         |
17+30      12.6185     11.92  |O        |         |         |         |
17+45      10.0027      9.68  |O        |         |         |         |
18+ 0       8.7333      8.58  |O        |         |         |         |
18+15       7.6107      7.45  |O        |         |         |         |
18+30       6.6326      6.50  O         |         |         |         |
18+45       6.0011      5.92  O         |         |         |         |
19+ 0       5.2357      5.12  O         |         |         |         |
19+15       4.3459      4.22  O         |         |         |         |
19+30       4.1122      4.09  O         |         |         |         |
19+45       4.5935      4.68  O         |         |         |         |
20+ 0       4.6232      4.61  O         |         |         |         |
20+15       4.0297      3.93  O         |         |         |         |
20+30       3.8712      3.86  O         |         |         |         |
20+45       4.0935      4.13  O         |         |         |         |
21+ 0       4.1000      4.09  O         |         |         |         |
21+15       3.7814      3.73  O         |         |         |         |
21+30       3.6708      3.66  O         |         |         |         |
21+45       3.6087      3.60  O         |         |         |         |
22+ 0       3.5890      3.59  O         |         |         |         |
22+15       3.5507      3.54  O         |         |         |         |
22+30       3.5527      3.55  O         |         |         |         |
22+45       3.4675      3.45  O         |         |         |         |
23+ 0       3.1388      3.09  O         |         |         |         |
23+15       2.9911      2.98  O         |         |         |         |
23+30       2.9189      2.91  O         |         |         |         |
23+45       2.8789      2.87  O         |         |         |         |
24+ 0       2.8535      2.85  O         |         |         |         |
24+15       2.7035      2.68  O         |         |         |         |
24+30       1.8792      1.75  O         |         |         |         |
24+45       0.9307      0.80  O         |         |         |         |
25+ 0       0.4971      0.45  O         |         |         |         |
25+15       0.2753      0.25  O         |         |         |         |
25+30       0.1450      0.13  O         |         |         |         |
25+45       0.0736      0.06  O         |         |         |         |
26+ 0       0.0437      0.04  O         |         |         |         |
26+15       0.0272      0.03  O         |         |         |         |
26+30       0.0147      0.01  O         |         |         |         |
26+45       0.0052      0.00  O         |         |         |         |
27+ 0       0.0000      0.00  O         |         |         |         |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
```

```
                Number of intervals =   108
                Time interval =   15.0 (Min.)
                Maximum/Peak flow rate =      272.338 (CFS)
                Total volume =      95.034 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      721.000 to Point/Station       72.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file SUBE21RT.rte
****************************HYDROGRAPH DATA***************************
                Number of intervals =     0
                Time interval =    0.0 (Min.)
                Maximum/Peak flow rate =        0.000 (CFS)
                Total volume =       0.000 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

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```

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       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
              Study date  05/07/12 File: SUBE124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed E, Subdrain Area E1
Proposed Condition
100 Yr, 24 Hr.

--------------------------------------------------------------------
Drainage Area =    1648.50(Ac.)  =      2.576 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =    1648.50(Ac.)  =      2.576 Sq. Mi.
Length along longest watercourse =   14430.00(Ft.)
Length along longest watercourse measured to centroid =    9640.00(Ft.)
Length along longest watercourse =      2.733 Mi.
Length along longest watercourse measured to centroid =      1.826 Mi.
Difference in elevation =     815.00(Ft.)
Slope along watercourse =    298.2121 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.449 Hr.
Lag time =    26.95 Min.
25% of lag time =     6.74 Min.
40% of lag time =    10.78 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1648.50           1.80                2967.30

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
     1648.50           4.50                7418.25

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.68 %
Adjusted average point rain =    4.486(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   105.000           46.00         0.000
    47.400           66.00         0.000
```

18.500	77.00	0.000
1477.600	83.00	0.000

Total Area Entered = 1648.50(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.064	0.039
66.0	66.0	0.405	0.000	0.405	0.029	0.012
77.0	77.0	0.279	0.000	0.279	0.011	0.003
83.0	83.0	0.210	0.000	0.210	0.896	0.188
					Sum (F) =	0.242

Area averaged mean soil loss (F) (In/Hr) = 0.242
Minimum soil loss rate ((In/Hr)) = 0.121
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	55.654	4.998	83.034
2	0.500	111.309	26.859	446.222
3	0.750	166.963	36.143	600.478
4	1.000	222.617	13.228	219.760
5	1.250	278.271	7.651	127.110
6	1.500	333.926	4.833	80.291
7	1.750	389.580	2.918	48.473
8	2.000	445.234	1.465	24.333
9	2.250	500.889	0.637	10.581
10	2.500	556.543	0.443	7.358
11	2.750	612.197	0.397	6.588
12	3.000	667.851	0.285	4.731
13	3.250	723.506	0.146	2.419
			Sum = 100.000	Sum= 1661.379

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.427)	0.032	0.004
2	0.50	0.30	0.054	(0.422)	0.048	0.005
3	0.75	0.30	0.054	(0.417)	0.048	0.005
4	1.00	0.40	0.072	(0.412)	0.065	0.007
5	1.25	0.30	0.054	(0.407)	0.048	0.005
6	1.50	0.30	0.054	(0.402)	0.048	0.005
7	1.75	0.30	0.054	(0.398)	0.048	0.005
8	2.00	0.40	0.072	(0.393)	0.065	0.007
9	2.25	0.40	0.072	(0.388)	0.065	0.007
10	2.50	0.40	0.072	(0.383)	0.065	0.007
11	2.75	0.50	0.090	(0.379)	0.081	0.009
12	3.00	0.50	0.090	(0.374)	0.081	0.009
13	3.25	0.50	0.090	(0.369)	0.081	0.009
14	3.50	0.50	0.090	(0.365)	0.081	0.009
15	3.75	0.50	0.090	(0.360)	0.081	0.009
16	4.00	0.60	0.108	(0.356)	0.097	0.011
17	4.25	0.60	0.108	(0.351)	0.097	0.011
18	4.50	0.70	0.126	(0.347)	0.113	0.013
19	4.75	0.70	0.126	(0.342)	0.113	0.013
20	5.00	0.80	0.144	(0.338)	0.129	0.014
21	5.25	0.60	0.108	(0.333)	0.097	0.011
22	5.50	0.70	0.126	(0.329)	0.113	0.013
23	5.75	0.80	0.144	(0.325)	0.129	0.014

24	6.00	0.80	0.144	(	0.321)	0.129	0.014
25	6.25	0.90	0.161	(	0.316)	0.145	0.016
26	6.50	0.90	0.161	(	0.312)	0.145	0.016
27	6.75	1.00	0.179	(	0.308)	0.161	0.018
28	7.00	1.00	0.179	(	0.304)	0.161	0.018
29	7.25	1.00	0.179	(	0.300)	0.161	0.018
30	7.50	1.10	0.197	(	0.296)	0.178	0.020
31	7.75	1.20	0.215	(	0.291)	0.194	0.022
32	8.00	1.30	0.233	(	0.287)	0.210	0.023
33	8.25	1.50	0.269	(	0.283)	0.242	0.027
34	8.50	1.50	0.269	(	0.280)	0.242	0.027
35	8.75	1.60	0.287	(	0.276)	0.258	0.029
36	9.00	1.70	0.305		0.272	(0.275)	0.033
37	9.25	1.90	0.341		0.268	(0.307)	0.073
38	9.50	2.00	0.359		0.264	(0.323)	0.095
39	9.75	2.10	0.377		0.260	(0.339)	0.116
40	10.00	2.20	0.395		0.257	(0.355)	0.138
41	10.25	1.50	0.269	(	0.253)	0.242	0.027
42	10.50	1.50	0.269	(	0.249)	0.242	0.027
43	10.75	2.00	0.359		0.246	(0.323)	0.113
44	11.00	2.00	0.359		0.242	(0.323)	0.117
45	11.25	1.90	0.341		0.238	(0.307)	0.103
46	11.50	1.90	0.341		0.235	(0.307)	0.106
47	11.75	1.70	0.305		0.231	(0.275)	0.074
48	12.00	1.80	0.323		0.228	(0.291)	0.095
49	12.25	2.50	0.449		0.225	(0.404)	0.224
50	12.50	2.60	0.466		0.221	(0.420)	0.245
51	12.75	2.80	0.502		0.218	(0.452)	0.285
52	13.00	2.90	0.520		0.215	(0.468)	0.306
53	13.25	3.40	0.610		0.211	(0.549)	0.399
54	13.50	3.40	0.610		0.208	(0.549)	0.402
55	13.75	2.30	0.413		0.205	(0.371)	0.208
56	14.00	2.30	0.413		0.202	(0.371)	0.211
57	14.25	2.70	0.484		0.199	(0.436)	0.286
58	14.50	2.60	0.466		0.196	(0.420)	0.271
59	14.75	2.60	0.466		0.193	(0.420)	0.274
60	15.00	2.50	0.449		0.190	(0.404)	0.259
61	15.25	2.40	0.431		0.187	(0.388)	0.244
62	15.50	2.30	0.413		0.184	(0.371)	0.229
63	15.75	1.90	0.341		0.181	(0.307)	0.160
64	16.00	1.90	0.341		0.178	(0.307)	0.162
65	16.25	0.40	0.072	(	0.176)	0.065	0.007
66	16.50	0.40	0.072	(	0.173)	0.065	0.007
67	16.75	0.30	0.054	(	0.170)	0.048	0.005
68	17.00	0.30	0.054	(	0.168)	0.048	0.005
69	17.25	0.50	0.090	(	0.165)	0.081	0.009
70	17.50	0.50	0.090	(	0.163)	0.081	0.009
71	17.75	0.50	0.090	(	0.160)	0.081	0.009
72	18.00	0.40	0.072	(	0.158)	0.065	0.007
73	18.25	0.40	0.072	(	0.156)	0.065	0.007
74	18.50	0.40	0.072	(	0.153)	0.065	0.007
75	18.75	0.30	0.054	(	0.151)	0.048	0.005
76	19.00	0.20	0.036	(	0.149)	0.032	0.004
77	19.25	0.30	0.054	(	0.147)	0.048	0.005
78	19.50	0.40	0.072	(	0.145)	0.065	0.007
79	19.75	0.30	0.054	(	0.143)	0.048	0.005
80	20.00	0.20	0.036	(	0.141)	0.032	0.004
81	20.25	0.30	0.054	(	0.139)	0.048	0.005
82	20.50	0.30	0.054	(	0.137)	0.048	0.005
83	20.75	0.30	0.054	(	0.136)	0.048	0.005
84	21.00	0.20	0.036	(	0.134)	0.032	0.004
85	21.25	0.30	0.054	(	0.132)	0.048	0.005
86	21.50	0.20	0.036	(	0.131)	0.032	0.004
87	21.75	0.30	0.054	(	0.129)	0.048	0.005
88	22.00	0.20	0.036	(	0.128)	0.032	0.004
89	22.25	0.30	0.054	(	0.127)	0.048	0.005
90	22.50	0.20	0.036	(	0.126)	0.032	0.004
91	22.75	0.20	0.036	(	0.125)	0.032	0.004
92	23.00	0.20	0.036	(	0.124)	0.032	0.004
93	23.25	0.20	0.036	(	0.123)	0.032	0.004
94	23.50	0.20	0.036	(	0.122)	0.032	0.004

```
95  23.75     0.20      0.036       (  0.121)       0.032        0.004
96  24.00     0.20      0.036       (  0.121)       0.032        0.004
              (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     5.9
      Flood volume = Effective rainfall      1.48(In)
       times area    1648.5(Ac.)/[(In)/(Ft.)] =     202.7(Ac.Ft)
      Total soil loss =      3.01(In)
      Total soil loss =   413.516(Ac.Ft)
      Total rainfall =      4.49(In)
      Flood volume =     8828781.1 Cubic Feet
      Total soil loss =    18012764.8 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    575.561(CFS)
      ---------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0      150.0     300.0     450.0     600.0
-------------------------------------------------------------------------
  0+15       0.0062      0.30  Q         |         |         |         |
  0+30       0.0485      2.05  Q         |         |         |         |
  0+45       0.1519      5.01  Q         |         |         |         |
  1+ 0       0.2970      7.02  Q         |         |         |         |
  1+15       0.4732      8.52  Q         |         |         |         |
  1+30       0.6657      9.32  Q         |         |         |         |
  1+45       0.8507      8.95  Q         |         |         |         |
  2+ 0       1.0389      9.11  Q         |         |         |         |
  2+15       1.2436      9.91  Q         |         |         |         |
  2+30       1.4704     10.98  Q         |         |         |         |
  2+45       1.7082     11.51  Q         |         |         |         |
  3+ 0       1.9674     12.55  Q         |         |         |         |
  3+15       2.2521     13.78  Q         |         |         |         |
  3+30       2.5468     14.26  Q         |         |         |         |
  3+45       2.8471     14.53  Q         |         |         |         |
  4+ 0       3.1537     14.84  Q         |         |         |         |
  4+15       3.4788     15.74  VQ        |         |         |         |
  4+30       3.8304     17.02  VQ        |         |         |         |
  4+45       4.2074     18.24  VQ        |         |         |         |
  5+ 0       4.6147     19.72  VQ        |         |         |         |
  5+15       5.0438     20.77  VQ        |         |         |         |
  5+30       5.4718     20.72  |Q        |         |         |         |
  5+45       5.8871     20.10  |Q        |         |         |         |
  6+ 0       6.3317     21.52  |Q        |         |         |         |
  6+15       6.8046     22.89  |Q        |         |         |         |
  6+30       7.3034     24.14  |Q        |         |         |         |
  6+45       7.8330     25.63  |Q        |         |         |         |
  7+ 0       8.3910     27.01  |Q        |         |         |         |
  7+15       8.9784     28.43  |Q        |         |         |         |
  7+30       9.5810     29.17  |Q        |         |         |         |
  7+45      10.2101     30.45  | Q       |         |         |         |
  8+ 0      10.8853     32.68  | Q       |         |         |         |
  8+15      11.6160     35.37  | Q       |         |         |         |
  8+30      12.4164     38.74  | Q       |         |         |         |
  8+45      13.2810     41.85  | Q       |         |         |         |
  9+ 0      14.1963     44.30  | Q       |         |         |         |
  9+15      15.2598     51.47  |  Q      |         |         |         |
  9+30      16.8015     74.62  |  VQ     |         |         |         |
  9+45      19.1051    111.50  |  V   Q  |         |         |         |
 10+ 0      22.1145    145.66  |   V    Q|         |         |         |
 10+15      25.6167    169.50  |    V    |Q        |         |         |
 10+30      28.5899    143.90  |    V   Q|         |         |         |
 10+45      30.5652     95.60  |     Q   |         |         |         |
 11+ 0      32.9745    116.61  |     VQ  |         |         |         |
 11+15      36.2507    158.57  |      V  Q         |         |         |
 11+30      39.6968    166.79  |      V  |Q        |         |         |
 11+45      43.0979    164.61  |       V Q         |         |         |
 12+ 0      46.3271    156.29  |        VQ         |         |         |
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12+15      49.6295    159.83  |        VQ         |         |         |
12+30      54.2982    225.97  |         V    Q    |         |         |
12+45      60.8441    316.82  |         | V       |Q        |         |
13+ 0      68.6415    377.39  |         |  V      |    Q    |         |
13+15      77.7249    439.64  |         |    V    |        Q|         |
13+30      88.3957    516.46  |         |      V  |         |   Q     |
13+45     100.2874    575.56  |         |        V|         |       Q |
14+ 0     111.0613    521.45  |         |          V        |   Q     |
14+15     119.9525    430.33  |         |         |  V    Q |         |
14+30     128.8929    432.72  |         |         |    V  Q |         |
14+45     138.2729    453.99  |         |         |      V  Q         |
15+ 0     147.5727    450.11  |         |         |        VQ         |
15+15     156.7242    442.93  |         |         |        QV         |
15+30     165.5516    427.25  |         |         |       Q | V       |
15+45     173.9012    404.12  |         |         |     Q   |   V     |
16+ 0     181.3340    359.75  |         |         |  Q      |    V    |
16+15     187.5279    299.78  |         |        Q|         |      V  |
16+30     191.9222    212.69  |         |   Q     |         |      V  |
16+45     194.1691    108.75  |      Q  |         |         |       V |
17+ 0     195.5668     67.65  |   Q     |         |         |       V |
17+15     196.4655     43.50  | Q       |         |         |       V |
17+30     197.0914     30.29  | Q       |         |         |       V |
17+45     197.5822     23.76  |Q        |         |         |       V |
18+ 0     197.9910     19.79  |Q        |         |         |        V|
18+15     198.3457     17.17  |Q        |         |         |        V|
18+30     198.6524     14.85  Q         |         |         |        V|
18+45     198.9269     13.28  Q         |         |         |        V|
19+ 0     199.1634     11.45  Q         |         |         |        V|
19+15     199.3540      9.23  Q         |         |         |        V|
19+30     199.5324      8.63  Q         |         |         |        V|
19+45     199.7331      9.72  Q         |         |         |        V|
20+ 0     199.9370      9.86  Q         |         |         |        V|
20+15     200.1130      8.52  Q         |         |         |        V|
20+30     200.2800      8.08  Q         |         |         |        V|
20+45     200.4596      8.70  Q         |         |         |        V|
21+ 0     200.6386      8.66  Q         |         |         |        V|
21+15     200.8048      8.05  Q         |         |         |        V|
21+30     200.9628      7.64  Q         |         |         |        V|
21+45     201.1221      7.71  Q         |         |         |        V|
22+ 0     201.2767      7.48  Q         |         |         |        V|
22+15     201.4338      7.60  Q         |         |         |        V|
22+30     201.5866      7.40  Q         |         |         |        V|
22+45     201.7396      7.41  Q         |         |         |        V|
23+ 0     201.8756      6.58  Q         |         |         |        V|
23+15     202.0063      6.32  Q         |         |         |        V|
23+30     202.1339      6.18  Q         |         |         |        V|
23+45     202.2597      6.09  Q         |         |         |        V|
24+ 0     202.3843      6.03  Q         |         |         |        V|
24+15     202.5021      5.70  Q         |         |         |        V|
24+30     202.5865      4.09  Q         |         |         |        V|
24+45     202.6263      1.92  Q         |         |         |        V|
25+ 0     202.6496      1.13  Q         |         |         |        V|
25+15     202.6634      0.67  Q         |         |         |        V|
25+30     202.6711      0.38  Q         |         |         |        V|
25+45     202.6753      0.20  Q         |         |         |        V|
26+ 0     202.6776      0.11  Q         |         |         |        V|
26+15     202.6792      0.08  Q         |         |         |        V|
26+30     202.6802      0.05  Q         |         |         |        V|
26+45     202.6807      0.03  Q         |         |         |        V|
27+ 0     202.6809      0.01  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  05/07/12 File: SUBE2124100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed E, Subdrain Area E21
Proposed Conditions
100 Yr. 24 Hr.

--------------------------------------------------------------------
Drainage Area =     780.80(Ac.)  =      1.220 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     780.80(Ac.)  =      1.220 Sq. Mi.
Length along longest watercourse =   14080.00(Ft.)
Length along longest watercourse measured to centroid =    8100.00(Ft.)
Length along longest watercourse =      2.667 Mi.
Length along longest watercourse measured to centroid =      1.534 Mi.
Difference in elevation =     877.00(Ft.)
Slope along watercourse =    328.8750 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.409 Hr.
Lag time =    24.53 Min.
25% of lag time =     6.13 Min.
40% of lag time =     9.81 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      780.80           1.80                1405.44

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      780.80           4.50                3513.60

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.85 %
Adjusted average point rain =    4.493(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    62.200           46.00         0.000
    11.200           66.00         0.000
```

4.800	77.00	0.000
702.600	83.00	0.000

Total Area Entered = 780.80(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
46.0	46.0	0.611	0.000	0.611	0.080	0.049
66.0	66.0	0.405	0.000	0.405	0.014	0.006
77.0	77.0	0.279	0.000	0.279	0.006	0.002
83.0	83.0	0.210	0.000	0.210	0.900	0.189
					Sum (F) =	0.245

Area averaged mean soil loss (F) (In/Hr) = 0.245
Minimum soil loss rate ((In/Hr)) = 0.123
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	61.144	5.754	45.282
2	0.500	122.287	32.815	258.222
3	0.750	183.431	33.484	263.483
4	1.000	244.575	12.198	95.988
5	1.250	305.719	7.029	55.312
6	1.500	366.862	4.194	33.004
7	1.750	428.006	2.244	17.661
8	2.000	489.150	0.859	6.758
9	2.250	550.293	0.537	4.223
10	2.500	611.437	0.428	3.369
11	2.750	672.581	0.317	2.495
12	3.000	733.725	0.140	1.104
			Sum = 100.000	Sum= 786.900

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.433)	0.032	0.004
2	0.50	0.30	0.054	(0.428)	0.049	0.005
3	0.75	0.30	0.054	(0.423)	0.049	0.005
4	1.00	0.40	0.072	(0.418)	0.065	0.007
5	1.25	0.30	0.054	(0.413)	0.049	0.005
6	1.50	0.30	0.054	(0.408)	0.049	0.005
7	1.75	0.30	0.054	(0.403)	0.049	0.005
8	2.00	0.40	0.072	(0.398)	0.065	0.007
9	2.25	0.40	0.072	(0.393)	0.065	0.007
10	2.50	0.40	0.072	(0.389)	0.065	0.007
11	2.75	0.50	0.090	(0.384)	0.081	0.009
12	3.00	0.50	0.090	(0.379)	0.081	0.009
13	3.25	0.50	0.090	(0.374)	0.081	0.009
14	3.50	0.50	0.090	(0.370)	0.081	0.009
15	3.75	0.50	0.090	(0.365)	0.081	0.009
16	4.00	0.60	0.108	(0.360)	0.097	0.011
17	4.25	0.60	0.108	(0.356)	0.097	0.011
18	4.50	0.70	0.126	(0.351)	0.113	0.013
19	4.75	0.70	0.126	(0.347)	0.113	0.013
20	5.00	0.80	0.144	(0.342)	0.129	0.014
21	5.25	0.60	0.108	(0.338)	0.097	0.011
22	5.50	0.70	0.126	(0.334)	0.113	0.013
23	5.75	0.80	0.144	(0.329)	0.129	0.014
24	6.00	0.80	0.144	(0.325)	0.129	0.014

25	6.25	0.90	0.162	(0.321)	0.146	0.016
26	6.50	0.90	0.162	(0.316)	0.146	0.016
27	6.75	1.00	0.180	(0.312)	0.162	0.018
28	7.00	1.00	0.180	(0.308)	0.162	0.018
29	7.25	1.00	0.180	(0.304)	0.162	0.018
30	7.50	1.10	0.198	(0.299)	0.178	0.020
31	7.75	1.20	0.216	(0.295)	0.194	0.022
32	8.00	1.30	0.234	(0.291)	0.210	0.023
33	8.25	1.50	0.270	(0.287)	0.243	0.027
34	8.50	1.50	0.270	(0.283)	0.243	0.027
35	8.75	1.60	0.288	(0.279)	0.259	0.029
36	9.00	1.70	0.306	(0.275)	0.275	0.031
37	9.25	1.90	0.341	0.271	(0.307)	0.070
38	9.50	2.00	0.359	0.268	(0.324)	0.092
39	9.75	2.10	0.377	0.264	(0.340)	0.114
40	10.00	2.20	0.395	0.260	(0.356)	0.135
41	10.25	1.50	0.270	(0.256)	0.243	0.027
42	10.50	1.50	0.270	(0.253)	0.243	0.027
43	10.75	2.00	0.359	0.249	(0.324)	0.111
44	11.00	2.00	0.359	0.245	(0.324)	0.114
45	11.25	1.90	0.341	0.242	(0.307)	0.100
46	11.50	1.90	0.341	0.238	(0.307)	0.103
47	11.75	1.70	0.306	0.234	(0.275)	0.071
48	12.00	1.80	0.324	0.231	(0.291)	0.092
49	12.25	2.50	0.449	0.228	(0.404)	0.222
50	12.50	2.60	0.467	0.224	(0.421)	0.243
51	12.75	2.80	0.503	0.221	(0.453)	0.282
52	13.00	2.90	0.521	0.217	(0.469)	0.304
53	13.25	3.40	0.611	0.214	(0.550)	0.397
54	13.50	3.40	0.611	0.211	(0.550)	0.400
55	13.75	2.30	0.413	0.208	(0.372)	0.206
56	14.00	2.30	0.413	0.205	(0.372)	0.209
57	14.25	2.70	0.485	0.201	(0.437)	0.284
58	14.50	2.60	0.467	0.198	(0.421)	0.269
59	14.75	2.60	0.467	0.195	(0.421)	0.272
60	15.00	2.50	0.449	0.192	(0.404)	0.257
61	15.25	2.40	0.431	0.189	(0.388)	0.242
62	15.50	2.30	0.413	0.187	(0.372)	0.227
63	15.75	1.90	0.341	0.184	(0.307)	0.158
64	16.00	1.90	0.341	0.181	(0.307)	0.161
65	16.25	0.40	0.072	(0.178)	0.065	0.007
66	16.50	0.40	0.072	(0.175)	0.065	0.007
67	16.75	0.30	0.054	(0.173)	0.049	0.005
68	17.00	0.30	0.054	(0.170)	0.049	0.005
69	17.25	0.50	0.090	(0.168)	0.081	0.009
70	17.50	0.50	0.090	(0.165)	0.081	0.009
71	17.75	0.50	0.090	(0.163)	0.081	0.009
72	18.00	0.40	0.072	(0.160)	0.065	0.007
73	18.25	0.40	0.072	(0.158)	0.065	0.007
74	18.50	0.40	0.072	(0.155)	0.065	0.007
75	18.75	0.30	0.054	(0.153)	0.049	0.005
76	19.00	0.20	0.036	(0.151)	0.032	0.004
77	19.25	0.30	0.054	(0.149)	0.049	0.005
78	19.50	0.40	0.072	(0.147)	0.065	0.007
79	19.75	0.30	0.054	(0.145)	0.049	0.005
80	20.00	0.20	0.036	(0.143)	0.032	0.004
81	20.25	0.30	0.054	(0.141)	0.049	0.005
82	20.50	0.30	0.054	(0.139)	0.049	0.005
83	20.75	0.30	0.054	(0.137)	0.049	0.005
84	21.00	0.20	0.036	(0.136)	0.032	0.004
85	21.25	0.30	0.054	(0.134)	0.049	0.005
86	21.50	0.20	0.036	(0.133)	0.032	0.004
87	21.75	0.30	0.054	(0.131)	0.049	0.005
88	22.00	0.20	0.036	(0.130)	0.032	0.004
89	22.25	0.30	0.054	(0.129)	0.049	0.005
90	22.50	0.20	0.036	(0.127)	0.032	0.004
91	22.75	0.20	0.036	(0.126)	0.032	0.004
92	23.00	0.20	0.036	(0.125)	0.032	0.004
93	23.25	0.20	0.036	(0.124)	0.032	0.004
94	23.50	0.20	0.036	(0.124)	0.032	0.004
95	23.75	0.20	0.036	(0.123)	0.032	0.004

```
96  24.00     0.20      0.036       (  0.123)       0.032        0.004
              (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     5.8
      Flood volume = Effective rainfall      1.46(In)
       times area     780.8(Ac.)/[(In)/(Ft.)] =      95.0(Ac.Ft)
      Total soil loss =      3.03(In)
      Total soil loss =   197.319(Ac.Ft)
      Total rainfall =      4.49(In)
      Flood volume =     4139699.7 Cubic Feet
      Total soil loss =     8595217.9 Cubic Feet
      --------------------------------------------------------------------
       Peak flow rate of this hydrograph =    275.722(CFS)
      --------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      --------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      --------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
-------------------------------------------------------------------------
  0+15       0.0034      0.16  Q         |         |         |         |
  0+30       0.0276      1.17  Q         |         |         |         |
  0+45       0.0810      2.58  Q         |         |         |         |
  1+ 0       0.1530      3.49  Q         |         |         |         |
  1+15       0.2406      4.24  Q         |         |         |         |
  1+30       0.3329      4.47  Q         |         |         |         |
  1+45       0.4215      4.29  Q         |         |         |         |
  2+ 0       0.5115      4.35  Q         |         |         |         |
  2+15       0.6107      4.80  Q         |         |         |         |
  2+30       0.7196      5.27  Q         |         |         |         |
  2+45       0.8337      5.52  Q         |         |         |         |
  3+ 0       0.9595      6.09  Q         |         |         |         |
  3+15       1.0963      6.62  Q         |         |         |         |
  3+30       1.2373      6.82  Q         |         |         |         |
  3+45       1.3805      6.93  Q         |         |         |         |
  4+ 0       1.5268      7.08  Q         |         |         |         |
  4+15       1.6835      7.58  VQ        |         |         |         |
  4+30       1.8519      8.15  VQ        |         |         |         |
  4+45       2.0338      8.80  VQ        |         |         |         |
  5+ 0       2.2292      9.46  VQ        |         |         |         |
  5+15       2.4358     10.00   Q        |         |         |         |
  5+30       2.6375      9.76  |Q        |         |         |         |
  5+45       2.8358      9.60  |Q        |         |         |         |
  6+ 0       3.0493     10.33  |Q        |         |         |         |
  6+15       3.2753     10.94  |Q        |         |         |         |
  6+30       3.5150     11.60  |Q        |         |         |         |
  6+45       3.7686     12.27  |Q        |         |         |         |
  7+ 0       4.0369     12.99  |Q        |         |         |         |
  7+15       4.3178     13.60  |Q        |         |         |         |
  7+30       4.6055     13.92  |Q        |         |         |         |
  7+45       4.9073     14.61  |QV       |         |         |         |
  8+ 0       5.2317     15.70  | Q       |         |         |         |
  8+15       5.5835     17.02  | Q       |         |         |         |
  8+30       5.9702     18.72  | Q       |         |         |         |
  8+45       6.3853     20.09  | Q       |         |         |         |
  9+ 0       6.8229     21.18  | Q       |         |         |         |
  9+15       7.3232     24.21  |  Q      |         |         |         |
  9+30       8.0714     36.22  |  VQ     |         |         |         |
  9+45       9.1791     53.61  |  V   Q  |         |         |         |
 10+ 0      10.6249     69.98  |   V    Q|         |         |         |
 10+15      12.2949     80.83  |    V    Q         |         |         |
 10+30      13.6010     63.22  |    V  Q |         |         |         |
 10+45      14.4927     43.16  |    QV   |         |         |         |
 11+ 0      15.6728     57.12  |     VQ  |         |         |         |
 11+15      17.2201     74.89  |      V Q|         |         |         |
 11+30      18.8216     77.51  |      V  Q         |         |         |
 11+45      20.4053     76.65  |       V Q         |         |         |
 12+ 0      21.8786     71.30  |        Q|         |         |         |
 12+15      23.4281     75.00  |        Q|         |         |         |
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  12+30      25.7415    111.97  |         V   Q     |         |         |
  12+45      28.9153    153.61  |         | V       Q         |         |
  13+ 0      32.6972    183.04  |         |  V      |   Q     |         |
  13+15      37.0909    212.66  |         |    V    |       Q |         |
  13+30      42.2963    251.94  |         |      V  |         |  Q      |
  13+45      47.9930    275.72  |         |         V         |     Q   |
  14+ 0      52.9336    239.12  |         |           V       |Q        |
  14+15      57.0578    199.61  |         |         |   V Q   |         |
  14+30      61.2916    204.92  |         |         |    V Q  |         |
  14+45      65.6925    213.00  |         |         |      VQ |         |
  15+ 0      70.0569    211.24  |         |         |       QV|         |
  15+15      74.3438    207.48  |         |         |      Q   V        |
  15+30      78.4776    200.08  |         |         |     Q   |  V      |
  15+45      82.3644    188.12  |         |         |    Q    |   V     |
  16+ 0      85.7524    163.98  |         |         |Q        |     V   |
  16+15      88.5742    136.58  |         |       Q |         |      V  |
  16+30      90.4224     89.45  |         |Q        |         |       V |
  16+45      91.3450     44.66  |    Q    |         |         |       V |
  17+ 0      91.9020     26.96  |  Q      |         |         |       V |
  17+15      92.2491     16.80  | Q       |         |         |       V |
  17+30      92.4955     11.92  |Q        |         |         |       V |
  17+45      92.6955      9.68  |Q        |         |         |        V|
  18+ 0      92.8727      8.58  |Q        |         |         |        V|
  18+15      93.0267      7.45  Q         |         |         |        V|
  18+30      93.1609      6.50  Q         |         |         |        V|
  18+45      93.2832      5.92  Q         |         |         |        V|
  19+ 0      93.3890      5.12  Q         |         |         |        V|
  19+15      93.4761      4.22  Q         |         |         |        V|
  19+30      93.5607      4.09  Q         |         |         |        V|
  19+45      93.6574      4.68  Q         |         |         |        V|
  20+ 0      93.7527      4.61  Q         |         |         |        V|
  20+15      93.8340      3.93  Q         |         |         |        V|
  20+30      93.9137      3.86  Q         |         |         |        V|
  20+45      93.9991      4.13  Q         |         |         |        V|
  21+ 0      94.0837      4.09  Q         |         |         |        V|
  21+15      94.1608      3.73  Q         |         |         |        V|
  21+30      94.2364      3.66  Q         |         |         |        V|
  21+45      94.3108      3.60  Q         |         |         |        V|
  22+ 0      94.3849      3.59  Q         |         |         |        V|
  22+15      94.4581      3.54  Q         |         |         |        V|
  22+30      94.5316      3.55  Q         |         |         |        V|
  22+45      94.6029      3.45  Q         |         |         |        V|
  23+ 0      94.6667      3.09  Q         |         |         |        V|
  23+15      94.7281      2.98  Q         |         |         |        V|
  23+30      94.7883      2.91  Q         |         |         |        V|
  23+45      94.8476      2.87  Q         |         |         |        V|
  24+ 0      94.9065      2.85  Q         |         |         |        V|
  24+15      94.9619      2.68  Q         |         |         |        V|
  24+30      94.9980      1.75  Q         |         |         |        V|
  24+45      95.0144      0.80  Q         |         |         |        V|
  25+ 0      95.0237      0.45  Q         |         |         |        V|
  25+15      95.0287      0.25  Q         |         |         |        V|
  25+30      95.0314      0.13  Q         |         |         |        V|
  25+45      95.0327      0.06  Q         |         |         |        V|
  26+ 0      95.0336      0.04  Q         |         |         |        V|
  26+15      95.0341      0.03  Q         |         |         |        V|
  26+30      95.0343      0.01  Q         |         |         |        V|
  26+45      95.0344      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  05/07/12 File: SUBE324100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

--------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



--------------------------------------------------------------------
Watershed E, Subdrain Area E3
Proposed Conditions
100 Yr. 24 Hr.

-------------------------------------------------------------------
Drainage Area =      17.10(Ac.)  =      0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      17.10(Ac.)  =      0.027 Sq. Mi.
Length along longest watercourse =    2900.00(Ft.)
Length along longest watercourse measured to centroid =    1850.00(Ft.)
Length along longest watercourse =      0.549 Mi.
Length along longest watercourse measured to centroid =      0.350 Mi.
Difference in elevation =      53.00(Ft.)
Slope along watercourse =     96.4966 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.162 Hr.
Lag time =     9.69 Min.
25% of lag time =     2.42 Min.
40% of lag time =     3.88 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.10           1.80                 30.78

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.10           4.50                 76.95

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    17.100           85.00         0.750
 Total Area Entered =     17.10(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.750	0.061	1.000	0.061
					Sum (F) =	0.061

Area averaged mean soil loss (F) (In/Hr) = 0.061
Minimum soil loss rate ((In/Hr)) = 0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.300

U n i t H y d r o g r a p h
FOOTHILL S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	154.750	31.833	5.486
2	0.500	309.500	53.965	9.300
3	0.750	464.249	11.299	1.947
4	1.000	618.999	2.163	0.373
5	1.250	773.749	0.741	0.128
			Sum = 100.000	Sum= 17.234

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275

38	9.50	2.00	0.360	0.066	(	0.108)	0.294
39	9.75	2.10	0.378	0.065	(	0.113)	0.313
40	10.00	2.20	0.396	0.064	(	0.119)	0.331
41	10.25	1.50	0.270	0.064	(	0.081)	0.206
42	10.50	1.50	0.270	0.063	(	0.081)	0.207
43	10.75	2.00	0.360	0.062	(	0.108)	0.298
44	11.00	2.00	0.360	0.061	(	0.108)	0.299
45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.394
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.420
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(	0.044)	0.022	0.050
66	16.50	0.40	0.072	(	0.044)	0.022	0.050
67	16.75	0.30	0.054	(	0.043)	0.016	0.038
68	17.00	0.30	0.054	(	0.042)	0.016	0.038
69	17.25	0.50	0.090	(	0.042)	0.027	0.063
70	17.50	0.50	0.090	(	0.041)	0.027	0.063
71	17.75	0.50	0.090	(	0.040)	0.027	0.063
72	18.00	0.40	0.072	(	0.040)	0.022	0.050
73	18.25	0.40	0.072	(	0.039)	0.022	0.050
74	18.50	0.40	0.072	(	0.039)	0.022	0.050
75	18.75	0.30	0.054	(	0.038)	0.016	0.038
76	19.00	0.20	0.036	(	0.037)	0.011	0.025
77	19.25	0.30	0.054	(	0.037)	0.016	0.038
78	19.50	0.40	0.072	(	0.036)	0.022	0.050
79	19.75	0.30	0.054	(	0.036)	0.016	0.038
80	20.00	0.20	0.036	(	0.035)	0.011	0.025
81	20.25	0.30	0.054	(	0.035)	0.016	0.038
82	20.50	0.30	0.054	(	0.035)	0.016	0.038
83	20.75	0.30	0.054	(	0.034)	0.016	0.038
84	21.00	0.20	0.036	(	0.034)	0.011	0.025
85	21.25	0.30	0.054	(	0.033)	0.016	0.038
86	21.50	0.20	0.036	(	0.033)	0.011	0.025
87	21.75	0.30	0.054	(	0.033)	0.016	0.038
88	22.00	0.20	0.036	(	0.032)	0.011	0.025
89	22.25	0.30	0.054	(	0.032)	0.016	0.038
90	22.50	0.20	0.036	(	0.032)	0.011	0.025
91	22.75	0.20	0.036	(	0.031)	0.011	0.025
92	23.00	0.20	0.036	(	0.031)	0.011	0.025
93	23.25	0.20	0.036	(	0.031)	0.011	0.025
94	23.50	0.20	0.036	(	0.031)	0.011	0.025
95	23.75	0.20	0.036	(	0.031)	0.011	0.025
96	24.00	0.20	0.036	(	0.030)	0.011	0.025

(Loss Rate Not Used)

Sum = 100.0 Sum = 14.5

Flood volume = Effective rainfall 3.64(In)
times area 17.1(Ac.)/[(In)/(Ft.)] = 5.2(Ac.Ft)
Total soil loss = 0.86(In)
Total soil loss = 1.232(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 225645.5 Cubic Feet
Total soil loss = 53673.7 Cubic Feet

Peak flow rate of this hydrograph = 9.404(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+15	0.0029	0.14	Q | | | |
0+30	0.0120	0.44	VQ | | | |
0+45	0.0246	0.61	V Q | | | |
1+ 0	0.0393	0.71	V Q | | | |
1+15	0.0551	0.77	V Q | | | |
1+30	0.0691	0.68	V Q | | | |
1+45	0.0826	0.66	V Q | | | |
2+ 0	0.0976	0.72	V Q | | | |
2+15	0.1149	0.84	V Q | | | |
2+30	0.1327	0.86	V Q | | | |
2+45	0.1521	0.94	|V Q | | | |
3+ 0	0.1739	1.06	|V Q | | | |
3+15	0.1962	1.08	|V Q | | | |
3+30	0.2186	1.08	|V Q | | | |
3+45	0.2410	1.09	|V Q | | | |
4+ 0	0.2649	1.16	| V Q | | | |
4+15	0.2912	1.27	| V Q | | | |
4+30	0.3194	1.37	| V Q | | | |
4+45	0.3502	1.49	| V Q | | | |
5+ 0	0.3829	1.58	| V Q | | | |
5+15	0.4153	1.57	| V Q | | | |
5+30	0.4448	1.43	| V Q | | | |
5+45	0.4772	1.57	| V Q | | | |
6+ 0	0.5124	1.70	| V Q | | | |
6+15	0.5496	1.80	| V Q | | | |
6+30	0.5893	1.92	| V Q | | | |
6+45	0.6310	2.02	| V Q | | | |
7+ 0	0.6752	2.14	| V Q | | | |
7+15	0.7200	2.17	| V Q | | | |
7+30	0.7663	2.24	| V Q | | | |
7+45	0.8164	2.43	| V Q| | | |
8+ 0	0.8710	2.64	| V Q | | |
8+15	0.9325	2.98	| V |Q | | |
8+30	1.0015	3.34	| V | Q | | |
8+45	1.0743	3.53	| V | Q | | |
9+ 0	1.1533	3.82	| V | Q | | |
9+15	1.2410	4.25	| V| Q | | |
9+30	1.3389	4.74	| V Q | | |
9+45	1.4443	5.10	| V Q | |
10+ 0	1.5565	5.43	| V |Q | |
10+15	1.6592	4.97	| V Q| | |
10+30	1.7390	3.86	| V Q | | |
10+45	1.8243	4.13	| V Q | | |
11+ 0	1.9264	4.94	| V Q| | |
11+15	2.0301	5.02	| V Q | |
11+30	2.1313	4.90	| V Q| | |
11+45	2.2282	4.69	| VQ | | |
12+ 0	2.3204	4.46	| Q | | |
12+15	2.4292	5.27	| V |Q | |
12+30	2.5651	6.57	| V| Q | |
12+45	2.7138	7.20	| V Q | |
13+ 0	2.8736	7.73	| | V Q |
13+15	3.0493	8.50	| | V | Q |
13+30	3.2436	9.40	| | V | Q |
13+45	3.4195	8.52	| | V | Q |
14+ 0	3.5585	6.72	| | QV | |
14+15	3.6981	6.76	| | QV | |
14+30	3.8483	7.27	| | Q| |
14+45	3.9977	7.23	| | Q V |
15+ 0	4.1452	7.14	| | Q | V |
15+15	4.2875	6.89	| | Q | V |
15+30	4.4237	6.59	| | Q | V |

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   15+45       4.5477      6.00  |         |         |   Q     |    V    |
   16+ 0       4.6572      5.30  |         |         |Q        |    V    |
   16+15       4.7358      3.81  |         |    Q    |         |     V   |
   16+30       4.7665      1.48  |    Q    |         |         |     V   |
   16+45       4.7855      0.92  |  Q      |         |         |     V   |
   17+ 0       4.8003      0.71  | Q       |         |         |      V  |
   17+15       4.8168      0.80  |  Q      |         |         |      V  |
   17+30       4.8380      1.03  |   Q     |         |         |      V  |
   17+45       4.8601      1.07  |   Q     |         |         |      V  |
   18+ 0       4.8811      1.01  |   Q     |         |         |      V  |
   18+15       4.8997      0.90  |  Q      |         |         |      V  |
   18+30       4.9178      0.88  |  Q      |         |         |      V  |
   18+45       4.9343      0.80  |  Q      |         |         |       V |
   19+ 0       4.9470      0.61  | Q       |         |         |       V |
   19+15       4.9582      0.54  | Q       |         |         |       V |
   19+30       4.9726      0.70  | Q       |         |         |       V |
   19+45       4.9884      0.76  |  Q      |         |         |       V |
   20+ 0       5.0009      0.61  | Q       |         |         |       V |
   20+15       5.0120      0.54  | Q       |         |         |       V |
   20+30       5.0250      0.63  | Q       |         |         |       V |
   20+45       5.0384      0.65  | Q       |         |         |       V |
   21+ 0       5.0504      0.58  | Q       |         |         |       V |
   21+15       5.0614      0.53  | Q       |         |         |        V|
   21+30       5.0730      0.56  | Q       |         |         |        V|
   21+45       5.0839      0.53  | Q       |         |         |        V|
   22+ 0       5.0954      0.56  | Q       |         |         |        V|
   22+15       5.1064      0.53  | Q       |         |         |        V|
   22+30       5.1179      0.56  | Q       |         |         |        V|
   22+45       5.1274      0.46  |Q        |         |         |        V|
   23+ 0       5.1364      0.44  |Q        |         |         |        V|
   23+15       5.1455      0.44  |Q        |         |         |        V|
   23+30       5.1544      0.43  |Q        |         |         |        V|
   23+45       5.1634      0.43  |Q        |         |         |        V|
   24+ 0       5.1724      0.43  |Q        |         |         |        V|
   24+15       5.1785      0.30  |Q        |         |         |        V|
   24+30       5.1798      0.06  Q         |         |         |        V|
   24+45       5.1800      0.01  Q         |         |         |        V|
   25+ 0       5.1801      0.00  Q         |         |         |        V|
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                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                        Study date: 11/01/12

------------------------------------------------------------------


Watershed F, LineF
Proposed Condition
100 Yr. 24 Hr.

-----------------------------------------------------------------


Program License Serial Number 6097

-----------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

               From study/file name: OffsiteF124100.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =    97
               Time interval =   15.0 (Min.)
               Maximum/Peak flow rate =        6.330 (CFS)
               Total volume =       1.736 (Ac.Ft)
       Status of hydrographs being held in storage
                  Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STREAM ROUTING SCS CONVEX METHOD ****
______________________________________________________________________
HYDROGRAPH STREAM ROUTING DATA:
Length of stream =   1200.00 (Ft.)
Elevation difference =   24.00 (Ft.)
Slope of channel =  0.020000 (Vert/Horiz)
Channel type - Improved Channel


Channel length =  1200.00(Ft.)     Elevation difference =  24.00(Ft.)
Channel evaluation using mean flow rate of hydrograph
Covered channel
Channel base width  =    5.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    5.000(Ft.)
Flow(q) thru subarea =      1.200(CFS)
Depth of flow =     0.087(Ft.)
Average velocity =     2.701(Ft/s)
Total flow rate =     1.200(CFS)
Channel flow top width =    5.175(Ft.)
Depth of flow in channel =   0.09(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    2.70(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    1.200(CFS)
Total capacity of improved channels =      1.200(CFS)
Critical Depth in Channel =    0.12(Ft.)


Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =      6.330(CFS)
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Depth of flow =     0.237(Ft.)
Average velocity =     5.093(Ft/s)
Total flow rate =     6.330(CFS)
Channel flow top width =    5.475(Ft.)
Depth of flow in channel =   0.24(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =    5.09(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =    6.330(CFS)
Total capacity of improved channels =      6.330(CFS)
Critical Depth in Channel =    0.36(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.7497   Travel time =   3.93 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   3.7297
       dt(routing time-step) =   2.94 (min.),   c* =   0.9943

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

---------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0        1.6       3.2       4.7       6.3
----------------------------------------------------------------------
  0+15       0.0336      0.04  O         |         |         |         |
  0+30       0.0760      0.08  O         |         |         |         |
  0+45       0.0931      0.10  O         |         |         |         |
  1+ 0       0.1121      0.12  O         |         |         |         |
  1+15       0.1081      0.11  O         |         |         |         |
  1+30       0.0974      0.10  O         |         |         |         |
  1+45       0.0953      0.10  O         |         |         |         |
  2+ 0       0.1121      0.12  O         |         |         |         |
  2+15       0.1249      0.13  O         |         |         |         |
  2+30       0.1270      0.13  O         |         |         |         |
  2+45       0.1439      0.15  O         |         |         |         |
  3+ 0       0.1566      0.16  OI        |         |         |         |
  3+15       0.1588      0.16  |O        |         |         |         |
  3+30       0.1588      0.16  |O        |         |         |         |
  3+45       0.1588      0.16  |O        |         |         |         |
  4+ 0       0.1756      0.18  |O        |         |         |         |
  4+15       0.1884      0.19  |O        |         |         |         |
  4+30       0.2074      0.21  |O        |         |         |         |
  4+45       0.2202      0.22  |O        |         |         |         |
  5+ 0       0.2391      0.24  |O        |         |         |         |
  5+15       0.2183      0.21  |O        |         |         |         |
  5+30       0.2117      0.21  |O        |         |         |         |
  5+45       0.2370      0.24  |O        |         |         |         |
  6+ 0       0.2519      0.25  |O        |         |         |         |
  6+15       0.2709      0.28  |O        |         |         |         |
  6+30       0.2837      0.29  |O        |         |         |         |
  6+45       0.3027      0.31  |O        |         |         |         |
  7+ 0       0.3154      0.32  |OI       |         |         |         |
  7+15       0.3176      0.32  | O       |         |         |         |
  7+30       0.3344      0.34  | O       |         |         |         |
  7+45       0.3640      0.37  | O       |         |         |         |
  8+ 0       0.3958      0.40  | O       |         |         |         |
  8+15       0.4443      0.45  | O       |         |         |         |
  8+30       0.4721      0.48  | OI      |         |         |         |
  8+45       0.4932      0.50  |  O      |         |         |         |
  9+ 0       0.5228      0.53  |  O      |         |         |         |
  9+15       0.5714      0.58  |  O      |         |         |         |
```

```
   9+30       0.6567      0.68  |   O     |         |         |         |
   9+45       0.9156      0.98  |    OI   |         |         |         |
  10+ 0       1.2936      1.37  |       O |         |         |         |
  10+15       0.9345      0.82  |    O    |         |         |         |
  10+30       0.5470      0.48  |  O      |         |         |         |
  10+45       0.8110      0.89  |    O    |         |         |         |
  11+ 0       1.1050      1.16  |     OI  |         |         |         |
  11+15       1.0510      1.02  |     O   |         |         |         |
  11+30       0.9991      0.99  |     O   |         |         |         |
  11+45       0.7598      0.70  |   O     |         |         |         |
  12+ 0       0.7358      0.74  |   O     |         |         |         |
  12+15       2.0427      2.37  |         | O I     |         |         |
  12+30       3.1927      3.40  |         |         OI        |         |
  12+45       3.8798      4.00  |         |         |   OI    |         |
  13+ 0       4.3965      4.50  |         |         |      OI |         |
  13+15       5.4781      5.73  |         |         |         |   O I   |
  13+30       6.2073      6.33  |         |         |         |         OI
  13+45       4.5341      4.08  |         |         |    I  O |         |
  14+ 0       3.1972      2.97  |         |       I O         |         |
  14+15       3.6978      3.88  |         |         |  OI     |         |
  14+30       4.1044      4.16  |         |         |    OI   |         |
  14+45       4.1277      4.12  |         |         |     O   |         |
  15+ 0       4.0019      3.97  |         |         |    O    |         |
  15+15       3.7685      3.72  |         |         |  O      |         |
  15+30       3.5126      3.46  |         |         |IO       |         |
  15+45       2.7512      2.57  |         |     IO  |         |         |
  16+ 0       2.2783      2.20  |         |  IO     |         |         |
  16+15       1.1098      0.83  |    I O  |         |         |         |
  16+30       0.2707      0.13  IO        |         |         |         |
  16+45       0.1111      0.11  O         |         |         |         |
  17+ 0       0.0975      0.10  O         |         |         |         |
  17+15       0.1289      0.14  O         |         |         |         |
  17+30       0.1545      0.16  OI        |         |         |         |
  17+45       0.1588      0.16  |O        |         |         |         |
  18+ 0       0.1420      0.14  O         |         |         |         |
  18+15       0.1292      0.13  O         |         |         |         |
  18+30       0.1271      0.13  O         |         |         |         |
  18+45       0.1102      0.11  O         |         |         |         |
  19+ 0       0.0806      0.07  O         |         |         |         |
  19+15       0.0825      0.08  O         |         |         |         |
  19+30       0.1099      0.12  O         |         |         |         |
  19+45       0.1080      0.11  O         |         |         |         |
  20+ 0       0.0806      0.07  O         |         |         |         |
  20+15       0.0825      0.08  O         |         |         |         |
  20+30       0.0931      0.10  O         |         |         |         |
  20+45       0.0953      0.10  O         |         |         |         |
  21+ 0       0.0785      0.07  O         |         |         |         |
  21+15       0.0825      0.08  O         |         |         |         |
  21+30       0.0763      0.07  O         |         |         |         |
  21+45       0.0825      0.08  O         |         |         |         |
  22+ 0       0.0763      0.07  O         |         |         |         |
  22+15       0.0825      0.08  O         |         |         |         |
  22+30       0.0763      0.07  O         |         |         |         |
  22+45       0.0657      0.06  O         |         |         |         |
  23+ 0       0.0635      0.06  O         |         |         |         |
  23+15       0.0635      0.06  O         |         |         |         |
  23+30       0.0635      0.06  O         |         |         |         |
  23+45       0.0635      0.06  O         |         |         |         |
  24+ 0       0.0635      0.06  O         |         |         |         |
  24+15       0.0299      0.02  O         |         |         |         |
  24+30       0.0044      0.00  O         |         |         |         |
  24+45       0.0000      0.00  O         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                 Number of intervals =    99
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =        6.207 (CFS)
                 Total volume =       1.736 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
```

```
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*********************************************************************

-------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: LineF24hrBsnF1.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
-------------------------------------------------------------------
             Hydrograph in  15   Minute intervals (CFS)

-------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       10.3      20.7      31.0      41.3
-------------------------------------------------------------------
  0+15       0.1641      0.20  Q         |         |         |         |
  0+30       0.6398      0.72  Q         |         |         |         |
  0+45       1.1776      1.27  |Q        |         |         |         |
  1+ 0       1.7107      1.82  |Q        |         |         |         |
  1+15       2.1481      2.26  | Q       |         |         |         |
  1+30       2.3933      2.49  | Q       |         |         |         |
  1+45       2.5561      2.65  | Q       |         |         |         |
  2+ 0       2.7738      2.89  | Q       |         |         |         |
  2+15       3.0600      3.18  | qQ      |         |         |         |
  2+30       3.3071      3.43  |  Q      |         |         |         |
  2+45       3.5897      3.73  |  Q      |         |         |         |
  3+ 0       3.9261      4.08  |  Q      |         |         |         |
  3+15       4.2118      4.37  |   Q     |         |         |         |
  3+30       4.4321      4.59  |   Q     |         |         |         |
  3+45       4.6020      4.76  |   Q     |         |         |         |
  4+ 0       4.8252      5.00  |   Q     |         |         |         |
  4+15       5.1157      5.30  |   qQ    |         |         |         |
  4+30       5.4581      5.67  |    Q    |         |         |         |
  4+45       5.8406      6.06  |    Q    |         |         |         |
  5+ 0       6.2539      6.49  |     Q   |         |         |         |
  5+15       6.5068      6.73  |     Q   |         |         |         |
  5+30       6.5835      6.80  |     Q   |         |         |         |
  5+45       6.8006      7.04  |     Q   |         |         |         |
  6+ 0       7.1127      7.36  |     qQ  |         |         |         |
  6+15       7.4718      7.74  |      Q  |         |         |         |
  6+30       7.8671      8.15  |      Q  |         |         |         |
  6+45       8.2904      8.59  |       Q |         |         |         |
  7+ 0       8.7352      9.05  |       Q |         |         |         |
  7+15       9.1045      9.42  |       qQ|         |         |         |
  7+30       9.4815      9.82  |        Q|         |         |         |
  7+45       9.9827     10.35  |        qQ         |         |         |
  8+ 0      10.6060     11.00  |         Q         |         |         |
  8+15      11.4869     11.93  |         |Q        |         |         |
  8+30      12.5279     13.00  |         | Q       |         |         |
  8+45      13.5518     14.04  |         |  Q      |         |         |
  9+ 0      14.6606     15.18  |         |   Q     |         |         |
  9+15      16.0039     16.58  |         |    qQ   |         |         |
  9+30      17.5654     18.22  |         |      Q  |         |         |
  9+45      19.1634     20.08  |         |       qQ|         |         |
 10+ 0      20.7518     22.05  |         |         qQ        |         |
 10+15      21.2796     22.21  |         |         qQ        |         |
 10+30      20.5576     21.10  |         |        qQ         |         |
 10+45      20.4136     21.22  |         |        qQ         |         |
 11+ 0      21.1654     22.27  |         |         qQ        |         |
 11+15      21.8180     22.87  |         |         |qQ       |         |
 11+30      22.1689     23.17  |         |         |qQ       |         |
 11+45      22.1553     22.92  |         |         |qQ       |         |
 12+ 0      21.9546     22.69  |         |         |Q        |         |
 12+15      22.8315     24.87  |         |         | q Q     |         |
```

```
12+30      24.8770     28.07  |         |         |   q  Q  |         |
12+45      27.1654     31.05  |         |         |     q   Q         |
13+ 0      29.4532     33.85  |         |         |       q | Q       |
13+15      32.1353     37.61  |         |         |         |q    Q   |
13+30      35.1023     41.31  |         |         |         |  q      Q
13+45      36.1450     40.68  |         |         |         |   q    Q|
14+ 0      35.1034     38.30  |         |         |         |  q   Q  |
14+15      34.4286     38.13  |         |         |         |  q  Q   |
14+30      34.4677     38.57  |         |         |         |  q   Q  |
14+45      34.4930     38.62  |         |         |         |  q   Q  |
15+ 0      34.3575     38.36  |         |         |         |  q   Q  |
15+15      33.9661     37.73  |         |         |         | q   Q   |
15+30      33.3396     36.85  |         |         |         | q  Q    |
15+45      32.1367     34.89  |         |         |         |q Q      |
16+ 0      30.5082     32.79  |         |         |       q|Q         |
16+15      27.3059     28.42  |         |         |     qQ  |         |
16+30      22.5192     22.79  |         |         |qQ       |         |
16+45      18.2213     18.33  |         |      Q  |         |         |
17+ 0      14.7885     14.89  |         |   Q     |         |         |
17+15      12.2993     12.43  |         |qQ       |         |         |
17+30      10.6164     10.77  |         Q         |         |         |
17+45       9.3712      9.53  |        Q|         |         |         |
18+ 0       8.3187      8.46  |       Q |         |         |         |
18+15       7.3887      7.52  |      Q  |         |         |         |
18+30       6.6453      6.77  |     Q   |         |         |         |
18+45       5.9798      6.09  |    Q    |         |         |         |
19+ 0       5.2560      5.34  |    Q    |         |         |         |
19+15       4.6453      4.73  |   Q     |         |         |         |
19+30       4.3587      4.47  |   Q     |         |         |         |
19+45       4.1902      4.30  |   Q     |         |         |         |
20+ 0       3.8759      3.96  |  Q      |         |         |         |
20+15       3.5810      3.66  |  Q      |         |         |         |
20+30       3.4458      3.54  |  Q      |         |         |         |
20+45       3.3677      3.46  |  Q      |         |         |         |
21+ 0       3.2154      3.29  |  Q      |         |         |         |
21+15       3.0717      3.15  | qQ      |         |         |         |
21+30       2.9608      3.04  | Q       |         |         |         |
21+45       2.8754      2.96  | Q       |         |         |         |
22+ 0       2.8094      2.89  | Q       |         |         |         |
22+15       2.7586      2.84  | Q       |         |         |         |
22+30       2.7194      2.80  | Q       |         |         |         |
22+45       2.5970      2.66  | Q       |         |         |         |
23+ 0       2.4764      2.54  | Q       |         |         |         |
23+15       2.3834      2.45  | Q       |         |         |         |
23+30       2.3116      2.38  | Q       |         |         |         |
23+45       2.2563      2.32  | Q       |         |         |         |
24+ 0       2.2136      2.28  | Q       |         |         |         |
24+15       1.9964      2.03  |Q        |         |         |         |
24+30       1.5921      1.60  |Q        |         |         |         |
24+45       1.2278      1.23  |Q        |         |         |         |
25+ 0       0.9469      0.95  Q         |         |         |         |
25+15       0.7302      0.73  Q         |         |         |         |
25+30       0.5631      0.56  Q         |         |         |         |
25+45       0.4342      0.43  Q         |         |         |         |
26+ 0       0.3349      0.33  Q         |         |         |         |
26+15       0.2583      0.26  Q         |         |         |         |
26+30       0.1992      0.20  Q         |         |         |         |
26+45       0.1536      0.15  Q         |         |         |         |
27+ 0       0.1184      0.12  Q         |         |         |         |
27+15       0.0913      0.09  Q         |         |         |         |
27+30       0.0704      0.07  Q         |         |         |         |
27+45       0.0543      0.05  Q         |         |         |         |
28+ 0       0.0419      0.04  Q         |         |         |         |
28+15       0.0323      0.03  Q         |         |         |         |
28+30       0.0249      0.02  Q         |         |         |         |
28+45       0.0192      0.02  Q         |         |         |         |
29+ 0       0.0148      0.01  Q         |         |         |         |
29+15       0.0114      0.01  Q         |         |         |         |
29+30       0.0088      0.01  Q         |         |         |         |
29+45       0.0068      0.01  Q         |         |         |         |
30+ 0       0.0052      0.01  Q         |         |         |         |
```

```
  30+15       0.0040      0.00  Q         |         |         |         |
  30+30       0.0031      0.00  Q         |         |         |         |
  30+45       0.0024      0.00  Q         |         |         |         |
  31+ 0       0.0019      0.00  Q         |         |         |         |
  31+15       0.0014      0.00  Q         |         |         |         |
  31+30       0.0011      0.00  Q         |         |         |         |
  31+45       0.0010      0.00  Q         |         |         |         |
-------------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   127
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       41.310 (CFS)
                      Total volume =      26.410 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       *************************************************************************

       ------------------------------------------------------------------

       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        1.000 to Point/Station        2.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ********************* HYDROGRAPH INFORMATION **********************

                      From study/file name: OffsiteF224100.rte
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       ------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       ------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       11.8      23.5      35.3      47.0
  -----------------------------------------------------------------------
    0+15       0.0283      0.23  Q         |         |         |         |
    0+30       0.0583      0.77  Q         |         |         |         |
    0+45       0.0682      1.34  qQ        |         |         |         |
    1+ 0       0.0833      1.91  qQ        |         |         |         |
    1+15       0.0771      2.33  qQ        |         |         |         |
    1+30       0.0701      2.56  q Q       |         |         |         |
    1+45       0.0691      2.72  q Q       |         |         |         |
    2+ 0       0.0833      2.97  q Q       |         |         |         |
    2+15       0.0912      3.28  q Q       |         |         |         |
    2+30       0.0922      3.53  q Q       |         |         |         |
    2+45       0.1063      3.84  q  Q      |         |         |         |
    3+ 0       0.1143      4.20  q  Q      |         |         |         |
    3+15       0.1152      4.49  q  Q      |         |         |         |
    3+30       0.1152      4.71  q   Q     |         |         |         |
    3+45       0.1152      4.88  q   Q     |         |         |         |
    4+ 0       0.1294      5.13  q   Q     |         |         |         |
    4+15       0.1373      5.44  q   Q     |         |         |         |
    4+30       0.1524      5.82  q   Q     |         |         |         |
    4+45       0.1604      6.22  q    Q    |         |         |         |
    5+ 0       0.1755      6.67  q    Q    |         |         |         |
    5+15       0.1552      6.88  q    Q    |         |         |         |
    5+30       0.1544      6.95  q    Q    |         |         |         |
    5+45       0.1745      7.21  q     Q   |         |         |         |
    6+ 0       0.1834      7.55  q     Q   |         |         |         |
    6+15       0.1985      7.94  q     Q   |         |         |         |
    6+30       0.2065      8.36  q      Q  |         |         |         |
    6+45       0.2216      8.81  q      Q  |         |         |         |
    7+ 0       0.2295      9.28  q      Q  |         |         |         |
    7+15       0.2305      9.65  q       Q |         |         |         |
    7+30       0.2446     10.06  q       Q |         |         |         |
    7+45       0.2667     10.61  q        Q|         |         |         |
    8+ 0       0.2898     11.29  q        Q|         |         |         |
    8+15       0.5136     12.44  q         Q         |         |         |
```

```
 8+30       0.6592     13.66  q          |Q        |         |         |
 8+45       0.8525     14.90  q          | Q       |         |         |
 9+ 0       1.1121     16.30  q          |  Q      |         |         |
 9+15       1.5223     18.10  |q         |    Q    |         |         |
 9+30       1.8702     20.09  |q         |      Q  |         |         |
 9+45       2.1478     22.23  |q         |       Q |         |         |
10+ 0       2.4155     24.46  | q        |         Q         |         |
10+15       1.5511     23.77  |q         |         Q         |         |
10+30       1.0408     22.15  q          |       Q |         |         |
10+45       1.7173     22.94  |q         |        Q|         |         |
11+ 0       2.1504     24.42  |q         |         Q         |         |
11+15       2.0921     24.96  |q         |         |Q        |         |
11+30       2.0477     25.22  |q         |         |Q        |         |
11+45       1.7898     24.70  |q         |         |Q        |         |
12+ 0       1.8066     24.50  |q         |         Q         |         |
12+15       2.8910     27.77  | q        |         |  Q      |         |
12+30       3.6319     31.70  |  q       |         |     Q   |         |
12+45       4.0943     35.14  |  q       |         |        Q|         |
13+ 0       4.4370     38.29  |  q       |         |         | Q       |
13+15       5.2752     42.89  |   q      |         |         |     Q   |
13+30       5.7140     47.02  |   q      |         |         |        Q
13+45       4.2372     44.92  |  q       |         |         |       Q |
14+ 0       3.3941     41.69  | q        |         |         |    Q    |
14+15       3.8854     42.01  |  q       |         |         |    Q    |
14+30       4.0921     42.66  |  q       |         |         |     Q   |
14+45       4.0807     42.70  |  q       |         |         |     Q   |
15+ 0       3.9590     42.32  |  q       |         |         |    Q    |
15+15       3.7670     41.50  |  q       |         |         |    Q    |
15+30       3.5651     40.42  |  q       |         |         |   Q     |
15+45       2.9382     37.83  | q        |         |         | Q       |
16+ 0       2.6384     35.42  | q        |         |        Q          |
16+15       1.0644     29.48  q          |         |    Q    |         |
16+30       0.1967     22.99  q          |        Q|         |         |
16+45       0.0781     18.41  q          |    Q    |         |         |
17+ 0       0.0701     14.96  q          | Q       |         |         |
17+15       0.0974     12.53  q         Q          |         |         |
17+30       0.1133     10.88  q        Q|          |         |         |
17+45       0.1152      9.65  q       Q |          |         |         |
18+ 0       0.1011      8.56  q      Q  |          |         |         |
18+15       0.0932      7.61  q     Q   |          |         |         |
18+30       0.0922      6.86  q    Q    |          |         |         |
18+45       0.0781      6.17  q    Q    |          |         |         |
19+ 0       0.0560      5.39  q   Q     |          |         |         |
19+15       0.0612      4.79  q   Q     |          |         |         |
19+30       0.0823      4.55  q  Q      |          |         |         |
19+45       0.0771      4.38  q  Q      |          |         |         |
20+ 0       0.0560      4.01  q  Q      |          |         |         |
20+15       0.0612      3.72  q  Q      |          |         |         |
20+30       0.0682      3.61  q  Q      |          |         |         |
20+45       0.0691      3.53  q  Q      |          |         |         |
21+ 0       0.0550      3.35  q Q       |          |         |         |
21+15       0.0612      3.22  q Q       |          |         |         |
21+30       0.0540      3.09  q Q       |          |         |         |
21+45       0.0612      3.02  q Q       |          |         |         |
22+ 0       0.0540      2.94  q Q       |          |         |         |
22+15       0.0612      2.90  q Q       |          |         |         |
22+30       0.0540      2.85  q Q       |          |         |         |
22+45       0.0471      2.71  q Q       |          |         |         |
23+ 0       0.0461      2.59  q Q       |          |         |         |
23+15       0.0461      2.49  q Q       |          |         |         |
23+30       0.0461      2.42  q Q       |          |         |         |
23+45       0.0461      2.37  q Q       |          |         |         |
24+ 0       0.0461      2.32  qQ        |          |         |         |
24+15       0.0178      2.04  qQ        |          |         |         |
24+30       0.0019      1.60  qQ        |          |         |         |
24+45       0.0000      1.23  qQ        |          |         |         |
25+ 0       0.0000      0.95  Q         |          |         |         |
25+15       0.0000      0.73  Q         |          |         |         |
25+30       0.0000      0.56  Q         |          |         |         |
25+45       0.0000      0.43  Q         |          |         |         |
26+ 0       0.0000      0.33  Q         |          |         |         |
```

```
   26+15       0.0000      0.26  Q          |          |          |          |
   26+30       0.0000      0.20  Q          |          |          |          |
   26+45       0.0000      0.15  Q          |          |          |          |
   27+ 0       0.0000      0.12  Q          |          |          |          |
   27+15       0.0000      0.09  Q          |          |          |          |
   27+30       0.0000      0.07  Q          |          |          |          |
   27+45       0.0000      0.05  Q          |          |          |          |
   28+ 0       0.0000      0.04  Q          |          |          |          |
   28+15       0.0000      0.03  Q          |          |          |          |
   28+30       0.0000      0.02  Q          |          |          |          |
   28+45       0.0000      0.02  Q          |          |          |          |
   29+ 0       0.0000      0.01  Q          |          |          |          |
   29+15       0.0000      0.01  Q          |          |          |          |
   29+30       0.0000      0.01  Q          |          |          |          |
   29+45       0.0000      0.01  Q          |          |          |          |
   30+ 0       0.0000      0.01  Q          |          |          |          |
   30+15       0.0000      0.00  Q          |          |          |          |
   30+30       0.0000      0.00  Q          |          |          |          |
   30+45       0.0000      0.00  Q          |          |          |          |
   31+ 0       0.0000      0.00  Q          |          |          |          |
   31+15       0.0000      0.00  Q          |          |          |          |
   31+30       0.0000      0.00  Q          |          |          |          |
   31+45       0.0000      0.00  Q          |          |          |          |
-----------------------------------------------------------------------
        ****************************HYDROGRAPH DATA***************************
                       Number of intervals =   127
                       Time interval =   15.0 (Min.)
                       Maximum/Peak flow rate =       47.024 (CFS)
                       Total volume =      28.390 (Ac.Ft)
               Status of hydrographs being held in storage
                           Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
        ***********************************************************************

        ---------------------------------------------------------------------


        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station        2.000 to Point/Station        3.000
        **** STREAM ROUTING SCS CONVEX METHOD ****
        ______________________________________________________________________
        HYDROGRAPH STREAM ROUTING DATA:
        Length of stream =   1200.00 (Ft.)
        Elevation difference =   24.00 (Ft.)
        Slope of channel =  0.020000 (Vert/Horiz)
        Channel type - Improved Channel


        Channel length =  1200.00(Ft.)     Elevation difference =  24.00(Ft.)
        Channel evaluation using mean flow rate of hydrograph
        Covered channel
        Channel base width  =    5.000(Ft.)
        Slope or 'Z' of left channel bank =   1.000
        Slope or 'Z' of right channel bank =   1.000
        Manning's 'N'    = 0.015
        Maximum depth of channel  =    5.000(Ft.)
        Flow(q) thru subarea =     18.095(CFS)
        Depth of flow =     0.446(Ft.)
        Average velocity =     7.451(Ft/s)
        Total flow rate =    18.095(CFS)
        Channel flow top width =    5.892(Ft.)
        Depth of flow in channel =   0.45(Ft.)
        Total number of channels (same dimensions) = 1
        Flow Velocity =    7.45(Ft/s)
        Travel time  =    0.00 min.
        Individual channel flow =   18.095(CFS)
        Total capacity of improved channels =     18.095(CFS)
        Critical Depth in Channel =    0.70(Ft.)
```

```
Channel evaluation using maximum flow rate of hydrograph
Covered channel
Flow(q) thru subarea =     47.024(CFS)
Depth of flow =     0.788(Ft.)
Average velocity =    10.308(Ft/s)
Total flow rate =    47.024(CFS)
Channel flow top width =    6.576(Ft.)
Depth of flow in channel =   0.79(Ft.)
Total number of channels (same dimensions) = 1
Flow Velocity =   10.31(Ft/s)
Travel time  =    0.00 min.
Individual channel flow =   47.024(CFS)
Total capacity of improved channels =     47.024(CFS)
Critical Depth in Channel =    1.28(Ft.)


********************** SCS CONVEX CHANNEL ROUTING ********************
Convex method of stream routing  data items:
Using equation: Outflow =
O(t+dt) = (1-c*)O(t+dt-dt*) + Input(c*)
         where c* = 1 - (1-c)^e and dt = c(length)/velocity
         c(v/v+1.7) =   0.8584   Travel time =   1.94 (min.)
       dt*(unit time interval) =  15.00(min.),  e=   6.3371
       dt(routing time-step) =   1.67 (min.),   c* =   1.0000

Output hydrograph delayed by 0  unit time increments


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                  P R I N T  O F  S T O R M
               R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Out = O(CFS) In = I  0       11.8      23.5      35.3      47.0
----------------------------------------------------------------------
  0+15       0.2009      0.23  O         |         |         |         |
  0+30       0.7133      0.77  O         |         |         |         |
  0+45       1.2761      1.34  |O        |         |         |         |
  1+ 0       1.8431      1.91  |O        |         |         |         |
  1+15       2.2858      2.33  |O        |         |         |         |
  1+30       2.5355      2.56  | O       |         |         |         |
  1+45       2.7028      2.72  | O       |         |         |         |
  2+ 0       2.9415      2.97  | O       |         |         |         |
  2+15       3.2421      3.28  | O       |         |         |         |
  2+30       3.4985      3.53  | O       |         |         |         |
  2+45       3.8051      3.84  |  O      |         |         |         |
  3+ 0       4.1574      4.20  |  O      |         |         |         |
  3+15       4.4538      4.49  |  O      |         |         |         |
  3+30       4.6817      4.71  |  OI     |         |         |         |
  3+45       4.8572      4.88  |   O     |         |         |         |
  4+ 0       5.1020      5.13  |   O     |         |         |         |
  4+15       5.4068      5.44  |   O     |         |         |         |
  4+30       5.7761      5.82  |   O     |         |         |         |
  4+45       6.1763      6.22  |    O    |         |         |         |
  5+ 0       6.6189      6.67  |    O    |         |         |         |
  5+15       6.8568      6.88  |    O    |         |         |         |
  5+30       6.9419      6.95  |    O    |         |         |         |
  5+45       7.1830      7.21  |     O   |         |         |         |
  6+ 0       7.5107      7.55  |     O   |         |         |         |
  6+15       7.8976      7.94  |     O   |         |         |         |
  6+30       8.3111      8.36  |      O  |         |         |         |
  6+45       8.7638      8.81  |      O  |         |         |         |
  7+ 0       9.2285      9.28  |      O  |         |         |         |
  7+15       9.6113      9.65  |       O |         |         |         |
  7+30      10.0152     10.06  |       O |         |         |         |
  7+45      10.5520     10.61  |       OI|         |         |         |
  8+ 0      11.2163     11.29  |        O|         |         |         |
  8+15      12.3167     12.44  |         O         |         |         |
  8+30      13.5244     13.66  |         |O        |         |         |
```

8+45	14.7600	14.90	
9+ 0	16.1402	16.30	
9+15	17.8974	18.10	
9+30	19.8707	20.09	
9+45	21.9897	22.23	
10+ 0	24.2127	24.46	
10+15	23.8424	23.77	
10+30	22.3252	22.15	
10+45	22.8534	22.94	
11+ 0	24.2566	24.42	
11+15	24.9012	24.96	
11+30	25.1874	25.22	
11+45	24.7617	24.70	
12+ 0	24.5201	24.50	
12+15	27.4023	27.77	
12+30	31.2645	31.70	
12+45	34.7577	35.14	
13+ 0	37.9371	38.29	
13+15	42.3775	42.89	
13+30	46.5644	47.02	
13+45	45.1503	44.92	
14+ 0	42.0524	41.69	
14+15	41.9766	42.01	
14+30	42.5917	42.66	
14+45	42.6973	42.70	
15+ 0	42.3610	42.32	
15+15	41.5923	41.50	
15+30	40.5377	40.42	
15+45	38.1139	37.83	
16+ 0	35.6915	35.42	
16+15	30.1402	29.48	
16+30	23.7077	22.99	
16+45	18.9186	18.41	
17+ 0	15.3397	14.96	
17+15	12.7955	12.53	
17+30	11.0665	10.88	
17+45	9.7828	9.65	
18+ 0	8.6821	8.56	
18+15	7.7167	7.61	
18+30	6.9474	6.86	
18+45	6.2454	6.17	
19+ 0	5.4787	5.39	
19+15	4.8561	4.79	
19+30	4.5774	4.55	
19+45	4.3948	4.38	
20+ 0	4.0528	4.01	
20+15	3.7567	3.72	
20+30	3.6202	3.61	
20+45	3.5405	3.53	
21+ 0	3.3692	3.35	
21+15	3.2302	3.22	
21+30	3.1050	3.09	
21+45	3.0271	3.02	
22+ 0	2.9486	2.94	
22+15	2.9065	2.90	
22+30	2.8556	2.85	
22+45	2.7253	2.71	
23+ 0	2.5998	2.59	
23+15	2.5033	2.49	
23+30	2.4292	2.42	
23+45	2.3721	2.37	
24+ 0	2.3280	2.32	
24+15	2.0751	2.04	
24+30	1.6479	1.60	
24+45	1.2690	1.23	
25+ 0	0.9780	0.95	
25+15	0.7542	0.73	
25+30	0.5817	0.56	
25+45	0.4486	0.43	
26+ 0	0.3459	0.33	
26+15	0.2668	0.26	

```
  26+30       0.2057      0.20  O         |         |         |         |
  26+45       0.1586      0.15  O         |         |         |         |
  27+ 0       0.1223      0.12  O         |         |         |         |
  27+15       0.0943      0.09  O         |         |         |         |
  27+30       0.0728      0.07  O         |         |         |         |
  27+45       0.0561      0.05  O         |         |         |         |
  28+ 0       0.0433      0.04  O         |         |         |         |
  28+15       0.0334      0.03  O         |         |         |         |
  28+30       0.0257      0.02  O         |         |         |         |
  28+45       0.0198      0.02  O         |         |         |         |
  29+ 0       0.0153      0.01  O         |         |         |         |
  29+15       0.0118      0.01  O         |         |         |         |
  29+30       0.0091      0.01  O         |         |         |         |
  29+45       0.0070      0.01  O         |         |         |         |
  30+ 0       0.0054      0.01  O         |         |         |         |
  30+15       0.0042      0.00  O         |         |         |         |
  30+30       0.0032      0.00  O         |         |         |         |
  30+45       0.0025      0.00  O         |         |         |         |
  31+ 0       0.0019      0.00  O         |         |         |         |
  31+15       0.0015      0.00  O         |         |         |         |
  31+30       0.0011      0.00  O         |         |         |         |
  31+45       0.0010      0.00  O         |         |         |         |
  32+ 0       0.0000      0.00  O         |         |         |         |
-------------------------------------------------------------------------
      ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   128
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       46.564 (CFS)
                     Total volume =      28.390 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **************************************************************************

      ------------------------------------------------------------------

      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
      ______________________________________________________________________
      ********************* HYDROGRAPH INFORMATION **********************

                     From study/file name: LineF24hrBsnF2.rte
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        P R I N T  O F  S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals (CFS)

      ------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       20.7      41.3      62.0      82.7
  -------------------------------------------------------------------------
  0+15       0.1021      0.30  Q         |         |         |         |
  0+30       0.4038      1.12  Q         |         |         |         |
  0+45       0.7714      2.05  Q         |         |         |         |
  1+ 0       1.1643      3.01  qQ        |         |         |         |
  1+15       1.5226      3.81  qQ        |         |         |         |
  1+30       1.7782      4.31  q Q       |         |         |         |
  1+45       1.9847      4.69  q Q       |         |         |         |
  2+ 0       2.2211      5.16  |qQ       |         |         |         |
  2+15       2.4997      5.74  |qQ       |         |         |         |
  2+30       2.7584      6.26  |q Q      |         |         |         |
  2+45       3.0403      6.85  |q Q      |         |         |         |
  3+ 0       3.3585      7.52  |q Q      |         |         |         |
  3+15       3.6518      8.11  |q Q      |         |         |         |
  3+30       3.9073      8.59  |q  Q     |         |         |         |
  3+45       4.1298      8.99  |q  Q     |         |         |         |
  4+ 0       4.3801      9.48  | q Q     |         |         |         |
  4+15       4.6708     10.08  | q Q     |         |         |         |
```

```
 4+30       4.9967     10.77  | q  Q    |         |         |         |
 4+45       5.3532     11.53  | q  Q    |         |         |         |
 5+ 0       5.7363     12.36  | q  Q    |         |         |         |
 5+15       6.0296     12.89  | q   Q   |         |         |         |
 5+30       6.2125     13.15  |  q  Q   |         |         |         |
 5+45       6.4687     13.65  |  q  Q   |         |         |         |
 6+ 0       6.7807     14.29  |  q  Q   |         |         |         |
 6+15       7.1250     15.02  |  q   Q  |         |         |         |
 6+30       7.4976     15.81  |  q   Q  |         |         |         |
 6+45       7.8948     16.66  |  q    Q |         |         |         |
 7+ 0       8.3134     17.54  |   q   Q |         |         |         |
 7+15       8.6941     18.31  |   q   Q |         |         |         |
 7+30       9.0822     19.10  |   q    Q|         |         |         |
 7+45       9.5495     20.10  |   q    Q|         |         |         |
 8+ 0      10.1018     21.32  |   q     Q         |         |         |
 8+15      10.8283     23.15  |    q    |Q        |         |         |
 8+30      11.6830     25.21  |    q    | Q       |         |         |
 8+45      12.5631     27.32  |     q   |  Q      |         |         |
 9+ 0      13.5256     29.67  |     q   |   Q     |         |         |
 9+15      14.6634     32.56  |      q  |    Q    |         |         |
 9+30      15.9770     35.85  |      q  |      Q  |         |         |
 9+45      17.3627     39.35  |       q |        Q|         |         |
10+ 0      18.7882     43.00  |        q|         Q         |         |
10+15      19.6022     43.44  |        q|         |Q        |         |
10+30      19.6187     41.94  |        q|         Q         |         |
10+45      19.8862     42.74  |        q|         Q         |         |
11+ 0      20.9420     45.20  |         q         |Q        |         |
11+15      21.9165     46.82  |         q         | Q       |         |
11+30      22.5727     47.76  |         q         |  Q      |         |
11+45      22.8528     47.61  |         |q        |  Q      |         |
12+ 0      22.9109     47.43  |         |q        | Q       |         |
12+15      23.8774     51.28  |         |q        |   Q     |         |
12+30      25.8827     57.15  |         | q       |      Q  |         |
12+45      28.1458     62.90  |         |  q      |        Q        |
13+ 0      30.4511     68.39  |         |   q     |         |  Q      |
13+15      33.1424     75.52  |         |     q   |         |     Q   |
13+30      36.1303     82.69  |         |      q  |         |        Q
13+45      37.4492     82.60  |         |       q |         |       Q|
14+ 0      36.8767     78.93  |         |      q  |         |       Q |
14+15      36.5259     78.50  |         |      q  |         |      Q  |
14+30      36.7392     79.33  |         |      q  |         |       Q |
14+45      36.9083     79.61  |         |      q  |         |       Q |
15+ 0      36.9076     79.27  |         |      q  |         |       Q |
15+15      36.6514     78.24  |         |      q  |         |      Q  |
15+30      36.1540     76.69  |         |      q  |         |      Q  |
15+45      35.1085     73.22  |         |     q   |         |    Q    |
16+ 0      33.6344     69.33  |         |     q   |         |  Q      |
16+15      30.7023     60.84  |         |   q     |        Q|         |
16+30      26.2549     49.96  |         | q       |   Q     |         |
16+45      22.1001     41.02  |         q       Q|         |         |
17+ 0      19.0483     34.39  |        q|     Q   |         |         |
17+15      17.1410     29.94  |        q |   Q    |         |         |
17+30      15.6250     26.69  |       q  | Q       |         |         |
17+45      14.3366     24.12  |      q   |Q        |         |         |
18+ 0      13.1578     21.84  |      q   Q         |         |         |
18+15      12.0584     19.78  |     q   Q|         |         |         |
18+30      11.0847     18.03  |     q  Q |         |         |         |
18+45      10.1800     16.43  |   q  Q  |         |         |         |
19+ 0       9.2627     14.74  |   q  Q  |         |         |         |
19+15       8.4316     13.29  |   q Q   |         |         |         |
19+30       7.8206     12.40  |  q Q    |         |         |         |
19+45       7.3206     11.72  |  q Q    |         |         |         |
20+ 0       6.7721     10.82  |  q Q    |         |         |         |
20+15       6.2621     10.02  |  qQ     |         |         |         |
20+30       5.8743      9.49  | q Q     |         |         |         |
20+45       5.5527      9.09  | q Q     |         |         |         |
21+ 0       5.2160      8.59  | q Q     |         |         |         |
21+15       4.9066      8.14  | qQ      |         |         |         |
21+30       4.6371      7.74  | qQ      |         |         |         |
21+45       4.4024      7.43  | qQ      |         |         |         |
22+ 0       4.1979      7.15  | qQ      |         |         |         |
```

```
  22+15       4.0198      6.93  |q Q      |         |         |         |
  22+30       3.8646      6.72  |q Q      |         |         |         |
  22+45       3.6730      6.40  |q Q      |         |         |         |
  23+ 0       3.4899      6.09  |qQ       |         |         |         |
  23+15       3.3304      5.83  |qQ       |         |         |         |
  23+30       3.1915      5.62  |qQ       |         |         |         |
  23+45       3.0706      5.44  |qQ       |         |         |         |
  24+ 0       2.9652      5.29  |qQ       |         |         |         |
  24+15       2.7603      4.84  |qQ       |         |         |         |
  24+30       2.4366      4.08  |Q        |         |         |         |
  24+45       2.1225      3.39  |Q        |         |         |         |
  25+ 0       1.8488      2.83  qQ        |         |         |         |
  25+15       1.6104      2.36  qQ        |         |         |         |
  25+30       1.4028      1.98  Q         |         |         |         |
  25+45       1.2219      1.67  Q         |         |         |         |
  26+ 0       1.0643      1.41  Q         |         |         |         |
  26+15       0.9271      1.19  Q         |         |         |         |
  26+30       0.8076      1.01  Q         |         |         |         |
  26+45       0.7034      0.86  Q         |         |         |         |
  27+ 0       0.6127      0.74  Q         |         |         |         |
  27+15       0.5337      0.63  Q         |         |         |         |
  27+30       0.4649      0.54  Q         |         |         |         |
  27+45       0.4050      0.46  Q         |         |         |         |
  28+ 0       0.3527      0.40  Q         |         |         |         |
  28+15       0.3073      0.34  Q         |         |         |         |
  28+30       0.2676      0.29  Q         |         |         |         |
  28+45       0.2331      0.25  Q         |         |         |         |
  29+ 0       0.2031      0.22  Q         |         |         |         |
  29+15       0.1769      0.19  Q         |         |         |         |
  29+30       0.1541      0.16  Q         |         |         |         |
  29+45       0.1342      0.14  Q         |         |         |         |
  30+ 0       0.1169      0.12  Q         |         |         |         |
  30+15       0.1018      0.11  Q         |         |         |         |
  30+30       0.0887      0.09  Q         |         |         |         |
  30+45       0.0773      0.08  Q         |         |         |         |
  31+ 0       0.0673      0.07  Q         |         |         |         |
  31+15       0.0586      0.06  Q         |         |         |         |
  31+30       0.0511      0.05  Q         |         |         |         |
  31+45       0.0445      0.05  Q         |         |         |         |
  32+ 0       0.0387      0.04  Q         |         |         |         |
  32+15       0.0338      0.03  Q         |         |         |         |
  32+30       0.0294      0.03  Q         |         |         |         |
  32+45       0.0256      0.03  Q         |         |         |         |
  33+ 0       0.0223      0.02  Q         |         |         |         |
  33+15       0.0194      0.02  Q         |         |         |         |
  33+30       0.0169      0.02  Q         |         |         |         |
  33+45       0.0147      0.01  Q         |         |         |         |
  34+ 0       0.0128      0.01  Q         |         |         |         |
  34+15       0.0112      0.01  Q         |         |         |         |
  34+30       0.0097      0.01  Q         |         |         |         |
  34+45       0.0085      0.01  Q         |         |         |         |
  35+ 0       0.0074      0.01  Q         |         |         |         |
  35+15       0.0064      0.01  Q         |         |         |         |
  35+30       0.0056      0.01  Q         |         |         |         |
  35+45       0.0049      0.00  Q         |         |         |         |
  36+ 0       0.0043      0.00  Q         |         |         |         |
  36+15       0.0037      0.00  Q         |         |         |         |
  36+30       0.0032      0.00  Q         |         |         |         |
  36+45       0.0028      0.00  Q         |         |         |         |
  37+ 0       0.0025      0.00  Q         |         |         |         |
  37+15       0.0021      0.00  Q         |         |         |         |
  37+30       0.0019      0.00  Q         |         |         |         |
  37+45       0.0016      0.00  Q         |         |         |         |
  38+ 0       0.0014      0.00  Q         |         |         |         |
  38+15       0.0012      0.00  Q         |         |         |         |
  38+30       0.0011      0.00  Q         |         |         |         |
  38+45       0.0010      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                     Number of intervals =   155
                     Time interval =   15.0 (Min.)
```

```
                Maximum/Peak flow rate =       82.695 (CFS)
                Total volume =      55.251 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

----------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** ADD/COMBINE/RECOVER HYDROGRAPHS ****
______________________________________________________________________
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: OffsiteF324100.rte
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                   P R I N T  O F  S T O R M
                R u n o f f     H y d r o g r a p h
----------------------------------------------------------------------
            Hydrograph in  15   Minute intervals (CFS)

----------------------------------------------------------------------
Time(h+m) Add q(CFS)  Tot. Q   0       34.0      67.9     101.9     135.8
----------------------------------------------------------------------
  0+15       0.1313      0.43  Q         |         |         |         |
  0+30       0.4930      1.61  Q         |         |         |         |
  0+45       0.7168      2.76  Q         |         |         |         |
  1+ 0       0.8413      3.85  qQ        |         |         |         |
  1+15       0.9397      4.75  qQ        |         |         |         |
  1+30       0.8348      5.15  qQ        |         |         |         |
  1+45       0.8085      5.50  qQ        |         |         |         |
  2+ 0       0.8664      6.03  qQ        |         |         |         |
  2+15       1.0129      6.75  qQ        |         |         |         |
  2+30       1.0496      7.31  q Q       |         |         |         |
  2+45       1.1257      7.97  q Q       |         |         |         |
  3+ 0       1.2765      8.79  q Q       |         |         |         |
  3+15       1.3156      9.42  q Q       |         |         |         |
  3+30       1.3261      9.92  q Q       |         |         |         |
  3+45       1.3288     10.32  q  Q      |         |         |         |
  4+ 0       1.3957     10.88  q  Q      |         |         |         |
  4+15       1.5437     11.62  q  Q      |         |         |         |
  4+30       1.6473     12.42  q  Q      |         |         |         |
  4+45       1.8057     13.34  q  Q      |         |         |         |
  5+ 0       1.9121     14.27  q   Q     |         |         |         |
  5+15       1.9404     14.83  q   Q     |         |         |         |
  5+30       1.7508     14.91  q   Q     |         |         |         |
  5+45       1.9002     15.55  q   Q     |         |         |         |
  6+ 0       2.0680     16.36  q   Q     |         |         |         |
  6+15       2.1777     17.20  q    Q    |         |         |         |
  6+30       2.3365     18.15  q    Q    |         |         |         |
  6+45       2.4441     19.10  q    Q    |         |         |         |
  7+ 0       2.6037     20.15  q    Q    |         |         |         |
  7+15       2.6444     20.95  q     Q   |         |         |         |
  7+30       2.7217     21.82  q     Q   |         |         |         |
  7+45       2.9381     23.04  q     Q   |         |         |         |
  8+ 0       3.1909     24.51  q      Q  |         |         |         |
  8+15       3.5186     26.66  |q     Q  |         |         |         |
  8+30       3.8658     29.07  |q      Q |         |         |         |
  8+45       4.0217     31.34  |q       Q|         |         |         |
  9+ 0       4.2602     33.93  |q       Q|         |         |         |
  9+15       5.0391     37.60  |q        |Q        |         |         |
  9+30       7.2210     43.07  | q       | Q       |         |         |
  9+45      10.2068     49.56  |  q      |   Q     |         |         |
 10+ 0      13.4013     56.40  |  q      |     Q   |         |         |
 10+15      12.6994     56.14  |  q      |     Q   |         |         |
 10+30       6.2553     48.20  |q        |   Q     |         |         |
 10+45       6.8886     49.63  | q       |   Q     |         |         |
 11+ 0      11.7022     56.90  |  q      |     Q   |         |         |
```

11+15	12.7098	59.53		q	Q			
11+30	12.0819	59.84		q	Q			
11+45	11.0493	58.66		q	Q			
12+ 0	9.2471	56.68		q	Q			
12+15	15.0975	66.38		q	Q			
12+30	26.8264	83.97		q		Q		
12+45	32.8727	95.78		q		Q		
13+ 0	38.1461	106.53		q		Q		
13+15	44.5125	120.03		q	Q			
13+30	53.1405	135.84		q	Q			
13+45	48.5088	131.11		q	Q			
14+ 0	33.3191	112.25		q		Q		
14+15	32.4305	110.93		q		Q		
14+30	37.1045	116.44		q	Q			
14+45	37.3332	116.94		q	Q			
15+ 0	37.0719	116.34		q	Q			
15+15	35.4218	113.67		q	Q			
15+30	33.3994	110.09		q		Q		
15+45	29.2633	102.49		q	Q			
16+ 0	23.2907	92.62		q	Q			
16+15	16.9351	77.78		q	Q			
16+30	5.2159	55.18		q	Q			
16+45	2.1428	43.16	q	Q			
17+ 0	1.1515	35.54	q	Q			
17+15	1.0353	30.97	q	Q			
17+30	1.2293	27.92	q	Q			
17+45	1.3024	25.42	q	Q			
18+ 0	1.2565	23.10	q	Q			
18+15	1.1140	20.89	q	Q			
18+30	1.0784	19.11	q	Q			
18+45	1.0023	17.43	q	Q			
19+ 0	0.7859	15.53	q	Q			
19+15	0.6644	13.95	q	Q			
19+30	0.8297	13.23	q	Q			
19+45	0.9367	12.65	q	Q			
20+ 0	0.7675	11.59	q	Q			
20+15	0.6593	10.68	q	Q			
20+30	0.7628	10.26	q	Q			
20+45	0.7887	9.88	q Q				
21+ 0	0.7296	9.31	q Q				
21+15	0.6488	8.79	q Q				
21+30	0.6944	8.44	q Q				
21+45	0.6396	8.07	q Q				
22+ 0	0.6917	7.84	q Q				
22+15	0.6384	7.56	q Q				
22+30	0.6917	7.41	q Q				
22+45	0.5727	6.97	q Q				
23+ 0	0.5437	6.63	qQ				
23+15	0.5348	6.37	qQ				
23+30	0.5332	6.15	qQ				
23+45	0.5320	5.97	qQ				
24+ 0	0.5320	5.83	qQ				
24+15	0.4007	5.24	qQ				
24+30	0.1047	4.19	qQ				
24+45	0.0288	3.42	qQ				
25+ 0	0.0079	2.83	Q				
25+15	0.0024	2.37	Q				
25+30	0.0000	1.98	Q				
25+45	0.0000	1.67	Q				
26+ 0	0.0000	1.41	Q				
26+15	0.0000	1.19	Q				
26+30	0.0000	1.01	Q				
26+45	0.0000	0.86	Q				
27+ 0	0.0000	0.74	Q				
27+15	0.0000	0.63	Q				
27+30	0.0000	0.54	Q				
27+45	0.0000	0.46	Q				
28+ 0	0.0000	0.40	Q				
28+15	0.0000	0.34	Q				
28+30	0.0000	0.29	Q				
28+45	0.0000	0.25	Q				

```
  29+ 0       0.0000      0.22  Q         |         |         |         |
  29+15       0.0000      0.19  Q         |         |         |         |
  29+30       0.0000      0.16  Q         |         |         |         |
  29+45       0.0000      0.14  Q         |         |         |         |
  30+ 0       0.0000      0.12  Q         |         |         |         |
  30+15       0.0000      0.11  Q         |         |         |         |
  30+30       0.0000      0.09  Q         |         |         |         |
  30+45       0.0000      0.08  Q         |         |         |         |
  31+ 0       0.0000      0.07  Q         |         |         |         |
  31+15       0.0000      0.06  Q         |         |         |         |
  31+30       0.0000      0.05  Q         |         |         |         |
  31+45       0.0000      0.05  Q         |         |         |         |
  32+ 0       0.0000      0.04  Q         |         |         |         |
  32+15       0.0000      0.03  Q         |         |         |         |
  32+30       0.0000      0.03  Q         |         |         |         |
  32+45       0.0000      0.03  Q         |         |         |         |
  33+ 0       0.0000      0.02  Q         |         |         |         |
  33+15       0.0000      0.02  Q         |         |         |         |
  33+30       0.0000      0.02  Q         |         |         |         |
  33+45       0.0000      0.01  Q         |         |         |         |
  34+ 0       0.0000      0.01  Q         |         |         |         |
  34+15       0.0000      0.01  Q         |         |         |         |
  34+30       0.0000      0.01  Q         |         |         |         |
  34+45       0.0000      0.01  Q         |         |         |         |
  35+ 0       0.0000      0.01  Q         |         |         |         |
  35+15       0.0000      0.01  Q         |         |         |         |
  35+30       0.0000      0.01  Q         |         |         |         |
  35+45       0.0000      0.00  Q         |         |         |         |
  36+ 0       0.0000      0.00  Q         |         |         |         |
  36+15       0.0000      0.00  Q         |         |         |         |
  36+30       0.0000      0.00  Q         |         |         |         |
  36+45       0.0000      0.00  Q         |         |         |         |
  37+ 0       0.0000      0.00  Q         |         |         |         |
  37+15       0.0000      0.00  Q         |         |         |         |
  37+30       0.0000      0.00  Q         |         |         |         |
  37+45       0.0000      0.00  Q         |         |         |         |
  38+ 0       0.0000      0.00  Q         |         |         |         |
  38+15       0.0000      0.00  Q         |         |         |         |
  38+30       0.0000      0.00  Q         |         |         |         |
  38+45       0.0000      0.00  Q         |         |         |         |
-----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   155
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      135.835 (CFS)
                      Total volume =      71.597 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       -----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** ADD/COMBINE/RECOVER HYDROGRAPHS ****
       ______________________________________________________________________
       ******************** HYDROGRAPH INFORMATION **********************

                      From study/file name: OffsiteF424100.rte
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         P R I N T  O F  S T O R M
                      R u n o f f     H y d r o g r a p h
       -----------------------------------------------------------------------
                   Hydrograph in  15   Minute intervals (CFS)

       -----------------------------------------------------------------------
  Time(h+m) Add q(CFS)  Tot. Q   0       40.2      80.5     120.7     161.0
  ----------------------------------------------------------------------
```

