

**PRELIMINARY
HYDROLOGY
ANALYSIS**

VTTM 36557

**CITY OF LAKE ELSINORE
RIVERSIDE COUNTY**

Volume 1 - 3

Prepared for:

**TERRACINA INVESTORS, LLC
5753 G Santa Ana Canyon Road,
Ste 507
Anaheim Hills, CA 92807
(714) 745-6546**

Preliminary Hydrology Analysis
VTM 36557, 'TERRACINA'
City of Lake Elsinore
Volume 1 of 3



HYDROLOGY ANALYSIS

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CITY OF LAKE ELSINORE

RIVERSIDE COUNTY



Prepared Under the Supervision of:

Gary A. Martin, RCE 50318, Exp. 6/30/15

Date:

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I. DRAINAGE OVERVIEW

1. INTRODUCTION

A. Purpose

The purpose of this report is to provide a hydrology calculation for the drainage within Tentative Tract 36557 located in the City of Lake Elsinore, County of Riverside. This development is proposed to include an Infiltration Basin and two Extended Detention/Water Quality Basins that will treat the developed area within it. This analysis is to determine the existing and developed runoff so that a preliminary drainage system can be sized and the size of the proposed basins, outlet risers, and the location and the drain holes in the risers can also be properly sized.

B. Project Description

The project tributary drainage area lies within the Santa Ana River Watershed within the City of Lake Elsinore. The project site is currently an undeveloped parcel with no known structures. The site is located at the northeast corner of the intersection of Lakeshore Drive and Dryden Street in the City of Lake Elsinore.

C. Proposed Conditions

As Tract 36557 is developed, the storm runoff for the project site will be collected through a proposed storm drain system, catch basins and inlets onsite. The majority of this runoff will be collected in a storm drain system that will be discharged into three separate drainage areas. These drainage areas include an infiltration basin and two extended detention/water quality basins.

Area "A" has four subareas. Subarea "1" is the most westerly and has an existing residential community within it. Subarea "2" is north and has been graded in preparation for residential development. Both Subareas "1" & "2" convey directly to their outlet at the upstream end of Subarea "3" by storm drain pipes. Subarea "3" is a natural open space that contains the remainder of the downstream natural channel. The proposed development flows are directed to Basin "A" where the flows are treated for water quality and retained to mitigate to reduce any flow increase above natural flow rate.

This area is tributary to a storm drain system within the tract that represents Line "B" in the City of Lake Elsinore Master Plan of Drainage. See Nichols Street South West District Hydrology Map, in Section V of this report.

Area "B" has three subareas. There are two natural offsite drainage areas. The largest, Subarea "2", of these areas consists of several natural canyons east of the site that drains to the west. They are collected in a storm drain system and conveyed around the site to the outlet into the natural canyon. The smaller, Subarea "3", is located north and drains south and east in natural and graded flow lines where it outlets in the natural canyon. The proposed development flows start by collecting an offsite development to the south and west of the site. This flow and the development flows are conveyed through the site by way of a storm drain system into Basin "B" where the flows are treated for water quality and retained to mitigate to reduce any flow increase above natural flow rate.

This area is tributary to a storm drain system within the tract that represents Line "A" in the City of Lake Elsinore Master Plan of Drainage. See Nichols Street South West District Hydrology Map, in Section V of this report.

Area "C" has two subareas. The Natural Area Subarea "2" consists of two natural slopes that are conveyed to their outlet by storm drain systems. The proposed development flows are conveyed to Basin "C" where the flows are treated for water quality and retained to mitigate to reduce any flow increase above natural flow rate and then is conveyed to the outlet by storm drain a system to the outlet at the natural stream.

This area is tributary to a storm drain system within the tract that represents Line "D" in the City of Lake Elsinore Master Plan of Drainage. See Nichols Street South West District Hydrology Map, in Section V of this report.