```
 0+15       0.0988      0.53  Q         |         |         |         |
 0+30       0.2778      1.89  Q         |         |         |         |
 0+45       0.3627      3.13  Q         |         |         |         |
 1+ 0       0.4259      4.27  qQ        |         |         |         |
 1+15       0.4432      5.19  qQ        |         |         |         |
 1+30       0.3884      5.54  qQ        |         |         |         |
 1+45       0.3802      5.88  qQ        |         |         |         |
 2+ 0       0.4278      6.46  qQ        |         |         |         |
 2+15       0.4926      7.25  qQ        |         |         |         |
 2+30       0.5026      7.81  qQ        |         |         |         |
 2+45       0.5539      8.53  q Q       |         |         |         |
 3+ 0       0.6187      9.41  q Q       |         |         |         |
 3+15       0.6288     10.05  q Q       |         |         |         |
 3+30       0.6306     10.55  q Q       |         |         |         |
 3+45       0.6306     10.95  q Q       |         |         |         |
 4+ 0       0.6800     11.56  q Q       |         |         |         |
 4+15       0.7448     12.37  q  Q      |         |         |         |
 4+30       0.8043     13.22  q  Q      |         |         |         |
 4+45       0.8710     14.21  q  Q      |         |         |         |
 5+ 0       0.9304     15.20  q  Q      |         |         |         |
 5+15       0.8983     15.73  q  Q      |         |         |         |
 5+30       0.8281     15.73  q  Q      |         |         |         |
 5+45       0.9241     16.48  q   Q     |         |         |         |
 6+ 0       0.9952     17.35  q   Q     |         |         |         |
 6+15       1.0565     18.26  q   Q     |         |         |         |
 6+30       1.1232     19.27  q   Q     |         |         |         |
 6+45       1.1827     20.29  q    Q    |         |         |         |
 7+ 0       1.2493     21.39  q    Q    |         |         |         |
 7+15       1.2594     22.21  q    Q    |         |         |         |
 7+30       1.3107     23.13  q    Q    |         |         |         |
 7+45       1.4249     24.46  q     Q   |         |         |         |
 8+ 0       1.5491     26.06  q     Q   |         |         |         |
 8+15       1.7247     28.39  q      Q  |         |         |         |
 8+30       1.8662     30.94  q      Q  |         |         |         |
 8+45       1.9376     33.28  q       Q |         |         |         |
 9+ 0       2.0555     35.98  q       Q |         |         |         |
 9+15       2.2292     39.83  q        Q|         |         |         |
 9+30       2.8995     45.97  q         |Q        |         |         |
 9+45       4.2296     53.79  |q        |  Q      |         |         |
10+ 0       5.7600     62.16  |q        |    Q    |         |         |
10+15       4.7554     60.90  |q        |    Q    |         |         |
10+30       2.3398     50.54  q         | Q       |         |         |
10+45       3.2819     52.91  q         |  Q      |         |         |
11+ 0       5.0497     61.95  |q        |    Q    |         |         |
11+15       5.0869     64.61  |q        |     Q   |         |         |
11+30       4.7724     64.61  |q        |     Q   |         |         |
11+45       3.9691     62.63  q         |    Q    |         |         |
12+ 0       3.4304     60.11  q         |   Q     |         |         |
12+15       7.6147     73.99  |q        |       Q |         |         |
12+30      12.9848     96.96  |  q      |         |   Q     |         |
12+45      15.6155    111.39  |  q      |         |      Q  |         |
13+ 0      17.9061    124.44  |   q     |         |         Q         |
13+15      21.5101    141.54  |    q    |         |         |    Q    |
13+30      25.1514    160.99  |     q   |         |         |       Q |
13+45      20.4977    151.61  |    q    |         |         |      Q  |
14+ 0      13.7174    125.97  |  q      |         |         |Q        |
14+15      14.8413    125.77  |  q      |         |         |Q        |
14+30      16.9843    133.42  |   q     |         |         |  Q      |
14+45      16.9838    133.92  |   q     |         |         |  Q      |
15+ 0      16.7063    133.05  |   q     |         |         |  Q      |
15+15      15.7843    129.45  |  q      |         |         | Q       |
15+30      14.7769    124.87  |  q      |         |         |Q        |
15+45      12.2652    114.75  |  q      |         |       Q |         |
16+ 0       9.7814    102.40  | q       |         |    Q    |         |
16+15       5.9951     83.77  |q        |         Q         |         |
16+30       1.3457     56.52  q         |   Q     |         |         |
16+45       0.5873     43.75  q         Q         |         |         |
17+ 0       0.3903     35.93  q       Q |         |         |         |
17+15       0.4790     31.45  q      Q  |         |         |         |
17+30       0.6068     28.53  q      Q  |         |         |         |
17+45       0.6269     26.05  q     Q   |         |         |         |
```

```
18+ 0       0.5812     23.68  q    Q    |         |         |         |
18+15       0.5164     21.41  q    Q    |         |         |         |
18+30       0.5064     19.62  q   Q     |         |         |         |
18+45       0.4551     17.88  q   Q     |         |         |         |
19+ 0       0.3409     15.87  q  Q      |         |         |         |
19+15       0.3154     14.27  q  Q      |         |         |         |
19+30       0.4177     13.65  q  Q      |         |         |         |
19+45       0.4413     13.09  q  Q      |         |         |         |
20+ 0       0.3390     11.93  q Q       |         |         |         |
20+15       0.3154     10.99  q Q       |         |         |         |
20+30       0.3683     10.63  q Q       |         |         |         |
20+45       0.3765     10.26  q Q       |         |         |         |
21+ 0       0.3290      9.64  q Q       |         |         |         |
21+15       0.3136      9.10  q Q       |         |         |         |
21+30       0.3189      8.76  q Q       |         |         |         |
21+45       0.3117      8.38  q Q       |         |         |         |
22+ 0       0.3189      8.16  q Q       |         |         |         |
22+15       0.3117      7.88  qQ        |         |         |         |
22+30       0.3189      7.73  qQ        |         |         |         |
22+45       0.2623      7.23  qQ        |         |         |         |
23+ 0       0.2541      6.89  qQ        |         |         |         |
23+15       0.2523      6.62  qQ        |         |         |         |
23+30       0.2523      6.41  qQ        |         |         |         |
23+45       0.2523      6.23  qQ        |         |         |         |
24+ 0       0.2523      6.08  qQ        |         |         |         |
24+15       0.1534      5.39  qQ        |         |         |         |
24+30       0.0238      4.21  qQ        |         |         |         |
24+45       0.0037      3.42  Q         |         |         |         |
25+ 0       0.0000      2.83  Q         |         |         |         |
25+15       0.0000      2.37  Q         |         |         |         |
25+30       0.0000      1.98  Q         |         |         |         |
25+45       0.0000      1.67  Q         |         |         |         |
26+ 0       0.0000      1.41  Q         |         |         |         |
26+15       0.0000      1.19  Q         |         |         |         |
26+30       0.0000      1.01  Q         |         |         |         |
26+45       0.0000      0.86  Q         |         |         |         |
27+ 0       0.0000      0.74  Q         |         |         |         |
27+15       0.0000      0.63  Q         |         |         |         |
27+30       0.0000      0.54  Q         |         |         |         |
27+45       0.0000      0.46  Q         |         |         |         |
28+ 0       0.0000      0.40  Q         |         |         |         |
28+15       0.0000      0.34  Q         |         |         |         |
28+30       0.0000      0.29  Q         |         |         |         |
28+45       0.0000      0.25  Q         |         |         |         |
29+ 0       0.0000      0.22  Q         |         |         |         |
29+15       0.0000      0.19  Q         |         |         |         |
29+30       0.0000      0.16  Q         |         |         |         |
29+45       0.0000      0.14  Q         |         |         |         |
30+ 0       0.0000      0.12  Q         |         |         |         |
30+15       0.0000      0.11  Q         |         |         |         |
30+30       0.0000      0.09  Q         |         |         |         |
30+45       0.0000      0.08  Q         |         |         |         |
31+ 0       0.0000      0.07  Q         |         |         |         |
31+15       0.0000      0.06  Q         |         |         |         |
31+30       0.0000      0.05  Q         |         |         |         |
31+45       0.0000      0.05  Q         |         |         |         |
32+ 0       0.0000      0.04  Q         |         |         |         |
32+15       0.0000      0.03  Q         |         |         |         |
32+30       0.0000      0.03  Q         |         |         |         |
32+45       0.0000      0.03  Q         |         |         |         |
33+ 0       0.0000      0.02  Q         |         |         |         |
33+15       0.0000      0.02  Q         |         |         |         |
33+30       0.0000      0.02  Q         |         |         |         |
33+45       0.0000      0.01  Q         |         |         |         |
34+ 0       0.0000      0.01  Q         |         |         |         |
34+15       0.0000      0.01  Q         |         |         |         |
34+30       0.0000      0.01  Q         |         |         |         |
34+45       0.0000      0.01  Q         |         |         |         |
35+ 0       0.0000      0.01  Q         |         |         |         |
35+15       0.0000      0.01  Q         |         |         |         |
35+30       0.0000      0.01  Q         |         |         |         |
```

```
   35+45       0.0000      0.00  Q         |         |         |         |
   36+ 0       0.0000      0.00  Q         |         |         |         |
   36+15       0.0000      0.00  Q         |         |         |         |
   36+30       0.0000      0.00  Q         |         |         |         |
   36+45       0.0000      0.00  Q         |         |         |         |
   37+ 0       0.0000      0.00  Q         |         |         |         |
   37+15       0.0000      0.00  Q         |         |         |         |
   37+30       0.0000      0.00  Q         |         |         |         |
   37+45       0.0000      0.00  Q         |         |         |         |
   38+ 0       0.0000      0.00  Q         |         |         |         |
   38+15       0.0000      0.00  Q         |         |         |         |
   38+30       0.0000      0.00  Q         |         |         |         |
   38+45       0.0000      0.00  Q         |         |         |         |
----------------------------------------------------------------------
       ****************************HYDROGRAPH DATA***************************
                      Number of intervals =   155
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =      160.987 (CFS)
                      Total volume =      78.873 (Ac.Ft)
              Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
              Peak (CFS)      0.000     0.000     0.000     0.000     0.000
              Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       **********************************************************************

       ----------------------------------------------------------------------
```

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 11/01/12

      ----------------------------------------------------------------


      Watershed F, Basin F1
      Proposed Condition
      100-year, 24-hour

      ----------------------------------------------------------------


      Program License Serial Number 6097

      ----------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION *********************

                    From study/file name: SubF124100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    97
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       45.954 (CFS)
                    Total volume =      24.676 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        1.000 to Point/Station        2.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------
      Total number of inflow hydrograph intervals = 97
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000      4.000     50.000      3.483        4.517
         5.000      6.000     60.000      5.380        6.620
         6.000      8.000    100.000      6.967        9.033
      ----------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      11.5   22.98   34.47   45.95 (Ft.)
 0.250    1.61    0.16      0.015  OI      |       |       |       |     2.00
```

0.500	2.88	0.64	0.053	O I	2.01
0.750	3.10	1.18	0.096	O I	2.02
1.000	3.91	1.71	0.139	OI	2.03
1.250	3.33	2.15	0.174	OI	2.04
1.500	3.10	2.39	0.193	OI	2.05
1.750	3.10	2.56	0.206	OI	2.05
2.000	3.91	2.77	0.224	OI	2.06
2.250	4.14	3.06	0.247	O	2.06
2.500	4.14	3.31	0.266	O	2.07
2.750	4.95	3.59	0.289	OI	2.07
3.000	5.17	3.93	0.316	OI	2.08
3.250	5.17	4.21	0.339	OI	2.08
3.500	5.17	4.43	0.356	O	2.09
3.750	5.17	4.60	0.370	O	2.09
4.000	5.98	4.83	0.388	OI	2.10
4.250	6.21	5.12	0.411	OI	2.10
4.500	7.01	5.46	0.438	OI	2.11
4.750	7.24	5.84	0.469	OI	2.12
5.000	8.05	6.25	0.502	OI	2.13
5.250	6.67	6.51	0.522	O	2.13
5.500	7.01	6.58	0.528	O	2.13
5.750	8.05	6.80	0.546	OI	2.14
6.000	8.28	7.11	0.571	OI	2.14
6.250	9.08	7.47	0.599	OI	2.15
6.500	9.31	7.87	0.631	OI	2.16
6.750	10.12	8.29	0.665	O I	2.17
7.000	10.35	8.74	0.700	OI	2.17
7.250	10.35	9.10	0.730	OI	2.18
7.500	11.15	9.48	0.760	OI	2.19
7.750	12.19	9.98	0.800	O I	2.20
8.000	13.22	10.61	0.850	O I	2.21
8.250	15.69	11.49	0.920	O I	2.23
8.500	16.39	12.53	1.004	O I	2.25
8.750	17.62	13.55	1.086	O I	2.27
9.000	19.18	14.66	1.174	O I	2.29
9.250	21.89	16.00	1.282	O I	2.32
9.500	23.77	17.57	1.406	O I	2.35
9.750	25.33	19.16	1.534	O I	2.38
10.000	26.88	20.75	1.661	O I	2.42
10.250	19.23	21.28	1.703	IO	2.43
10.500	17.01	20.56	1.646	I O	2.41
10.750	22.84	20.41	1.634	OI	2.41
11.000	24.56	21.17	1.694	O I	2.42
11.250	23.48	21.82	1.747	OI	2.44
11.500	23.22	22.17	1.775	OI	2.44
11.750	21.00	22.16	1.773	IO	2.44
12.000	21.56	21.95	1.757	O	2.44
12.250	30.01	22.83	1.828	O I	2.46
12.500	33.53	24.88	1.991	O I	2.50
12.750	36.23	27.17	2.174	O I	2.54
13.000	38.10	29.45	2.357	O I	2.59
13.250	44.25	32.14	2.572	O I	2.64
13.500	45.95	35.10	2.809	O I	2.70
13.750	33.36	36.15	2.892	I O	2.72
14.000	29.82	35.10	2.809	I O	2.70
14.250	34.49	34.43	2.755	OI	2.69
14.500	34.71	34.47	2.758	O	2.69
14.750	34.45	34.49	2.760	IO	2.69
15.000	33.36	34.36	2.749	O	2.69
15.250	31.94	33.97	2.718	IO	2.68
15.500	30.52	33.34	2.668	I O	2.67
15.750	25.65	32.14	2.572	I O	2.64
16.000	24.39	30.51	2.441	I O	2.61
16.250	8.63	27.31	2.185	I O	2.55
16.500	4.14	22.52	1.803	I O	2.45
16.750	3.33	18.22	1.459	I O	2.36
17.000	3.10	14.79	1.184	I O	2.30
17.250	4.72	12.30	0.985	I O	2.25
17.500	5.17	10.62	0.851	I O	2.21
17.750	5.17	9.37	0.751	I O	2.19
18.000	4.37	8.32	0.667	I O	2.17

```
18.250    4.14    7.39      0.593  | I  O  |       |       |       |     2.15
18.500    4.14    6.65      0.533  | I O   |       |       |       |     2.13
18.750    3.33    5.98      0.480  | I O   |       |       |       |     2.12
19.000    2.30    5.26      0.422  |I O    |       |       |       |     2.11
19.250    2.88    4.65      0.373  | IO    |       |       |       |     2.09
19.500    3.91    4.36      0.350  | IO    |       |       |       |     2.09
19.750    3.33    4.19      0.337  | O     |       |       |       |     2.08
20.000    2.30    3.88      0.312  |IO     |       |       |       |     2.08
20.250    2.88    3.58      0.288  | O     |       |       |       |     2.07
20.500    3.10    3.45      0.277  | O     |       |       |       |     2.07
20.750    3.10    3.37      0.271  | O     |       |       |       |     2.07
21.000    2.30    3.22      0.259  |IO     |       |       |       |     2.06
21.250    2.88    3.07      0.248  | O     |       |       |       |     2.06
21.500    2.30    2.96      0.239  |IO     |       |       |       |     2.06
21.750    2.88    2.88      0.232  | O     |       |       |       |     2.06
22.000    2.30    2.81      0.227  |O      |       |       |       |     2.06
22.250    2.88    2.76      0.223  |OI     |       |       |       |     2.06
22.500    2.30    2.72      0.219  |O      |       |       |       |     2.05
22.750    2.07    2.60      0.210  |O      |       |       |       |     2.05
23.000    2.07    2.48      0.200  |O      |       |       |       |     2.05
23.250    2.07    2.38      0.192  |O      |       |       |       |     2.05
23.500    2.07    2.31      0.187  |O      |       |       |       |     2.05
23.750    2.07    2.26      0.182  |O      |       |       |       |     2.05
24.000    2.07    2.21      0.179  |O      |       |       |       |     2.04
24.250    0.46    2.00      0.162  IO      |       |       |       |     2.04
24.500    0.00    1.59      0.129  IO      |       |       |       |     2.03
24.750    0.00    1.23      0.100  O       |       |       |       |     2.02
25.000    0.00    0.95      0.078  O       |       |       |       |     2.02
25.250    0.00    0.73      0.060  O       |       |       |       |     2.01
25.500    0.00    0.56      0.047  O       |       |       |       |     2.01
25.750    0.00    0.43      0.037  O       |       |       |       |     2.01
26.000    0.00    0.33      0.029  O       |       |       |       |     2.01
26.250    0.00    0.26      0.023  O       |       |       |       |     2.01
26.500    0.00    0.20      0.018  O       |       |       |       |     2.00
26.750    0.00    0.15      0.014  O       |       |       |       |     2.00
27.000    0.00    0.12      0.011  O       |       |       |       |     2.00
27.250    0.00    0.09      0.009  O       |       |       |       |     2.00
27.500    0.00    0.07      0.008  O       |       |       |       |     2.00
27.750    0.00    0.05      0.006  O       |       |       |       |     2.00
28.000    0.00    0.04      0.005  O       |       |       |       |     2.00
28.250    0.00    0.03      0.005  O       |       |       |       |     2.00
28.500    0.00    0.02      0.004  O       |       |       |       |     2.00
28.750    0.00    0.02      0.003  O       |       |       |       |     2.00
29.000    0.00    0.01      0.003  O       |       |       |       |     2.00
29.250    0.00    0.01      0.003  O       |       |       |       |     2.00
29.500    0.00    0.01      0.003  O       |       |       |       |     2.00
29.750    0.00    0.01      0.002  O       |       |       |       |     2.00
30.000    0.00    0.01      0.002  O       |       |       |       |     2.00
30.250    0.00    0.00      0.002  O       |       |       |       |     2.00
30.500    0.00    0.00      0.002  O       |       |       |       |     2.00
30.750    0.00    0.00      0.002  O       |       |       |       |     2.00
31.000    0.00    0.00      0.002  O       |       |       |       |     2.00
31.250    0.00    0.00      0.002  O       |       |       |       |     2.00
31.500    0.00    0.00      0.002  O       |       |       |       |     2.00
31.750    0.00    0.00      0.002  O       |       |       |       |     1.99

      Remaining water in basin =    0.00 (Ac.Ft)

      ****************************HYDROGRAPH DATA****************************
                     Number of intervals =   127
                     Time interval =   15.0 (Min.)
                     Maximum/Peak flow rate =       36.145 (CFS)
                     Total volume =      24.674 (Ac.Ft)
             Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      ***********************************************************************
```

```
-----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** STORE OR DELETE CURRENT HYDROGRAPH ****
______________________________________________________________________
Current stream hydrograph saved in file LineF24hrBsnF1.rte
****************************HYDROGRAPH DATA***************************
               Number of intervals =     0
               Time interval =    0.0 (Min.)
               Maximum/Peak flow rate =        0.000 (CFS)
               Total volume =       0.000 (Ac.Ft)
       Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
       Peak (CFS)      0.000     0.000     0.000     0.000     0.000
       Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
**********************************************************************

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```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
             Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 11/01/12

      ----------------------------------------------------------------


      Watershed F, Basin F2
      Proposed Condition
      100-year, 24-hour

      ----------------------------------------------------------------


      Program License Serial Number 6097

      ----------------------------------------------------------------
      ******************** HYDROGRAPH INFORMATION **********************

                    From study/file name: SubF224100.rte
      ****************************HYDROGRAPH DATA****************************
                    Number of intervals =    97
                    Time interval =   15.0 (Min.)
                    Maximum/Peak flow rate =       50.026 (CFS)
                    Total volume =      26.863 (Ac.Ft)
             Status of hydrographs being held in storage
                        Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
             Peak (CFS)      0.000     0.000     0.000     0.000     0.000
             Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
      **********************************************************************



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      Process from Point/Station        2.000 to Point/Station        3.000
      **** RETARDING BASIN ROUTING ****
      ______________________________________________________________________

      User entry of depth-outflow-storage data
      ----------------------------------------------------------------
      Total number of inflow hydrograph intervals = 97
      Hydrograph time unit = 15.000 (Min.)
      Initial depth in storage basin =   0.10(Ft.)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ----------------------------------------------------------------
      ----------------------------------------------------------------
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ----------------------------------------------------------------
         0.000      0.000      0.000      0.000        0.000
         1.000      0.001      0.001      0.001        0.001
         2.000      0.002      0.001      0.002        0.002
         3.000      3.000     20.000      2.793        3.207
         5.000      6.000     50.000      5.483        6.517
         6.000      8.000    100.000      6.967        9.033
      ----------------------------------------------------------------
                    Hydrograph Detention Basin Routing
      ----------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ----------------------------------------------------------------
 Time   Inflow  Outflow    Storage                                      Depth
(Hours)  (CFS)   (CFS)     (Ac.Ft) .0      12.5   25.01   37.52   50.03 (Ft.)
 0.250    1.75    0.10      0.017  OI      |       |       |       |     2.01
```

0.500	3.13	0.40	0.062	O I					2.02
0.750	3.38	0.77	0.117	O I					2.04
1.000	4.26	1.16	0.176	O I					2.06
1.250	3.63	1.52	0.230	O I					2.08
1.500	3.38	1.78	0.268	OI					2.09
1.750	3.38	1.98	0.299	OI					2.10
2.000	4.26	2.22	0.335	OI					2.11
2.250	4.51	2.50	0.377	OI					2.12
2.500	4.51	2.76	0.415	OI					2.14
2.750	5.38	3.04	0.458	O I					2.15
3.000	5.63	3.36	0.505	OI					2.17
3.250	5.63	3.65	0.549	OI					2.18
3.500	5.63	3.91	0.588	OI					2.20
3.750	5.63	4.13	0.621	OI					2.21
4.000	6.51	4.38	0.658	O I					2.22
4.250	6.76	4.67	0.702	O I					2.23
4.500	7.64	5.00	0.751	OI					2.25
4.750	7.89	5.35	0.804	O I					2.27
5.000	8.76	5.74	0.862	O I					2.29
5.250	7.26	6.03	0.906	OI					2.30
5.500	7.64	6.21	0.933	OI					2.31
5.750	8.76	6.47	0.972	OI					2.32
6.000	9.01	6.78	1.018	OI					2.34
6.250	9.89	7.13	1.070	O I					2.36
6.500	10.14	7.50	1.126	O I					2.37
6.750	11.02	7.89	1.185	O I					2.39
7.000	11.27	8.31	1.248	O I					2.42
7.250	11.27	8.69	1.305	O I					2.43
7.500	12.14	9.08	1.363	O I					2.45
7.750	13.27	9.55	1.433	O I					2.48
8.000	14.40	10.10	1.516	O I					2.51
8.250	17.08	10.83	1.625	O I					2.54
8.500	17.84	11.68	1.753	O I					2.58
8.750	19.18	12.56	1.885	O I					2.63
9.000	20.88	13.53	2.029	O I					2.68
9.250	23.82	14.66	2.200	O I					2.73
9.500	25.88	15.98	2.397	O I					2.80
9.750	27.57	17.36	2.605	O I					2.87
10.000	29.26	18.79	2.818	O I					2.94
10.250	20.94	19.60	2.940	OI					2.98
10.500	18.52	19.62	2.943	IO					2.98
10.750	24.87	19.89	2.983	O I					2.99
11.000	26.73	20.94	3.094	O I					3.06
11.250	25.56	21.92	3.192	O I					3.13
11.500	25.28	22.57	3.257	O I					3.17
11.750	22.86	22.85	3.285	O					3.19
12.000	23.47	22.91	3.291	OI					3.19
12.250	32.67	23.88	3.388	O I					3.26
12.500	36.50	25.88	3.588	O I					3.39
12.750	39.44	28.15	3.815	O I					3.54
13.000	41.48	30.45	4.045	O I					3.70
13.250	48.17	33.14	4.314	O I					3.88
13.500	50.03	36.13	4.613	O I					4.08
13.750	36.32	37.45	4.745	O					4.16
14.000	32.46	36.88	4.688	I O					4.13
14.250	37.54	36.53	4.653	OI					4.10
14.500	37.79	36.74	4.674	OI					4.12
14.750	37.50	36.91	4.691	O					4.13
15.000	36.31	36.91	4.691	O					4.13
15.250	34.77	36.65	4.665	IO					4.11
15.500	33.22	36.15	4.615	I O					4.08
15.750	27.92	35.11	4.511	I O					4.01
16.000	26.55	33.63	4.363	I O					3.91
16.250	9.40	30.70	4.070	I	O				3.71
16.500	4.51	26.25	3.625	I	O				3.42
16.750	3.63	22.10	3.210	I	O				3.14
17.000	3.38	19.05	2.857	I	O				2.95
17.250	5.13	17.14	2.571	I	O				2.86
17.500	5.63	15.62	2.344	I	O				2.78
17.750	5.63	14.34	2.151	I	O				2.72
18.000	4.76	13.16	1.974	I	O				2.66

18.250	4.51	12.06	1.810	| I O|	|	|	|	2.60
18.500	4.51	11.08	1.664	| I O|	|	|	|	2.55
18.750	3.63	10.18	1.528	| I O |	|	|	|	2.51
19.000	2.50	9.26	1.390	|I O |	|	|	|	2.46
19.250	3.13	8.43	1.266	| I O |	|	|	|	2.42
19.500	4.26	7.82	1.174	| I O |	|	|	|	2.39
19.750	3.63	7.32	1.099	| I O |	|	|	|	2.37
20.000	2.50	6.77	1.017	|I O |	|	|	|	2.34
20.250	3.13	6.26	0.941	| I O |	|	|	|	2.31
20.500	3.38	5.87	0.882	| IO |	|	|	|	2.29
20.750	3.38	5.55	0.834	| IO |	|	|	|	2.28
21.000	2.50	5.22	0.784	|I O |	|	|	|	2.26
21.250	3.13	4.91	0.737	| IO |	|	|	|	2.25
21.500	2.50	4.64	0.697	|IO |	|	|	|	2.23
21.750	3.13	4.40	0.662	| O |	|	|	|	2.22
22.000	2.50	4.20	0.631	|IO |	|	|	|	2.21
22.250	3.13	4.02	0.604	| O |	|	|	|	2.20
22.500	2.50	3.86	0.581	|IO |	|	|	|	2.19
22.750	2.25	3.67	0.552	|IO |	|	|	|	2.18
23.000	2.25	3.49	0.525	|IO |	|	|	|	2.17
23.250	2.25	3.33	0.501	|IO |	|	|	|	2.17
23.500	2.25	3.19	0.480	|IO |	|	|	|	2.16
23.750	2.25	3.07	0.462	|O |	|	|	|	2.15
24.000	2.25	2.97	0.446	|O |	|	|	|	2.15
24.250	0.50	2.76	0.416	IO |	|	|	|	2.14
24.500	0.00	2.44	0.367	IO |	|	|	|	2.12
24.750	0.00	2.12	0.320	IO |	|	|	|	2.11
25.000	0.00	1.85	0.279	IO |	|	|	|	2.09
25.250	0.00	1.61	0.243	IO |	|	|	|	2.08
25.500	0.00	1.40	0.212	O |	|	|	|	2.07
25.750	0.00	1.22	0.185	O |	|	|	|	2.06
26.000	0.00	1.06	0.161	O |	|	|	|	2.05
26.250	0.00	0.93	0.141	O |	|	|	|	2.05
26.500	0.00	0.81	0.123	O |	|	|	|	2.04
26.750	0.00	0.70	0.107	O |	|	|	|	2.04
27.000	0.00	0.61	0.094	O |	|	|	|	2.03
27.250	0.00	0.53	0.082	O |	|	|	|	2.03
27.500	0.00	0.46	0.072	O |	|	|	|	2.02
27.750	0.00	0.40	0.063	O |	|	|	|	2.02
28.000	0.00	0.35	0.055	O |	|	|	|	2.02
28.250	0.00	0.31	0.048	O |	|	|	|	2.02
28.500	0.00	0.27	0.042	O |	|	|	|	2.01
28.750	0.00	0.23	0.037	O |	|	|	|	2.01
29.000	0.00	0.20	0.032	O |	|	|	|	2.01
29.250	0.00	0.18	0.028	O |	|	|	|	2.01
29.500	0.00	0.15	0.025	O |	|	|	|	2.01
29.750	0.00	0.13	0.022	O |	|	|	|	2.01
30.000	0.00	0.12	0.019	O |	|	|	|	2.01
30.250	0.00	0.10	0.017	O |	|	|	|	2.01
30.500	0.00	0.09	0.015	O |	|	|	|	2.00
30.750	0.00	0.08	0.013	O |	|	|	|	2.00
31.000	0.00	0.07	0.012	O |	|	|	|	2.00
31.250	0.00	0.06	0.011	O |	|	|	|	2.00
31.500	0.00	0.05	0.010	O |	|	|	|	2.00
31.750	0.00	0.04	0.009	O |	|	|	|	2.00
32.000	0.00	0.04	0.008	O |	|	|	|	2.00
32.250	0.00	0.03	0.007	O |	|	|	|	2.00
32.500	0.00	0.03	0.006	O |	|	|	|	2.00
32.750	0.00	0.03	0.006	O |	|	|	|	2.00
33.000	0.00	0.02	0.005	O |	|	|	|	2.00
33.250	0.00	0.02	0.005	O |	|	|	|	2.00
33.500	0.00	0.02	0.004	O |	|	|	|	2.00
33.750	0.00	0.01	0.004	O |	|	|	|	2.00
34.000	0.00	0.01	0.004	O |	|	|	|	2.00
34.250	0.00	0.01	0.004	O |	|	|	|	2.00
34.500	0.00	0.01	0.003	O |	|	|	|	2.00
34.750	0.00	0.01	0.003	O |	|	|	|	2.00
35.000	0.00	0.01	0.003	O |	|	|	|	2.00
35.250	0.00	0.01	0.003	O |	|	|	|	2.00
35.500	0.00	0.01	0.003	O |	|	|	|	2.00
35.750	0.00	0.00	0.003	O |	|	|	|	2.00

```
36.000    0.00    0.00      0.002  O       |       |       |       |     2.00
36.250    0.00    0.00      0.002  O       |       |       |       |     2.00
36.500    0.00    0.00      0.002  O       |       |       |       |     2.00
36.750    0.00    0.00      0.002  O       |       |       |       |     2.00
37.000    0.00    0.00      0.002  O       |       |       |       |     2.00
37.250    0.00    0.00      0.002  O       |       |       |       |     2.00
37.500    0.00    0.00      0.002  O       |       |       |       |     2.00
37.750    0.00    0.00      0.002  O       |       |       |       |     2.00
38.000    0.00    0.00      0.002  O       |       |       |       |     2.00
38.250    0.00    0.00      0.002  O       |       |       |       |     2.00
38.500    0.00    0.00      0.002  O       |       |       |       |     2.00
38.750    0.00    0.00      0.002  O       |       |       |       |     1.99

       Remaining water in basin =    0.00 (Ac.Ft)

       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =   155
                      Time interval =   15.0 (Min.)
                      Maximum/Peak flow rate =       37.449 (CFS)
                      Total volume =      26.861 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------


       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
       Process from Point/Station        2.000 to Point/Station        3.000
       **** STORE OR DELETE CURRENT HYDROGRAPH ****
       ______________________________________________________________________
       Current stream hydrograph saved in file LineF24hrBsnF2.rte
       ****************************HYDROGRAPH DATA****************************
                      Number of intervals =     0
                      Time interval =    0.0 (Min.)
                      Maximum/Peak flow rate =        0.000 (CFS)
                      Total volume =       0.000 (Ac.Ft)
               Status of hydrographs being held in storage
                         Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
               Peak (CFS)      0.000     0.000     0.000     0.000     0.000
               Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
       ***********************************************************************

       ----------------------------------------------------------------------
```

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                    FLOOD HYDROGRAPH ROUTING PROGRAM
              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
                         Study date: 04/29/12


      ------------------------------------------------------------------
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      Watershed F, Basin F3
      Proposed Condition
      100-year, 24-hour

      ------------------------------------------------------------------
-


      Program License Serial Number 6097

      ------------------------------------------------------------------
-
      ******************** HYDROGRAPH INFORMATION **********************

                 From study/file name: SubF324100.rte
      ****************************HYDROGRAPH
DATA****************************
                 Number of intervals =    97
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =       21.993 (CFS)
                 Total volume =      11.811 (Ac.Ft)
            Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
            Peak (CFS)      0.000     0.000     0.000     0.000     0.000
            Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****



      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station        1.000 to Point/Station
2.000
      **** RETARDING BASIN ROUTING ****
      ____________________________________________________________________
___

      User entry of depth-outflow-storage data
      ------------------------------------------------------------------
-
      Total number of inflow hydrograph intervals = 97
      Hydrograph time unit = 15.000 (Min.)
```

```
      Initial depth in storage basin =   0.10(Ft.)
      ------------------------------------------------------------------
-
      ------------------------------------------------------------------
-
      Initial basin depth =   0.10 (Ft.)
      Initial basin storage =      0.00 (Ac.Ft)
      Initial basin outflow =   0.00 (CFS)
      ------------------------------------------------------------------
--
      ------------------------------------------------------------------
-
      Depth vs. Storage and Depth vs. Discharge data:
       Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
           (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
      ------------------------------------------------------------------
--
          0.000      0.000      0.000      0.000        0.000
          1.000      0.001      0.001      0.001        0.001
          2.000      0.002      0.001      0.002        0.002
          3.000      4.000     20.000      3.793        4.207
          5.000      6.500     35.000      6.138        6.862
          6.000      8.800     60.000      8.180        9.420
      ------------------------------------------------------------------
-
                  Hydrograph Detention Basin Routing
      ------------------------------------------------------------------
--

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ------------------------------------------------------------------
--
  Time   Inflow  Outflow    Storage
Depth
 (Hours)  (CFS)   (CFS)     (Ac.Ft) .0       5.5   11.00   16.49   21.99
(Ft.)
  0.250    0.72    0.03      0.007  OI      |       |       |       |
2.00
  0.500    1.35    0.13      0.027  OI      |       |       |       |
2.01
  0.750    1.49    0.25      0.053  O I     |       |       |       |
2.01
  1.000    1.85    0.39      0.080  O I     |       |       |       |
2.02
  1.250    1.62    0.52      0.107  O I     |       |       |       |
2.03
  1.500    1.49    0.63      0.127  O I     |       |       |       |
2.03
  1.750    1.49    0.71      0.144  |OI     |       |       |       |
2.04
  2.000    1.85    0.80      0.163  |OI     |       |       |       |
2.04
  2.250    1.98    0.91      0.184  |OI     |       |       |       |
2.05
```

```
  2.500    1.98    1.02      0.205  |OI     |       |       |       |
2.05
  2.750    2.34    1.13      0.228  |O I    |       |       |       |
2.06
  3.000    2.48    1.26      0.253  |O I    |       |       |       |
2.06
  3.250    2.48    1.38      0.277  | OI    |       |       |       |
2.07
  3.500    2.48    1.48      0.299  | OI    |       |       |       |
2.07
  3.750    2.48    1.58      0.318  | OI    |       |       |       |
2.08
  4.000    2.84    1.69      0.339  | O I   |       |       |       |
2.08
  4.250    2.97    1.81      0.363  | O I   |       |       |       |
2.09
  4.500    3.33    1.94      0.389  | O I   |       |       |       |
2.10
  4.750    3.47    2.08      0.418  |  O I  |       |       |       |
2.10
  5.000    3.83    2.24      0.449  |  O I  |       |       |       |
2.11
  5.250    3.24    2.36      0.474  |  OI   |       |       |       |
2.12
  5.500    3.33    2.45      0.493  |  OI   |       |       |       |
2.12
  5.750    3.83    2.57      0.515  |  O I  |       |       |       |
2.13
  6.000    3.96    2.70      0.541  |  O I  |       |       |       |
2.13
  6.250    4.32    2.84      0.569  |   O I |       |       |       |
2.14
  6.500    4.46    2.99      0.600  |   O I |       |       |       |
2.15
  6.750    4.82    3.15      0.632  |   O  I|       |       |       |
2.16
  7.000    4.95    3.32      0.666  |   O  I|       |       |       |
2.17
  7.250    4.95    3.48      0.698  |    O I|       |       |       |
2.17
  7.500    5.31    3.65      0.731  |    O I|       |       |       |
2.18
  7.750    5.81    3.83      0.768  |    O  I       |       |       |
2.19
  8.000    6.31    4.05      0.812  |    O  |I      |       |       |
2.20
  8.250    7.44    4.33      0.867  |     O | I     |       |       |
2.22
  8.500    7.84    4.66      0.932  |     O |  I    |       |       |
2.23
  8.750    8.40    5.00      1.000  |      O|   I   |       |       |
2.25
  9.000    9.14    5.37      1.075  |      O|    I  |       |       |
2.27
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  9.250   10.40    5.80      1.161  |       O      I|       |       |
2.29
  9.500   11.34    6.30      1.261  |       |O      I       |       |
2.31
  9.750   12.09    6.83      1.367  |       |O      |I      |       |
2.34
 10.000   12.83    7.38      1.478  |       | O     | I     |       |
2.37
 10.250    9.45    7.75      1.552  |       |  O I  |       |       |
2.39
 10.500    8.14    7.85      1.572  |       |  O    |       |       |
2.39
 10.750   10.76    8.01      1.603  |       |  O   I|       |       |
2.40
 11.000   11.75    8.33      1.667  |       |   O   |I      |       |
2.42
 11.250   11.27    8.64      1.730  |       |   O   I       |       |
2.43
 11.500   11.11    8.89      1.780  |       |   O   I       |       |
2.44
 11.750   10.12    9.06      1.813  |       |    OI |       |       |
2.45
 12.000   10.28    9.17      1.836  |       |    OI |       |       |
2.46
 12.250   14.12    9.47      1.895  |       |    O  |   I   |       |
2.47
 12.500   16.01   10.02      2.005  |       |     O |      I|       |
2.50
 12.750   17.27   10.67      2.135  |       |      O|       |I      |
2.53
 13.000   18.20   11.37      2.274  |       |       O       | I     |
2.57
 13.250   21.00   12.18      2.436  |       |       |O      |     I |
2.61
 13.500   21.99   13.09      2.619  |       |       |  O    |       I
2.65
 13.750   16.35   13.69      2.738  |       |       |  O   I|       |
2.68
 14.000   14.27   13.85      2.770  |       |       |   O   |       |
2.69
 14.250   16.37   13.99      2.799  |       |       |   O  I|       |
2.70
 14.500   16.65   14.24      2.848  |       |       |   O   I       |
2.71
 14.750   16.49   14.47      2.894  |       |       |    O I|       |
2.72
 15.000   16.00   14.64      2.929  |       |       |    O I|       |
2.73
 15.250   15.32   14.74      2.949  |       |       |    OI |       |
2.74
 15.500   14.64   14.77      2.954  |       |       |    O  |       |
2.74
 15.750   12.41   14.64      2.929  |       |       | I  O  |       |
2.73
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 16.000   11.67   14.39      2.878  |       |       I   O   |       |
2.72
 16.250    4.61   13.77      2.755  |     I |       |   O   |       |
2.69
 16.500    1.98   12.74      2.550  | I     |       | O     |       |
2.64
 16.750    1.62   11.67      2.335  | I     |       O       |       |
2.58
 17.000    1.49   10.67      2.136  | I     |      O|       |       |
2.53
 17.250    2.21    9.81      1.962  |  I    |     O |       |       |
2.49
 17.500    2.48    9.07      1.816  |  I    |    O  |       |       |
2.45
 17.750    2.48    8.43      1.686  |  I    |   O   |       |       |
2.42
 18.000    2.12    7.82      1.566  |  I    |  O    |       |       |
2.39
 18.250    1.98    7.26      1.452  | I     | O     |       |       |
2.36
 18.500    1.98    6.74      1.349  | I     |O      |       |       |
2.34
 18.750    1.62    6.25      1.252  | I     |O      |       |       |
2.31
 19.000    1.12    5.77      1.156  |I      O       |       |       |
2.29
 19.250    1.35    5.33      1.067  |I     O|       |       |       |
2.27
 19.500    1.85    4.96      0.993  | I    O|       |       |       |
2.25
 19.750    1.62    4.64      0.930  | I   O |       |       |       |
2.23
 20.000    1.12    4.32      0.866  |I    O |       |       |       |
2.22
 20.250    1.35    4.02      0.805  |I   O  |       |       |       |
2.20
 20.500    1.49    3.76      0.754  | I  O  |       |       |       |
2.19
 20.750    1.49    3.54      0.709  | I  O  |       |       |       |
2.18
 21.000    1.12    3.32      0.666  |I  O   |       |       |       |
2.17
 21.250    1.35    3.12      0.625  |I  O   |       |       |       |
2.16
 21.500    1.12    2.93      0.588  |I  O   |       |       |       |
2.15
 21.750    1.35    2.76      0.554  |I  O   |       |       |       |
2.14
 22.000    1.12    2.61      0.525  |I O    |       |       |       |
2.13
 22.250    1.35    2.48      0.497  |I O    |       |       |       |
2.12
 22.500    1.12    2.36      0.473  |I O    |       |       |       |
2.12
```

```
 22.750    0.99    2.23      0.448  |I O    |       |       |       |
2.11
 23.000    0.99    2.11      0.423  |I O    |       |       |       |
2.11
 23.250    0.99    2.00      0.401  |IO     |       |       |       |
2.10
 23.500    0.99    1.90      0.381  |IO     |       |       |       |
2.09
 23.750    0.99    1.81      0.364  |IO     |       |       |       |
2.09
 24.000    0.99    1.73      0.348  |IO     |       |       |       |
2.09
 24.250    0.27    1.62      0.326  I O    |       |       |       |
2.08
 24.500    0.00    1.48      0.297  I O    |       |       |       |
2.07
 24.750    0.00    1.33      0.268  IO     |       |       |       |
2.07
 25.000    0.00    1.20      0.242  IO     |       |       |       |
2.06
 25.250    0.00    1.08      0.218  IO     |       |       |       |
2.05
 25.500    0.00    0.98      0.197  IO     |       |       |       |
2.05
 25.750    0.00    0.88      0.178  IO     |       |       |       |
2.04
 26.000    0.00    0.79      0.160  IO     |       |       |       |
2.04
 26.250    0.00    0.72      0.145  IO     |       |       |       |
2.04
 26.500    0.00    0.64      0.131  O      |       |       |       |
2.03
 26.750    0.00    0.58      0.118  O      |       |       |       |
2.03
 27.000    0.00    0.52      0.107  O      |       |       |       |
2.03
 27.250    0.00    0.47      0.096  O      |       |       |       |
2.02
 27.500    0.00    0.43      0.087  O      |       |       |       |
2.02
 27.750    0.00    0.38      0.079  O      |       |       |       |
2.02
 28.000    0.00    0.35      0.071  O      |       |       |       |
2.02
 28.250    0.00    0.31      0.064  O      |       |       |       |
2.02
 28.500    0.00    0.28      0.058  O      |       |       |       |
2.01
 28.750    0.00    0.25      0.053  O      |       |       |       |
2.01
 29.000    0.00    0.23      0.048  O      |       |       |       |
2.01
 29.250    0.00    0.21      0.043  O      |       |       |       |
2.01
```

29.500	0.00	0.19	0.039	O	|	|	|	|
2.01								
29.750	0.00	0.17	0.035	O	|	|	|	|
2.01								
30.000	0.00	0.15	0.032	O	|	|	|	|
2.01								
30.250	0.00	0.14	0.029	O	|	|	|	|
2.01								
30.500	0.00	0.12	0.026	O	|	|	|	|
2.01								
30.750	0.00	0.11	0.024	O	|	|	|	|
2.01								
31.000	0.00	0.10	0.022	O	|	|	|	|
2.00								
31.250	0.00	0.09	0.020	O	|	|	|	|
2.00								
31.500	0.00	0.08	0.018	O	|	|	|	|
2.00								
31.750	0.00	0.07	0.016	O	|	|	|	|
2.00								
32.000	0.00	0.07	0.015	O	|	|	|	|
2.00								
32.250	0.00	0.06	0.014	O	|	|	|	|
2.00								
32.500	0.00	0.05	0.013	O	|	|	|	|
2.00								
32.750	0.00	0.05	0.012	O	|	|	|	|
2.00								
33.000	0.00	0.04	0.011	O	|	|	|	|
2.00								
33.250	0.00	0.04	0.010	O	|	|	|	|
2.00								
33.500	0.00	0.04	0.009	O	|	|	|	|
2.00								
33.750	0.00	0.03	0.008	O	|	|	|	|
2.00								
34.000	0.00	0.03	0.008	O	|	|	|	|
2.00								
34.250	0.00	0.03	0.007	O	|	|	|	|
2.00								
34.500	0.00	0.02	0.007	O	|	|	|	|
2.00								
34.750	0.00	0.02	0.006	O	|	|	|	|
2.00								
35.000	0.00	0.02	0.006	O	|	|	|	|
2.00								
35.250	0.00	0.02	0.005	O	|	|	|	|
2.00								
35.500	0.00	0.02	0.005	O	|	|	|	|
2.00								
35.750	0.00	0.01	0.005	O	|	|	|	|
2.00								
36.000	0.00	0.01	0.004	O	|	|	|	|
2.00								

```
 36.250    0.00    0.01      0.004  O       |       |       |       |
2.00
 36.500    0.00    0.01      0.004  O       |       |       |       |
2.00
 36.750    0.00    0.01      0.004  O       |       |       |       |
2.00
 37.000    0.00    0.01      0.003  O       |       |       |       |
2.00
 37.250    0.00    0.01      0.003  O       |       |       |       |
2.00
 37.500    0.00    0.01      0.003  O       |       |       |       |
2.00
 37.750    0.00    0.01      0.003  O       |       |       |       |
2.00
 38.000    0.00    0.01      0.003  O       |       |       |       |
2.00
 38.250    0.00    0.00      0.003  O       |       |       |       |
2.00
 38.500    0.00    0.00      0.003  O       |       |       |       |
2.00
 38.750    0.00    0.00      0.003  O       |       |       |       |
2.00
 39.000    0.00    0.00      0.003  O       |       |       |       |
2.00
 39.250    0.00    0.00      0.002  O       |       |       |       |
2.00
 39.500    0.00    0.00      0.002  O       |       |       |       |
2.00
 39.750    0.00    0.00      0.002  O       |       |       |       |
2.00
 40.000    0.00    0.00      0.002  O       |       |       |       |
2.00
 40.250    0.00    0.00      0.002  O       |       |       |       |
2.00
 40.500    0.00    0.00      0.002  O       |       |       |       |
2.00
 40.750    0.00    0.00      0.002  O       |       |       |       |
2.00
 41.000    0.00    0.00      0.002  O       |       |       |       |
2.00
 41.250    0.00    0.00      0.002  O       |       |       |       |
2.00
 41.500    0.00    0.00      0.002  O       |       |       |       |
2.00
 41.750    0.00    0.00      0.002  O       |       |       |       |
2.00
 42.000    0.00    0.00      0.002  O       |       |       |       |
2.00
 42.250    0.00    0.00      0.002  O       |       |       |       |
1.99


      Remaining water in basin =    0.00 (Ac.Ft)
```

```
      ****************************HYDROGRAPH
DATA***************************
                 Number of intervals =   169
                 Time interval =   15.0 (Min.)
                 Maximum/Peak flow rate =       14.766 (CFS)
                 Total volume =      11.809 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****

      ------------------------------------------------------------------
-


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++
      Process from Point/Station        1.000 to Point/Station
2.000
      **** STORE OR DELETE CURRENT HYDROGRAPH ****
      ___________________________________________________________________
___
      Current stream hydrograph saved in file LineF24hrBsn3.rte
      ****************************HYDROGRAPH
DATA***************************
                 Number of intervals =     0
                 Time interval =    0.0 (Min.)
                 Maximum/Peak flow rate =        0.000 (CFS)
                 Total volume =       0.000 (Ac.Ft)
           Status of hydrographs being held in storage
                      Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
           Peak (CFS)      0.000     0.000     0.000     0.000     0.000
           Vol (Ac.Ft)      0.000     0.000     0.000     0.000
0.000
      ******************************************************************
****

      ------------------------------------------------------------------
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```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/27/12 File: OffsiteF124100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed F, Offsite F1
Proposed Condition
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      17.50(Ac.)  =      0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      17.50(Ac.)  =      0.027 Sq. Mi.
Length along longest watercourse =    1610.00(Ft.)
Length along longest watercourse measured to centroid =     650.00(Ft.)
Length along longest watercourse =      0.305 Mi.
Length along longest watercourse measured to centroid =      0.123 Mi.
Difference in elevation =     139.00(Ft.)
Slope along watercourse =    455.8509 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.065 Hr.
Lag time =     3.88 Min.
25% of lag time =     0.97 Min.
40% of lag time =     1.55 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.50           1.80                 31.50

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       17.50           4.50                 78.75

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     2.200           46.00         0.000
     2.900           66.00         0.000
```

```
    12.400          83.00         0.000
 Total Area Entered =     17.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
46.0  46.0      0.611     0.000        0.611       0.126      0.077
66.0  66.0      0.405     0.000        0.405       0.166      0.067
83.0  83.0      0.210     0.000        0.210       0.709      0.149
                                                  Sum (F) =   0.293
Area averaged mean soil loss (F) (In/Hr) =  0.293
Minimum soil loss rate ((In/Hr)) =  0.146
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        386.798         66.248             11.684
    2   0.500        773.597         33.752              5.953
                                Sum = 100.000   Sum=      17.637
---------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.25     0.20      0.036       (  0.517)       0.032        0.004
   2   0.50     0.30      0.054       (  0.511)       0.049        0.005
   3   0.75     0.30      0.054       (  0.505)       0.049        0.005
   4   1.00     0.40      0.072       (  0.499)       0.065        0.007
   5   1.25     0.30      0.054       (  0.493)       0.049        0.005
   6   1.50     0.30      0.054       (  0.487)       0.049        0.005
   7   1.75     0.30      0.054       (  0.481)       0.049        0.005
   8   2.00     0.40      0.072       (  0.476)       0.065        0.007
   9   2.25     0.40      0.072       (  0.470)       0.065        0.007
  10   2.50     0.40      0.072       (  0.464)       0.065        0.007
  11   2.75     0.50      0.090       (  0.458)       0.081        0.009
  12   3.00     0.50      0.090       (  0.453)       0.081        0.009
  13   3.25     0.50      0.090       (  0.447)       0.081        0.009
  14   3.50     0.50      0.090       (  0.442)       0.081        0.009
  15   3.75     0.50      0.090       (  0.436)       0.081        0.009
  16   4.00     0.60      0.108       (  0.431)       0.097        0.011
  17   4.25     0.60      0.108       (  0.425)       0.097        0.011
  18   4.50     0.70      0.126       (  0.420)       0.113        0.013
  19   4.75     0.70      0.126       (  0.414)       0.113        0.013
  20   5.00     0.80      0.144       (  0.409)       0.130        0.014
  21   5.25     0.60      0.108       (  0.404)       0.097        0.011
  22   5.50     0.70      0.126       (  0.398)       0.113        0.013
  23   5.75     0.80      0.144       (  0.393)       0.130        0.014
  24   6.00     0.80      0.144       (  0.388)       0.130        0.014
  25   6.25     0.90      0.162       (  0.383)       0.146        0.016
  26   6.50     0.90      0.162       (  0.378)       0.146        0.016
  27   6.75     1.00      0.180       (  0.373)       0.162        0.018
  28   7.00     1.00      0.180       (  0.368)       0.162        0.018
  29   7.25     1.00      0.180       (  0.363)       0.162        0.018
  30   7.50     1.10      0.198       (  0.358)       0.178        0.020
  31   7.75     1.20      0.216       (  0.353)       0.194        0.022
  32   8.00     1.30      0.234       (  0.348)       0.211        0.023
  33   8.25     1.50      0.270       (  0.343)       0.243        0.027
  34   8.50     1.50      0.270       (  0.338)       0.243        0.027
  35   8.75     1.60      0.288       (  0.334)       0.259        0.029
  36   9.00     1.70      0.306       (  0.329)       0.275        0.031
```

37	9.25	1.90	0.342	(	0.324)	0.308	0.034
38	9.50	2.00	0.360		0.320	(0.324)	0.040
39	9.75	2.10	0.378		0.315	(0.340)	0.063
40	10.00	2.20	0.396		0.311	(0.356)	0.085
41	10.25	1.50	0.270	(	0.306)	0.243	0.027
42	10.50	1.50	0.270	(	0.302)	0.243	0.027
43	10.75	2.00	0.360		0.297	(0.324)	0.063
44	11.00	2.00	0.360		0.293	(0.324)	0.067
45	11.25	1.90	0.342		0.289	(0.308)	0.053
46	11.50	1.90	0.342		0.284	(0.308)	0.058
47	11.75	1.70	0.306	(	0.280)	0.275	0.031
48	12.00	1.80	0.324		0.276	(0.292)	0.048
49	12.25	2.50	0.450		0.272	(0.405)	0.178
50	12.50	2.60	0.468		0.268	(0.421)	0.200
51	12.75	2.80	0.504		0.264	(0.454)	0.240
52	13.00	2.90	0.522		0.260	(0.470)	0.262
53	13.25	3.40	0.612		0.256	(0.551)	0.356
54	13.50	3.40	0.612		0.252	(0.551)	0.360
55	13.75	2.30	0.414		0.248	(0.373)	0.166
56	14.00	2.30	0.414		0.244	(0.373)	0.170
57	14.25	2.70	0.486		0.241	(0.437)	0.245
58	14.50	2.60	0.468		0.237	(0.421)	0.231
59	14.75	2.60	0.468		0.233	(0.421)	0.235
60	15.00	2.50	0.450		0.230	(0.405)	0.220
61	15.25	2.40	0.432		0.226	(0.389)	0.206
62	15.50	2.30	0.414		0.223	(0.373)	0.191
63	15.75	1.90	0.342		0.219	(0.308)	0.123
64	16.00	1.90	0.342		0.216	(0.308)	0.126
65	16.25	0.40	0.072	(	0.213)	0.065	0.007
66	16.50	0.40	0.072	(	0.209)	0.065	0.007
67	16.75	0.30	0.054	(	0.206)	0.049	0.005
68	17.00	0.30	0.054	(	0.203)	0.049	0.005
69	17.25	0.50	0.090	(	0.200)	0.081	0.009
70	17.50	0.50	0.090	(	0.197)	0.081	0.009
71	17.75	0.50	0.090	(	0.194)	0.081	0.009
72	18.00	0.40	0.072	(	0.191)	0.065	0.007
73	18.25	0.40	0.072	(	0.188)	0.065	0.007
74	18.50	0.40	0.072	(	0.186)	0.065	0.007
75	18.75	0.30	0.054	(	0.183)	0.049	0.005
76	19.00	0.20	0.036	(	0.180)	0.032	0.004
77	19.25	0.30	0.054	(	0.178)	0.049	0.005
78	19.50	0.40	0.072	(	0.175)	0.065	0.007
79	19.75	0.30	0.054	(	0.173)	0.049	0.005
80	20.00	0.20	0.036	(	0.171)	0.032	0.004
81	20.25	0.30	0.054	(	0.168)	0.049	0.005
82	20.50	0.30	0.054	(	0.166)	0.049	0.005
83	20.75	0.30	0.054	(	0.164)	0.049	0.005
84	21.00	0.20	0.036	(	0.162)	0.032	0.004
85	21.25	0.30	0.054	(	0.160)	0.049	0.005
86	21.50	0.20	0.036	(	0.158)	0.032	0.004
87	21.75	0.30	0.054	(	0.157)	0.049	0.005
88	22.00	0.20	0.036	(	0.155)	0.032	0.004
89	22.25	0.30	0.054	(	0.154)	0.049	0.005
90	22.50	0.20	0.036	(	0.152)	0.032	0.004
91	22.75	0.20	0.036	(	0.151)	0.032	0.004
92	23.00	0.20	0.036	(	0.150)	0.032	0.004
93	23.25	0.20	0.036	(	0.149)	0.032	0.004
94	23.50	0.20	0.036	(	0.148)	0.032	0.004
95	23.75	0.20	0.036	(	0.147)	0.032	0.004
96	24.00	0.20	0.036	(	0.146)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.8

Flood volume = Effective rainfall 1.19(In)
times area 17.5(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)
Total soil loss = 3.31(In)
Total soil loss = 4.826(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 75617.2 Cubic Feet
Total soil loss = 210235.6 Cubic Feet

Peak flow rate of this hydrograph = 6.330(CFS)

```
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

      ------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
  0+15       0.0009      0.04  Q         |         |         |         |
  0+30       0.0026      0.08  Q         |         |         |         |
  0+45       0.0046      0.10  Q         |         |         |         |
  1+ 0       0.0070      0.12  Q         |         |         |         |
  1+15       0.0092      0.11  Q         |         |         |         |
  1+30       0.0111      0.10  Q         |         |         |         |
  1+45       0.0131      0.10  Q         |         |         |         |
  2+ 0       0.0155      0.12  Q         |         |         |         |
  2+15       0.0181      0.13  Q         |         |         |         |
  2+30       0.0208      0.13  Q         |         |         |         |
  2+45       0.0238      0.15  Q         |         |         |         |
  3+ 0       0.0271      0.16  Q         |         |         |         |
  3+15       0.0304      0.16  Q         |         |         |         |
  3+30       0.0337      0.16  Q         |         |         |         |
  3+45       0.0370      0.16  Q         |         |         |         |
  4+ 0       0.0407      0.18  Q         |         |         |         |
  4+15       0.0446      0.19  QV        |         |         |         |
  4+30       0.0490      0.21  QV        |         |         |         |
  4+45       0.0536      0.22  QV        |         |         |         |
  5+ 0       0.0586      0.24  QV        |         |         |         |
  5+15       0.0630      0.21  QV        |         |         |         |
  5+30       0.0674      0.21  QV        |         |         |         |
  5+45       0.0724      0.24  QV        |         |         |         |
  6+ 0       0.0776      0.25  |Q        |         |         |         |
  6+15       0.0833      0.28  |Q        |         |         |         |
  6+30       0.0892      0.29  |QV       |         |         |         |
  6+45       0.0956      0.31  |QV       |         |         |         |
  7+ 0       0.1021      0.32  |QV       |         |         |         |
  7+15       0.1087      0.32  |QV       |         |         |         |
  7+30       0.1157      0.34  |QV       |         |         |         |
  7+45       0.1233      0.37  |QV       |         |         |         |
  8+ 0       0.1316      0.40  |Q V      |         |         |         |
  8+15       0.1410      0.45  |Q V      |         |         |         |
  8+30       0.1509      0.48  |Q V      |         |         |         |
  8+45       0.1612      0.50  |Q V      |         |         |         |
  9+ 0       0.1721      0.53  | QV      |         |         |         |
  9+15       0.1841      0.58  | Q V     |         |         |         |
  9+30       0.1981      0.68  | Q V     |         |         |         |
  9+45       0.2183      0.98  |  Q V    |         |         |         |
 10+ 0       0.2466      1.37  |    Q    |         |         |         |
 10+15       0.2637      0.82  |  Q  V   |         |         |         |
 10+30       0.2735      0.48  |Q    V   |         |         |         |
 10+45       0.2920      0.89  |  Q  V   |         |         |         |
 11+ 0       0.3159      1.16  |   Q  V  |         |         |         |
 11+15       0.3371      1.02  |   Q  V  |         |         |         |
 11+30       0.3576      0.99  |  Q    V |         |         |         |
 11+45       0.3721      0.70  | Q     V |         |         |         |
 12+ 0       0.3875      0.74  | Q     V |         |         |         |
 12+15       0.4364      2.37  |        QV         |         |         |
 12+30       0.5067      3.40  |          V Q      |         |         |
 12+45       0.5894      4.00  |         |  V  Q   |         |         |
 13+ 0       0.6823      4.50  |         |    V Q  |         |         |
 13+15       0.8006      5.73  |         |       V | Q       |         |
 13+30       0.9314      6.33  |         |          V   Q    |         |
 13+45       1.0157      4.08  |         |     Q   |  V      |         |
 14+ 0       1.0771      2.97  |         |Q        |   V     |         |
 14+15       1.1573      3.88  |         |    Q    |     V   |         |
 14+30       1.2433      4.16  |         |     Q   |       V |         |
 14+45       1.3284      4.12  |         |     Q   |         V         |
 15+ 0       1.4105      3.97  |         |    Q    |         | V       |
 15+15       1.4873      3.72  |         |   Q     |         |   V     |
```

```
   15+30       1.5588      3.46  |         |  Q      |         |    V    |
   15+45       1.6119      2.57  |         Q         |         |      V  |
   16+ 0       1.6574      2.20  |       Q |         |         |       V |
   16+15       1.6747      0.83  |  Q      |         |         |       V |
   16+30       1.6773      0.13  Q         |         |         |       V |
   16+45       1.6795      0.11  Q         |         |         |       V |
   17+ 0       1.6815      0.10  Q         |         |         |       V |
   17+15       1.6843      0.14  Q         |         |         |       V |
   17+30       1.6876      0.16  Q         |         |         |       V |
   17+45       1.6909      0.16  Q         |         |         |       V |
   18+ 0       1.6937      0.14  Q         |         |         |        V|
   18+15       1.6963      0.13  Q         |         |         |        V|
   18+30       1.6990      0.13  Q         |         |         |        V|
   18+45       1.7011      0.11  Q         |         |         |        V|
   19+ 0       1.7027      0.07  Q         |         |         |        V|
   19+15       1.7044      0.08  Q         |         |         |        V|
   19+30       1.7068      0.12  Q         |         |         |        V|
   19+45       1.7090      0.11  Q         |         |         |        V|
   20+ 0       1.7106      0.07  Q         |         |         |        V|
   20+15       1.7123      0.08  Q         |         |         |        V|
   20+30       1.7143      0.10  Q         |         |         |        V|
   20+45       1.7162      0.10  Q         |         |         |        V|
   21+ 0       1.7178      0.07  Q         |         |         |        V|
   21+15       1.7195      0.08  Q         |         |         |        V|
   21+30       1.7211      0.07  Q         |         |         |        V|
   21+45       1.7228      0.08  Q         |         |         |        V|
   22+ 0       1.7243      0.07  Q         |         |         |        V|
   22+15       1.7261      0.08  Q         |         |         |        V|
   22+30       1.7276      0.07  Q         |         |         |        V|
   22+45       1.7289      0.06  Q         |         |         |        V|
   23+ 0       1.7302      0.06  Q         |         |         |        V|
   23+15       1.7316      0.06  Q         |         |         |        V|
   23+30       1.7329      0.06  Q         |         |         |        V|
   23+45       1.7342      0.06  Q         |         |         |        V|
   24+ 0       1.7355      0.06  Q         |         |         |        V|
   24+15       1.7359      0.02  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
           U n i t   H y d r o g r a p h   A n a l y s i s

           Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
                 Study date  04/27/12 File: OffsiteF224100.out


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      ----------------------------------------------------------------------
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      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6097

      ----------------------------------------------------------------------
--
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
--
      Watershed F, Offsite F2
      Proposed Condition
      100-year, 24-hour

      ----------------------------------------------------------------------
-
      Drainage Area =      12.70(Ac.)  =      0.020 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =      12.70(Ac.)  =
0.020 Sq. Mi.
      Length along longest watercourse =     980.00(Ft.)
      Length along longest watercourse measured to centroid =
750.00(Ft.)
      Length along longest watercourse =      0.186 Mi.
      Length along longest watercourse measured to centroid =      0.142
Mi.
      Difference in elevation =      25.00(Ft.)
      Slope along watercourse =    134.6939 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.071 Hr.
      Lag time =     4.27 Min.
      25% of lag time =     1.07 Min.
      40% of lag time =     1.71 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)
```

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	1.80	22.86

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
12.70	4.50	57.15

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.800(In)
Area Averaged 100-Year Rainfall = 4.500(In)

Point rain (area averaged) = 4.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
12.700	85.00	0.000

Total Area Entered = 12.70(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
85.0	85.0	0.187	0.000	0.187	1.000	0.187
					Sum (F) =	0.187

Area averaged mean soil loss (F) (In/Hr) = 0.187
Minimum soil loss rate ((In/Hr)) = 0.094
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	350.910	61.373	7.855
2	0.500	701.821	34.479	4.413
3	0.750	1052.731	4.148	0.531

Sum = 100.000 Sum= 12.799

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.330)	0.032	0.004
2	0.50	0.30	0.054	(0.326)	0.049	0.005
3	0.75	0.30	0.054	(0.323)	0.049	0.005
4	1.00	0.40	0.072	(0.319)	0.065	0.007
5	1.25	0.30	0.054	(0.315)	0.049	0.005
6	1.50	0.30	0.054	(0.311)	0.049	0.005
7	1.75	0.30	0.054	(0.308)	0.049	0.005
8	2.00	0.40	0.072	(0.304)	0.065	0.007
9	2.25	0.40	0.072	(0.300)	0.065	0.007
10	2.50	0.40	0.072	(0.297)	0.065	0.007
11	2.75	0.50	0.090	(0.293)	0.081	0.009
12	3.00	0.50	0.090	(0.289)	0.081	0.009
13	3.25	0.50	0.090	(0.286)	0.081	0.009
14	3.50	0.50	0.090	(0.282)	0.081	0.009
15	3.75	0.50	0.090	(0.279)	0.081	0.009
16	4.00	0.60	0.108	(0.275)	0.097	0.011
17	4.25	0.60	0.108	(0.272)	0.097	0.011
18	4.50	0.70	0.126	(0.268)	0.113	0.013
19	4.75	0.70	0.126	(0.265)	0.113	0.013
20	5.00	0.80	0.144	(0.261)	0.130	0.014
21	5.25	0.60	0.108	(0.258)	0.097	0.011
22	5.50	0.70	0.126	(0.255)	0.113	0.013
23	5.75	0.80	0.144	(0.251)	0.130	0.014
24	6.00	0.80	0.144	(0.248)	0.130	0.014
25	6.25	0.90	0.162	(0.245)	0.146	0.016
26	6.50	0.90	0.162	(0.241)	0.146	0.016
27	6.75	1.00	0.180	(0.238)	0.162	0.018
28	7.00	1.00	0.180	(0.235)	0.162	0.018
29	7.25	1.00	0.180	(0.232)	0.162	0.018
30	7.50	1.10	0.198	(0.229)	0.178	0.020
31	7.75	1.20	0.216	(0.225)	0.194	0.022
32	8.00	1.30	0.234	(0.222)	0.211	0.023
33	8.25	1.50	0.270	0.219	(0.243)	0.051
34	8.50	1.50	0.270	0.216	(0.243)	0.054
35	8.75	1.60	0.288	0.213	(0.259)	0.075
36	9.00	1.70	0.306	0.210	(0.275)	0.096
37	9.25	1.90	0.342	0.207	(0.308)	0.135
38	9.50	2.00	0.360	0.204	(0.324)	0.156
39	9.75	2.10	0.378	0.201	(0.340)	0.177
40	10.00	2.20	0.396	0.198	(0.356)	0.198
41	10.25	1.50	0.270	0.196	(0.243)	0.074
42	10.50	1.50	0.270	0.193	(0.243)	0.077
43	10.75	2.00	0.360	0.190	(0.324)	0.170

44	11.00	2.00	0.360	0.187	(0.324)	0.173
45	11.25	1.90	0.342	0.184	(0.308)	0.158
46	11.50	1.90	0.342	0.182	(0.308)	0.160
47	11.75	1.70	0.306	0.179	(0.275)	0.127
48	12.00	1.80	0.324	0.176	(0.292)	0.148
49	12.25	2.50	0.450	0.174	(0.405)	0.276
50	12.50	2.60	0.468	0.171	(0.421)	0.297
51	12.75	2.80	0.504	0.169	(0.454)	0.335
52	13.00	2.90	0.522	0.166	(0.470)	0.356
53	13.25	3.40	0.612	0.163	(0.551)	0.449
54	13.50	3.40	0.612	0.161	(0.551)	0.451
55	13.75	2.30	0.414	0.159	(0.373)	0.255
56	14.00	2.30	0.414	0.156	(0.373)	0.258
57	14.25	2.70	0.486	0.154	(0.437)	0.332
58	14.50	2.60	0.468	0.151	(0.421)	0.317
59	14.75	2.60	0.468	0.149	(0.421)	0.319
60	15.00	2.50	0.450	0.147	(0.405)	0.303
61	15.25	2.40	0.432	0.145	(0.389)	0.287
62	15.50	2.30	0.414	0.142	(0.373)	0.272
63	15.75	1.90	0.342	0.140	(0.308)	0.202
64	16.00	1.90	0.342	0.138	(0.308)	0.204
65	16.25	0.40	0.072	(0.136)	0.065	0.007
66	16.50	0.40	0.072	(0.134)	0.065	0.007
67	16.75	0.30	0.054	(0.132)	0.049	0.005
68	17.00	0.30	0.054	(0.130)	0.049	0.005
69	17.25	0.50	0.090	(0.128)	0.081	0.009
70	17.50	0.50	0.090	(0.126)	0.081	0.009
71	17.75	0.50	0.090	(0.124)	0.081	0.009
72	18.00	0.40	0.072	(0.122)	0.065	0.007
73	18.25	0.40	0.072	(0.120)	0.065	0.007
74	18.50	0.40	0.072	(0.119)	0.065	0.007
75	18.75	0.30	0.054	(0.117)	0.049	0.005
76	19.00	0.20	0.036	(0.115)	0.032	0.004
77	19.25	0.30	0.054	(0.114)	0.049	0.005
78	19.50	0.40	0.072	(0.112)	0.065	0.007
79	19.75	0.30	0.054	(0.111)	0.049	0.005
80	20.00	0.20	0.036	(0.109)	0.032	0.004
81	20.25	0.30	0.054	(0.108)	0.049	0.005
82	20.50	0.30	0.054	(0.106)	0.049	0.005
83	20.75	0.30	0.054	(0.105)	0.049	0.005
84	21.00	0.20	0.036	(0.104)	0.032	0.004
85	21.25	0.30	0.054	(0.102)	0.049	0.005
86	21.50	0.20	0.036	(0.101)	0.032	0.004
87	21.75	0.30	0.054	(0.100)	0.049	0.005
88	22.00	0.20	0.036	(0.099)	0.032	0.004
89	22.25	0.30	0.054	(0.098)	0.049	0.005
90	22.50	0.20	0.036	(0.097)	0.032	0.004
91	22.75	0.20	0.036	(0.096)	0.032	0.004
92	23.00	0.20	0.036	(0.096)	0.032	0.004
93	23.25	0.20	0.036	(0.095)	0.032	0.004
94	23.50	0.20	0.036	(0.094)	0.032	0.004
95	23.75	0.20	0.036	(0.094)	0.032	0.004
96	24.00	0.20	0.036	(0.094)	0.032	0.004

(Loss Rate Not Used)

```
     Sum =     100.0                                    Sum =     7.5
      Flood volume = Effective rainfall      1.87(In)
       times area      12.7(Ac.)/[(In)/(Ft.)] =       2.0(Ac.Ft)
      Total soil loss =      2.63(In)
      Total soil loss =     2.783(Ac.Ft)
      Total rainfall =      4.50(In)
      Flood volume =       86234.7 Cubic Feet
      Total soil loss =      121214.6 Cubic Feet
      ---------------------------------------------------------------------
-
       Peak flow rate of this hydrograph =      5.714(CFS)
      ---------------------------------------------------------------------
-
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                           24 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
-
                    Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5
10.0
  ------------------------------------------------------------------------
    0+15       0.0006      0.03  Q         |         |         |
|
    0+30       0.0018      0.06  Q         |         |         |
|
    0+45       0.0032      0.07  Q         |         |         |
|
    1+ 0       0.0049      0.08  Q         |         |         |
|
    1+15       0.0065      0.08  Q         |         |         |
|
    1+30       0.0080      0.07  Q         |         |         |
|
    1+45       0.0094      0.07  Q         |         |         |
|
    2+ 0       0.0111      0.08  Q         |         |         |
|
    2+15       0.0130      0.09  Q         |         |         |
|
    2+30       0.0149      0.09  Q         |         |         |
|
    2+45       0.0171      0.11  Q         |         |         |
|
    3+ 0       0.0195      0.11  Q         |         |         |
|
    3+15       0.0218      0.12  Q         |         |         |
|
    3+30       0.0242      0.12  Q         |         |         |
|
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   3+45       0.0266      0.12  Q         |         |         |
|
   4+ 0       0.0293      0.13  Q         |         |         |
|
   4+15       0.0321      0.14  Q         |         |         |
|
   4+30       0.0353      0.15  Q         |         |         |
|
   4+45       0.0386      0.16  Q         |         |         |
|
   5+ 0       0.0422      0.18  Q         |         |         |
|
   5+15       0.0454      0.16  Q         |         |         |
|
   5+30       0.0486      0.15  Q         |         |         |
|
   5+45       0.0522      0.17  QV        |         |         |
|
   6+ 0       0.0560      0.18  QV        |         |         |
|
   6+15       0.0601      0.20  QV        |         |         |
|
   6+30       0.0644      0.21  QV        |         |         |
|
   6+45       0.0689      0.22  QV        |         |         |
|
   7+ 0       0.0737      0.23  QV        |         |         |
|
   7+15       0.0784      0.23  QV        |         |         |
|
   7+30       0.0835      0.24  QV        |         |         |
|
   7+45       0.0890      0.27  |Q        |         |         |
|
   8+ 0       0.0950      0.29  |Q        |         |         |
|
   8+15       0.1056      0.51  | Q       |         |         |
|
   8+30       0.1192      0.66  | Q       |         |         |
|
   8+45       0.1368      0.85  | VQ      |         |         |
|
   9+ 0       0.1598      1.11  |  VQ     |         |         |
|
   9+15       0.1913      1.52  |  V  Q   |         |         |
|
   9+30       0.2299      1.87  |   V  Q  |         |         |
|
   9+45       0.2743      2.15  |    V  Q |         |         |
|
  10+ 0       0.3242      2.42  |     V  Q|         |         |
|
  10+15       0.3562      1.55  |     QV  |         |         |
|
```

```
   10+30       0.3777      1.04  |   Q  V  |         |         |
|
   10+45       0.4132      1.72  |     Q V |         |         |
|
   11+ 0       0.4577      2.15  |       QV|         |         |
|
   11+15       0.5009      2.09  |       Q V         |         |
|
   11+30       0.5432      2.05  |       Q V         |         |
|
   11+45       0.5802      1.79  |      Q  |V        |         |
|
   12+ 0       0.6175      1.81  |      Q  | V       |         |
|
   12+15       0.6772      2.89  |         |Q V      |         |
|
   12+30       0.7523      3.63  |         |   QV    |         |
|
   12+45       0.8369      4.09  |         |     Q   |         |
|
   13+ 0       0.9285      4.44  |         |      QV |         |
|
   13+15       1.0375      5.28  |         |         VQ        |
|
   13+30       1.1556      5.71  |         |         | QV      |
|
   13+45       1.2431      4.24  |         |     Q   |    V    |
|
   14+ 0       1.3133      3.39  |         |  Q      |     V   |
|
   14+15       1.3935      3.89  |         |    Q    |       V |
|
   14+30       1.4781      4.09  |         |     Q   |        V|
|
   14+45       1.5624      4.08  |         |     Q   |          V
|
   15+ 0       1.6442      3.96  |         |    Q    |         |  V
|
   15+15       1.7220      3.77  |         |    Q    |         |   V
|
   15+30       1.7957      3.57  |         |   Q     |         |     V
|
   15+45       1.8564      2.94  |         |Q        |         |      V
|
   16+ 0       1.9109      2.64  |         Q         |         |       V
|
   16+15       1.9329      1.06  |   Q     |         |         |
V|
   16+30       1.9370      0.20  Q         |         |         |
V|
   16+45       1.9386      0.08  Q         |         |         |
V|
   17+ 0       1.9400      0.07  Q         |         |         |
V|
```

```
   17+15       1.9420      0.10  Q         |         |         |
V|
   17+30       1.9444      0.11  Q         |         |         |
V|
   17+45       1.9468      0.12  Q         |         |         |
V|
   18+ 0       1.9488      0.10  Q         |         |         |
V|
   18+15       1.9508      0.09  Q         |         |         |
V|
   18+30       1.9527      0.09  Q         |         |         |
V|
   18+45       1.9543      0.08  Q         |         |         |
V|
   19+ 0       1.9554      0.06  Q         |         |         |
V|
   19+15       1.9567      0.06  Q         |         |         |
V|
   19+30       1.9584      0.08  Q         |         |         |
V|
   19+45       1.9600      0.08  Q         |         |         |
V|
   20+ 0       1.9612      0.06  Q         |         |         |
V|
   20+15       1.9624      0.06  Q         |         |         |
V|
   20+30       1.9638      0.07  Q         |         |         |
V|
   20+45       1.9653      0.07  Q         |         |         |
V|
   21+ 0       1.9664      0.06  Q         |         |         |
V|
   21+15       1.9677      0.06  Q         |         |         |
V|
   21+30       1.9688      0.05  Q         |         |         |
V|
   21+45       1.9700      0.06  Q         |         |         |
V|
   22+ 0       1.9712      0.05  Q         |         |         |
V|
   22+15       1.9724      0.06  Q         |         |         |
V|
   22+30       1.9735      0.05  Q         |         |         |
V|
   22+45       1.9745      0.05  Q         |         |         |
V|
   23+ 0       1.9755      0.05  Q         |         |         |
V|
   23+15       1.9764      0.05  Q         |         |         |
V|
   23+30       1.9774      0.05  Q         |         |         |
V|
   23+45       1.9783      0.05  Q         |         |         |
V|
```

```
   24+ 0       1.9793      0.05  Q         |         |         |
V|
   24+15       1.9796      0.02  Q         |         |         |
V|
   24+30       1.9797      0.00  Q         |         |         |
V|
----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/27/12 File: OffsiteF324100.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed F, Offsite F3
Proposed Condition
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =     146.60(Ac.)  =      0.229 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     146.60(Ac.)  =      0.229 Sq. Mi.
Length along longest watercourse =    5600.00(Ft.)
Length along longest watercourse measured to centroid =    3020.00(Ft.)
Length along longest watercourse =      1.061 Mi.
Length along longest watercourse measured to centroid =      0.572 Mi.
Difference in elevation =     408.00(Ft.)
Slope along watercourse =    384.6857 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.192 Hr.
Lag time =    11.53 Min.
25% of lag time =     2.88 Min.
40% of lag time =     4.61 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      146.60           1.80                 263.88

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      146.60           4.50                 659.70

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    15.100           46.00         0.000
    11.500           66.00         0.000
```

```
   120.000          83.00         0.000
 Total Area Entered =    146.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
46.0  46.0      0.611     0.000        0.611       0.103      0.063
66.0  66.0      0.405     0.000        0.405       0.078      0.032
83.0  83.0      0.210     0.000        0.210       0.819      0.172
                                                  Sum (F) =   0.266
Area averaged mean soil loss (F) (In/Hr) =  0.266
Minimum soil loss rate ((In/Hr)) =  0.133
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        130.096         24.683             36.468
    2   0.500        260.193         55.636             82.200
    3   0.750        390.289         14.262             21.072
    4   1.000        520.386          3.932              5.809
    5   1.250        650.482          1.037              1.532
    6   1.500        780.579          0.449              0.663
                              Sum = 100.000   Sum=     147.745
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.471)	0.032	0.004
2	0.50	0.30	0.054	(0.465)	0.049	0.005
3	0.75	0.30	0.054	(0.460)	0.049	0.005
4	1.00	0.40	0.072	(0.454)	0.065	0.007
5	1.25	0.30	0.054	(0.449)	0.049	0.005
6	1.50	0.30	0.054	(0.444)	0.049	0.005
7	1.75	0.30	0.054	(0.438)	0.049	0.005
8	2.00	0.40	0.072	(0.433)	0.065	0.007
9	2.25	0.40	0.072	(0.428)	0.065	0.007
10	2.50	0.40	0.072	(0.423)	0.065	0.007
11	2.75	0.50	0.090	(0.417)	0.081	0.009
12	3.00	0.50	0.090	(0.412)	0.081	0.009
13	3.25	0.50	0.090	(0.407)	0.081	0.009
14	3.50	0.50	0.090	(0.402)	0.081	0.009
15	3.75	0.50	0.090	(0.397)	0.081	0.009
16	4.00	0.60	0.108	(0.392)	0.097	0.011
17	4.25	0.60	0.108	(0.387)	0.097	0.011
18	4.50	0.70	0.126	(0.382)	0.113	0.013
19	4.75	0.70	0.126	(0.377)	0.113	0.013
20	5.00	0.80	0.144	(0.372)	0.130	0.014
21	5.25	0.60	0.108	(0.368)	0.097	0.011
22	5.50	0.70	0.126	(0.363)	0.113	0.013
23	5.75	0.80	0.144	(0.358)	0.130	0.014
24	6.00	0.80	0.144	(0.353)	0.130	0.014
25	6.25	0.90	0.162	(0.349)	0.146	0.016
26	6.50	0.90	0.162	(0.344)	0.146	0.016
27	6.75	1.00	0.180	(0.339)	0.162	0.018
28	7.00	1.00	0.180	(0.335)	0.162	0.018
29	7.25	1.00	0.180	(0.330)	0.162	0.018
30	7.50	1.10	0.198	(0.326)	0.178	0.020
31	7.75	1.20	0.216	(0.321)	0.194	0.022
32	8.00	1.30	0.234	(0.317)	0.211	0.023

33	8.25	1.50	0.270	(	0.312)	0.243	0.027
34	8.50	1.50	0.270	(	0.308)	0.243	0.027
35	8.75	1.60	0.288	(	0.304)	0.259	0.029
36	9.00	1.70	0.306	(	0.299)	0.275	0.031
37	9.25	1.90	0.342		0.295	(0.308)	0.047
38	9.50	2.00	0.360		0.291	(0.324)	0.069
39	9.75	2.10	0.378		0.287	(0.340)	0.091
40	10.00	2.20	0.396		0.283	(0.356)	0.113
41	10.25	1.50	0.270	(	0.279)	0.243	0.027
42	10.50	1.50	0.270	(	0.275)	0.243	0.027
43	10.75	2.00	0.360		0.271	(0.324)	0.089
44	11.00	2.00	0.360		0.267	(0.324)	0.093
45	11.25	1.90	0.342		0.263	(0.308)	0.079
46	11.50	1.90	0.342		0.259	(0.308)	0.083
47	11.75	1.70	0.306		0.255	(0.275)	0.051
48	12.00	1.80	0.324		0.251	(0.292)	0.073
49	12.25	2.50	0.450		0.248	(0.405)	0.202
50	12.50	2.60	0.468		0.244	(0.421)	0.224
51	12.75	2.80	0.504		0.240	(0.453)	0.264
52	13.00	2.90	0.522		0.237	(0.470)	0.285
53	13.25	3.40	0.612		0.233	(0.551)	0.379
54	13.50	3.40	0.612		0.229	(0.551)	0.382
55	13.75	2.30	0.414		0.226	(0.372)	0.188
56	14.00	2.30	0.414		0.222	(0.372)	0.191
57	14.25	2.70	0.486		0.219	(0.437)	0.267
58	14.50	2.60	0.468		0.216	(0.421)	0.252
59	14.75	2.60	0.468		0.212	(0.421)	0.255
60	15.00	2.50	0.450		0.209	(0.405)	0.241
61	15.25	2.40	0.432		0.206	(0.389)	0.226
62	15.50	2.30	0.414		0.203	(0.372)	0.211
63	15.75	1.90	0.342		0.200	(0.308)	0.142
64	16.00	1.90	0.342		0.197	(0.308)	0.145
65	16.25	0.40	0.072	(	0.194)	0.065	0.007
66	16.50	0.40	0.072	(	0.191)	0.065	0.007
67	16.75	0.30	0.054	(	0.188)	0.049	0.005
68	17.00	0.30	0.054	(	0.185)	0.049	0.005
69	17.25	0.50	0.090	(	0.182)	0.081	0.009
70	17.50	0.50	0.090	(	0.179)	0.081	0.009
71	17.75	0.50	0.090	(	0.177)	0.081	0.009
72	18.00	0.40	0.072	(	0.174)	0.065	0.007
73	18.25	0.40	0.072	(	0.172)	0.065	0.007
74	18.50	0.40	0.072	(	0.169)	0.065	0.007
75	18.75	0.30	0.054	(	0.167)	0.049	0.005
76	19.00	0.20	0.036	(	0.164)	0.032	0.004
77	19.25	0.30	0.054	(	0.162)	0.049	0.005
78	19.50	0.40	0.072	(	0.160)	0.065	0.007
79	19.75	0.30	0.054	(	0.158)	0.049	0.005
80	20.00	0.20	0.036	(	0.155)	0.032	0.004
81	20.25	0.30	0.054	(	0.153)	0.049	0.005
82	20.50	0.30	0.054	(	0.151)	0.049	0.005
83	20.75	0.30	0.054	(	0.149)	0.049	0.005
84	21.00	0.20	0.036	(	0.148)	0.032	0.004
85	21.25	0.30	0.054	(	0.146)	0.049	0.005
86	21.50	0.20	0.036	(	0.144)	0.032	0.004
87	21.75	0.30	0.054	(	0.143)	0.049	0.005
88	22.00	0.20	0.036	(	0.141)	0.032	0.004
89	22.25	0.30	0.054	(	0.140)	0.049	0.005
90	22.50	0.20	0.036	(	0.138)	0.032	0.004
91	22.75	0.20	0.036	(	0.137)	0.032	0.004
92	23.00	0.20	0.036	(	0.136)	0.032	0.004
93	23.25	0.20	0.036	(	0.135)	0.032	0.004
94	23.50	0.20	0.036	(	0.134)	0.032	0.004
95	23.75	0.20	0.036	(	0.134)	0.032	0.004
96	24.00	0.20	0.036	(	0.133)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.4

Flood volume = Effective rainfall 1.34(In)
times area 146.6(Ac.)/[(In)/(Ft.)] = 16.3(Ac.Ft)
Total soil loss = 3.16(In)
Total soil loss = 38.613(Ac.Ft)
Total rainfall = 4.50(In)

```
Flood volume =      712062.5 Cubic Feet
Total soil loss =     1681962.8 Cubic Feet
---------------------------------------------------------------------
 Peak flow rate of this hydrograph =     53.141(CFS)
---------------------------------------------------------------------
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    24 - H O U R    S T O R M
                R u n o f f     H y d r o g r a p h
---------------------------------------------------------------------
            Hydrograph in  15   Minute intervals ((CFS))

---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
---------------------------------------------------------------------
  0+15       0.0027      0.13  Q         |         |         |         |
  0+30       0.0129      0.49  Q         |         |         |         |
  0+45       0.0277      0.72  Q         |         |         |         |
  1+ 0       0.0451      0.84  Q         |         |         |         |
  1+15       0.0645      0.94  Q         |         |         |         |
  1+30       0.0818      0.83  Q         |         |         |         |
  1+45       0.0985      0.81  Q         |         |         |         |
  2+ 0       0.1164      0.87  Q         |         |         |         |
  2+15       0.1373      1.01  Q         |         |         |         |
  2+30       0.1590      1.05  Q         |         |         |         |
  2+45       0.1822      1.13  Q         |         |         |         |
  3+ 0       0.2086      1.28  Q         |         |         |         |
  3+15       0.2358      1.32  Q         |         |         |         |
  3+30       0.2632      1.33  Q         |         |         |         |
  3+45       0.2906      1.33  Q         |         |         |         |
  4+ 0       0.3195      1.40  Q         |         |         |         |
  4+15       0.3514      1.54  VQ        |         |         |         |
  4+30       0.3854      1.65  VQ        |         |         |         |
  4+45       0.4227      1.81   Q        |         |         |         |
  5+ 0       0.4622      1.91  |Q        |         |         |         |
  5+15       0.5023      1.94  |Q        |         |         |         |
  5+30       0.5385      1.75  |Q        |         |         |         |
  5+45       0.5777      1.90  |Q        |         |         |         |
  6+ 0       0.6205      2.07  |Q        |         |         |         |
  6+15       0.6655      2.18  |Q        |         |         |         |
  6+30       0.7137      2.34  |Q        |         |         |         |
  6+45       0.7642      2.44  |Q        |         |         |         |
  7+ 0       0.8180      2.60  |QV       |         |         |         |
  7+15       0.8727      2.64  |QV       |         |         |         |
  7+30       0.9289      2.72  |QV       |         |         |         |
  7+45       0.9896      2.94  |QV       |         |         |         |
  8+ 0       1.0555      3.19  | Q       |         |         |         |
  8+15       1.1282      3.52  | Q       |         |         |         |
  8+30       1.2081      3.87  | Q       |         |         |         |
  8+45       1.2912      4.02  | QV      |         |         |         |
  9+ 0       1.3792      4.26  | QV      |         |         |         |
  9+15       1.4833      5.04  |  Q      |         |         |         |
  9+30       1.6325      7.22  |  VQ     |         |         |         |
  9+45       1.8434     10.21  |   V Q   |         |         |         |
 10+ 0       2.1203     13.40  |    V  Q |         |         |         |
 10+15       2.3827     12.70  |    V  Q |         |         |         |
 10+30       2.5119      6.26  |   Q V   |         |         |         |
 10+45       2.6543      6.89  |   Q V   |         |         |         |
 11+ 0       2.8960     11.70  |      Q  |         |         |         |
 11+15       3.1586     12.71  |      VQ |         |         |         |
 11+30       3.4083     12.08  |       Q |         |         |         |
 11+45       3.6365     11.05  |      QV |         |         |         |
 12+ 0       3.8276      9.25  |     Q  V|         |         |         |
 12+15       4.1395     15.10  |         Q         |         |         |
 12+30       4.6938     26.83  |          V     Q  |         |         |
 12+45       5.3730     32.87  |          |  V     |Q        |         |
 13+ 0       6.1611     38.15  |          |    V   |    Q    |         |
 13+15       7.0808     44.51  |          |      V |        Q|         |
 13+30       8.1788     53.14  |          |         V         |    Q    |
 13+45       9.1810     48.51  |          |           V       | Q       |
 14+ 0       9.8694     33.32  |          |          | Q V    |         |
 14+15      10.5395     32.43  |          |          |Q   V   |         |
```

```
   14+30      11.3061     37.10  |         |         |   Q  V  |         |
   14+45      12.0774     37.33  |         |         |   Q    V|         |
   15+ 0      12.8434     37.07  |         |         |   Q      V        |
   15+15      13.5752     35.42  |         |         |  Q      |  V      |
   15+30      14.2653     33.40  |         |         | Q       |   V     |
   15+45      14.8699     29.26  |         |        Q|         |     V   |
   16+ 0      15.3511     23.29  |         |    Q    |         |      V  |
   16+15      15.7010     16.94  |         |Q        |         |       V |
   16+30      15.8088      5.22  |   Q     |         |         |       V |
   16+45      15.8531      2.14  |Q        |         |         |       V |
   17+ 0      15.8769      1.15  Q         |         |         |       V |
   17+15      15.8983      1.04  Q         |         |         |       V |
   17+30      15.9237      1.23  Q         |         |         |       V |
   17+45      15.9506      1.30  Q         |         |         |        V|
   18+ 0      15.9765      1.26  Q         |         |         |        V|
   18+15      15.9995      1.11  Q         |         |         |        V|
   18+30      16.0218      1.08  Q         |         |         |        V|
   18+45      16.0425      1.00  Q         |         |         |        V|
   19+ 0      16.0588      0.79  Q         |         |         |        V|
   19+15      16.0725      0.66  Q         |         |         |        V|
   19+30      16.0896      0.83  Q         |         |         |        V|
   19+45      16.1090      0.94  Q         |         |         |        V|
   20+ 0      16.1249      0.77  Q         |         |         |        V|
   20+15      16.1385      0.66  Q         |         |         |        V|
   20+30      16.1542      0.76  Q         |         |         |        V|
   20+45      16.1705      0.79  Q         |         |         |        V|
   21+ 0      16.1856      0.73  Q         |         |         |        V|
   21+15      16.1990      0.65  Q         |         |         |        V|
   21+30      16.2134      0.69  Q         |         |         |        V|
   21+45      16.2266      0.64  Q         |         |         |        V|
   22+ 0      16.2409      0.69  Q         |         |         |        V|
   22+15      16.2541      0.64  Q         |         |         |        V|
   22+30      16.2683      0.69  Q         |         |         |        V|
   22+45      16.2802      0.57  Q         |         |         |        V|
   23+ 0      16.2914      0.54  Q         |         |         |        V|
   23+15      16.3025      0.53  Q         |         |         |        V|
   23+30      16.3135      0.53  Q         |         |         |        V|
   23+45      16.3245      0.53  Q         |         |         |        V|
   24+ 0      16.3355      0.53  Q         |         |         |        V|
   24+15      16.3437      0.40  Q         |         |         |        V|
   24+30      16.3459      0.10  Q         |         |         |        V|
   24+45      16.3465      0.03  Q         |         |         |        V|
   25+ 0      16.3467      0.01  Q         |         |         |        V|
   25+15      16.3467      0.00  Q         |         |         |         V
-----------------------------------------------------------------------
```

```
       U n i t   H y d r o g r a p h   A n a l y s i s

       Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/27/12 File: OffsiteF424100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6097

---------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



---------------------------------------------------------------------
Watershed F, Offsite F4
Proposed Condition
100-year, 24-hour

--------------------------------------------------------------------
Drainage Area =      69.50(Ac.)  =      0.109 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      69.50(Ac.)  =      0.109 Sq. Mi.
Length along longest watercourse =    3750.00(Ft.)
Length along longest watercourse measured to centroid =    1820.00(Ft.)
Length along longest watercourse =      0.710 Mi.
Length along longest watercourse measured to centroid =      0.345 Mi.
Difference in elevation =     285.00(Ft.)
Slope along watercourse =    401.2800 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.135 Hr.
Lag time =     8.10 Min.
25% of lag time =     2.03 Min.
40% of lag time =     3.24 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       69.50           1.80                 125.10

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       69.50           4.50                 312.75

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     5.300           46.00         0.000
    14.300           66.00         0.000
```

```
    49.900          83.00         0.000
 Total Area Entered =     69.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
46.0  46.0      0.611     0.000        0.611       0.076      0.047
66.0  66.0      0.405     0.000        0.405       0.206      0.083
83.0  83.0      0.210     0.000        0.210       0.718      0.151
                                                  Sum (F) =   0.281
Area averaged mean soil loss (F) (In/Hr) =  0.281
Minimum soil loss rate ((In/Hr)) =  0.140
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
---------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      FOOTHILL S-Curve
--------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
---------------------------------------------------------------------
    1   0.250        185.142         39.169             27.435
    2   0.500        370.284         51.389             35.994
    3   0.750        555.426          7.965              5.579
    4   1.000        740.569          1.478              1.035
                                Sum = 100.000   Sum=      70.043
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1 0.25	0.20	0.036	(0.496)	0.032	0.004
2 0.50	0.30	0.054	(0.490)	0.049	0.005
3 0.75	0.30	0.054	(0.484)	0.049	0.005
4 1.00	0.40	0.072	(0.478)	0.065	0.007
5 1.25	0.30	0.054	(0.473)	0.049	0.005
6 1.50	0.30	0.054	(0.467)	0.049	0.005
7 1.75	0.30	0.054	(0.462)	0.049	0.005
8 2.00	0.40	0.072	(0.456)	0.065	0.007
9 2.25	0.40	0.072	(0.450)	0.065	0.007
10 2.50	0.40	0.072	(0.445)	0.065	0.007
11 2.75	0.50	0.090	(0.440)	0.081	0.009
12 3.00	0.50	0.090	(0.434)	0.081	0.009
13 3.25	0.50	0.090	(0.429)	0.081	0.009
14 3.50	0.50	0.090	(0.423)	0.081	0.009
15 3.75	0.50	0.090	(0.418)	0.081	0.009
16 4.00	0.60	0.108	(0.413)	0.097	0.011
17 4.25	0.60	0.108	(0.408)	0.097	0.011
18 4.50	0.70	0.126	(0.402)	0.113	0.013
19 4.75	0.70	0.126	(0.397)	0.113	0.013
20 5.00	0.80	0.144	(0.392)	0.130	0.014
21 5.25	0.60	0.108	(0.387)	0.097	0.011
22 5.50	0.70	0.126	(0.382)	0.113	0.013
23 5.75	0.80	0.144	(0.377)	0.130	0.014
24 6.00	0.80	0.144	(0.372)	0.130	0.014
25 6.25	0.90	0.162	(0.367)	0.146	0.016
26 6.50	0.90	0.162	(0.362)	0.146	0.016
27 6.75	1.00	0.180	(0.357)	0.162	0.018
28 7.00	1.00	0.180	(0.353)	0.162	0.018
29 7.25	1.00	0.180	(0.348)	0.162	0.018
30 7.50	1.10	0.198	(0.343)	0.178	0.020
31 7.75	1.20	0.216	(0.338)	0.194	0.022
32 8.00	1.30	0.234	(0.334)	0.211	0.023
33 8.25	1.50	0.270	(0.329)	0.243	0.027
34 8.50	1.50	0.270	(0.324)	0.243	0.027

35	8.75	1.60	0.288	(	0.320)	0.259	0.029
36	9.00	1.70	0.306	(	0.315)	0.275	0.031
37	9.25	1.90	0.342	(	0.311)	0.308	0.034
38	9.50	2.00	0.360		0.306	(0.324)	0.053
39	9.75	2.10	0.378		0.302	(0.340)	0.076
40	10.00	2.20	0.396		0.298	(0.356)	0.098
41	10.25	1.50	0.270	(	0.293)	0.243	0.027
42	10.50	1.50	0.270	(	0.289)	0.243	0.027
43	10.75	2.00	0.360		0.285	(0.324)	0.075
44	11.00	2.00	0.360		0.281	(0.324)	0.079
45	11.25	1.90	0.342		0.277	(0.308)	0.065
46	11.50	1.90	0.342		0.273	(0.308)	0.069
47	11.75	1.70	0.306		0.269	(0.275)	0.037
48	12.00	1.80	0.324		0.265	(0.292)	0.059
49	12.25	2.50	0.450		0.261	(0.405)	0.189
50	12.50	2.60	0.468		0.257	(0.421)	0.211
51	12.75	2.80	0.504		0.253	(0.454)	0.251
52	13.00	2.90	0.522		0.249	(0.470)	0.273
53	13.25	3.40	0.612		0.245	(0.551)	0.367
54	13.50	3.40	0.612		0.242	(0.551)	0.370
55	13.75	2.30	0.414		0.238	(0.373)	0.176
56	14.00	2.30	0.414		0.234	(0.373)	0.180
57	14.25	2.70	0.486		0.231	(0.437)	0.255
58	14.50	2.60	0.468		0.227	(0.421)	0.241
59	14.75	2.60	0.468		0.224	(0.421)	0.244
60	15.00	2.50	0.450		0.220	(0.405)	0.230
61	15.25	2.40	0.432		0.217	(0.389)	0.215
62	15.50	2.30	0.414		0.214	(0.373)	0.200
63	15.75	1.90	0.342		0.210	(0.308)	0.132
64	16.00	1.90	0.342		0.207	(0.308)	0.135
65	16.25	0.40	0.072	(	0.204)	0.065	0.007
66	16.50	0.40	0.072	(	0.201)	0.065	0.007
67	16.75	0.30	0.054	(	0.198)	0.049	0.005
68	17.00	0.30	0.054	(	0.195)	0.049	0.005
69	17.25	0.50	0.090	(	0.192)	0.081	0.009
70	17.50	0.50	0.090	(	0.189)	0.081	0.009
71	17.75	0.50	0.090	(	0.186)	0.081	0.009
72	18.00	0.40	0.072	(	0.183)	0.065	0.007
73	18.25	0.40	0.072	(	0.181)	0.065	0.007
74	18.50	0.40	0.072	(	0.178)	0.065	0.007
75	18.75	0.30	0.054	(	0.176)	0.049	0.005
76	19.00	0.20	0.036	(	0.173)	0.032	0.004
77	19.25	0.30	0.054	(	0.171)	0.049	0.005
78	19.50	0.40	0.072	(	0.168)	0.065	0.007
79	19.75	0.30	0.054	(	0.166)	0.049	0.005
80	20.00	0.20	0.036	(	0.164)	0.032	0.004
81	20.25	0.30	0.054	(	0.162)	0.049	0.005
82	20.50	0.30	0.054	(	0.159)	0.049	0.005
83	20.75	0.30	0.054	(	0.157)	0.049	0.005
84	21.00	0.20	0.036	(	0.156)	0.032	0.004
85	21.25	0.30	0.054	(	0.154)	0.049	0.005
86	21.50	0.20	0.036	(	0.152)	0.032	0.004
87	21.75	0.30	0.054	(	0.150)	0.049	0.005
88	22.00	0.20	0.036	(	0.149)	0.032	0.004
89	22.25	0.30	0.054	(	0.147)	0.049	0.005
90	22.50	0.20	0.036	(	0.146)	0.032	0.004
91	22.75	0.20	0.036	(	0.145)	0.032	0.004
92	23.00	0.20	0.036	(	0.143)	0.032	0.004
93	23.25	0.20	0.036	(	0.142)	0.032	0.004
94	23.50	0.20	0.036	(	0.142)	0.032	0.004
95	23.75	0.20	0.036	(	0.141)	0.032	0.004
96	24.00	0.20	0.036	(	0.140)	0.032	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.0

Flood volume = Effective rainfall 1.26(In)
times area 69.5(Ac.)/[(In)/(Ft.)] = 7.3(Ac.Ft)
Total soil loss = 3.24(In)
Total soil loss = 18.783(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 316923.9 Cubic Feet
Total soil loss = 818204.5 Cubic Feet

```
      ----------------------------------------------------------------------
       Peak flow rate of this hydrograph =     25.151(CFS)
      ----------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ----------------------------------------------------------------------
                  Hydrograph in  15   Minute intervals ((CFS))

      ----------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-------------------------------------------------------------------------
  0+15       0.0020      0.10  Q         |         |         |         |
  0+30       0.0078      0.28  Q         |         |         |         |
  0+45       0.0153      0.36  Q         |         |         |         |
  1+ 0       0.0241      0.43  Q         |         |         |         |
  1+15       0.0332      0.44  Q         |         |         |         |
  1+30       0.0413      0.39  Q         |         |         |         |
  1+45       0.0491      0.38  Q         |         |         |         |
  2+ 0       0.0580      0.43  Q         |         |         |         |
  2+15       0.0681      0.49  Q         |         |         |         |
  2+30       0.0785      0.50  Q         |         |         |         |
  2+45       0.0900      0.55  Q         |         |         |         |
  3+ 0       0.1027      0.62  Q         |         |         |         |
  3+15       0.1157      0.63  Q         |         |         |         |
  3+30       0.1288      0.63  Q         |         |         |         |
  3+45       0.1418      0.63  Q         |         |         |         |
  4+ 0       0.1558      0.68  Q         |         |         |         |
  4+15       0.1712      0.74  Q         |         |         |         |
  4+30       0.1879      0.80   Q        |         |         |         |
  4+45       0.2058      0.87  |Q        |         |         |         |
  5+ 0       0.2251      0.93  |Q        |         |         |         |
  5+15       0.2436      0.90  |Q        |         |         |         |
  5+30       0.2607      0.83  |Q        |         |         |         |
  5+45       0.2798      0.92  |Q        |         |         |         |
  6+ 0       0.3004      1.00  |Q        |         |         |         |
  6+15       0.3222      1.06  |Q        |         |         |         |
  6+30       0.3454      1.12  |Q        |         |         |         |
  6+45       0.3699      1.18  |QV       |         |         |         |
  7+ 0       0.3957      1.25  |QV       |         |         |         |
  7+15       0.4217      1.26  |QV       |         |         |         |
  7+30       0.4488      1.31  |QV       |         |         |         |
  7+45       0.4782      1.42  |QV       |         |         |         |
  8+ 0       0.5102      1.55  | Q       |         |         |         |
  8+15       0.5459      1.72  | QV      |         |         |         |
  8+30       0.5844      1.87  | QV      |         |         |         |
  8+45       0.6244      1.94  | QV      |         |         |         |
  9+ 0       0.6669      2.06  | QV      |         |         |         |
  9+15       0.7130      2.23  | QV      |         |         |         |
  9+30       0.7729      2.90  |  QV     |         |         |         |
  9+45       0.8603      4.23  |   VQ    |         |         |         |
 10+ 0       0.9793      5.76  |    V Q  |         |         |         |
 10+15       1.0775      4.76  |    VQ   |         |         |         |
 10+30       1.1259      2.34  |  Q  V   |         |         |         |
 10+45       1.1937      3.28  |   Q V   |         |         |         |
 11+ 0       1.2980      5.05  |     QV  |         |         |         |
 11+15       1.4031      5.09  |     QV  |         |         |         |
 11+30       1.5017      4.77  |     Q V |         |         |         |
 11+45       1.5837      3.97  |    Q  V |         |         |         |
 12+ 0       1.6546      3.43  |   Q    V|         |         |         |
 12+15       1.8119      7.61  |        VQ         |         |         |
 12+30       2.0802     12.98  |          V     Q  |         |         |
 12+45       2.4028     15.62  |          |  V      Q         |         |
 13+ 0       2.7728     17.91  |          |    V    |  Q      |         |
 13+15       3.2172     21.51  |          |      V  |       Q |         |
 13+30       3.7369     25.15  |          |         V         |  Q      |
 13+45       4.1604     20.50  |          |          | V    Q  |         |
 14+ 0       4.4438     13.72  |          |       Q |   V     |         |
 14+15       4.7504     14.84  |          |        Q|     V   |         |
 14+30       5.1014     16.98  |          |          | Q     V |         |
 14+45       5.4523     16.98  |          |          | Q      V|         |
```

```
   15+ 0       5.7974     16.71  |         |         | Q        V        |
   15+15       6.1236     15.78  |         |         |Q        |  V      |
   15+30       6.4289     14.78  |         |        Q|         |    V    |
   15+45       6.6823     12.27  |         |     Q   |         |     V   |
   16+ 0       6.8844      9.78  |         |  Q      |         |      V  |
   16+15       7.0082      6.00  |      Q  |         |         |       V |
   16+30       7.0360      1.35  |Q        |         |         |       V |
   16+45       7.0482      0.59  Q         |         |         |       V |
   17+ 0       7.0562      0.39  Q         |         |         |       V |
   17+15       7.0661      0.48  Q         |         |         |       V |
   17+30       7.0787      0.61  Q         |         |         |       V |
   17+45       7.0916      0.63  Q         |         |         |       V |
   18+ 0       7.1036      0.58  Q         |         |         |        V|
   18+15       7.1143      0.52  Q         |         |         |        V|
   18+30       7.1248      0.51  Q         |         |         |        V|
   18+45       7.1342      0.46  Q         |         |         |        V|
   19+ 0       7.1412      0.34  Q         |         |         |        V|
   19+15       7.1477      0.32  Q         |         |         |        V|
   19+30       7.1564      0.42  Q         |         |         |        V|
   19+45       7.1655      0.44  Q         |         |         |        V|
   20+ 0       7.1725      0.34  Q         |         |         |        V|
   20+15       7.1790      0.32  Q         |         |         |        V|
   20+30       7.1866      0.37  Q         |         |         |        V|
   20+45       7.1944      0.38  Q         |         |         |        V|
   21+ 0       7.2012      0.33  Q         |         |         |        V|
   21+15       7.2077      0.31  Q         |         |         |        V|
   21+30       7.2143      0.32  Q         |         |         |        V|
   21+45       7.2207      0.31  Q         |         |         |        V|
   22+ 0       7.2273      0.32  Q         |         |         |        V|
   22+15       7.2337      0.31  Q         |         |         |        V|
   22+30       7.2403      0.32  Q         |         |         |        V|
   22+45       7.2457      0.26  Q         |         |         |        V|
   23+ 0       7.2510      0.25  Q         |         |         |        V|
   23+15       7.2562      0.25  Q         |         |         |        V|
   23+30       7.2614      0.25  Q         |         |         |        V|
   23+45       7.2666      0.25  Q         |         |         |        V|
   24+ 0       7.2718      0.25  Q         |         |         |        V|
   24+15       7.2750      0.15  Q         |         |         |        V|
   24+30       7.2755      0.02  Q         |         |         |        V|
   24+45       7.2756      0.00  Q         |         |         |        V|
-----------------------------------------------------------------------
```

```
          U n i t   H y d r o g r a p h   A n a l y s i s

          Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
               Study date  04/27/12 File: SubF124100.out


     ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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     ----------------------------------------------------------------------
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     Riverside County Synthetic Unit Hydrology Method
     RCFC & WCD Manual date - April 1978


     Program License Serial Number 6097

     ----------------------------------------------------------------------
--
      English (in-lb) Input Units Used
      English Rainfall Data (Inches) Input Values Used

      English Units used in output format



     ----------------------------------------------------------------------
--
     Watershed F, Subarea F1
     Proposed Condition
     100-year, 24-hour

     ----------------------------------------------------------------------
-
     Drainage Area =      81.47(Ac.)  =      0.127 Sq. Mi.
     Drainage Area for Depth-Area Areal Adjustment =      81.47(Ac.)  =
0.127 Sq. Mi.
     Length along longest watercourse =    1200.00(Ft.)
     Length along longest watercourse measured to centroid =
600.00(Ft.)
     Length along longest watercourse =      0.227 Mi.
     Length along longest watercourse measured to centroid =      0.114
Mi.
     Difference in elevation =      24.00(Ft.)
     Slope along watercourse =    105.6000 Ft./Mi.
     Average Manning's 'N' = 0.015
     Lag time =    0.037 Hr.
     Lag time =     2.22 Min.
     25% of lag time =     0.56 Min.
     40% of lag time =     0.89 Min.
     Unit time =    15.00 Min.
     Duration of storm = 24 Hour(s)
     User Entered Base Flow =     0.00(CFS)
```

```
2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       81.47             1.80                 146.65

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       81.47             4.50                 366.62

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    81.470           85.00         0.750
 Total Area Entered =     81.47(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)
(In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                     Sum (F) =
0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-----------------------------------------------------------------
--

            U n i t  H y d r o g r a p h
                  VALLEY S-Curve
-----------------------------------------------------------------
-
            Unit Hydrograph Data
-----------------------------------------------------------------
--
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-----------------------------------------------------------------
--
    1   0.250        675.381         77.819             63.894
    2   0.500       1350.763         22.181             18.212
                                Sum = 100.000   Sum=      82.106
```

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.313
40	10.00	2.20	0.396	0.064	(0.119)	0.331
41	10.25	1.50	0.270	0.064	(0.081)	0.206
42	10.50	1.50	0.270	0.063	(0.081)	0.207
43	10.75	2.00	0.360	0.062	(0.108)	0.298
44	11.00	2.00	0.360	0.061	(0.108)	0.299

45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025
		(Loss Rate Not Used)					
	Sum =	100.0				Sum =	14.5

```
      Flood volume = Effective rainfall      3.63(In)
       times area      81.5(Ac.)/[(In)/(Ft.)] =      24.7(Ac.Ft)
      Total soil loss =      0.86(In)
      Total soil loss =     5.870(Ac.Ft)
      Total rainfall =      4.50(In)
      Flood volume =     1074896.8 Cubic Feet
      Total soil loss =      255703.9 Cubic Feet
      ---------------------------------------------------------------
-
       Peak flow rate of this hydrograph =     45.954(CFS)
      ---------------------------------------------------------------
-
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------
-
                   Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5
50.0
  ---------------------------------------------------------------------
    0+15       0.0333      1.61  VQ        |         |         |
|
    0+30       0.0927      2.88  V Q       |         |         |
|
    0+45       0.1568      3.10  V Q       |         |         |
|
    1+ 0       0.2376      3.91  V  Q      |         |         |
|
    1+15       0.3065      3.33  V Q       |         |         |
|
    1+30       0.3707      3.10  V Q       |         |         |
|
    1+45       0.4348      3.10  V Q       |         |         |
|
    2+ 0       0.5156      3.91  V  Q      |         |         |
|
    2+15       0.6011      4.14  V  Q      |         |         |
|
    2+30       0.6866      4.14  |V Q      |         |         |
|
    2+45       0.7888      4.95  |V Q      |         |         |
|
    3+ 0       0.8957      5.17  |V  Q     |         |         |
|
    3+15       1.0026      5.17  |V  Q     |         |         |
|
    3+30       1.1096      5.17  |V  Q     |         |         |
|
```

```
   3+45       1.2165      5.17  |V  Q     |         |         |
|
   4+ 0       1.3400      5.98  | V Q     |         |         |
|
   4+15       1.4683      6.21  | V Q     |         |         |
|
   4+30       1.6132      7.01  | V  Q    |         |         |
|
   4+45       1.7629      7.24  | V  Q    |         |         |
|
   5+ 0       1.9292      8.05  |  V  Q   |         |         |
|
   5+15       2.0670      6.67  |  V Q    |         |         |
|
   5+30       2.2120      7.01  |  V Q    |         |         |
|
   5+45       2.3783      8.05  |  V  Q   |         |         |
|
   6+ 0       2.5493      8.28  |   V Q   |         |         |
|
   6+15       2.7370      9.08  |   V  Q  |         |         |
|
   6+30       2.9295      9.31  |   V  Q  |         |         |
|
   6+45       3.1386     10.12  |    V  Q |         |         |
|
   7+ 0       3.3524     10.35  |    V  Q |         |         |
|
   7+15       3.5662     10.35  |    V  Q |         |         |
|
   7+30       3.7967     11.15  |     V Q |         |         |
|
   7+45       4.0485     12.19  |     V  Q|         |         |
|
   8+ 0       4.3217     13.22  |      V  Q         |         |
|
   8+15       4.6459     15.69  |      V  | Q       |         |
|
   8+30       4.9844     16.39  |       V |  Q      |         |
|
   8+45       5.3484     17.62  |       V |   Q     |         |
|
   9+ 0       5.7446     19.18  |        V|    Q    |         |
|
   9+15       6.1968     21.89  |         V      Q  |         |
|
   9+30       6.6879     23.77  |         V        Q|         |
|
   9+45       7.2112     25.33  |         |V        Q         |
|
  10+ 0       7.7667     26.88  |         | V       |Q        |
|
  10+15       8.1641     19.23  |         |  V Q    |         |
|
```

```
  10+30       8.5156     17.01  |         |  Q      |         |
|
  10+45       8.9875     22.84  |         |   V   Q |         |
|
  11+ 0       9.4949     24.56  |         |    V   Q|         |
|
  11+15       9.9800     23.48  |         |     V Q |         |
|
  11+30      10.4598     23.22  |         |     V Q |         |
|
  11+45      10.8936     21.00  |         |     QV  |         |
|
  12+ 0      11.3391     21.56  |         |      QV |         |
|
  12+15      11.9592     30.01  |         |        V|   Q     |
|
  12+30      12.6519     33.53  |         |         V     Q   |
|
  12+45      13.4004     36.23  |         |          V      Q |
|
  13+ 0      14.1876     38.10  |         |         | V       Q
|
  13+15      15.1018     44.25  |         |         |   V     |    Q
|
  13+30      16.0513     45.95  |         |         |     V   |     Q
|
  13+45      16.7406     33.36  |         |         |     QV  |
|
  14+ 0      17.3568     29.82  |         |         |  Q    V |
|
  14+15      18.0693     34.49  |         |         |      Q V|
|
  14+30      18.7865     34.71  |         |         |      Q  V
|
  14+45      19.4982     34.45  |         |         |      Q   V
|
  15+ 0      20.1874     33.36  |         |         |     Q   | V
|
  15+15      20.8472     31.94  |         |         |    Q    |  V
|
  15+30      21.4778     30.52  |         |         |   Q     |   V
|
  15+45      22.0077     25.65  |         |         Q         |    V
|
  16+ 0      22.5117     24.39  |         |        Q|         |     V
|
  16+15      22.6901      8.63  |     Q   |         |         |     V
|
  16+30      22.7756      4.14  |  Q      |         |         |     V
|
  16+45      22.8445      3.33  | Q       |         |         |      V
|
  17+ 0      22.9086      3.10  | Q       |         |         |      V
|
```

```
   17+15      23.0061      4.72  |  Q      |         |         |      V
|
   17+30      23.1130      5.17  |   Q     |         |         |      V
|
   17+45      23.2199      5.17  |   Q     |         |         |      V
|
   18+ 0      23.3102      4.37  |  Q      |         |         |      V
|
   18+15      23.3957      4.14  |  Q      |         |         |      V
|
   18+30      23.4812      4.14  |  Q      |         |         |       V
|
   18+45      23.5501      3.33  | Q       |         |         |       V
|
   19+ 0      23.5976      2.30  |Q        |         |         |       V
|
   19+15      23.6570      2.88  | Q       |         |         |       V
|
   19+30      23.7378      3.91  |  Q      |         |         |       V
|
   19+45      23.8067      3.33  | Q       |         |         |       V
|
   20+ 0      23.8542      2.30  |Q        |         |         |       V
|
   20+15      23.9136      2.88  | Q       |         |         |       V
|
   20+30      23.9778      3.10  | Q       |         |         |       V
|
   20+45      24.0419      3.10  | Q       |         |         |       V
|
   21+ 0      24.0894      2.30  |Q        |         |         |
V|
   21+15      24.1488      2.88  | Q       |         |         |
V|
   21+30      24.1963      2.30  |Q        |         |         |
V|
   21+45      24.2557      2.88  | Q       |         |         |
V|
   22+ 0      24.3032      2.30  |Q        |         |         |
V|
   22+15      24.3627      2.88  | Q       |         |         |
V|
   22+30      24.4102      2.30  |Q        |         |         |
V|
   22+45      24.4529      2.07  |Q        |         |         |
V|
   23+ 0      24.4957      2.07  |Q        |         |         |
V|
   23+15      24.5385      2.07  |Q        |         |         |
V|
   23+30      24.5812      2.07  |Q        |         |         |
V|
   23+45      24.6240      2.07  |Q        |         |         |
V|
```

```
   24+ 0      24.6667      2.07  |Q        |         |         |
V|
   24+15      24.6762      0.46  Q         |         |         |
V|
-------------------------------------------------------------------------
```

```
           U n i t   H y d r o g r a p h   A n a l y s i s

           Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
                 Study date  04/29/12 File: SubF224100.out


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++
      ----------------------------------------------------------------------
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      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6097

      ----------------------------------------------------------------------
--
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
--
      Watershed F, Subarea F2
      Proposed Condition
      100-year, 24-hour

      ----------------------------------------------------------------------
-
      Drainage Area =      88.69(Ac.)  =      0.139 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =      88.69(Ac.)  =
0.139 Sq. Mi.
      Length along longest watercourse =    1200.00(Ft.)
      Length along longest watercourse measured to centroid =
600.00(Ft.)
      Length along longest watercourse =      0.227 Mi.
      Length along longest watercourse measured to centroid =      0.114
Mi.
      Difference in elevation =      24.00(Ft.)
      Slope along watercourse =    105.6000 Ft./Mi.
      Average Manning's 'N' = 0.015
      Lag time =    0.037 Hr.
      Lag time =     2.22 Min.
      25% of lag time =     0.56 Min.
      40% of lag time =     0.89 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)
```

```
2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       88.69             1.80                 159.64

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       88.69             4.50                 399.11

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    88.690           85.00         0.750
 Total Area Entered =     88.69(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)
(In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                     Sum (F) =
0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-------------------------------------------------------------------
--

            U n i t  H y d r o g r a p h
                  VALLEY S-Curve
-------------------------------------------------------------------
-
            Unit Hydrograph Data
-------------------------------------------------------------------
--
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
--
    1   0.250        675.381         77.819             69.557
    2   0.500       1350.763         22.181             19.826
                                Sum = 100.000   Sum=      89.383
```

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.313
40	10.00	2.20	0.396	0.064	(0.119)	0.331
41	10.25	1.50	0.270	0.064	(0.081)	0.206
42	10.50	1.50	0.270	0.063	(0.081)	0.207
43	10.75	2.00	0.360	0.062	(0.108)	0.298
44	11.00	2.00	0.360	0.061	(0.108)	0.299

45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.393
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.419
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025
		(Loss Rate Not Used)					
	Sum =	100.0				Sum =	14.5

```
      Flood volume = Effective rainfall      3.63(In)
       times area      88.7(Ac.)/[(In)/(Ft.)] =      26.9(Ac.Ft)
      Total soil loss =      0.86(In)
      Total soil loss =     6.390(Ac.Ft)
      Total rainfall =      4.50(In)
      Flood volume =     1170137.3 Cubic Feet
      Total soil loss =      278362.9 Cubic Feet
      ---------------------------------------------------------------
-
       Peak flow rate of this hydrograph =     50.026(CFS)
      ---------------------------------------------------------------
-
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------
-
                    Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0
60.0
  ---------------------------------------------------------------------
    0+15       0.0362      1.75  VQ        |         |         |
|
    0+30       0.1009      3.13  V Q       |         |         |
|
    0+45       0.1707      3.38  V Q       |         |         |
|
    1+ 0       0.2587      4.26  V Q       |         |         |
|
    1+15       0.3337      3.63  V Q       |         |         |
|
    1+30       0.4035      3.38  V Q       |         |         |
|
    1+45       0.4733      3.38  V Q       |         |         |
|
    2+ 0       0.5613      4.26  V Q       |         |         |
|
    2+15       0.6544      4.51  V  Q      |         |         |
|
    2+30       0.7475      4.51  |V Q      |         |         |
|
    2+45       0.8587      5.38  |V Q      |         |         |
|
    3+ 0       0.9751      5.63  |V Q      |         |         |
|
    3+15       1.0915      5.63  |V Q      |         |         |
|
    3+30       1.2079      5.63  |V Q      |         |         |
|
```

```
   3+45       1.3243      5.63  |V Q      |         |         |
|
   4+ 0       1.4588      6.51  | V Q     |         |         |
|
   4+15       1.5984      6.76  | V Q     |         |         |
|
   4+30       1.7562      7.64  | V  Q    |         |         |
|
   4+45       1.9191      7.89  | V  Q    |         |         |
|
   5+ 0       2.1002      8.76  |  V Q    |         |         |
|
   5+15       2.2502      7.26  |  VQ     |         |         |
|
   5+30       2.4080      7.64  |  V Q    |         |         |
|
   5+45       2.5890      8.76  |  V Q    |         |         |
|
   6+ 0       2.7752      9.01  |   V Q   |         |         |
|
   6+15       2.9796      9.89  |   V Q   |         |         |
|
   6+30       3.1890     10.14  |   V Q   |         |         |
|
   6+45       3.4167     11.02  |    V Q  |         |         |
|
   7+ 0       3.6494     11.27  |    V Q  |         |         |
|
   7+15       3.8822     11.27  |    V Q  |         |         |
|
   7+30       4.1331     12.14  |     V Q |         |         |
|
   7+45       4.4072     13.27  |     V Q |         |         |
|
   8+ 0       4.7047     14.40  |      V Q|         |         |
|
   8+15       5.0575     17.08  |      V  |Q        |         |
|
   8+30       5.4261     17.84  |       V |Q        |         |
|
   8+45       5.8223     19.18  |       V | Q       |         |
|
   9+ 0       6.2536     20.88  |        V|  Q      |         |
|
   9+15       6.7459     23.82  |         V    Q    |         |
|
   9+30       7.2805     25.88  |         V      Q  |         |
|
   9+45       7.8502     27.57  |         |V      Q |         |
|
  10+ 0       8.4548     29.26  |         | V      Q|         |
|
  10+15       8.8874     20.94  |         |  Q      |         |
|
```

```
  10+30       9.2701     18.52  |         | QV      |         |
|
  10+45       9.7839     24.87  |         |   V Q   |         |
|
  11+ 0      10.3362     26.73  |         |    V Q  |         |
|
  11+15      10.8643     25.56  |         |     VQ  |         |
|
  11+30      11.3866     25.28  |         |     Q   |         |
|
  11+45      11.8588     22.86  |         |    Q V  |         |
|
  12+ 0      12.3438     23.47  |         |    Q  V |         |
|
  12+15      13.0188     32.67  |         |        V|Q        |
|
  12+30      13.7729     36.50  |         |         V   Q     |
|
  12+45      14.5877     39.44  |         |          V    Q   |
|
  13+ 0      15.4447     41.48  |         |         | V    Q  |
|
  13+15      16.4399     48.17  |         |         |   V     | Q
|
  13+30      17.4735     50.03  |         |         |     V   |  Q
|
  13+45      18.2239     36.32  |         |         |   Q  V  |
|
  14+ 0      18.8947     32.46  |         |         |Q      V |
|
  14+15      19.6704     37.54  |         |         |    Q   V|
|
  14+30      20.4511     37.79  |         |         |    Q    V
|
  14+45      21.2258     37.50  |         |         |   Q      V
|
  15+ 0      21.9761     36.31  |         |         |   Q     | V
|
  15+15      22.6944     34.77  |         |         |  Q      |  V
|
  15+30      23.3808     33.22  |         |         | Q       |   V
|
  15+45      23.9577     27.92  |         |       Q |         |    V
|
  16+ 0      24.5063     26.55  |         |      Q  |         |     V
|
  16+15      24.7005      9.40  |     Q   |         |         |     V
|
  16+30      24.7936      4.51  |  Q      |         |         |     V
|
  16+45      24.8686      3.63  | Q       |         |         |      V
|
  17+ 0      24.9384      3.38  | Q       |         |         |      V
|
```

```
   17+15      25.0445      5.13  |  Q      |         |         |      V
|
   17+30      25.1609      5.63  |  Q      |         |         |      V
|
   17+45      25.2773      5.63  |  Q      |         |         |      V
|
   18+ 0      25.3755      4.76  |  Q      |         |         |      V
|
   18+15      25.4687      4.51  |  Q      |         |         |      V
|
   18+30      25.5618      4.51  |  Q      |         |         |       V
|
   18+45      25.6368      3.63  | Q       |         |         |       V
|
   19+ 0      25.6885      2.50  |Q        |         |         |       V
|
   19+15      25.7531      3.13  | Q       |         |         |       V
|
   19+30      25.8411      4.26  | Q       |         |         |       V
|
   19+45      25.9161      3.63  | Q       |         |         |       V
|
   20+ 0      25.9678      2.50  |Q        |         |         |       V
|
   20+15      26.0325      3.13  | Q       |         |         |       V
|
   20+30      26.1023      3.38  | Q       |         |         |       V
|
   20+45      26.1721      3.38  | Q       |         |         |       V
|
   21+ 0      26.2238      2.50  |Q        |         |         |
V|
   21+15      26.2885      3.13  | Q       |         |         |
V|
   21+30      26.3402      2.50  |Q        |         |         |
V|
   21+45      26.4049      3.13  | Q       |         |         |
V|
   22+ 0      26.4566      2.50  |Q        |         |         |
V|
   22+15      26.5213      3.13  | Q       |         |         |
V|
   22+30      26.5730      2.50  |Q        |         |         |
V|
   22+45      26.6196      2.25  |Q        |         |         |
V|
   23+ 0      26.6661      2.25  |Q        |         |         |
V|
   23+15      26.7127      2.25  |Q        |         |         |
V|
   23+30      26.7592      2.25  |Q        |         |         |
V|
   23+45      26.8058      2.25  |Q        |         |         |
V|
```

```
   24+ 0      26.8523      2.25  |Q        |         |         |
V|
   24+15      26.8627      0.50  Q         |         |         |
V|
-----------------------------------------------------------------------
```

```
           U n i t   H y d r o g r a p h   A n a l y s i s

           Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
                 Study date  04/29/12 File: SubF324100.out


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++
      ----------------------------------------------------------------------
-----

      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6097

      ----------------------------------------------------------------------
--
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
--
      Watershed F, Subarea F3
      Proposed Condition
      100-year, 24-hour

      ----------------------------------------------------------------------
-
      Drainage Area =      38.99(Ac.)  =      0.061 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =      38.99(Ac.)  =
0.061 Sq. Mi.
      Length along longest watercourse =    1600.00(Ft.)
      Length along longest watercourse measured to centroid =
800.00(Ft.)
      Length along longest watercourse =      0.303 Mi.
      Length along longest watercourse measured to centroid =      0.152
Mi.
      Difference in elevation =      32.00(Ft.)
      Slope along watercourse =    105.6000 Ft./Mi.
      Average Manning's 'N' = 0.015
      Lag time =    0.046 Hr.
      Lag time =     2.76 Min.
      25% of lag time =     0.69 Min.
      40% of lag time =     1.11 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)
```

```
2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       38.99             1.80                  70.18

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       38.99             4.50                 175.46

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.800(In)
Area Averaged 100-Year Rainfall =    4.500(In)

Point rain (area averaged) =    4.500(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    4.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    38.990           85.00         0.750
 Total Area Entered =     38.99(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)
(In/Hr)
85.0  85.0      0.187     0.750        0.061       1.000      0.061
                                                     Sum (F) =
0.061
Area averaged mean soil loss (F) (In/Hr) =  0.061
Minimum soil loss rate ((In/Hr)) =  0.030
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.300
-------------------------------------------------------------------
--

            U n i t  H y d r o g r a p h
                  VALLEY S-Curve
-------------------------------------------------------------------
-
            Unit Hydrograph Data
-------------------------------------------------------------------
--
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                           Graph %            (CFS)
-------------------------------------------------------------------
--
    1   0.250        542.745         72.919             28.653
    2   0.500       1085.490         27.081             10.641
                                Sum = 100.000   Sum=      39.295
```

The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.036	(0.107)	0.011	0.025
2	0.50	0.30	0.054	(0.106)	0.016	0.038
3	0.75	0.30	0.054	(0.105)	0.016	0.038
4	1.00	0.40	0.072	(0.104)	0.022	0.050
5	1.25	0.30	0.054	(0.102)	0.016	0.038
6	1.50	0.30	0.054	(0.101)	0.016	0.038
7	1.75	0.30	0.054	(0.100)	0.016	0.038
8	2.00	0.40	0.072	(0.099)	0.022	0.050
9	2.25	0.40	0.072	(0.098)	0.022	0.050
10	2.50	0.40	0.072	(0.096)	0.022	0.050
11	2.75	0.50	0.090	(0.095)	0.027	0.063
12	3.00	0.50	0.090	(0.094)	0.027	0.063
13	3.25	0.50	0.090	(0.093)	0.027	0.063
14	3.50	0.50	0.090	(0.092)	0.027	0.063
15	3.75	0.50	0.090	(0.091)	0.027	0.063
16	4.00	0.60	0.108	(0.089)	0.032	0.076
17	4.25	0.60	0.108	(0.088)	0.032	0.076
18	4.50	0.70	0.126	(0.087)	0.038	0.088
19	4.75	0.70	0.126	(0.086)	0.038	0.088
20	5.00	0.80	0.144	(0.085)	0.043	0.101
21	5.25	0.60	0.108	(0.084)	0.032	0.076
22	5.50	0.70	0.126	(0.083)	0.038	0.088
23	5.75	0.80	0.144	(0.082)	0.043	0.101
24	6.00	0.80	0.144	(0.081)	0.043	0.101
25	6.25	0.90	0.162	(0.080)	0.049	0.113
26	6.50	0.90	0.162	(0.078)	0.049	0.113
27	6.75	1.00	0.180	(0.077)	0.054	0.126
28	7.00	1.00	0.180	(0.076)	0.054	0.126
29	7.25	1.00	0.180	(0.075)	0.054	0.126
30	7.50	1.10	0.198	(0.074)	0.059	0.139
31	7.75	1.20	0.216	(0.073)	0.065	0.151
32	8.00	1.30	0.234	(0.072)	0.070	0.164
33	8.25	1.50	0.270	0.071	(0.081)	0.199
34	8.50	1.50	0.270	0.070	(0.081)	0.200
35	8.75	1.60	0.288	0.069	(0.086)	0.219
36	9.00	1.70	0.306	0.068	(0.092)	0.238
37	9.25	1.90	0.342	0.067	(0.103)	0.275
38	9.50	2.00	0.360	0.066	(0.108)	0.294
39	9.75	2.10	0.378	0.065	(0.113)	0.313
40	10.00	2.20	0.396	0.064	(0.119)	0.331
41	10.25	1.50	0.270	0.064	(0.081)	0.206
42	10.50	1.50	0.270	0.063	(0.081)	0.207
43	10.75	2.00	0.360	0.062	(0.108)	0.298
44	11.00	2.00	0.360	0.061	(0.108)	0.299

45	11.25	1.90	0.342	0.060	(	0.103)	0.282
46	11.50	1.90	0.342	0.059	(	0.103)	0.283
47	11.75	1.70	0.306	0.058	(	0.092)	0.248
48	12.00	1.80	0.324	0.057	(	0.097)	0.267
49	12.25	2.50	0.450	0.056	(	0.135)	0.394
50	12.50	2.60	0.468	0.056	(	0.140)	0.412
51	12.75	2.80	0.504	0.055	(	0.151)	0.449
52	13.00	2.90	0.522	0.054	(	0.157)	0.468
53	13.25	3.40	0.612	0.053	(	0.184)	0.559
54	13.50	3.40	0.612	0.052	(	0.184)	0.560
55	13.75	2.30	0.414	0.052	(	0.124)	0.362
56	14.00	2.30	0.414	0.051	(	0.124)	0.363
57	14.25	2.70	0.486	0.050	(	0.146)	0.436
58	14.50	2.60	0.468	0.049	(	0.140)	0.419
59	14.75	2.60	0.468	0.048	(	0.140)	0.420
60	15.00	2.50	0.450	0.048	(	0.135)	0.402
61	15.25	2.40	0.432	0.047	(	0.130)	0.385
62	15.50	2.30	0.414	0.046	(	0.124)	0.368
63	15.75	1.90	0.342	0.046	(	0.103)	0.296
64	16.00	1.90	0.342	0.045	(	0.103)	0.297
65	16.25	0.40	0.072	(0.044)		0.022	0.050
66	16.50	0.40	0.072	(0.044)		0.022	0.050
67	16.75	0.30	0.054	(0.043)		0.016	0.038
68	17.00	0.30	0.054	(0.042)		0.016	0.038
69	17.25	0.50	0.090	(0.042)		0.027	0.063
70	17.50	0.50	0.090	(0.041)		0.027	0.063
71	17.75	0.50	0.090	(0.040)		0.027	0.063
72	18.00	0.40	0.072	(0.040)		0.022	0.050
73	18.25	0.40	0.072	(0.039)		0.022	0.050
74	18.50	0.40	0.072	(0.039)		0.022	0.050
75	18.75	0.30	0.054	(0.038)		0.016	0.038
76	19.00	0.20	0.036	(0.037)		0.011	0.025
77	19.25	0.30	0.054	(0.037)		0.016	0.038
78	19.50	0.40	0.072	(0.036)		0.022	0.050
79	19.75	0.30	0.054	(0.036)		0.016	0.038
80	20.00	0.20	0.036	(0.035)		0.011	0.025
81	20.25	0.30	0.054	(0.035)		0.016	0.038
82	20.50	0.30	0.054	(0.035)		0.016	0.038
83	20.75	0.30	0.054	(0.034)		0.016	0.038
84	21.00	0.20	0.036	(0.034)		0.011	0.025
85	21.25	0.30	0.054	(0.033)		0.016	0.038
86	21.50	0.20	0.036	(0.033)		0.011	0.025
87	21.75	0.30	0.054	(0.033)		0.016	0.038
88	22.00	0.20	0.036	(0.032)		0.011	0.025
89	22.25	0.30	0.054	(0.032)		0.016	0.038
90	22.50	0.20	0.036	(0.032)		0.011	0.025
91	22.75	0.20	0.036	(0.031)		0.011	0.025
92	23.00	0.20	0.036	(0.031)		0.011	0.025
93	23.25	0.20	0.036	(0.031)		0.011	0.025
94	23.50	0.20	0.036	(0.031)		0.011	0.025
95	23.75	0.20	0.036	(0.031)		0.011	0.025
96	24.00	0.20	0.036	(0.030)		0.011	0.025
		(Loss Rate Not Used)					
	Sum =	100.0				Sum =	14.5

```
      Flood volume = Effective rainfall      3.63(In)
       times area      39.0(Ac.)/[(In)/(Ft.)] =      11.8(Ac.Ft)
      Total soil loss =      0.86(In)
      Total soil loss =     2.809(Ac.Ft)
      Total rainfall =      4.50(In)
      Flood volume =      514473.3 Cubic Feet
      Total soil loss =      122379.8 Cubic Feet
      ---------------------------------------------------------------
-
       Peak flow rate of this hydrograph =     21.993(CFS)
      ---------------------------------------------------------------
-
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------
-
                    Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------
-
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5
30.0
  ---------------------------------------------------------------------
    0+15       0.0149      0.72  Q         |         |         |
|
    0+30       0.0429      1.35  VQ        |         |         |
|
    0+45       0.0736      1.49  VQ        |         |         |
|
    1+ 0       0.1117      1.85  V Q       |         |         |
|
    1+15       0.1452      1.62  V Q       |         |         |
|
    1+30       0.1759      1.49  VQ        |         |         |
|
    1+45       0.2066      1.49  VQ        |         |         |
|
    2+ 0       0.2448      1.85  V Q       |         |         |
|
    2+15       0.2857      1.98  V Q       |         |         |
|
    2+30       0.3266      1.98  |VQ       |         |         |
|
    2+45       0.3750      2.34  |V Q      |         |         |
|
    3+ 0       0.4262      2.48  |V Q      |         |         |
|
    3+15       0.4774      2.48  |V Q      |         |         |
|
    3+30       0.5285      2.48  |V Q      |         |         |
|
```

```
   3+45       0.5797      2.48  |V Q      |         |         |
|
   4+ 0       0.6384      2.84  | VQ      |         |         |
|
   4+15       0.6998      2.97  | VQ      |         |         |
|
   4+30       0.7686      3.33  | V Q     |         |         |
|
   4+45       0.8403      3.47  | V Q     |         |         |
|
   5+ 0       0.9194      3.83  |  V Q    |         |         |
|
   5+15       0.9863      3.24  |  VQ     |         |         |
|
   5+30       1.0552      3.33  |  VQ     |         |         |
|
   5+45       1.1343      3.83  |  V Q    |         |         |
|
   6+ 0       1.2162      3.96  |   VQ    |         |         |
|
   6+15       1.3055      4.32  |   VQ    |         |         |
|
   6+30       1.3976      4.46  |   VQ    |         |         |
|
   6+45       1.4972      4.82  |    VQ   |         |         |
|
   7+ 0       1.5995      4.95  |    VQ   |         |         |
|
   7+15       1.7018      4.95  |    VQ   |         |         |
|
   7+30       1.8117      5.31  |     VQ  |         |         |
|
   7+45       1.9317      5.81  |     VQ  |         |         |
|
   8+ 0       2.0620      6.31  |     V Q |         |         |
|
   8+15       2.2157      7.44  |      V Q|         |         |
|
   8+30       2.3777      7.84  |       V Q         |         |
|
   8+45       2.5512      8.40  |       V |Q        |         |
|
   9+ 0       2.7401      9.14  |        V| Q       |         |
|
   9+15       2.9550     10.40  |         V  Q      |         |
|
   9+30       3.1893     11.34  |         V    Q    |         |
|
   9+45       3.4390     12.09  |         |V    Q   |         |
|
  10+ 0       3.7041     12.83  |         | V    Q  |         |
|
  10+15       3.8993      9.45  |         | QV      |         |
|
```

```
  10+30       4.0675      8.14  |         Q  V      |         |
|
  10+45       4.2898     10.76  |         |   Q     |         |
|
  11+ 0       4.5326     11.75  |         |    Q    |         |
|
  11+15       4.7655     11.27  |         |    QV   |         |
|
  11+30       4.9951     11.11  |         |   Q V   |         |
|
  11+45       5.2041     10.12  |         |  Q   V  |         |
|
  12+ 0       5.4166     10.28  |         |  Q    V |         |
|
  12+15       5.7083     14.12  |         |       QV|         |
|
  12+30       6.0391     16.01  |         |         VQ        |
|
  12+45       6.3959     17.27  |         |          V Q      |
|
  13+ 0       6.7719     18.20  |         |         | V Q     |
|
  13+15       7.2059     21.00  |         |         |   V   Q |
|
  13+30       7.6603     21.99  |         |         |    V   Q|
|
  13+45       7.9981     16.35  |         |         |Q     V  |
|
  14+ 0       8.2930     14.27  |         |        Q|       V |
|
  14+15       8.6311     16.37  |         |         |Q       V|
|
  14+30       8.9751     16.65  |         |         | Q       V
|
  14+45       9.3157     16.49  |         |         |Q         V
|
  15+ 0       9.6462     16.00  |         |         |Q        | V
|
  15+15       9.9627     15.32  |         |         Q         |  V
|
  15+30      10.2652     14.64  |         |        Q|         |   V
|
  15+45      10.5217     12.41  |         |     Q   |         |    V
|
  16+ 0      10.7629     11.67  |         |    Q    |         |     V
|
  16+15      10.8581      4.61  |     Q   |         |         |     V
|
  16+30      10.8990      1.98  | Q       |         |         |     V
|
  16+45      10.9325      1.62  | Q       |         |         |      V
|
  17+ 0      10.9632      1.49  |Q        |         |         |      V
|
```

```
   17+15      11.0088      2.21  | Q       |         |         |      V
|
   17+30      11.0600      2.48  |  Q      |         |         |      V
|
   17+45      11.1111      2.48  |  Q      |         |         |      V
|
   18+ 0      11.1548      2.12  | Q       |         |         |      V
|
   18+15      11.1958      1.98  | Q       |         |         |      V
|
   18+30      11.2367      1.98  | Q       |         |         |       V
|
   18+45      11.2702      1.62  | Q       |         |         |       V
|
   19+ 0      11.2934      1.12  |Q        |         |         |       V
|
   19+15      11.3214      1.35  |Q        |         |         |       V
|
   19+30      11.3595      1.85  | Q       |         |         |       V
|
   19+45      11.3930      1.62  | Q       |         |         |       V
|
   20+ 0      11.4162      1.12  |Q        |         |         |       V
|
   20+15      11.4442      1.35  |Q        |         |         |       V
|
   20+30      11.4749      1.49  |Q        |         |         |       V
|
   20+45      11.5056      1.49  |Q        |         |         |       V
|
   21+ 0      11.5288      1.12  |Q        |         |         |
V|
   21+15      11.5567      1.35  |Q        |         |         |
V|
   21+30      11.5800      1.12  |Q        |         |         |
V|
   21+45      11.6079      1.35  |Q        |         |         |
V|
   22+ 0      11.6312      1.12  |Q        |         |         |
V|
   22+15      11.6591      1.35  |Q        |         |         |
V|
   22+30      11.6823      1.12  |Q        |         |         |
V|
   22+45      11.7028      0.99  |Q        |         |         |
V|
   23+ 0      11.7233      0.99  |Q        |         |         |
V|
   23+15      11.7437      0.99  |Q        |         |         |
V|
   23+30      11.7642      0.99  |Q        |         |         |
V|
   23+45      11.7847      0.99  |Q        |         |         |
V|
```

```
   24+ 0      11.8051      0.99  |Q        |         |         |
V|
   24+15      11.8107      0.27  Q         |         |         |
V
-----------------------------------------------------------------------
```

Appendix B
FIRMs 06065C0760G, 06065C0770G, and 06065C0790G

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

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Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

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Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

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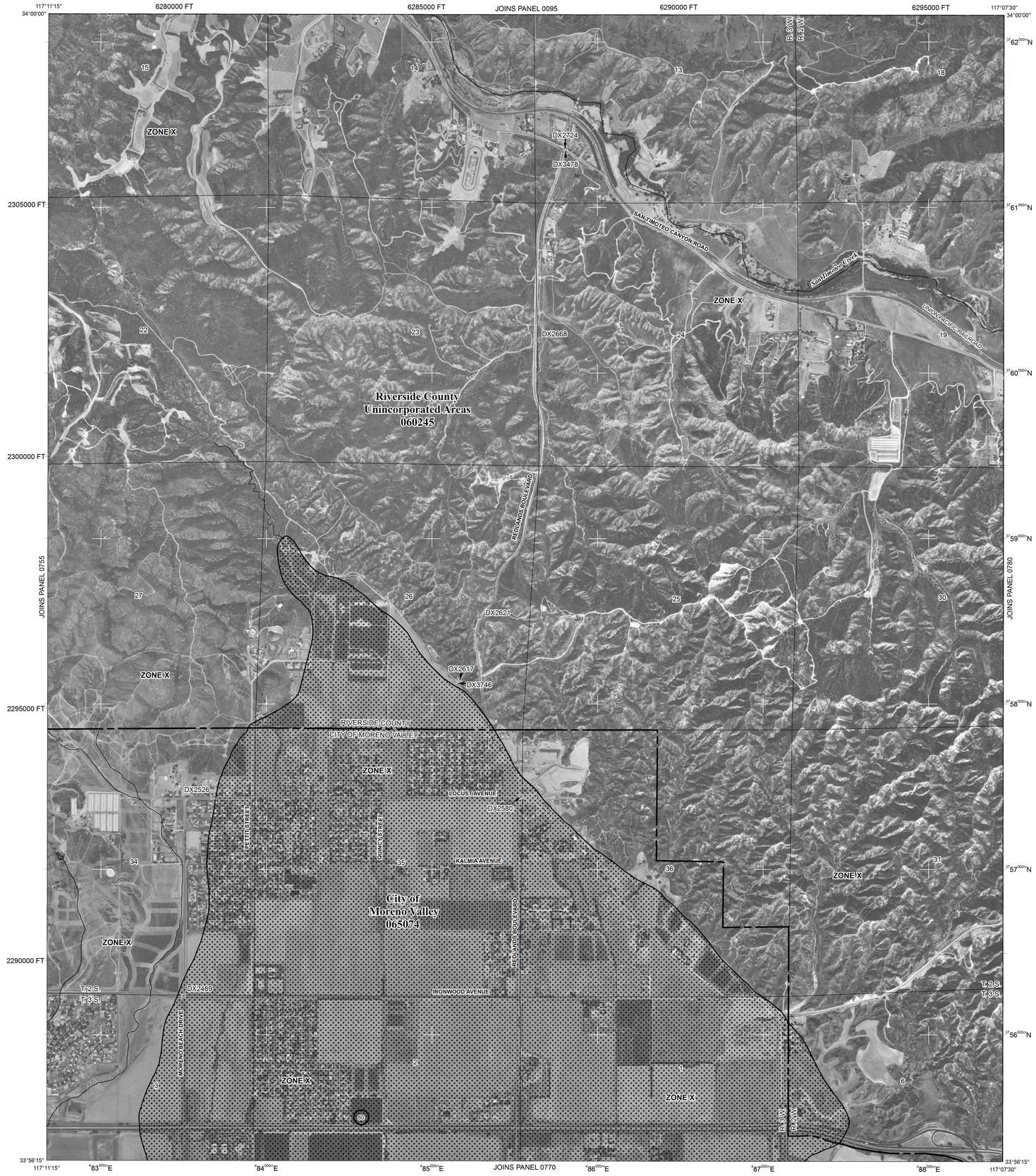

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(23)- - - - -(23)	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
3976000mN	1000-meter Universal Transverse Mercator grid values, zone 11N
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
●M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0760G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 760 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MORENO VALLEY, CITY OF	065074	0760	G
RIVERSIDE COUNTY	060245	0760	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C0760G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

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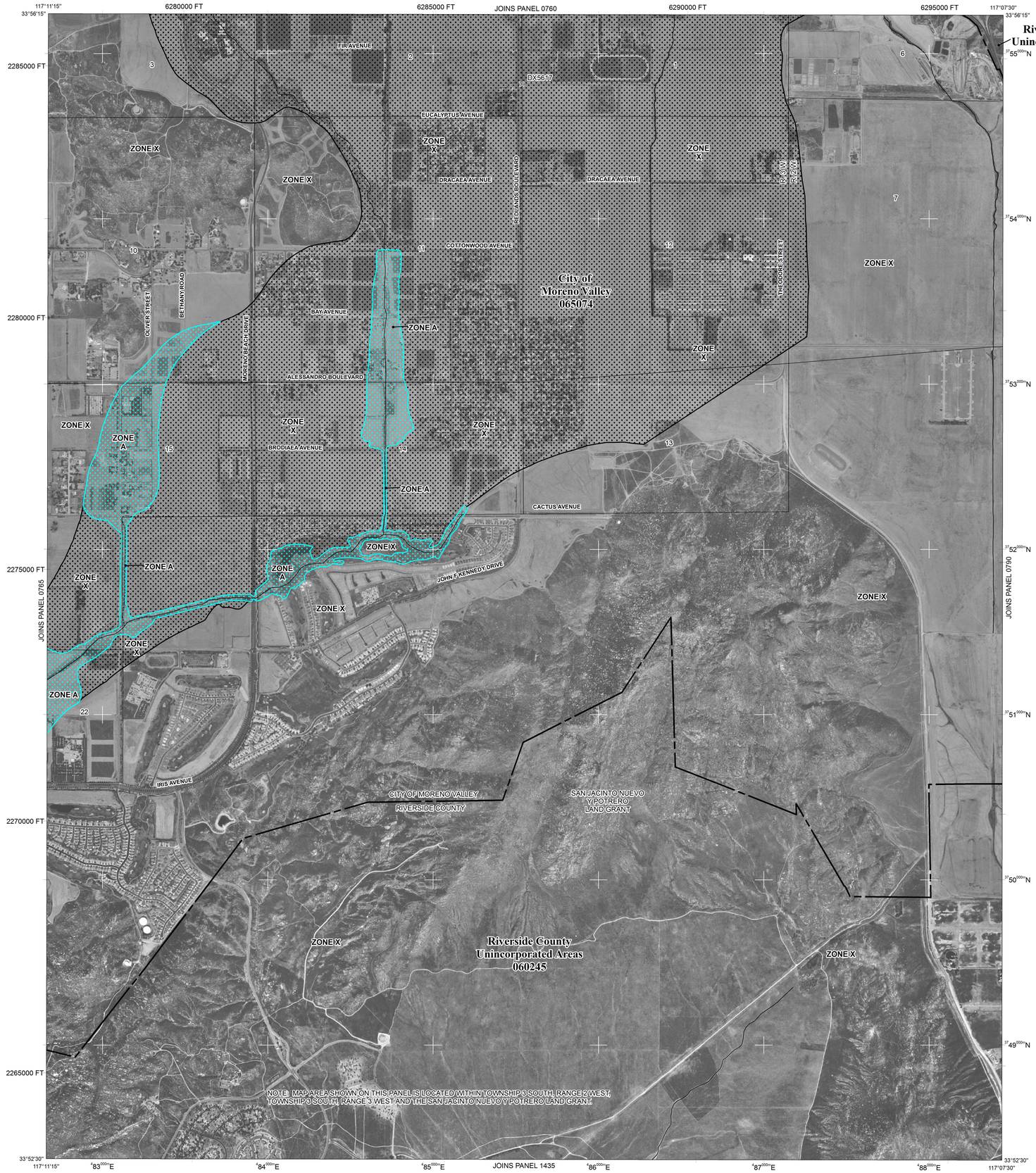

LEGEND

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0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

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$^{3}76^{000m}$N	1000-meter Universal Transverse Mercator grid values, zone 11N
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●M1.5	River Mile

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EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0770G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 770 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MORENO VALLEY, CITY OF	065074	0770	G
RIVERSIDE COUNTY	060245	0770	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C0770G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later.

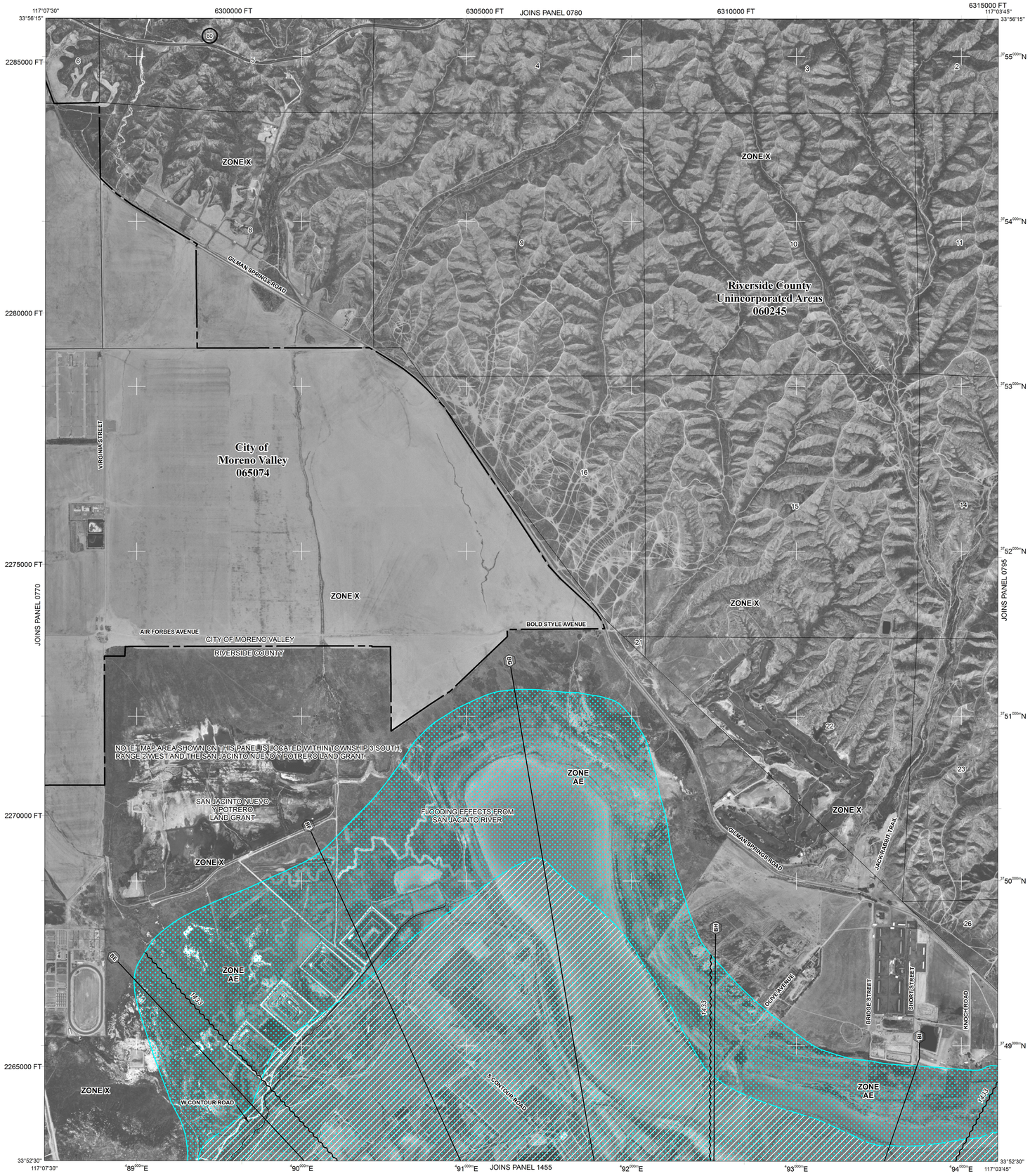
This map may reflect more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - 23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
2976000mN	1000-meter Universal Transverse Mercator grid values, zone 11N
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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N

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0790G

FIRM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 790 OF 3805

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MORENO VALLEY, CITY OF	065074	0790	G
RIVERSIDE COUNTY	060245	0790	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06065C0790G

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

Appendix C
Bulking Factor (Fb) Calculations and Pipe Sizing

Bulking Factor (Fb) Calculations

Watershed	Tributary Area	P(in)	PX100	A (ac)	A (mi2)	Elev Diff (ft)	L (ft)	L (mi)	RR (ft/mi)	FF	Log(Dy)	Unit Dy (cy/mi2)
"A"	A1	1.2	120	872.6	1.36	850	15000	2.835	299.82	4	3.896	7879.005
	A2	1.2	120	248.3	0.39	460	5000	0.945	486.77	4	3.929	8486.053
	A3	1.2	120	521.4	0.81	470	7200	1.3608	345.39	4	3.894	7839.833
	A4	1.2	120	841.7	1.32	120	12000	2.268	52.91	4	3.427	2670.483
"B"	B1	1.2	120	397.8	0.62	212	9460	1.78794	118.57	4	3.585	3848.371
	B2	1.2	120	104.5	0.16	30	2120	0.40068	74.87	4	3.357	2275.042
	B3	1.2	120	92.1	0.14	226	3800	0.7182	314.68	4	3.734	5416.386
	B4	1.2	120	765	1.20	239	11400	2.1546	110.93	4	3.618	4153.806
"C"	C1	1.2	120	403.1	0.63	700	9900	1.8711	374.11	4	3.896	7865.073
	C2-C8, C22, C42, C52	1.2	120	420.2	0.66	122	5100	0.9639	126.57	4	3.607	4047.000
	C21	1.2	120	180.1	0.28	547	5800	1.0962	499.00	4	3.910	8133.561
	C41	1.2	120	61.6	0.10	219	2300	0.4347	503.80	4	3.829	6745.127
	C51	1.2	120	12.7	0.02	129	1160	0.21924	588.40	4	3.747	5589.177
"D"	D1	1.2	120	443.5	0.69	857	13900	2.6271	326.22	4	3.866	7349.897
	D2	1.2	120	183.8	0.29	461	4950	0.93555	492.76	4	3.908	8099.963
	D3	1.2	120	139.2	0.22	74	4340	0.82026	90.22	4	3.430	2689.036
	D4	1.2	120	231.3	0.36	110	4400	0.8316	132.28	4	3.572	3735.390
"E"	E1	1.2	120	1648.5	2.58	815	14430	2.72727	298.83	4	3.945	**8816.782**
	E21	1.2	120	780.8	1.22	877	14080	2.66112	329.56	4	3.913	8189.262
	E2, E3, E22	1.2	120	80.4	0.13	53	1850	0.34965	151.58	4	3.526	3360.564
"F"	F1,F3,F32,F4, F6, F8	1.2	120	144.2	0.23	85	3020	0.57078	148.92	4	3.567	3692.416
	F2	1.2	120	54.7	0.09	330	3200	0.6048	545.63	4	3.841	6937.210
	F31	1.2	120	17.5	0.03	139	1610	0.30429	456.80	4	3.704	5061.106
	F5	1.2	120	146.6	0.23	408	5600	1.0584	385.49	4	3.825	6678.798
	F7	1.2	120	69.5	0.11	285	3750	0.70875	402.12	4	3.778	5994.089

Pick the Max Unit Dy from above 9578.778 as input to equation Fb= 1+ (Dy/120,000)

Bulking Factor	1.073
Safety Factor	50%
Final Bulking Factor	**1.6**

Worksheet for LineA

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Bottom Width	12.00	ft
Discharge	2993.00	ft^3/s

Results

Normal Depth	7.87	ft
Flow Area	94.41	ft^2
Wetted Perimeter	27.74	ft
Hydraulic Radius	3.40	ft
Top Width	12.00	ft
Critical Depth	12.46	ft
Critical Slope	0.00633	ft/ft
Velocity	31.70	ft/s
Velocity Head	15.62	ft
Specific Energy	23.49	ft
Froude Number	1.99	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	7.87	ft
Critical Depth	12.46	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00633	ft/ft

Worksheet for LineB

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Diameter	8.00	ft
Discharge	829.00	ft^3/s

Results

Normal Depth	5.13	ft
Flow Area	34.04	ft^2
Wetted Perimeter	14.86	ft
Hydraulic Radius	2.29	ft
Top Width	7.67	ft
Critical Depth	7.14	ft
Percent Full	64.1	%
Critical Slope	0.00976	ft/ft
Velocity	24.35	ft/s
Velocity Head	9.22	ft
Specific Energy	14.34	ft
Froude Number	2.04	
Maximum Discharge	1202.46	ft^3/s
Discharge Full	1117.83	ft^3/s
Slope Full	0.01100	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	64.11	%
Downstream Velocity	Infinity	ft/s

Worksheet for LineB

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	5.13	ft
Critical Depth	7.14	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00976	ft/ft

Worksheet for LineC

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Diameter	9.00	ft
Discharge	1428.00	ft^3/s

Results

Normal Depth	6.89	ft
Flow Area	52.25	ft^2
Wetted Perimeter	19.17	ft
Hydraulic Radius	2.73	ft
Top Width	7.63	ft
Critical Depth	8.57	ft
Percent Full	76.5	%
Critical Slope	0.01510	ft/ft
Velocity	27.33	ft/s
Velocity Head	11.61	ft
Specific Energy	18.50	ft
Froude Number	1.84	
Maximum Discharge	1646.17	ft^3/s
Discharge Full	1530.32	ft^3/s
Slope Full	0.01741	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	76.54	%
Downstream Velocity	Infinity	ft/s

Worksheet for LineC

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	6.89	ft
Critical Depth	8.57	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.01510	ft/ft

Worksheet for LineD

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Diameter	8.00	ft
Discharge	1144.00	ft^3/s

Results

Normal Depth	6.74	ft
Flow Area	45.19	ft^2
Wetted Perimeter	18.60	ft
Hydraulic Radius	2.43	ft
Top Width	5.83	ft
Critical Depth	7.71	ft
Percent Full	84.2	%
Critical Slope	0.01830	ft/ft
Velocity	25.32	ft/s
Velocity Head	9.96	ft
Specific Energy	16.70	ft
Froude Number	1.60	
Maximum Discharge	1202.46	ft^3/s
Discharge Full	1117.83	ft^3/s
Slope Full	0.02095	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	84.24	%
Downstream Velocity	Infinity	ft/s

Worksheet for LineD

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	6.74	ft
Critical Depth	7.71	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.01830	ft/ft

Worksheet for LineE_UsRCB

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Bottom Width	12.00	ft
Discharge	2170.00	ft^3/s

Results

Normal Depth	6.15	ft
Flow Area	73.84	ft^2
Wetted Perimeter	24.31	ft
Hydraulic Radius	3.04	ft
Top Width	12.00	ft
Critical Depth	10.05	ft
Critical Slope	0.00564	ft/ft
Velocity	29.39	ft/s
Velocity Head	13.42	ft
Specific Energy	19.57	ft
Froude Number	2.09	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	6.15	ft
Critical Depth	10.05	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00564	ft/ft

Worksheet for LineE_LatPipe

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Diameter	8.00	ft
Discharge	1034.00	ft^3/s

Results

Normal Depth	6.08	ft
Flow Area	40.96	ft^2
Wetted Perimeter	16.93	ft
Hydraulic Radius	2.42	ft
Top Width	6.84	ft
Critical Depth	7.57	ft
Percent Full	75.9	%
Critical Slope	0.01481	ft/ft
Velocity	25.25	ft/s
Velocity Head	9.90	ft
Specific Energy	15.98	ft
Froude Number	1.82	
Maximum Discharge	1202.46	ft^3/s
Discharge Full	1117.83	ft^3/s
Slope Full	0.01711	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	75.94	%
Downstream Velocity	Infinity	ft/s

Worksheet for LineE_LatPipe

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	6.08	ft
Critical Depth	7.57	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.01481	ft/ft

Worksheet for LineE_DsRCB

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Bottom Width	12.00	ft
Discharge	3121.00	ft^3/s

Results

Normal Depth	8.13	ft
Flow Area	97.54	ft^2
Wetted Perimeter	28.26	ft
Hydraulic Radius	3.45	ft
Top Width	12.00	ft
Critical Depth	12.81	ft
Critical Slope	0.00643	ft/ft
Velocity	32.00	ft/s
Velocity Head	15.91	ft
Specific Energy	24.04	ft
Froude Number	1.98	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	8.13	ft
Critical Depth	12.81	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00643	ft/ft

Worksheet for LineF

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.02000	ft/ft
Diameter	8.00	ft
Discharge	666.00	ft^3/s

Results

Normal Depth	4.45	ft
Flow Area	28.70	ft^2
Wetted Perimeter	13.46	ft
Hydraulic Radius	2.13	ft
Top Width	7.95	ft
Critical Depth	6.54	ft
Percent Full	55.6	%
Critical Slope	0.00713	ft/ft
Velocity	23.21	ft/s
Velocity Head	8.37	ft
Specific Energy	12.82	ft
Froude Number	2.15	
Maximum Discharge	1202.46	ft^3/s
Discharge Full	1117.83	ft^3/s
Slope Full	0.00710	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	55.58	%
Downstream Velocity	Infinity	ft/s

Worksheet for LineF

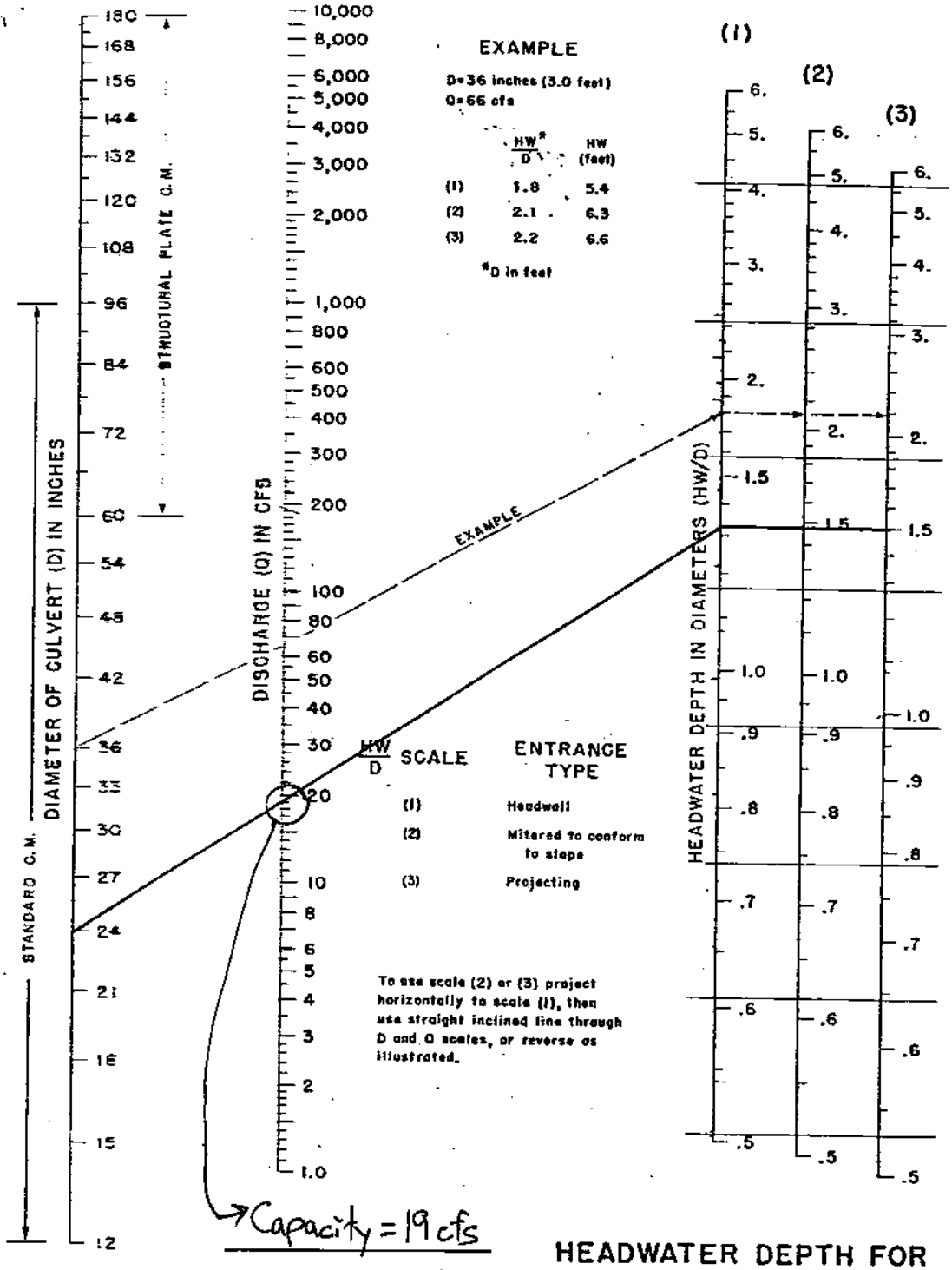
GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	4.45	ft
Critical Depth	6.54	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00713	ft/ft

Appendix D
Gilman Springs Road Culvert Capacity Analysis

Culvert #1
Node #341 - 24" CMP
$H_w = 3' \Rightarrow H_w/D = 1.5$

CHART 5

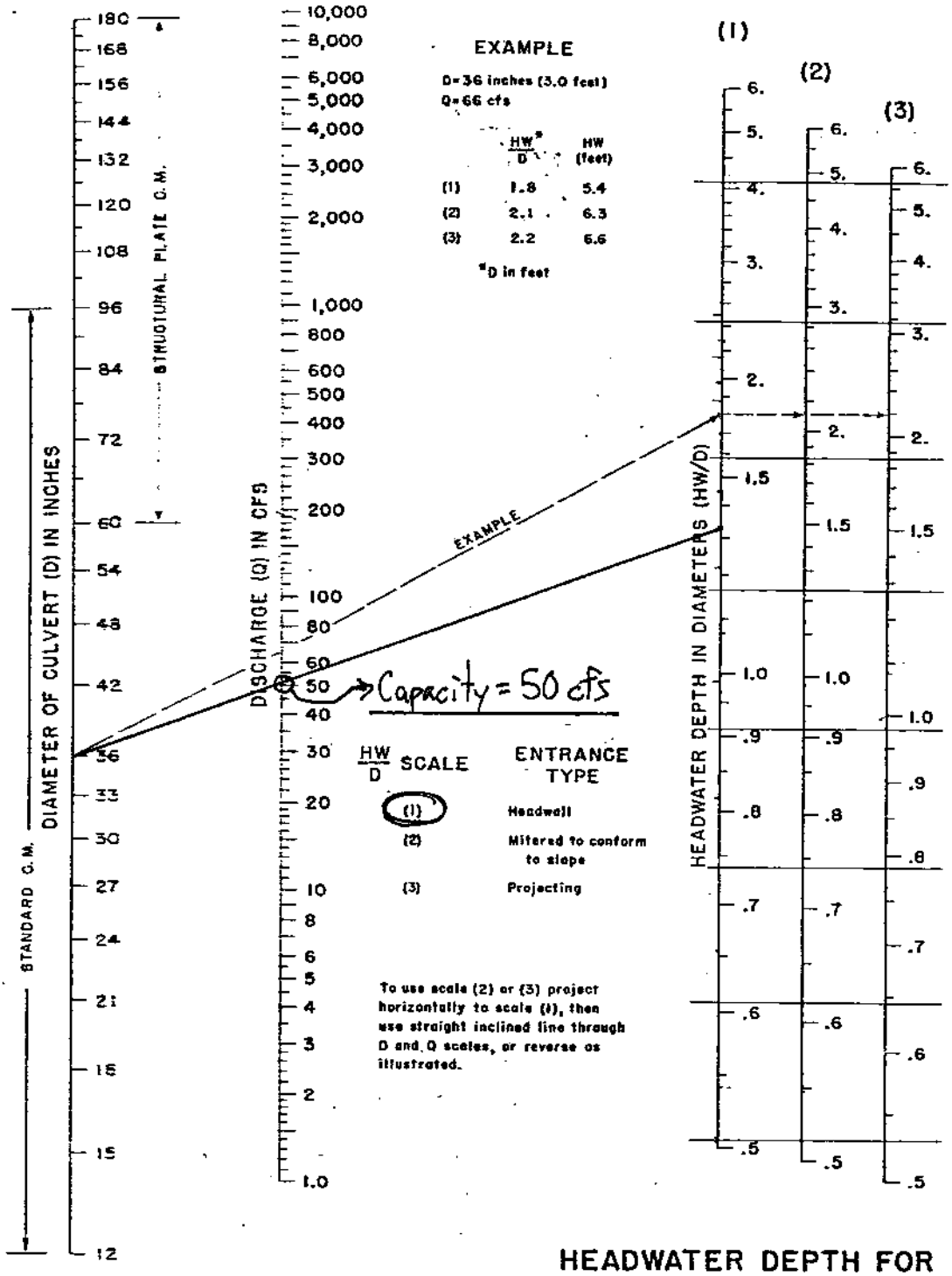


HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Culvert #2
Node #351 - 36" CMP
$H_w = 4' \Rightarrow H_w/D = 1.33$

CHART 5



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

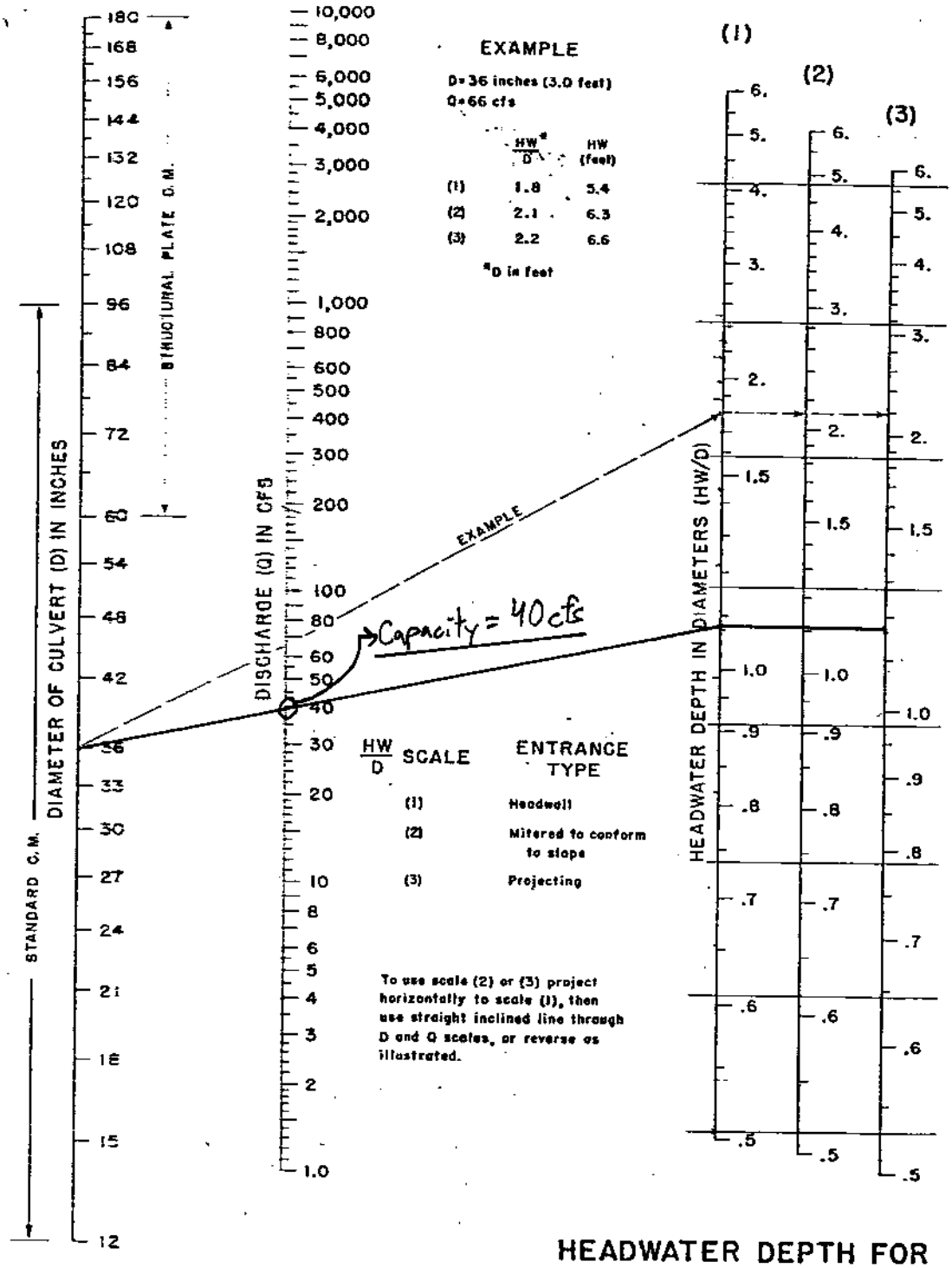
BUREAU OF PUBLIC ROADS JAN. 1963

Culvert #3

Node #51 - 36" CMP

Hw = 3.5 ⇒ Hw/D = 1.17

CHART 5

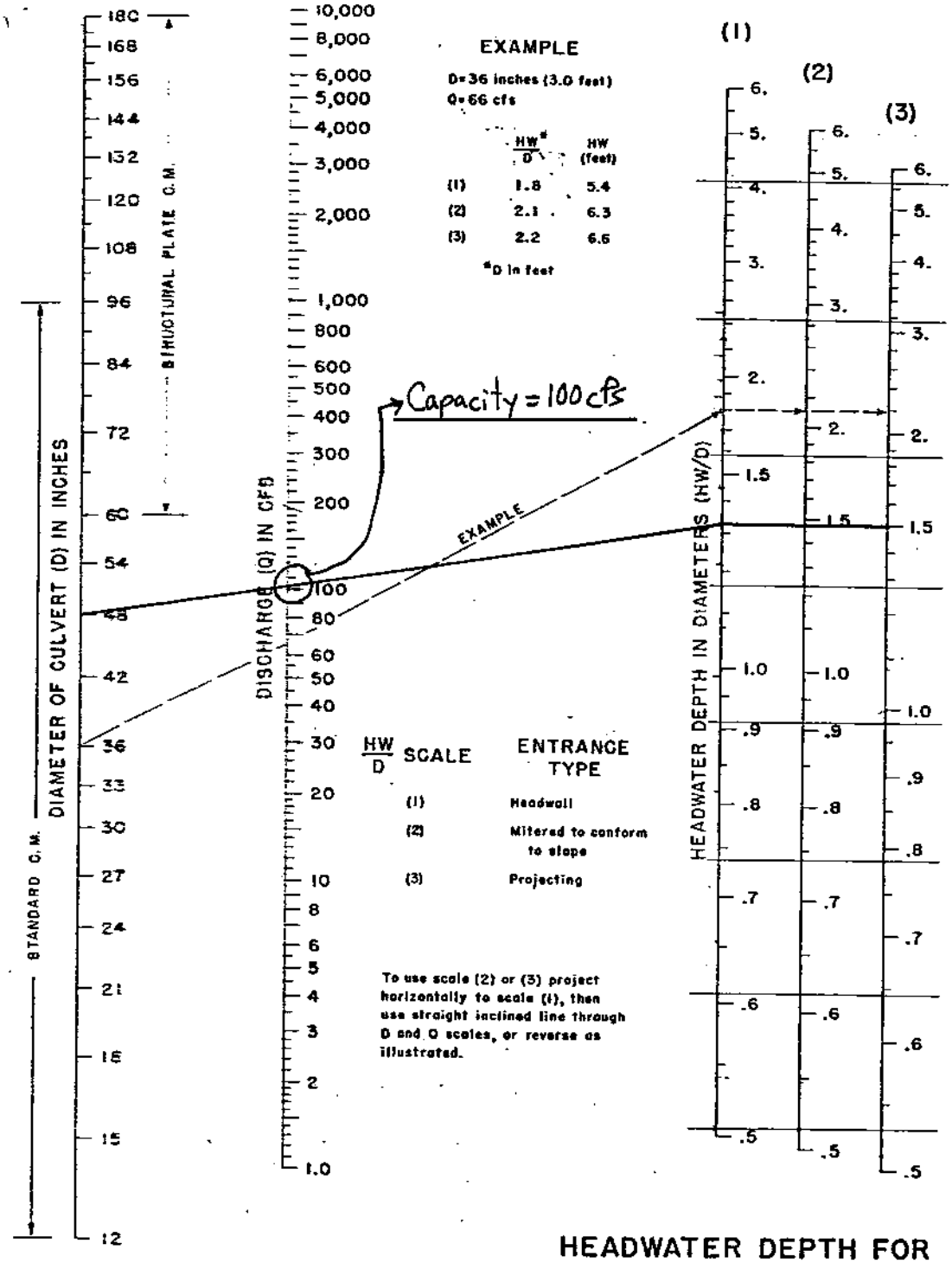


HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Culvert # 4
Node #52 - 48" CMP
Hw = 6' ⇒ Hw/D = 1.5

CHART 5



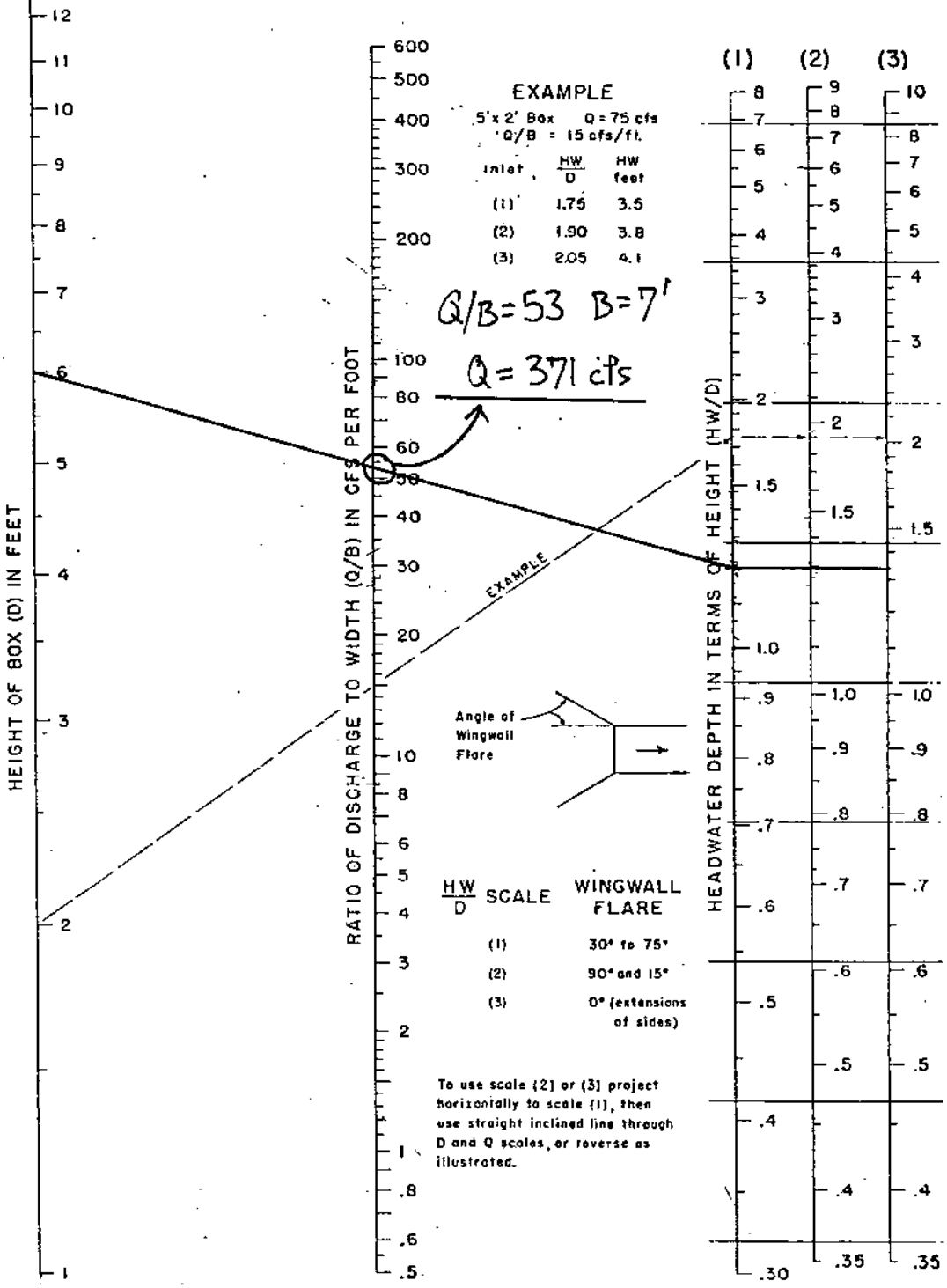
HEADWATER DEPTH FOR
C. M. PIPE CULVERTS
WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Culvert # 5
Node #71 - 7'(w) x 6'(h)

$H_w = 8' \Rightarrow H_w/D = 1.33$

CHART I



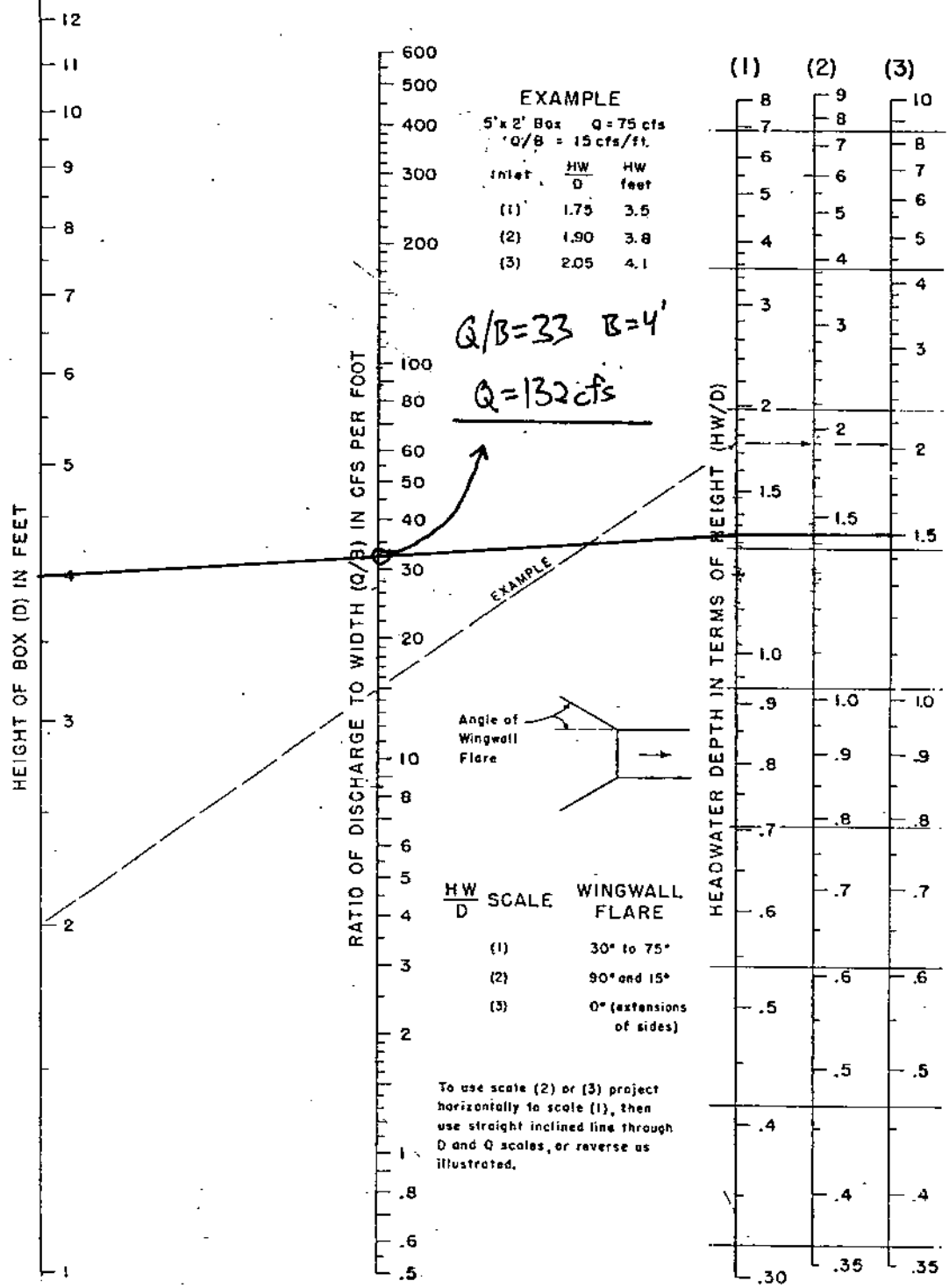
HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Culvert #6
Node # 721 - 4'x4' RCB

$H_w = 6' \Rightarrow H_w/D = 1.5$

CHART I



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

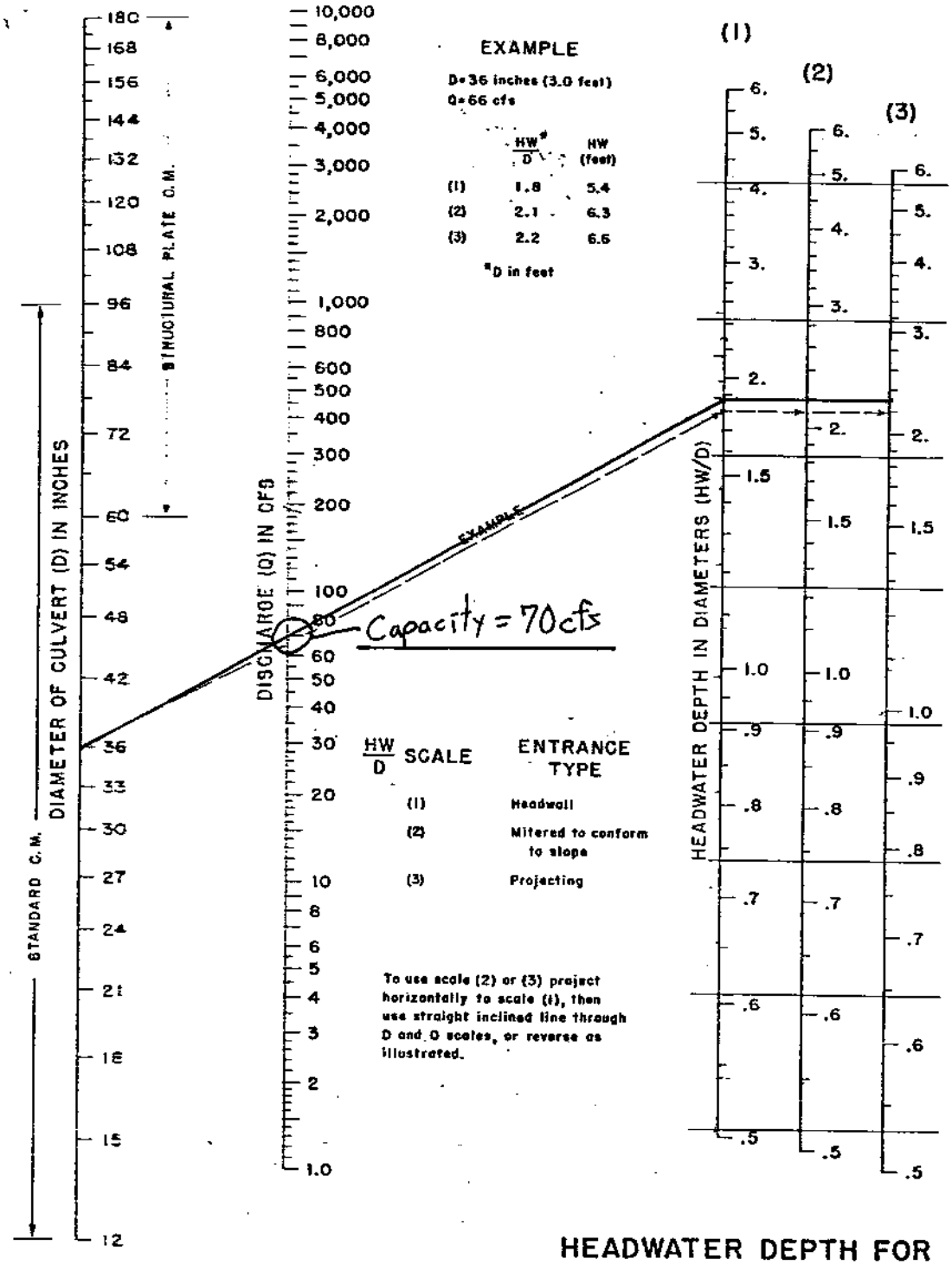
BUREAU OF PUBLIC ROADS JAN. 1963

Culvert #7

Node # 921 - 36" CMP

$H_w = 7' \Rightarrow H_w/D = 2.33$

CHART 5

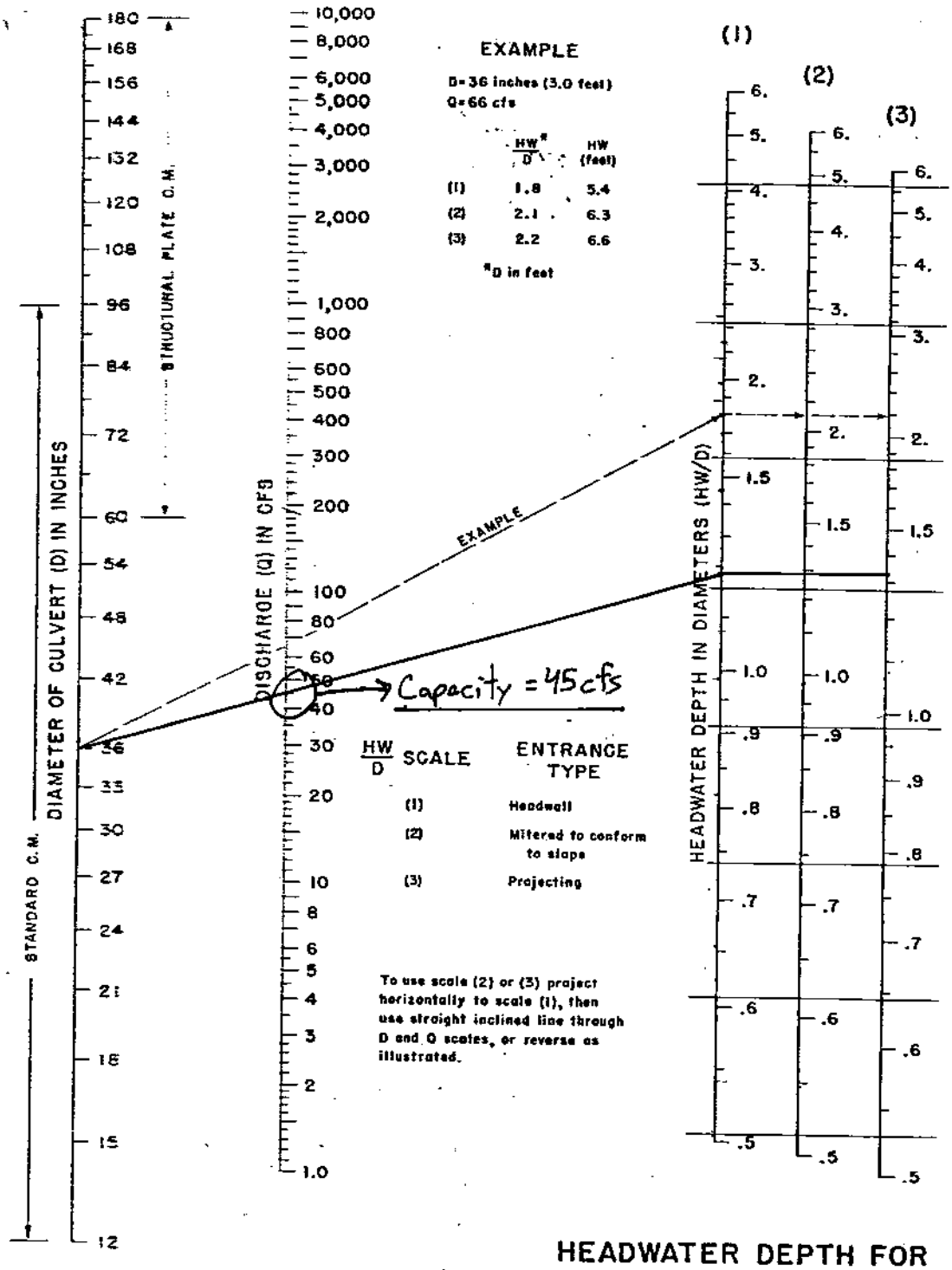


HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Culvert #8
Node #91 - 36" CMP
Hw = 4' ⇒ Hw/D = 1.33

CHART 5

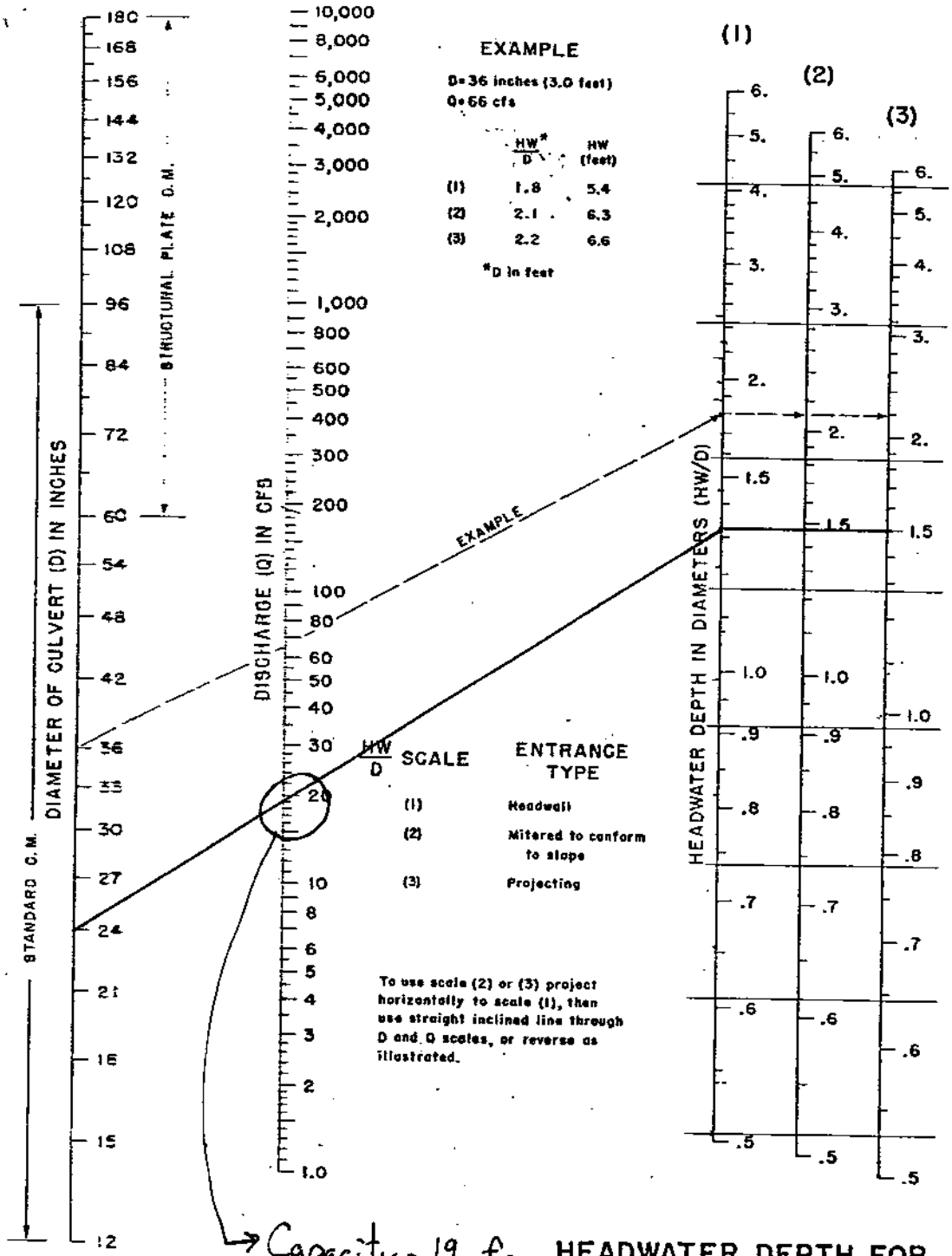


HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Culvert # 9
Node # 101 - 24" CMP
Hw = 3' ⇒ Hw/D = 1.5

CHART 5



Capacity = 19 cfs

HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

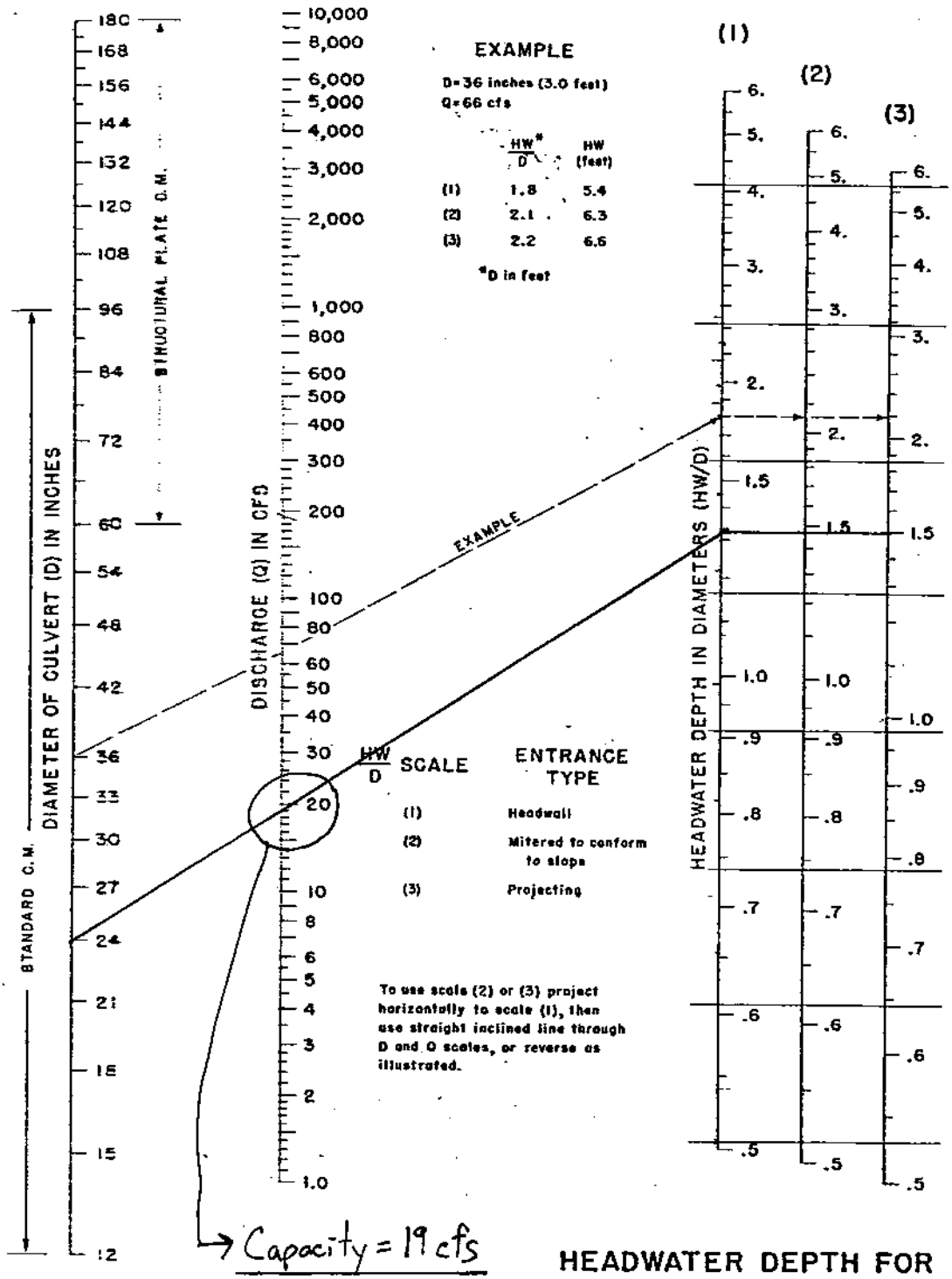
BUREAU OF PUBLIC ROADS JAN 1963

Culvert #10

Node #111 - 24" CMP

Hw = 3' ⇒ Hw/D = 1.5

CHART 5



Capacity = 19 cfs

HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E
Sediment Yield Calculations

Sediment Yield Calculations

Watershed	Tributary Area	P(in)	PX100	A (ac)	A (mi2)	Elev Diff (ft)	L (ft)	L (mi)	RR (ft/mi)	FF	Adjustment Factor	Log(Dy)	Unit Dy (cy/mi2)	Adjusted Unit Dy	Debris (cy)
"A"	A1	1.2	120	872.6	1.36	850	15000	2.835	299.82	4	0.5	3.896	7879.005	3939.503	5373
	A2	1.2	120	248.3	0.39	460	5000	0.945	486.77	4	0.5	3.929	8486.053	4243.027	1647
	A3	1.2	120	521.4	0.81	470	7200	1.3608	345.39	4	0.5	3.894	7839.833	3919.916	3195
	A4	1.2	120	841.7	1.32	120	12000	2.268	52.91	4	1	3.427	2670.483	2670.483	3513
														Sub Total	13727
"B"	B1	1.2	120	397.8	0.62	212	9460	1.78794	118.57	4	1	3.585	3848.371	3848.371	2393
	B2	1.2	120	104.5	0.16	30	2120	0.40068	74.87	4	1	3.357	2275.042	2275.042	372
	B3	1.2	120	92.1	0.14	226	3800	0.7182	314.68	4	0.5	3.734	5416.386	2708.193	390
	B4	1.2	120	765	1.20	239	11400	2.1546	110.93	4	1	3.618	4153.806	4153.806	4967
														Sub Total	8121
"C"	C1	1.2	120	403.1	0.63	700	9900	1.8711	374.11	4	0.5	3.896	7865.073	3932.537	2478
	C2-C8, C22, C42, C52	1.2	120	420.2	0.66	122	5100	0.9639	126.57	4	1	3.607	4047.000	4047.000	2658
	C21	1.2	120	180.1	0.28	547	5800	1.0962	499.00	4	0.5	3.910	8133.561	4066.781	1145
	C41	1.2	120	61.6	0.10	219	2300	0.4347	503.80	4	0.5	3.829	6745.127	3372.563	325
	C51	1.2	120	12.7	0.02	129	1160	0.21924	588.40	4	0.5	3.747	5589.177	2794.588	55
														Sub Total	380
"D"	D1	1.2	120	443.5	0.69	857	13900	2.6271	326.22	4	0.5	3.866	7349.897	3674.949	2547
	D2	1.2	120	183.8	0.29	461	4950	0.93555	492.76	4	0.5	3.908	8099.963	4049.981	1163
	D3	1.2	120	139.2	0.22	74	4340	0.82026	90.22	4	1	3.430	2689.036	2689.036	585
	D4	1.2	120	231.3	0.36	110	4400	0.8316	132.28	4	1	3.572	3735.390	3735.390	1350
														Sub Total	5646
"E"	E1	1.2	120	1648.5	2.58	815	14430	2.72727	298.83	4	0.5	3.945	**8816.782**	4408.391	11359
	E21	1.2	120	780.8	1.22	877	14080	2.66112	329.56	4	0.5	3.913	8189.262	4094.631	4997
	E2, E3, E22	1.2	120	80.4	0.13	53	1850	0.34965	151.58	4	1	3.526	3360.564	3360.564	422
														Sub Total	16778
"F"	F1,F3,F32,F4, F6, F8	1.2	120	144.2	0.23	85	3020	0.57078	148.92	4	1	3.567	3692.416	3692.416	832
	F2	1.2	120	54.7	0.09	330	3200	0.6048	545.63	4	0.5	3.841	6937.210	3468.605	297
	F31	1.2	120	17.5	0.03	139	1610	0.30429	456.80	4	0.5	3.704	5061.106	2530.553	69
	F5	1.2	120	146.6	0.23	408	5600	1.0584	385.49	4	0.5	3.825	6678.798	3339.399	765
	F7	1.2	120	69.5	0.11	285	3750	0.70875	402.12	4	0.5	3.778	5994.089	2997.044	326
														Sub Total	2289
	Total														**46942**

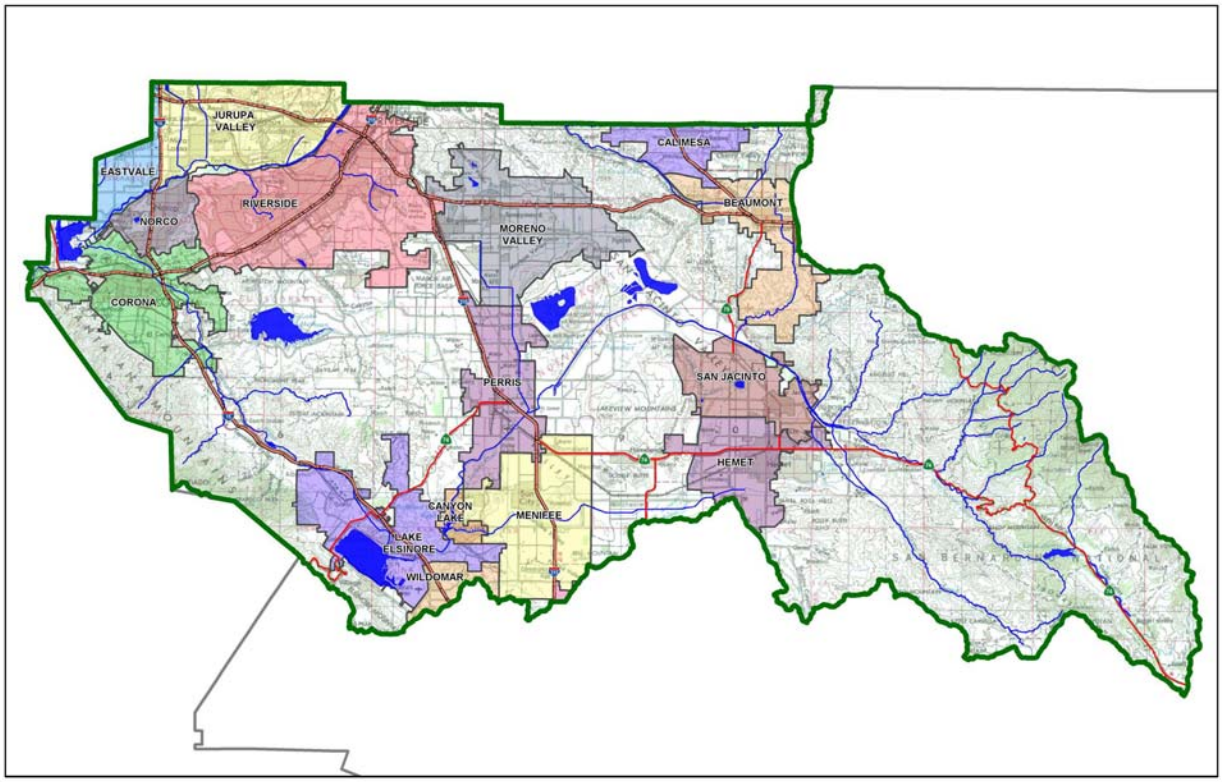
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: World Logistics Center Specific Plan

Development No: TBD

Design Review/Case No: TBD



Contact Information:

Prepared for:
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(951) 867-5300

☒ **Preliminary**
☐ **Final**

Original Date Prepared: November 2012

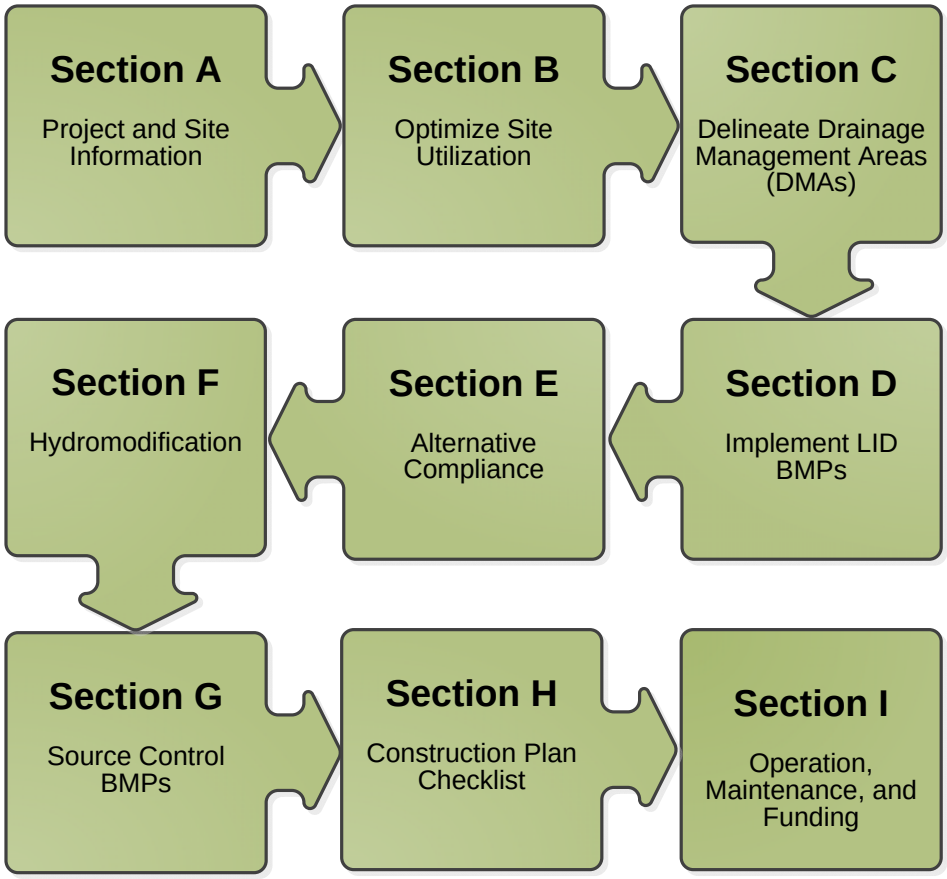
Revision Date(s): TBD

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

Prepared by: CH2M HILL
6 Hutton Centre Drive, Suite 700
Santa Ana, California 92707
(714) 429-2000
Wilfred Hsu, Project Manager

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Highland Fairview by CH2M HILL for the World Logistics Center Specific Plan project.

This WQMP is intended to comply with the requirements of the City of Moreno Valley for Municipal Code Section 8.10 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Moreno Valley Water Quality Ordinance Water Quality Ordinance (Municipal Code Section 8.10).

At the time of the Final WQMP, the undersigned will be authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Moreno Valley Water Quality Ordinance (Municipal Code Section 8.10).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	Date
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

The proposed World Logistics Center Specific Plan is a master plan for the development of logistics warehouse distribution facilities on approximately 2,710 acres of land in the Rancho Belago area of eastern Moreno Valley. The Specific Plan proposes the development of approximately 41.4 million square feet of high-cube logistics facilities on 2,606 acres, 200,000 square feet of general warehousing facilities on 29 acres, an in-project fueling station, and 75 acres of permanent open space.

The Specific Plan area is situated southerly of State Route 60, generally between Redlands Boulevard and Gilman Springs Road (the easterly City limit). The Specific Plan extends to, but does not include, the San Jacinto Wildlife Area (SJWA). The General Plan Amendment and Zone Change which accompany the Specific Plan do include the SJWA property in order to designate the SJWA land for open space use.

Within the Specific Plan the primary land use category will be Logistics Development. This use will provide for high-cube logistics warehouse space consisting of buildings of 500,000 square feet or greater. Warehousing and logistics activities consistent with the storage and processing of manufactured goods and materials prior to their distribution to other facilities and retail outlets will be permitted within this category. Ancillary office and maintenance space will be permitted, along with the outdoor storage of trucks, trailers, and shipping containers. The Light Logistics land use category provides for general warehouse, self-storage and vehicle storage uses. Figure A.1 depicts the proposed Land Use Plan.

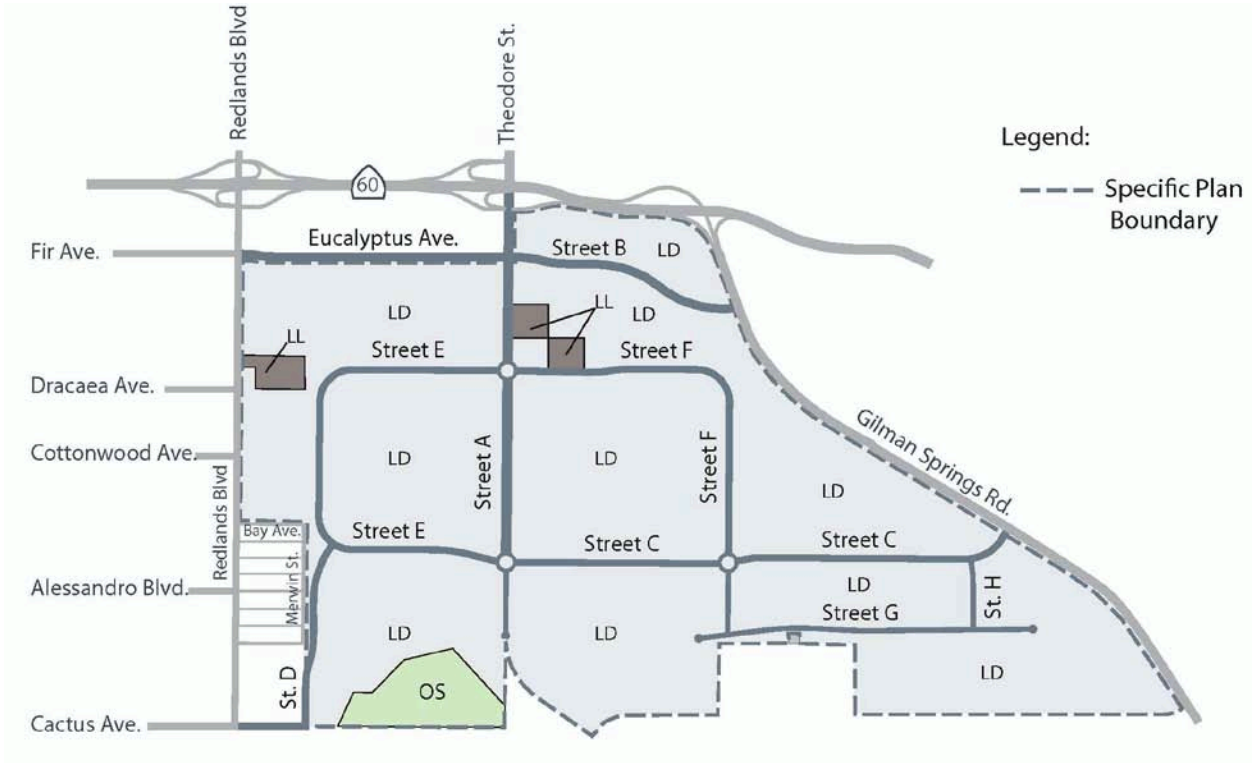


Figure A.1 Land Use Map

PROJECT INFORMATION	
Type of Project:	Logistics Development
Planning Area:	World Logistics Center
Community Name:	World Logistics Center
Development Name:	World Logistics Center
PROJECT LOCATION	
Latitude & Longitude (DMS): 33°55'58"N, 117° 8'23"W	
Project Watershed and Sub-Watershed: Santa Ana Watershed and San Jacinto Watershed	
APN(s): N/A	
Map Book and Page No.: Riverside County Page 718: Grids F, G, H, J, 2, 3, 4, 5, 6; Page 719: Grids A, B, C, D, 3, 4, 5, 6	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Logistics, Light Logistics
Proposed or Potential SIC Code(s)	1541 – General Contractors – Industrial Buildings and Warehouses
Area of Impervious Project Footprint (SF)	TBD during final WQMP
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	TBD during final WQMP
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☒ Y ☐ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	TBD during final WQMP
Is the project located within any MSHCP Criteria Cell?	☒ Y ☐ N
If so, identify the Cell number:	1297
Are there any natural hydrologic features on the project site?	☒ Y ☐ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	
What is the Water Quality Design Storm Depth for the project?	0.68 inch

A.1 Maps and Site Plans

Appendix 1 of this Project-Specific WQMP includes:

1. A Vicinity Map identifying the project site and surrounding planning areas in sufficient detail to allow the project site to be plotted on Co-Permittee base mapping;
2. A Receiving Waters Map identifying the locations of receiving waters to which the project directly or indirectly discharges; and
3. A Site Plan for the project. The following project features are not depicted in the current World Logistics Center Specific Plan Site Plan, but will be included in the final Project-Specific WQMP:

   - Drainage Management Areas
   - Drainage Path
   - Drainage Infrastructure, Inlets, Overflows
   - Location and identification of all structural BMPs, including LID and Treatment Control and Source Control BMPs;

- Landscaped areas;
- Impervious surfaces including paved areas and intended uses (i.e., parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.);
- Number and type of structures and intended uses (i.e., buildings, rooflines and downspouts, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.);
- Infrastructure (i.e., streets, storm drains, etc.) that will revert to public agency ownership and operation;
- Location of existing and proposed public and private storm drainage facilities (i.e., storm drains, channels, basins, etc.), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated;
- Location of points where onsite (or tributary offsite) flows exit the property/project site;
- Proposed drainage areas boundaries, including tributary offsite areas, for each location where flows exits the property/project site. Each tributary area should be clearly denoted;
- Pre- and post-project topography.

A.2 Identify Receiving Waters

The World Logistics Center Specific Plan project is immediately tributary to the Perris Valley (802.11) and Gilman Hot Springs (802.21) hydrologic unit basin numbers. Flows from the project site eventually drain south to the San Jacinto River. The San Jacinto River flows southwest and has been dammed to form Canyon Lake, which drains to Lake Elsinore. The Table A.1 lists each of the successive receiving waters and the pollutants for which the receiving waters are impaired, according to the Clean Water Act Section 303(d) list (2006).

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
San Jacinto River	None	All uses considered Intermittent MUN, AGR, GWR, REC1, REC2, WARM, WILD	Approx. 2 miles to RARE-designated San Jacinto Wildlife Preserve
Canyon Lake (Railroad Canyon Reservoir)	Nutrients, Pathogens	MUN, AGR, GWR, REC1, REC2, WARM, WILD	Not RARE
Lake Elsinore	Nutrients, Organic Enrichment/Low Dissolved Oxygen, PCBs, Unknown Toxicity	MUN, REC1, REC2, WARM, WILD	Not RARE

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☒ Y	☐ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☒ Y	☐ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ TBD	☐

US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ TBD	☐
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☒ Y	☐ N
Other *(please list in the space below as required)* State Water Resources Control Board General Permit – Construction City of Moreno Valley Building Permit City of Moreno Valley Grading Permit	 ☒ Y ☒ Y ☒ Y	 ☐ N ☐ N ☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

During preparation of the final WQMP a review of the information collected in Section 'A' will be made to identify the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, constraints might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. Opportunities might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). A brief narrative for each of the site optimization strategies is described below and will be included in the final WQMP. This narrative helps with the LID design and explains the design decisions.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, the narrative in the final WQMP will identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Opportunities that exist which will be utilized during project design will be noted. Upon completion of identifying Constraints and Opportunities as part of the final WQMP, they will be included on the WQMP Site plan in Appendix 1 in the final WQMP.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will also be used in preparation of the final WQMP to determine how best to optimize the final site layout and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

The majority of the project site is agricultural and currently sheet flows to small earthen ditches. Under the proposed condition which will require mass grading, most of these natural ditches will be removed, with the exception of one natural drainage course, Line H. This natural drainage course, located at the eastern portion of the project, will be maintained under the proposed condition.

Did you identify and protect existing vegetation? If so, how? If not, why?

There are 75 acres of natural areas that will be conserved as undisturbed open space. Although most of the project area is agricultural and will require mass grading, some existing native trees and shrubs will be preserved in areas where there is no grading.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

Detention basins and/or infiltration basins will be proposed onsite where soil conditions are appropriate. The locations of these facilities are not shown in the Specific Plan phase, but will be shown in the final Project-Specific WQMP.

Did you identify and minimize impervious area? If so, how? If not, why?

A significant portion of the project will remain pervious for the purposes of landscaping, water quality treatment, and flood detention. The use of impervious surfaces for decorative purposes will be

minimized where possible. Street, sidewalk, and parking design will incorporate minimum street widths that still meet City requirements and emergency access requirements.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Runoff from impervious areas will sheet flow or be directed to LID or Treatment Control BMPs. Streets, sidewalks, and parking lots will sheet flow to landscaping/bioretention areas. All flows, including first flush and high flows, will sheet flow or be directed to LID or Treatment Control BMPs. Treatment Control BMPs will be designed to meet water quality and hydromodification requirements.

Site Optimization BMPs

Site Optimization BMPs are intended to create a hydrologically functional project design that attempts to mimic the natural hydrologic regime. In accordance with the Riverside County WQMP, project proponents shall implement Site Design concepts that achieve each of the following:

1) Minimize Urban Runoff
2) Minimize Impervious Footprint
3) Conserve Natural Areas
4) Minimize Directly Connected Impervious Areas (DCIAs)

Each Site Optimization concept is presented below, with a discussion of whether the design concept will be incorporated in the project. The locations of the Site Optimization BMPs are not shown in the current Specific Plan phase, but will be shown in the final Project-Specific WQMP.

Minimize Urban Runoff

The project will be designed to minimize urban runoff using the following Site Design concepts.

- Maximize the permeable area. A significant portion of the project will remain pervious for the purposes of landscaping, water quality treatment, and flood detention. By incorporating more pervious, lower Runoff Coefficient (C factor) surfaces into the project, lower volumes of runoff will be produced.
- Incorporate landscaped buffer areas between sidewalks and streets. Bioretention areas between sidewalks and streets will be incorporated and serve the dual purpose of landscaping and water quality treatment.
- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs. Although most of the project area will require mass grading, some existing native trees and shrubs will be preserved in areas where there is no grading. The planting and landscape will be designed to maximize water conservation, including the use of drought-tolerant or native planting.
- Use natural drainage systems. The majority of the project site currently sheet flows to small earthen ditches. Under the proposed condition, most of these natural ditches will be removed, with the exception of one natural drainage course, Line H. This natural drainage path, located at the eastern portion of the project, will be maintained under the proposed condition.
- Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration. Infiltration basins will be proposed where soil conditions are appropriate.
- Construct onsite ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives. Detention basins and/or infiltration basins will be

proposed onsite. The locations of these facilities are not shown in the Specific Plan phase, but will be shown in the final Project-Specific WQMP.

Minimize Impervious Footprint

The project will be designed to minimize impervious footprint using the following Site Optimization concepts.

- Maximize the permeable area. A significant portion of the project will remain pervious for the purposes of landscaping, water quality treatment, and flood control. By incorporating the aforementioned pervious, lower Runoff Coefficient (C factor) surfaces into the project, lower volumes of runoff will be produced.
- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised. Street, sidewalk, and parking design will incorporate minimum street widths that still meet City requirements and emergency access requirements.
- Reduce widths of street where off-street parking is available. Street design will incorporate minimum street widths that still meet City requirements and emergency access requirements.
- Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design. The use of impervious surfaces for decorative purposes will be minimized where possible.

Conserve Natural Areas

The project will be designed to conserve natural areas using the following Site Optimization concepts.

- Conserve natural areas. There are 75 acres of natural areas that will be conserved as undisturbed open space.
- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs. Although most of the project area will require mass grading, some existing native trees and shrubs will be preserved in areas where there is no grading. The planting and landscape will be designed to maximize water conservation, including the use of drought-tolerant or native planting.
- Use natural drainage systems. The majority of the project site currently sheet flows to small earthen ditches. Under the proposed condition, most of these natural ditches will be removed, with the exception of one natural drainage course, Line H. This natural drainage path, located at the eastern portion of the project, will be maintained under the proposed condition.

Minimize Directly Connected Impervious Areas

The project will be designed to minimize directly connected impervious areas using the following Site Optimization concepts.

- Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas, where feasible. Runoff from impervious areas will sheet flow or be directed to Treatment Control BMPs.
- Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping. Streets, sidewalks, and parking lots will sheet flow to landscaping/bioretention areas.
- Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales. Runoff from impervious areas will sheet flow to vegetated swales, bioretention areas, infiltration basins, and/or detention basins.

- Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings. Streets will sheet flow to adjacent landscaping/ bioretention areas.
- Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter. Streets will sheet flow to adjacent landscaping/bioretention areas.
- Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the MS4. Driveways will sheet flow to adjacent landscaping/bioretention areas.
- Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface, or designed to drain into landscaping prior to discharging to the MS4. Parking lots will sheet flow to adjacent landscaping/bioretention areas.
- Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design. Parking lots will sheet flow to adjacent landscaping/bioretention areas.

Section C: Delineate Drainage Management Areas (DMAs)

To be completed as part of the final Project Specific WQMP.

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	**Area (Sq. Ft.)**	**Stabilization Type**	**Irrigation Type (if any)**

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

The BMP strategy is to select Low Impact Development (LID) BMPs that promote infiltration and evapotranspiration, including infiltration basins, bioretention facilities, and extended detention basins. Generally infiltration BMPs have advantages over other types of BMPs, including reduction of the volume and rate of runoff, as well as full treatment of all potential pollutants potentially contained in the stormwater runoff. It is recognized however that infiltration may not be feasible on sites with low infiltration rates, or located on compacted engineered fill. If the BMP is considered in a fill condition, and the infiltration surface of the BMP cannot extend down into native soils, or if the BMP is considered in a cut condition, and there is no practicable way to verify infiltration rates at the final BMP elevation, infiltration BMPs will not be used. Prior to final design, infiltration tests shall be performed within the boundaries of the proposed infiltration BMP and at the bottom elevation (infiltration surface) of the proposed infiltration BMP to confirm the suitability of infiltration. In situations where infiltration BMPs are not appropriate, bioretention and/or biotreatment BMPs (including extended detention basins, bioswales, and constructed wetlands) that provide opportunity for evapotranspiration and incidental infiltration will be considered. Harvest and use BMPs will also be considered as an LID BMP to store runoff for later non-potable uses. Ponds may be used to collect storm water runoff for harvest and use.

The locations of the LID BMPs are not shown in the current Specific Plan phase, but will be shown in the final Project-Specific WQMP. In order to meet Regional Water Quality Control Board (RWQCB) requirements, in the Santa Ana Watershed the design capture volume (VBMP) is based on capturing the volume of runoff generated from an 85th percentile, 24-hour storm event. The sizing and design criteria for the LID BMPs will follow the Riverside County Design Handbook for Low Impact Development Best Management Practices (Riverside County LID Design Handbook) (RCFCWCD, 2011). The Design Storm Depth (D85) was determined to be 0.68 inches per the Isohyetal Map for the 85th Percentile 24-hour Storm Event. Supporting engineering calculations and LID BMP design details will be provided in the final Project-Specific WQMP.

D.1 Infiltration Applicability

While infiltration testing has not been performed on the site, a preliminary review of the feasibility of infiltration has been conducted. According to the Riverside County Hydrology Manual, the majority of the study area consists of Hydrologic Soil Group (HSG) Type B, which is considered appropriate for infiltration. The HSG map within the study area is included in Appendix 3. A geotechnical evaluation has been performed for the World Logistics Center Specific Plan area, and the geotechnical report is contained in the EIR as a technical appendix. The geotechnical field explorations included 80 test pits, over 50 borings, and seven cone penetration tests. Based on the laboratory test data, the site mainly consists of silty sands (SM) with zones of silt (ML) beds. The silt beds range anywhere from 5 to 15 feet below ground surface (bgs). In some of the areas, the beds appear to be continuous from boring/pit to boring/pit. Based on the lab data, total fines (silt and clay) range from 36 percent (SM) to 80 percent (ML). Soils in the southeast portion of the site appear to be more granular, however. Based on the geotechnical report, most of the site is considered to be on the borderline between HSG Type B and C soils, with localized areas classified as HSG Type C. Infiltration testing will be performed prior to final design, and infiltration test reports will be included in the final Project-Specific WQMP. The determination of LID BMPs will be based on the results of the infiltration testing.

The remainder of this section will be completed as part of the final Project Specific WQMP.

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☐ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		
If Yes, list affected DMAs:		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☒ Reclaimed water will be used for the non-potable water demands for the project.

☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape:

Type of Landscaping (Conservation Design or Active Turf):

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces:

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor:

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area:

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users:

Project Type:

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces:

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor:

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users:

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand:

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces:

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3:

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use:

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

There is an existing 2% slope across the project site from north to south, which will require mass grading and significant cut and fill. The fill condition and/or native soil characteristics may preclude the implementation of infiltration basins at most BMP sites. Thus, while infiltration BMPs are preferred, the final BMPs will likely consist of limited infiltration basins where appropriate, and bioretention and biotreatment BMPs as the primary means for water quality treatment. A preliminary review of BMP sizing has been conducted, and the project has allowed for sufficient space to accommodate a combination of infiltration basins, bioretention facilities, and extended detention basins. Bioretention facilities will be proposed in landscaped spaces, like parking islands, medians, walkways, and site entrances. The goal will be to design landscaped areas on the site as bioretention facilities. The project site will be graded to direct runoff from impervious surfaces into the depressed landscaped bioretention facilities.

The remainder of this section will be completed as part of the final Project Specific WQMP.

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Narrative description to be included as part of the final Project Specific WQMP

D.5 LID BMP Sizing

This section will be completed as part of the final Project Specific WQMP.

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]			
						Design Storm Depth (in)	*Design Capture Volume,* $\mathbf{V_{BMP}}$ *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

This section will be completed as part of the final Project Specific WQMP.

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

- ☐ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

- ☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

  List DMAs here.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted the project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference has been done with this information with that of the selected Priority Development Project Category in Table E.1 below.

The potential pollutants associated with the project are metals, nutrients, pesticides, toxic organic compounds, sediments, trash & debris, and oil & grease. The potential pollutants associated with the project that are also present in impaired Receiving Waters are nutrients, pesticides, and toxic organic compounds, . There are no anticipated legacy pollutants as a result of past uses. A Phase I Environmental Site Assessment for the World Logistics Center Specific Plan has revealed no evidence of recognized environmental conditions (RECs) indicative of releases or threatened releases of hazardous substances on, at, in, or to the subject site.

The identified General Pollutant Categories that are the same as those listed for the receiving waters are the Pollutants of Concern and the appropriate boxes are checked on the last row. The purpose of this is to document compliance and to help appropriately plan for mitigating the Pollutants of Concern in lieu of implementing LID BMPs which will be determined in the final WQMP.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☒ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☐	☐	☒	☒	☒	☐	☐	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

This section will be completed as part of the final Project Specific WQMP.

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
Total Credit Percentage[1]	

[1]*Cannot Exceed 50%*
[2]*Obtain corresponding data from Table 3-8 in the WQMP Guidance Document*

E.3 Sizing Criteria

This section will be completed as part of the final Project Specific WQMP.

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA Area (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA Area x Runoff Factor**		***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

This section will be completed as part of the final Project Specific WQMP.

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 **Treatment Control BMP Selection**

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate2	Removal Efficiency Percentage[3]

[1] *Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.*

[2] *Cross Reference Table E.1 above to populate this column.*

[3] *As documented in a Co-Permittee Approved Study and provided in Appendix 6.*

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

If the project meets one of the following criteria which will be indicated by the check boxes below, Hydromodification does not need to be addressed at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration			
Volume (Cubic Feet)			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will

be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

This project proposes to direct runoff to landscaped areas and to construct a number of detention basins to mitigate the potential impacts caused by the proposed development. The landscaped areas and detention basins proposed at each drainage area will store increased runoff volume for a limited period of a time and release the outflow at a rate that does not exceed the pre-development condition identified in item c. above. As a result, the landscaped areas and detention basins will mitigate the impacts of increased peak runoff and reduced time of concentration by attenuating the flows. Riprap or flow blocks will be used in the entrance spillways to reduce the runoff velocity and dissipate the flow energy. Basins with the outflow risers and pipe structures at the downstream end of the watershed will be directed to a spreading area and limit and spread the outflow so that the flow exiting the project boundary will be consistent with the pre-project condition. The sheet flow exiting the southerly boundary will not exceed the flow velocity, and peak flow rate; and will not reduce the overall time of concentration at the most downstream of project site compared to the pre-development condition.

The proposed landscaped areas, detention basins and outflow structures along with open space, categorized as unpaved areas, will allow the flows to infiltrate. The ability of sediment to be conveyed through the existing drainage courses was determined. The majority of the drainage courses deposit sediment in the existing condition and this will occur in the proposed condition through the use of the basins. Runoff leaving the project site via the spreading areas will mimic the sheet flow of the pre existing condition to maintain the sediment carrying capacity and amount of available sediment for transport. Thus, the amount of sediment for transport will be in balance with the storm flows, and no

erosion is expected at the downstream project boundary. Therefore, there will be no significant impacts on the downstream watershed and the project will not degrade the downstream water quality.

By implementing the items above, the project will address the hydrologic conditions of concern. At the time of final design for each project, detailed hydrologic and hydraulic calculations in accordance with Item c, above will be performed to ensure that the mitigation is appropriately implemented.

Preliminary supporting engineering studies and calculations are contained in the Draft Drainage Report for the World Logistics Center Project, and final studies and calculations will be included in Appendix 7 of the final Project-Specific WQMP.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, the following procedure was used to specify Source Control BMPs for the site:

1. **Identify Pollutant Sources:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. **Note Locations on Project-Specific WQMP Exhibit:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1. **This will be provided as part of the final Project Specific WQMP.**

3. **Prepare a Table and Narrative:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. Add additional narrative in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. **Identify Operational Source Control BMPs:** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Source Control BMPs reduce the potential for stormwater runoff and pollutants from coming into contact with one another. Each Source Control BMP that is incorporated into the project is presented in the table below. The locations of the structural Source Control BMPs are not shown in the current Specific Plan phase, but will be shown in the final Project-Specific WQMP.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
A. On-site storm drain inlets	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	• Maintain and periodically repaint or replace inlet markings. • Provide stormwater pollution prevention information to new site owners, lessees, or operators. • See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

		• Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
D2. Landscape/ Outdoor Pesticide Use	State that final landscape plans will accomplish all of the following. • Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. • Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. • Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. • Consider using pest-resistant plants, especially adjacent to hardscape. • To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	• Maintain landscaping using minimum or no pesticides. • See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/ • Provide IPM information to new owners, lessees and operators.
E. Pools, spas, ponds, decorative fountains, and other water features.	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
G. Refuse areas	• State how site refuse will be handled and provide supporting detail to what is shown on plans. • State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	• State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference	See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

	documentation of compliance with the requirements of Hazardous Materials Programs for: • Hazardous Waste Generation • Hazardous Materials Release Response and Inventory • California Accidental Release (CalARP) • Aboveground Storage Tank • Uniform Fire Code Article 80 Section 103(b) & (c) 1991 • Underground Storage Tank www.cchealth.org/groups/hazmat/	
L. Fuel Dispensing Areas		The property owner shall dry sweep the fueling area routinely. See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
M. Loading Docks		• Move loaded and unloaded items indoors as soon as possible. • See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
N. Fire Sprinkler Test Water		See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources: • Condensate drain lines • Rooftop equipment • Roofing, gutters, and trim.	• Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. • Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. • Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	N/A
P. Plazas, sidewalks, and parking lots.		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Non-Structural Source Control BMPs

The project will be designed with the following non-structural Source Control BMPs.

- Education for Property Owners, Operators, Tenants, Occupants, or Employees. Practical informational materials to promote the prevention of Urban Runoff pollution will be provided to educate employees/users of the project site. These materials shall include general housekeeping practices that contribute to the protection of stormwater quality. The project owner will request copies of these materials from http://www.floodcontrol.co.riverside.ca.us/YouCanHelp.asp at least 30 days prior to distribution, as required by the Riverside County WQMP

- Activity Restrictions. The project owner will enforce activity restrictions. Activity restrictions for water quality protection will include:

    - Prohibit vehicle washing, maintenance, or repair. No car wash racks or maintenance bays will be allowed within the project.

    - Prohibit outdoor work areas and processing areas within the project.

    - Prohibit the blowing, sweeping, or hosing of debris (leaf litter, grass clippings, litter, etc.) into streets, storm drain inlets, or other conveyances.

    - Require dumpster lids to be closed at all times.

- Irrigation System and Landscape Maintenance. The irrigation system and landscaping shall be consistent with the County's water conservation policy. Fertilizer and pesticide usage shall be consistent with the instructions contained on product labels and with regulations administered by California's Department of Pesticide Regulation. Additionally, landscape maintenance must address replacement of dead vegetation, repair of erosion rills, proper disposal of green waste, etc. Irrigation system maintenance must address periodic testing and observation of the irrigation system to detect overspray, broken sprinkler heads, and other system failures.

- Common Area Litter Control. Trash receptacles will be provided at appropriate locations throughout the project area. Trash receptacles will be emptied weekly, or as needed.

- Street Sweeping Private Streets and Parking Lots. The project owner shall provide sweeping of the parking lots on a monthly basis.

- Drainage Facility Inspection and Maintenance. The project owner shall be responsible for having privately owned catch basins inspected and cleaned annually. Ownership of all offsite drainage facilities will be turned over to the City of Moreno Valley at project completion. The City will be responsible for maintaining and inspecting all public drainage facilities.

Section H: Construction Plan Checklist

This section will be completed as part of the final Project Specific WQMP.

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on the site are maintained and continue to operate as designed. To make this possible, the following will be included in Appendix 9 of the final Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

A detailed Stormwater BMP Operation and Maintenance Plan will be prepared as part of the final WQMP that sets forth a maintenance schedule for each of the Stormwater BMPs built on the site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required. Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document and will included in the final WQMP.

The table below describes the preliminary inspection and maintenance activities for each BMP. At the time of final design, an Operation and Maintenance (O&M) Plan will be prepared clearly stating the maintenance activities highlighted in the table, including the designated party to manage the BMPs, self-inspections and record-keeping requirements for BMPs, start-up dates, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, and any other necessary activities.

Operation and Maintenance Plan

BMP Requiring Maintenance	Visual Inspection Frequency	Responsible Party	Maintenance Frequency	Maintenance Tasks
Infiltration Basins	Ongoing, including just before wet season	Project owner	As needed	• Maintain vegetation. • Remove debris and litter. • Check for erosion and sediment laden areas. • Revegetate side slopes where needed.
	Within 72 hours following storm event	Project owner	As needed	• Check for standing water. No water should be present 72 hours after an event. Correct problem as needed.

BMP Requiring Maintenance	Visual Inspection Frequency	Responsible Party	Maintenance Frequency	Maintenance Tasks
	Annually	Project owner	Annually	• Inspect hydraulic and structural facilities. • Check for erosion, slumping and overgrowth. • Check for sediment build up. Scrape bottom as needed and remove sediment. Replant basin vegetation.
Bioretention Facilities	Ongoing, including just before wet season	Project owner	As needed	• Maintain vegetation. • Remove debris and litter. • Replace damaged grass and/or plants. • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
	Within 72 hours following storm event	Project owner	As needed	• Check for standing water. No water should be present 72 hours after an event. Correct problem as needed.
	Annually	Project owner	Annually	• Inspect/clean inlets and outlets.
Extended Detention Basins	Ongoing, including just before wet season	Project owner	As needed	• Maintain vegetation. • Remove debris and litter.
	Within 72 hours following storm event	Project owner	As needed	• Check for standing water. No water should be present 72 hours after an event. Correct problem as needed.
	Annually	Project owner	Annually	• Inspect hydraulic and structural facilities. • Check for erosion, slumping and overgrowth. • Inspect sand media at the filter drain. Scarify top 3 inches by raking the filter drain's sand surface. • Check media filter underdrains (via the cleanout) for damage or clogging. • Remove accumulated sediment and debris from the forebay. • Check gravel filled low flow and collector trenches for sediment buildup and repair as needed.
Irrigation System	Weekly as part of landscape maintenance activities	Project owner	As needed	• Repair broken sprinkler heads • Redirect heads where needed • Adjust irrigation interval and schedule as needed
Landscaped Areas	Weekly as part of landscape maintenance activities	Project owner	Weekly	• Mow, weed, trim, and remove accumulated dead vegetation, pet waste, trash and debris.
Parking Lot Sweeping	Monthly	Project owner	Monthly	• Sweep parking lots to remove litter, dust, and debris.

BMP Requiring Maintenance	Visual Inspection Frequency	Responsible Party	Maintenance Frequency	Maintenance Tasks
Catch Basin Signage	Annually	Project owner	As needed	• Refresh or replace as needed.

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

The Operation and Maintenance Plan and Maintenance Mechanism will be included in Appendix 9 of the final WQMP. Pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP are included in Appendix 10.

Operation and Maintenance Responsibility

Until construction is completed, the project owner will be responsible for the operation and maintenance for all structural Source Control and Treatment Control BMPs. Contact information for the project owner is as follows:

Highland Fairview
14225 Corporate Way
Moreno Valley, California 92553
(951) 867-5300
Contact: Brian Hixson

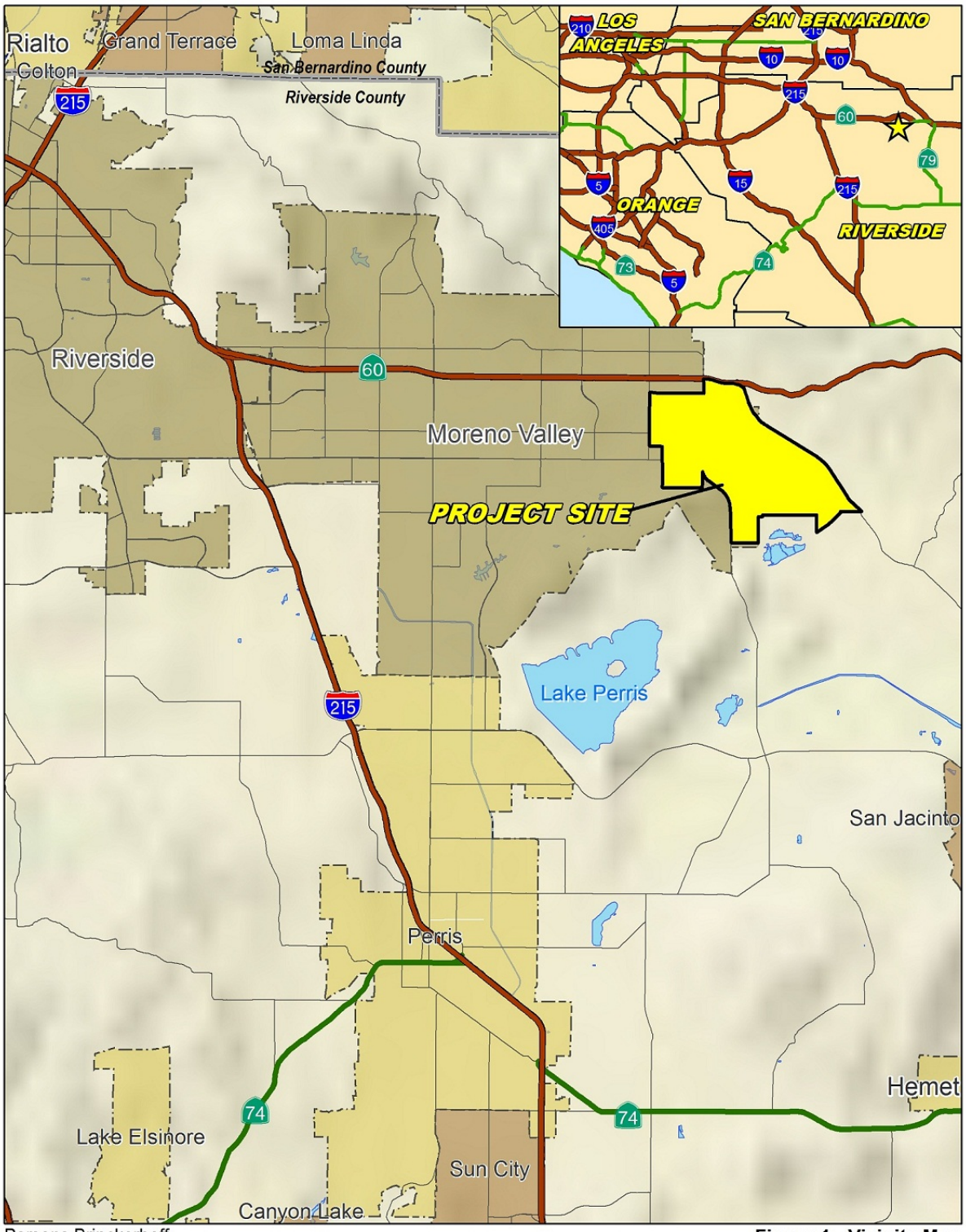
Funding

A funding source or sources for the O&M of each BMP identified in the Project-Specific WQMP must be identified. By certifying the Project-Specific WQMP, the Project applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners. One example of how to adhere to the requirement to transfer O&M responsibilities is to record the Project-Specific WQMP against the title to the property.

The project owner certifies that a funding source will be made available to support the operation and maintenance of each Treatment Control BMP included in the project. The O&M funding will be determined at a future date in the entitlement process. The project owner will have ultimate responsibility for funding all operation and maintenance.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

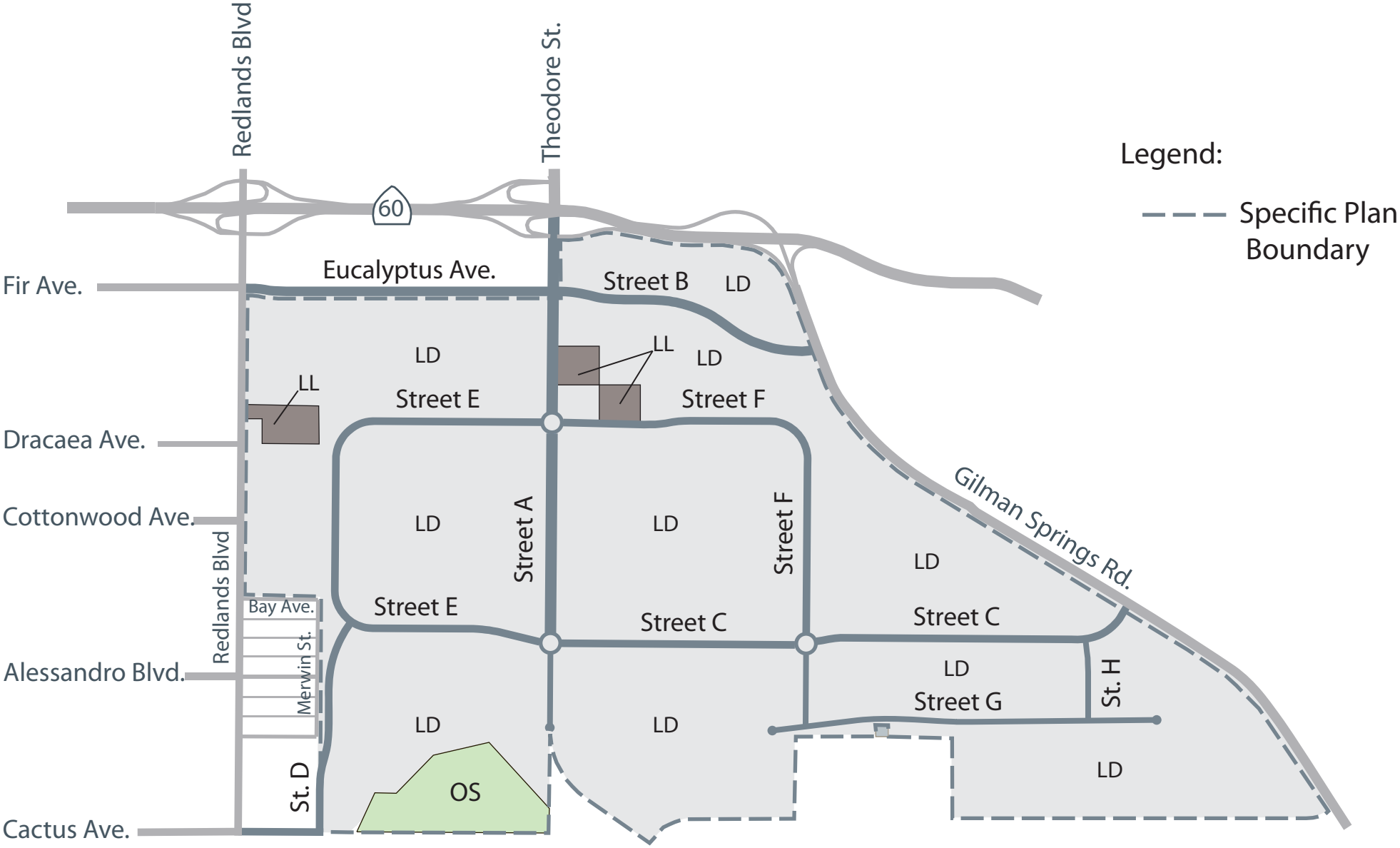


Parsons Brinckerhoff
Date: Feb. 2012

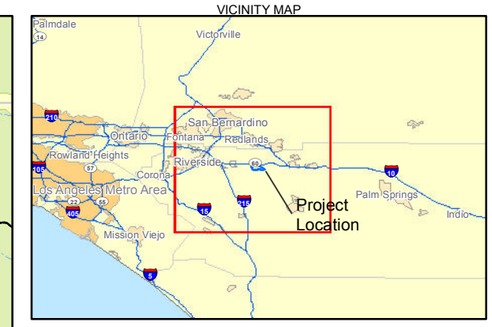
Source: ESRI (2011)

Figure 1 - Vicinity Map

World Logistics Center Specific Plan
Moreno Valley, CA


Redlands Blvd
Theodore St.
Legend:
Specific Plan Boundary
60
Fir Ave.
Eucalyptus Ave.
Street B
LD
LD
LL
LD
LL
Street E
Street F
Dracaea Ave.
Cottonwood Ave.
LD
Street A
LD
Street F
LD
Gilman Springs Rd.
Redlands Blvd
Bay Ave.
Street E
Street C
Street C
Alessandro Blvd.
Merwin St.
LD
Street G
St. H
LD
LD
St. D
OS
LD
Cactus Ave.

Site Plan



Legend

- Highway
- Road
- Stream
- Intermittent Stream
- Project Boundary
- Hydrologic Unit
- County Boundary

N

0 2 4
Miles

Receiving Waters Map
World Logistics Center Specific Plan

CH2MHILL

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Appendix 2: Construction Plans

Grading and Drainage Plans

This appendix will be completed as part of the final Project Specific WQMP.

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Hydrologic Soils Group Map is included in this Appendix.

Geotechnical Report is included in the EIR as a technical appendix.

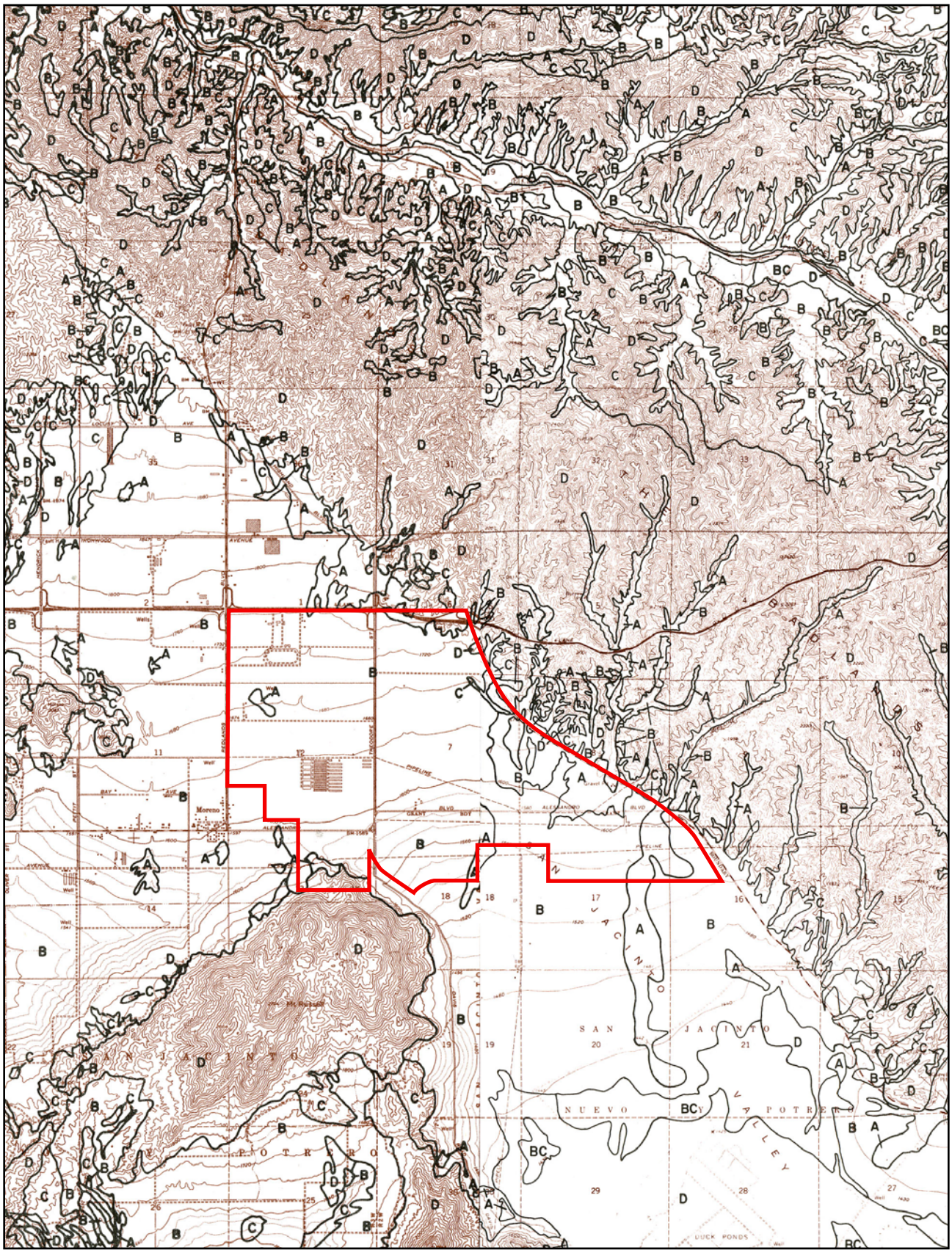

FIGURE 1
Hydrologic Soil Groups Within Study Area
World Logistics Center Specific Plan

CH2MHILL

SCO418273.TT.01 highland_hydrologic_soil_groups.ai 2/11

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

Phase 1 Environmental Site Assessment is included in the EIR as a technical appendix.

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

This appendix will be completed as part of the final Project Specific WQMP.

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

This appendix will be completed as part of the final Project Specific WQMP.

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

This appendix will be completed as part of the final Project Specific WQMP.

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☑ **A.** On-site storm drain inlets	☐ Locations of inlets.	☐ Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	☐ Maintain and periodically repaint or replace inlet markings. ☐ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ☐ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ☐ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
☐ **B.** Interior floor drains and elevator shaft sump pumps		☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ **C.** Interior parking garages		☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☐ **D1.** Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	☐ Provide Integrated Pest Management information to owners, lessees, and operators.
☑ **D2.** Landscape/ Outdoor Pesticide Use	☐ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☐ Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)	State that final landscape plans will accomplish all of the following. ☐ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ☐ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ☐ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ☐ Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	☐ Maintain landscaping using minimum or no pesticides. ☐ See applicable operational BMPs in "What you should know for.....Landscape and Gardening" at http://rcflood.org/stormwater/Error! Hyperlink reference not valid. ☐ Provide IPM information to new owners, lessees and operators.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☑ **E.** Pools, spas, ponds, decorative fountains, and other water features.	☐ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☐ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ **F.** Food service	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	☐ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.
☑ **G.** Refuse areas	☐ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ☐ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ☐ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	☐ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☐ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☐ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **H.** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	☐ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ☐ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ☐ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank www.cchealth.org/groups/hazmat/	☐ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ J. Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑ Car dealerships and similar may rinse cars with water only.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
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❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
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☑ L. Fuel Dispensing Areas	☐ Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ☐ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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☑ **M.** Loading Docks	☐ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ☐ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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☑ **N.** Fire Sprinkler Test Water		☐ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☐ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☑ Condensate drain lines ☑ Rooftop equipment ☐ Drainage sumps ☑ Roofing, gutters, and trim. ☐ Other sources		☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ☐ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ☐ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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☑ **P.** Plazas, sidewalks, and parking lots.			☐ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

This appendix will be completed as part of the final Project Specific WQMP.

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Sample educational materials are included in this Appendix.

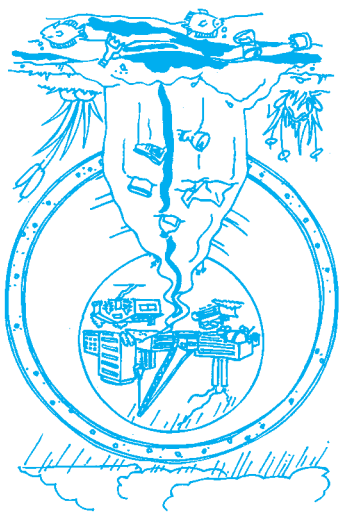
Educational materials may be ordered at http://www.floodcontrol.co.riverside.ca.us/stormwater/.

StormWater Pollution . . . What You Should Know

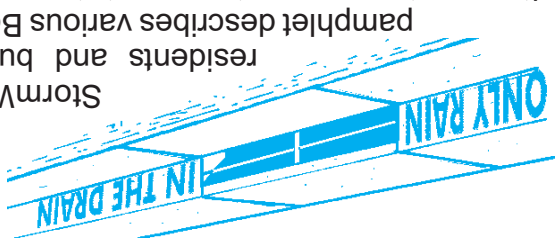
Riverside County has two drainage systems - sewers and storm drains. The storm drain system was designed to reduce flooding by carrying excess rainwater away from streets and developed areas. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our local waterways.

Unlike sanitary sewers, storm drains are not connected to a wastewater treatment plant – they flow directly to our local streams, rivers and lakes.

Stormwater runoff is a part of the natural hydrologic process. However, land development and construction activities can significantly alter natural drainage processes and introduce pollutants into stormwater runoff. Polluted stormwater runoff from construction sites has been identified as a major source of water pollution in California. It jeopardizes the quality of our local waterways and can pose a serious threat to the health of our aquatic ecosystems.



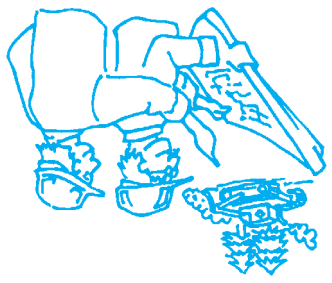
The Cities and County of Riverside StormWater/CleanWater Protection Program

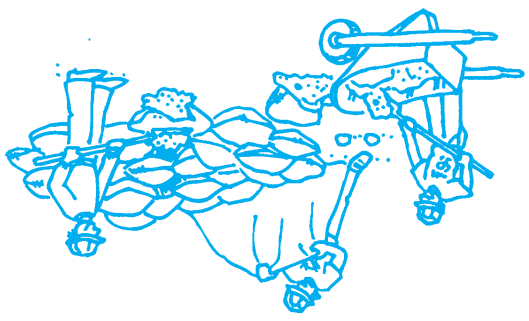


Because preventing pollution is much easier and less costly than cleaning up "after the fact," the Cities and County of Riverside StormWater/CleanWater Protection Program informs residents and businesses on pollution prevention activities. This pamphlet describes various Best Management Practices (BMPs) that construction site operators can use to prevent stormwater pollution.

In accordance with applicable federal and state law, the Cities and County of Riverside have adopted ordinances for stormwater management and discharge control that **prohibit** the discharge of pollutants into the storm drain system or local surface water. This includes discharges from construction sites containing sediment, concrete, mortar, paint, solvents, lubricants, vehicle fluids, fuel, pesticides, and construction debris.

PLEASE NOTE: The Federal, State and local regulations strictly prohibit the discharge of sediment and pollutants into the streets, the storm drain system or waterways. As an owner, operator or supervisor of a construction site, you may be held financially responsible for any environmental damage caused by your subcontractors or employees.





STORMWATER POLLUTION FROM CONSTRUCTION ACTIVITIES

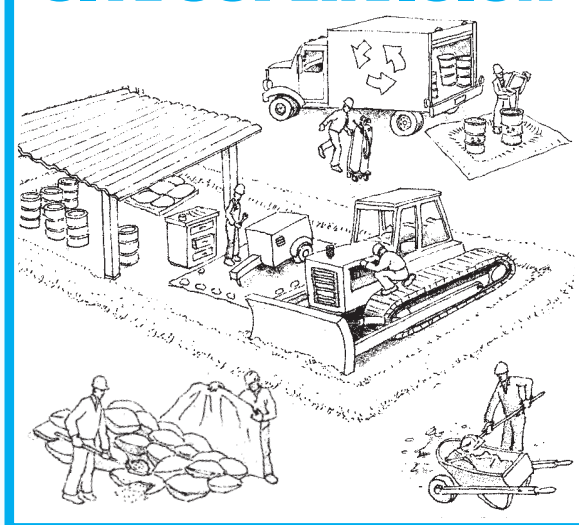
The two most common sources of stormwater pollution problems associated with construction activities are ***erosion*** and ***sedimentation***. Failure to maintain adequate erosion and sediment controls at construction sites often results in sediment discharges into the storm drain system, creating multiple problems once it enters local waterways.

Construction vehicles and heavy equipment can also track significant amounts of mud and sediment onto adjacent streets. Additionally, wind may transport construction materials and wastes into streets storm drains, or directly into our local waterways.

StormWater Pollution

What you should know for...

GENERAL CONSTRUCTION & SITE SUPERVISION



Best Management Practices (BMPs) for:

- Developers
- General Contractors
- Home Builders
- Construction Inspectors
- Anyone in the construction business

To report a hazardous materials spill, call:

Riverside County Hazardous Materials Emergency Response Team
(909) 358-5055 8:00 a.m. – 5:00 p.m.
(909) 358-5245 after 5:00 p.m.

In an emergency call: **911**

For recycling and hazardous waste disposal, call:

(909) 358-5055

To report an illegal dumping or a clogged storm drain, call:

1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, please call (909) 955-1200 or visit the StormWater/CleanWater Protection Program website at:
www.co.riverside.ca.us/depts/flood/waterquality npdes.asp

StormWater CleanWater PROTECTION PROGRAM

The StormWater/CleanWater Protection Program gratefully acknowledges the Santa Clara Valley Nonpoint Pollution Control Program, Alameda Countywide CleanWater Program and the City of Los Angeles Stormwater Management Division for information provided in this brochure.

Resources

State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento CA 95814
(916) 341-5455
www.swrcb.ca.gov/stormwtr/

Colorado River Basin Regional Water Quality Control Board - Region 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
(760) 346-7491
www.swrcb.ca.gov/~rwqcb7/

Santa Ana Regional Water Quality Control Board - Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3348
(909) 782-4130
www.swrcb.ca.gov/~rwqcb8/

San Diego Regional Water Quality Control Board - Region 9
9771 Clairemont Mesa Blvd., Suite A
San Diego, CA 92124
(858) 467-2952
www.swrcb.ca.gov/~rwqcb9/

What Should You Do?

Advance Planning to Prevent Pollution

- ❑ Remove existing vegetation only as needed.
- ❑ Schedule excavation, grading, and paving operations for dry weather periods, if possible.
- ❑ Designate a specific area of the construction site, well away from storm drain inlets or watercourses, for material storage and equipment maintenance.
- ❑ Develop and implement an effective combination of erosion and sediment controls for the construction site.
- ❑ Practice source reduction by ordering only the amount of materials that are needed to finish the project.
- ❑ Educate your employees and subcontractors about stormwater management requirements and their pollution prevention responsibilities.
- ❑ Control the amount of surface runoff at the construction site by impeding internally generated flows and using berms or drainage ditches to direct incoming offsite flows to go around the site. ***Note:*** *Consult local drainage policies for more information.*

Best Management Practices

The following Best Management Practices (BMPs) can significantly reduce pollutant discharges from your construction site. Compliance with stormwater regulations can be as simple as minimizing stormwater contact with potential pollutants by providing covers and secondary containment for construction materials, designating areas away from storm drain systems for storing equipment and materials and implementing good housekeeping practices at the construction site.

- ❑ Protect all storm drain inlets and streams located near the construction site to prevent sediment-laden water from entering the storm drain system.
- ❑ Limit access to and from the site. Stabilize construction entrances/exits to minimize the track out of dirt and mud onto adjacent streets. Conduct frequent street sweeping.
- ❑ Protect stockpiles and construction materials from winds and rain by storing them under a roof, secured impermeable tarp or plastic sheeting.
- ❑ Avoid storing or stockpiling materials near storm drain inlets, gullies or streams.
- ❑ Phase grading operations to limit disturbed areas and duration of exposure.
- ❑ Perform major maintenance and repairs of vehicles and equipment offsite.
- ❑ Wash out concrete mixers only in designated washout areas at the construction site.
- ❑ Set-up and operate small concrete mixers on tarps or heavy plastic drop cloths.
- ❑ Keep construction sites clean by removing trash, debris, wastes, etc. on a regular basis.
- ❑ Clean-up spills immediately using dry clean-up methods (e.g., absorbent materials such as cat litter, sand or rags for liquid spills; sweeping for dry spills such as cement, mortar or fertilizer) and by removing the contaminated soil from spills on dirt areas. .
- ❑ Prevent erosion by implementing any or a combination of soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding.
- ❑ Maintain all vehicles and equipment in good working condition. Inspect frequently for leaks, and repair promptly.
- ❑ Practice proper waste disposal. Many construction materials and wastes, including solvents, water-based paint, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation can be recycled. Materials that cannot be recycled must be taken to an appropriate landfill or disposed of as hazardous waste.
- ❑ Cover open dumpsters with secured tarps or plastic sheeting. Never clean out a dumpster by washing it down on the construction site.
- ❑ Arrange for an adequate debris disposal schedule to insure that dumpsters do not overflow.

General Construction Activities Stormwater Permit

(Construction Activities General Permit)

The State Water Resources Control Board (SWRCB) adopted a new Construction Activities General Permit (WQ Order No. 99-08DWQ) on August 19, 1999, superseding the now expired SWRCB statewide General Permit (WQ Order No. 92-08DWQ). This permit is administered and enforced by the SWRCB and the local Regional Water Quality Control Boards (RWQCB). The updated Construction Activities General Permit establishes a number of new stormwater management requirements for construction site operator.

NOTE: *Some construction activies stormwater permits are issued on a regional basis. Consult your local RWQCB to find out if your project requires coverage under any of these permits.*

Frequently Asked Questions:

Does my construction site require coverage under the Construction Activities General Permit?

Yes, if construction activity results in the disturbance of five or more acres of total land area or is part of a common plan of development that results in the disturbance of five or more acres.

How do I obtain coverage under the Construction Activities General Permit?

Obtain the permit package and submit the completed Notice of Intent (NOI) form to the SWRCB prior to grading or disturbing soil at the construction site. For ongoing construction activity involving a change of ownership, the new owner must submit a new NOI within 30 days of the date of change of ownership. The completed NOI along with the required fee should be mailed to the SWRCB.

What must I do to comply with the requirements of the Construction Activities General Permit?

- Implement BMPs for non-stormwater discharges year-round.
- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) prior to commencing construction activities.
- Keep a copy of the SWPPP at the construction site for the entire duration of the project.
- Calculate the anticipated stormwater run-off.
- Implement an effective combination of erosion and sediment control on all soil disturbed areas.
- Conduct site inspections prior to anticipated storm events, every 24-hours during extended storm events, and after actual storm event.
- Perform repair and maintenance of BMPs as soon as possible after storm events depending upon worker safety.
- Update the SWPPP as needed, to manage pollutants or reflect changes in site conditions.
- Include description of post construction BMPs at the construction site, including parties responsible for long-term maintenance.

NOTE: *Please refer to the Construction Activities General Permit for detailed information. You may contact the SWRCB, your local RWQCB, or visit the SWRCB website at www.swrcb.ca.gov/stormwtr/ to obtain a State Construction Activities Stormwater General Permit packet.*

How long is this Construction Activities General Permit in effect?

The Permit coverage stays in effect untilyou submit a Notice of Termination (NOT) to the SWRCB. For the purpose of submitting a NOT, all soil disturbing activities have to be completed and one of the three following criteria has to be met:

1. Change of ownership;
2. A uniform vegetative cover with 70 percent coverage has been established; or,
3. Equivalent stabilization measures such as the use of reinforced channel liners, soil cement, fiber matrices, geotextiles, etc., have been employed.

Helpful telephone numbers and links:

Riverside County Water Agencies

City of Banning	(951) 922-3130
City of Beaumont/Cherry Valley	(951) 845-9581
City of Blythe	(760) 922-6161
City of Coachella	(760) 398-3502
City of Corona	(951) 736-2263
City of Hemet	(951) 765-3710
City of Norco	(951) 270 5607
City of Riverside Public Works	(951) 351-6140
City of San Jacinto	(951) 654-4041
Coachella Valley Water District	(760) 398-2651
Desert Water Agency (Palm Springs)	(760) 323-4971
Eastern Municipal Water District	(951) 928-3777
Elsinore Valley Municipal Water District	(951) 674 3146
Elsinore Water District	(951) 674-2168
Farm Mutual Water Company	(951) 244-4198
Idyllwild Water District	(951) 659-2143
Indio Water Authority	(760) 391-4129
Jurupa Community Services District	(951) 685-7434
Lee Lake Water	(951) 658-3241
Mission Springs Water	(760) 329-6448
Rancho California Water District	(951) 296-6900
Ripley, CSA #62	(760) 922-4951
Riverside Co. Service Area #51	(760) 227-3203
Rubidoux Community Services District	(951) 684-7580
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(951) 789-5000
Yucaipa Valley Water District	(909) 797-5117

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org

Online resources include:

- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.waterboards.ca.gov
- Power Washers of North America
  www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers

Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

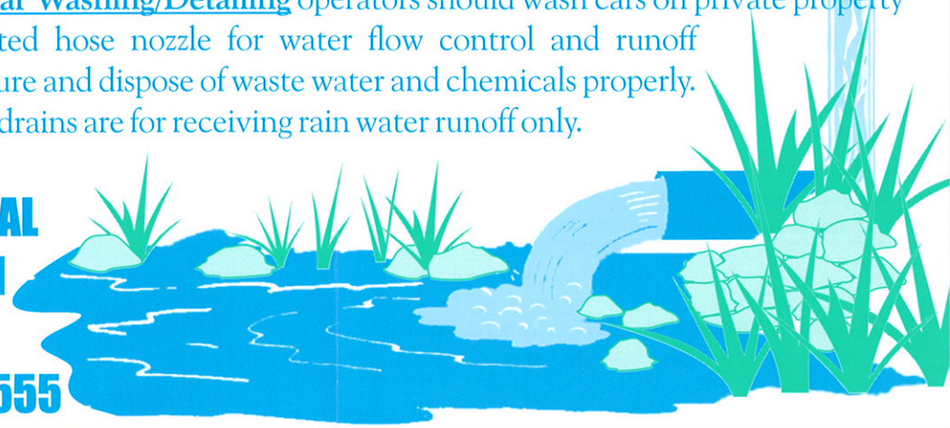
Do you know where street flows actually go?

Storm drains are NOT connected to sanitary sewer systems and treatment plants!

The primary purpose of storm drains is to carry rain water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** *Always* have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

REPORT ILLEGAL STORM DRAIN DISPOSAL 1-800-506-2555



Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is *PROHIBITED* by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. ***Each of us*** can do our part to keep storm water clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of ***small amounts*** of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing wash water to the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.

Report illegal storm drain disposal,
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them for being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.

When cleaning surfaces with a ***high-pressure washer*** or ***steam cleaner***, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks ***with loose paint***, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlet by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.

Stormwater and the Construction Industry

Protect Natural Features

Bad

Good

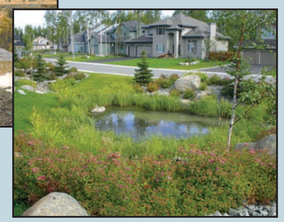
- Minimize clearing.
- Minimize the amount of exposed soil.
- Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
- Protect streams, stream buffers, wild woodlands, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.

Construction Phasing

- Sequence construction activities so that the soil is not exposed for long periods of time.
- Schedule or limit grading to small areas.
- Install key sediment control practices before site grading begins.
- Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.

Vegetative Buffers

Bad



Good

- Protect and install vegetative buffers along waterbodies to slow and filter stormwater runoff.
- Maintain buffers by mowing or replanting periodically to ensure their effectiveness.

Silt Fencing

Bad

Good

- Inspect and maintain silt fences after each rainstorm.
- Make sure the bottom of the silt fence is buried in the ground.
- Securely attach the material to the stakes.
- Don't place silt fences in the middle of a waterway or use them as a check dam.
- Make sure stormwater is not flowing around the silt fence.

Maintain your BMPs!

IN RIVERSIDE COUNTY....Call 1-800-506-2555

TO REPORT ILLEGAL STORMDRAIN DISPOSAL

E-mail: Flood.fcnpdes@co.riverside.ca.us

Visit our website: www.floodcontrol.co.riverside.ca.us

Brought to you by the Storm Water/Clean Water Pollution Protection Program.....

REMEMBER, ONLY RAIN IN THE STORMDRAIN!

Site Stabilization

Bad

Good

- Vegetate, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.

Construction Entrances

Bad

Good

- Remove mud and dirt from the tires of construction vehicles before they enter a paved roadway.
- Properly size entrance BMPs for all anticipated vehicles.
- Make sure that the construction entrance does not become buried in soil.

Slopes

Bad

Good

- Rough grade or terrace slopes.
- Break up long slopes with sediment barriers, or under drain, or divert stormwater away from slopes.

Dirt Stockpiles

Bad

Good

- Cover or seed all dirt stockpiles.

Storm Drain Inlet Protection

Bad

Good

- Use rock or other appropriate material to cover the storm drain inlet to filter out trash and debris.
- Make sure the rock size is appropriate (usually 1 to 2 inches in diameter).
- If you use inlet filters, maintain them regularly.

www.epa.gov/npdes/menuofbmps

Stormwater and the Construction Industry

Planning and Implementing Erosion and Sediment Control Practices

The construction industry is a critical participant in the nation's efforts to protect streams, rivers, lakes, wetlands, and oceans. Through the use of best management practices (BMPs), construction site operators are the key defense against erosion and sedimentation.

As stormwater flows over a construction site, it picks up pollutants like sediment, debris, and chemicals. High volumes of stormwater can also cause stream bank erosion, and destroy downstream aquatic habitat. Preventing soil erosion and sedimentation is an important responsibility at all construction sites.

In addition to the environmental impact, uncontrolled erosion can have a significant financial impact on a construction project. It costs money and time to repair gullies, replace vegetation, clean sediment-clogged storm drains, replace poorly installed BMPs, and mitigate damage to other people's property or to natural resources.

Best Management Practice (BMP)

A BMP is a method used to prevent or control stormwater runoff and the discharge of pollutants, including sediment, into local waterbodies. Silt fences, inlet protection, and site-stabilization techniques are typical BMPs on a construction site.

Operator

An operator is someone who has control over and the ability to modify construction plans and specifications (e.g. owner, general contractor)

or

Someone who has control over the day-to-day operations at a site (e.g., owner, general contractor) that are necessary to ensure compliance with the permit requirements. It is the responsibility of a construction site owner or operator to contain stormwater runoff and prevent erosion during **all** stages of a project.

There may be more than one person at a site who meets these definitions and must apply for permit coverage. (States may have different definitions of the term "operator.")

So what's being done about polluted runoff?

The Clean Water Act includes the National Pollutant Discharge Elimination System (NPDES) permitting program. As of January 2003, 44 states and territories are authorized to issue NPDES stormwater permits. If your state isn't authorized to operate the NPDES stormwater permit program, EPA issues the permits. Permits vary from state to state, so contact your state or EPA for specific information. Your permitting authority has specific information on your state's NPDES stormwater permit program. In general, construction permits require construction operators to do all of the following:

- Develop and implement a stormwater pollution prevention plan
- Submit a permit application or notice of intent (NOI)
- Comply with the permit, including maintaining BMPs and inspecting the site

Under the NPDES program, construction activities that disturb 1 or more acres are required to obtain stormwater permit coverage. States have different names for the plans that construction operators must develop, such as

- Stormwater pollution prevention plan
- Erosion and sediment control plan
- Erosion control and stormwater management plan
- Stormwater management plan
- Water pollution control plan
- Pollution prevention plan

This document uses the term "*Plan*."

I think I need a permit... Where do I start?

All land-disturbing activities, including clearing, grading, and excavation, that disturb **1 or more acres** are required to be covered under a state or EPA-issued NPDES construction stormwater permit **prior to land disturbance**. Permit requirements vary by state. Begin by researching the specific requirements in your state. You might already be subject to local erosion and sediment control requirements, but that doesn't release you from the requirements of the NPDES program at the state or EPA level. Although you must comply with both sets of requirements, in most cases they have been designed to be complementary. Contact your permitting authority to find out exactly what you need to do. A good place to start your search is the Construction Industry Compliance Assistance web site at http://www.envcap.org/cica.

The NPDES permit requirements include small construction activities that are part of a larger common plan of development or sale, such as a single lot within a larger subdivision. For developments with multiple operators, all operators must have permit coverage for their individual parts of the larger development, no matter how large or small each operation happens to be. When there are multiple operators at one site, they're encouraged to develop and share one comprehensive Plan and obtain permit coverage as co-permitees.

The **owner or operator** of the construction site is responsible for complying with the requirements of the permit. Responsibilities include developing a Plan, obtaining permit coverage, implementing BMPs, and stabilizing the site at the end of the construction activity.

Construction sites that discharge unpermitted stormwater are in violation of the Clean Water Act and may be subject to fines of up to $27,500 a day per violation.

Determine your eligibility

All construction activity that disturbs 1 or more acres of land, as well as activity that disturbs less than 1 acre but is part of a larger common plan of development, must obtain permit coverage.

Read and understand your stormwater permit requirements

Get a copy of the permit for construction activities and a permit application (or notice of intent form) from your state or EPA permitting authority.

Develop a Plan

Most states do not require you to submit your Plan. However, you do need to keep the Plan on site. If that's impractical, you may post a notice that tells where the Plan is kept so it can be accessed by the permitting authority and other interested parties.

You'll need to post a copy of your completed application on site. Put it in a place where the public can see it so they'll know your site is covered by an NPDES permit!

Apply for permit coverage

Once you understand your permit requirements and have developed a Plan, you can submit a stormwater permit application (or notice of intent) to your permitting authority. This must be done before beginning any land disturbance on the site. Some states require a few days of lead time, so check with your permitting authority. Once you've submitted the application, you must satisfy the conditions of the permit.

Implement the Plan

Be prepared to implement the BMPs in your Plan before construction begins. Ensure that BMPs are properly maintained, and upgrade and repair them as necessary.

Developing and Implementing a Plan

You must have a Plan that includes erosion and sediment control and pollution prevention BMPs. These Plans require

- Advance planning and training to ensure proper implementation of the BMPs
- Erosion and sediment control BMPs in place until the area is permanently stabilized
- Pollution prevention BMPs to keep the construction site "clean"
- Regular inspection of the construction site to ensure proper installation and maintenance of BMPs

Fortunately, the practices and measures that must be included in your Plan are already part of the standard operating procedures at many construction sites.

Six steps are associated with developing and implementing a stormwater Plan. There's a wealth of information available on developing pollution prevention plans. Please contact your permitting authority for help in finding additional guidance materials, or visit www.epa.gov/npdes/stormwater. A sample construction plan is available at www.epa.gov/npdes/pubs/sample_swppp.pdf.

1. Site Evaluation and Design Development

- **Collect site information**
- **Develop site plan design**
- **Prepare pollution prevention site map**

The first step in preparing a Plan is to define the characteristics of the site and the type of construction that will occur. This involves collecting site information, identifying natural features that should be protected, developing a site plan design, describing the nature of the construction activity, and preparing a pollution prevention site map.

2. Assessment

- **Measure the site area**
- **Determine the drainage areas**
- **Calculate the runoff coefficient**

The next step is assessing the impact the project will have on stormwater runoff. Determine the drainage areas and estimate the runoff amounts and velocities. For more information on calculatng the runoff coefficient, go to www.epa.gov/npdes/pubs/chap02_conguide.pdf, page 11.

3. Control Selection and Plan Design

- **Review and incorporate state or local requirements**
- **Select erosion and sediment controls**
- **Select other controls**
- **Select stormwater management controls**
- **Indicate the location of controls on the site map**
- **Prepare an inspection and maintenance plan**
- **Coordinate controls with construction activity**
- **Prepare sequence of major activities**

In the third step you'll actually document your procedures to prevent and control polluted stormwater runoff. You must delineate areas that will not be disturbed, including critical natural areas like streamside areas, floodplains, and trees. You must also identify the measures (or BMPs) you'll use to protect these areas.

Phasing your project to minimize the amount of exposed soil at any given time is a highly effective way to prevent erosion. Erosion control measures designed to prevent soil from being mobilized include diversions to route stormwater away from exposed soils and stabilization with vegetation, mulch, and geotextiles. Sedimentation control measures designed to remove sediment from stormwater or prevent it from leaving the site include silt fences, sediment traps, and diversions.

You'll need to select erosion and sediment controls—including stabilization measures for protecting disturbed areas and structural controls for diverting runoff and removing sediment—that are appropriate for your particular site. The appropriateness of the control measures will depend on several factors, but will be influenced most directly by the site characteristics. Some stabilization measures you might consider are temporary seeding, permanent seeding, and mulching. Structural control measures include earth dikes, silt fences, and sediment traps. No single BMP will meet all of the erosion and sedimentation control needs of a construction site. A combination of BMPs is necessary. For more information on the types of BMPs appropriate for your construction site, see the BMP fact sheet series available at www.epa.gov/npdes/menuofbmps.

Soil erosion control tips...

- Design the site to infiltrate stormwater into the ground and to keep it out of storm drains. Eliminate or minimize the use of stormwater collection and conveyance systems while maximizing the use of stormwater infiltration and bioretention techniques.
- Minimize the amount of exposed soil on site.
  - To the extent possible, plan the project in stages to minimize the amount of area that is bare and subject to erosion. The less soil exposed, the easier and cheaper it will be to control erosion.
  - Vegetate disturbed areas with permanent or temporary seeding immediately upon reaching final grade.
  - Vegetate or cover stockpiles that will not be used immediately.
- Reduce the velocity of stormwater both onto and away from the project area.
  - Interceptors, diversions, vegetated buffers, and check dams are a few of the BMPs that can be used to slow down stormwater as it travels across and away from the project site.
  - Diversion measures can also be used to direct flow away from exposed areas toward stable portions of the site.
  - Silt fences and other types of perimeter filters should never be used to reduce the velocity of runoff.
- Protect defined channels immediately with measures adequate to handle the storm flows expected.
  - Sod, geotextile, natural fiber, riprap, or other stabilization measures should be used to allow the channels to carry water without causing erosion. Use softer measures like geotextile or vegetation where possible to prevent downstream impacts.
- Keep sediment on site.
  - Place aggregate or stone at construction site vehicle exits to accommodate at least two tire revolutions of large construction vehicles. Much of the dirt on the tires will fall off before the vehicle gets to the street.
  - Regular street sweeping at the construction entrance will prevent dirt from entering storm drains. Do not hose paved areas.
  - Sediment traps and basins are temporary structures and should be used in conjunction with other measures to reduce the amount of erosion.
- Maintaining all BMPs is critical to ensure their effectiveness during the life of the project.
  - Regularily remove collected sediment from silt fences, berms, traps, and other BMPs.
  - Ensure that geotextiles and mulch remain in place until vegetation is well established.
  - Maintain fences that protect sensitive areas, silt fences, diversion structures, and other BMPs.

Other BMPs and Activities to Control Polluted Runoff

You'll need to select other controls to address potential pollutant sources on your site. Construction materials, debris, trash, fuel, paint, and stockpiles become pollution sources when it rains. Basic pollution prevention practices can significantly reduce the amount of pollution leaving construction sites. The following are some simple practices that should be included in the Plan and implemented on site:

- Keep potential sources of pollution out of the rain as practicable (e.g., inside a building, covered with plastic or tarps, or sealed tightly in a leak-proof container).
- Clearly identify a protected, lined area for concrete truck washouts. This area should be located away from streams, storm drain inlets, or ditches and should be cleaned out periodically.
- Park, refuel, and maintain vehicles and equipment in one area of the site to minimize the area exposed to possible spills and fuel storage. This area should be well away from streams, storm drain inlets, or ditches. Keep spill kits close by and clean up any spills or leaks immediately, including spills on pavement or earthen surfaces.
- Practice good housekeeping. Keep the construction site free of litter, construction debris, and leaking containers. Keep all waste in one area to minimize cleaning.
- Never hose down paved surfaces to clean dust, debris, or trash. This water could wash directly into storm drains or streams. Sweep up materials and dispose of them in the trash. Never bury trash or debris!
- Dispose of hazardous materials properly.

4. Certification and Notification

- **Certify the Plan**
- **Submit permit application or notice of intent**

Once the Plan has been developed, an authorized representative must sign it. Now is the time to submit the permit application or notice of intent. Your permit might require that the Plan be kept on site, so be sure to keep it available for the staff implementing the Plan.

Erosion and sedimentation control practices are only as good as their installation and maintenance.

5. Implementing and Maintaining a Plan

- **Implement controls**
- **Inspect and maintain controls**
- **Update/change the Plan**
- **Report releases of hazardous materials**

A Plan describes the practices and activities you'll use to prevent stormwater contamination and meet the NPDES permit requirements. Make sure that the Plan is implemented and that the Plan is updated as necessary to reflect changes on the site.

Erosion and sedimentation control practices are only as good as their installation and maintenance. Train the contractors that will install the BMPs and inspect immediately to ensure that the BMPs have been installed correctly.

Regularly inspect the BMPs (especially before and after rain events) and perform any necessary repairs or maintenance immediately. Many BMPs are designed to handle a limited amount of sediment. If not maintained, they'll become ineffective and a source of sediment pollution.

It's also important to keep records of BMP installation, implementation, and maintenance. Keep track of major grading activities that occur on the site, when construction activities cease (temporarily or permanently), and when a site is temporarily or permanently stabilized.

If construction plans change at any time, or if more appropriate BMPs are chosen for the site, update the Plan accordingly.

6. Completing the Project: Final Stabilization and Termination of the Permit

- **Final stabilization**
- **Notice of Termination**
- **Record retention**

Many states and EPA require a Notice of Termination (NOT) or other notification signifying that the construction activity is completed. An NOT is required when

- Final stabilization has been achieved on all portions of the site for which the permittee is responsible.
- Another operator has assumed control over all areas of the site that have not been finally stabilized. That operator would need to submit a new permit application to the permitting authority.
- For residential construction only, temporary stabilization of a lot has been completed prior to transference of ownership to the homeowner, with the homeowner being made aware of the need to perform final stabilization.

Permittees must keep a copy of their permit application and their Plan for at least 3 years following final stabilization. This period may be longer depending on state and local requirements.

Preconstruction Checklist

- A site description, including
  - Nature of the activity
  - Intended sequence of major construction activities
  - Total area of the site
  - Existing soil type and rainfall runoff data
  - A site map with:
    - Drainage patterns
    - Approximate slopes after major grading
    - Area of soil disturbance
    - Outline of areas which will not be disturbed
    - Location of major structural and nonstructural soil erosion controls
    - Areas where stabilization practices are expected to occur
    - Surface waters
    - Stormwater discharge locations
  - Name of the receiving water(s)
- A description of controls:
  - Erosion and sediment controls, including
    - Stabilization practices for all areas disturbed by construction
    - Structural practices for all drainage/discharge locations
  - Stormwater management controls, including
    - Measures used to control pollutants occurring in stormwater discharges after construction activities are complete
    - Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel
  - Other controls, including
    - Waste disposal practices that prevent discharge of solid materials
    - Measures to minimize offset tracking of sediments by construction vehicles
    - Measures to ensure compliance with state or local waste disposal, sanitary sewer, or septic system regulations
  - Description of the timing during the construction when measures will be implemented
- State or local requirements incorporated into the Plan
- Inspection and maintenance procedures for control measures identified in the Plan
- Contractor certification and Plan certification

Implementation Checklist

- Maintain records of construction activities, including
  - Dates when major grading activities occur
  - Dates when construction activities temporarily cease on the site or a portion of the site
  - Dates when construction activities permanently cease on the site or a portion of the site
  - Dates when stabilization measures are completed on the site
- Prepare inspection reports summarizing
  - Name of person conducting BMP inspections
  - Qualifications of person conducting BMP inspections
  - BMPs/areas inspected
  - Observed conditions
  - Necessary changes to the Plan
- Report releases of reportable quantities of oil or hazardous materials
  - Notify the National Response Center at 800-424-8802 immediately
  - Report releases to your permitting authority immediately, or as specified in your permit. You must also provide a written report within 14 days.
  - Modify the Plan to include
    - The date of release
    - Circumstances leading to the release
    - Steps taken to prevent reoccurrence of the release
- Modify Plan as necessary
  - Incorporate requests of the permitting authority to bring the Plan into compliance
  - Address changes in design, construction operation, or maintenance that affect the potential for discharge of pollutants

An ounce of prevention is worth a pound of cure! It's far more efficient and cost-effective to prevent pollution than it is to try to correct problems later. Installing and maintaining simple BMPs and pollution prevention techniques on site can greatly reduce the potential for stormwater pollution and can also save you money!

Visit www.epa.gov/npdes/stormwater for more information.

StormWater CleanWater PROTECTION PROGRAM

What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

Why is stormwater runoff a problem?

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.

- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.

- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

After the Storm

For more information contact:

or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps

A Citizen's Guide to Understanding Stormwater

EPA United States Environmental Protection Agency

EPA 833-B-03-002

January 2003

Internet Address (URL) • HTTP://www.epa.gov
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Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

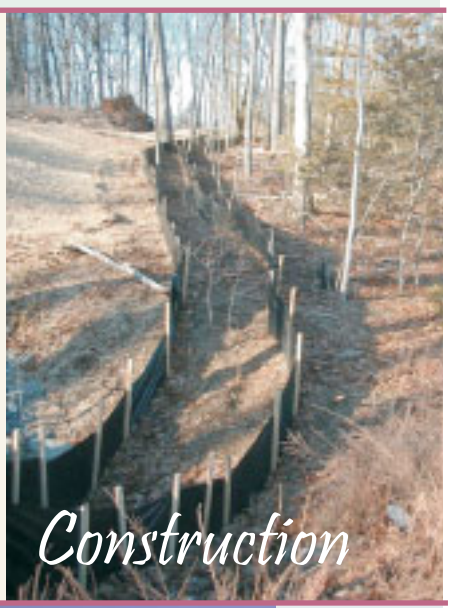
Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



Construction

Agriculture

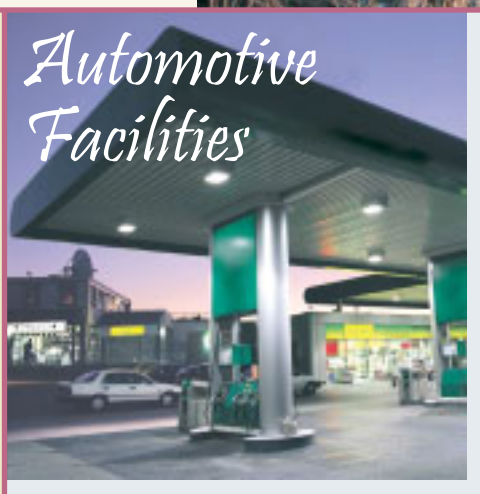
Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

6 *What can a business expect when inspected by the city?*

The inspection will include a meeting with the business representative, a walk-through of the facility, evaluation of current storm water best management practices and recommendations for additional measures that may be required to comply with the 2002 MS4 Permit and the city's storm water ordinance. Educational material will also be provided to the business representative. If a follow-up inspection is required the city's inspector will schedule one for a later date.

7 *What will happen if I do not comply with the city inspector's recommendations?*

The city is mandated by the State to establish sanctions for non-compliance. Sanctions may include:

- Verbal or written warnings
- Notice of violation or non-compliance
- Administrative Order
- Stop work or Cease and Desist Order
- Imposition of monetary penalties or criminal prosecution (infraction or misdemeanor)

8 *Will the city charge a fee for these inspections?*

The State of California has not provided any funding to Moreno Valley for this mandated inspection program, therefore the city is required to charge a fee to recover its costs. If the city ignores the State mandate it will be subject to significant monetary penalties, potentially up to and possibly greater than $27,500 per day. The city has adopted inspection fees for restaurants, commercial and industrial businesses and will be evaluating them this fiscal year.

9 *Businesses are not the only cause of storm water and non-storm water pollution. What is the city doing in those other areas?*

Storm water and non-storm water pollution comes from a variety of sources. The city is committed to improving water quality and reducing the amount of pollutants that enter our precious waterways. For example, the city already performs construction site inspections to address erosion and prevent sediment from entering our streets and storm drains. Also, the city is enforcing urban runoff requirements on new and significant redevelopment projects whereby developers must incorporate a variety of BMPs into their projects.

The City of Moreno Valley looks forward to working with you to help keep our waterways clean.

For more information or assistance,

please call 951.413.3497.

9/2004

MORENO VALLEY

City of Moreno Valley

Pollution Abatement

Business Inspection Program

National Pollutant Discharge Elimination System Permit

In order to comply with the 2002 Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit for the Santa Ana River Watershed Region issued by the Santa Ana Regional Water Quality Control Board for the State of California, the

City of Moreno Valley

is mandated

to perform storm water and non-storm water compliance inspections of local businesses to ensure the businesses are complying with the MS4 Permit and the city's storm water ordinance.

Questions & Answers

Below are some frequently asked questions about the NPDES Pollution Abatement Program

1 *Runoff from my business goes to a storm drain inlet in my parking lot or it flows to the city street. Doesn't this runoff eventually go the sewer treatment plant to be cleaned?*

The water that drains down the sink or toilet drains to the sanitary sewer and is treated at the sewer treatment plant, but storm water and non-storm water runoff from parking lots and landscape areas enter our streets and storm drains. This water does not receive any treatment and flows directly to our channels, rivers, lakes and finally the ocean. It is essential that this urban runoff be cleaned to the *"maximum extent practicable."*

2 *The County Department of Environmental Health Compliance Assistance Program (CAP) already comes to my business and performs a storm water compliance survey. Does this mean I will not be inspected by the city?*

The city is responsible for the inspection program. CAP provides a valuable service that the city will utilize. The city will evaluate the results of the most recent CAP survey to determine if the facility is in compliance with the MS4 Permit and its storm water ordinance. If the facility is in compliance, the city will not perform the currently scheduled inspection. If the facility is not in compliance, the city will contact the business and schedule a follow-up inspection using a city inspector.

3 *What businesses will be inspected?*

All food service facilities, and many existing commercial and industrial businesses must be inspected. If you are already being inspected by CAP you fall under this program. Other businesses not being inspected by CAP will fall under this program if they are the following types of businesses:

- Nurseries and green houses
- Mobile automobile or other vehicle washing - (base of operations)
- Mobile carpet and drapery cleaners - (base of operations)
- Mobile high pressure or steam cleaning - (base of operations)
- Landscape and hardscape installation - (base of operations)
- Painting and coating
- Pool, lake and fountain cleaning - (base of operations)
- Automotive related businesses
- Others that the city determines may contribute a significant pollutant load to the streets and storm drains

4 *How often will a business be inspected?*

Businesses will be prioritized according to their threat to water quality. A number of factors will be used to set the priority. Once the priority is set a business will be inspected annually, bi-annually or once every five years (city inspections may or may not coincide with the county's CAP inspections).

5 *What can I do before the inspection?*

There are many things you can do. Best Management Practices (BMPs) are procedures and practices you can implement with little or no cost to prevent pollutants and other hazardous materials from leaving your site. The city has a number of free brochures that address storm water and non-storm water pollution BMPs.

Some BMPs include:

- Good Housekeeping
- Safe Materials & Handling
- Preventative Maintenance
- Employee Training