2. METHODOLOGY

A. DISCUSSION

The methodology used in this report is based on the Riverside County Flood Control and Water Conservation District's Storm Water Quality Best Management Practice Design Handbook, Hydrology Manual, Civilcadd/Civildesign Engineering

Software Version 7.0, an Excel spreadsheet and Heastad Methods "FlowMaster" software.

The analysis for this study is based upon the following criteria:

- All available information and improvement plans were collected.
- The drainage areas within and tributary to the project site were defined.
- The water quality study was performed as shown in the Riverside County Stormwater Quality BMP Design Handbook.
- The existing hydrographs were prepared based on the existing and proposed drainage patterns using Civilcadd/Civildesign Engineering Software.
- An Excel spreadsheet was used to determine the outlet's rating curve "depth/flow rate" of the proposed orifices in the outlet tower.
- The basins "depth/volume" rating curve was determined from the geometry of the proposed graded basin.
- The Flood routing hydrographs were prepared based on the proposed basing configuration, outlet tower orifices flow rate using the Civilcadd/Civildesign Engineering Software.

The results of this study and the print out of these calculations for this hydrological analysis are presented herein.

3. RATIONAL HYDROLOGY ANALYSIS

A. GENERAL

The hydrologic studies prepared in this report utilized the rational method and unit hydrograph method in accordance with the Riverside County Hydrology Manual.

Hydrology calculations were prepared using the "Rational Method Hydrology Computer Program Package" by Civilcadd Software based on the hydrology manual criterion.

The rational method computes the peak runoff as a function of area, rainfall intensity, and a coefficient of runoff. The basic formula in the rational method is as follows:

$$Q = CIA$$

Where:

$$\begin{array}{ll} Q & = \text{Peak runoff in cubic feet per second (cfs)} \\ C & = \text{Coefficient of runoff} \end{array}$$

$I =$ Average rainfall in inches per hour corresponding to the
time of concentration
 $A =$ Drainage area in acres

This formula computes the peak flow rate at all points of concentration. The hydrology analysis is provided in this report.

Land use in the study area is a significant factor in the development of the hydrology study in that the coefficient of runoff used in the rational method are partially dependent upon the type of surface development proposed within the drainage area. The land use used in this study is based upon the development proposed for "Terracina".

The major factor affecting infiltration is the nature of the soil. Hydrologic soil types within the study area were determined from the Hydrologic Classification of Soils map contained in the Riverside County Hydrology Manual. The soil classification is based on the Soil Conservation Service criteria as follows:

Soil Group A Low runoff potential, consisting mainly of deep, well-defined sands or gravel.

Soil Group B Soils having moderate infiltration rates, consisting of moderately well drained sandy-loam soils with fine to moderate coarse textures.

Soil Group C Soils having slow infiltration rates, consisting of silty-loam soils with moderate fine textures.

Soil Group D High runoff potential with slow infiltration rates, consisting mainly of clay soils with a permanent high water table or shallow soils over impervious material.

Rainfall intensity is expressed in inches of rainfall per hour and is developed by statistical methods from historical rainfall records. The rainfall intensity data used in this study was obtained from the curves for mean precipitation intensities included in the Riverside County Hydrology Manual.

The Rational Hydrology Analysis is contained in **Section IV, Appendix A** of this report.

4. UNIT HYDROGRAPH HYDROLOGY ANALYSIS

A GENERAL

The Hydrograph Hydrology Analysis was performed per the Riverside County Flood Control and Water Conservation District's Hydrology Manual. A summary table of the results are shown in **Section III**.

The Unit Hydrograph Analysis is contained in **Section IV, Appendix B** of this report.

5. RETARDING BASIN FLOOD ROUTING ANALYSIS

A GENERAL

The Retarding Basin Flood Routing Analysis was performed per the Riverside County Flood Control and Water Conservation District's Hydrology Manual.

All of the Basins within Tentative Tract 36557 use outlet structures per Standard Drawing No. WQ501. The holes within this structure allow a controlled amount of flow to leave the basin based on the depth of water stored within the basin. A summary table the results are shown in **Section III, Table**. The Flood Routing Analysis is contained in **Section IV, Appendix C** of this report.

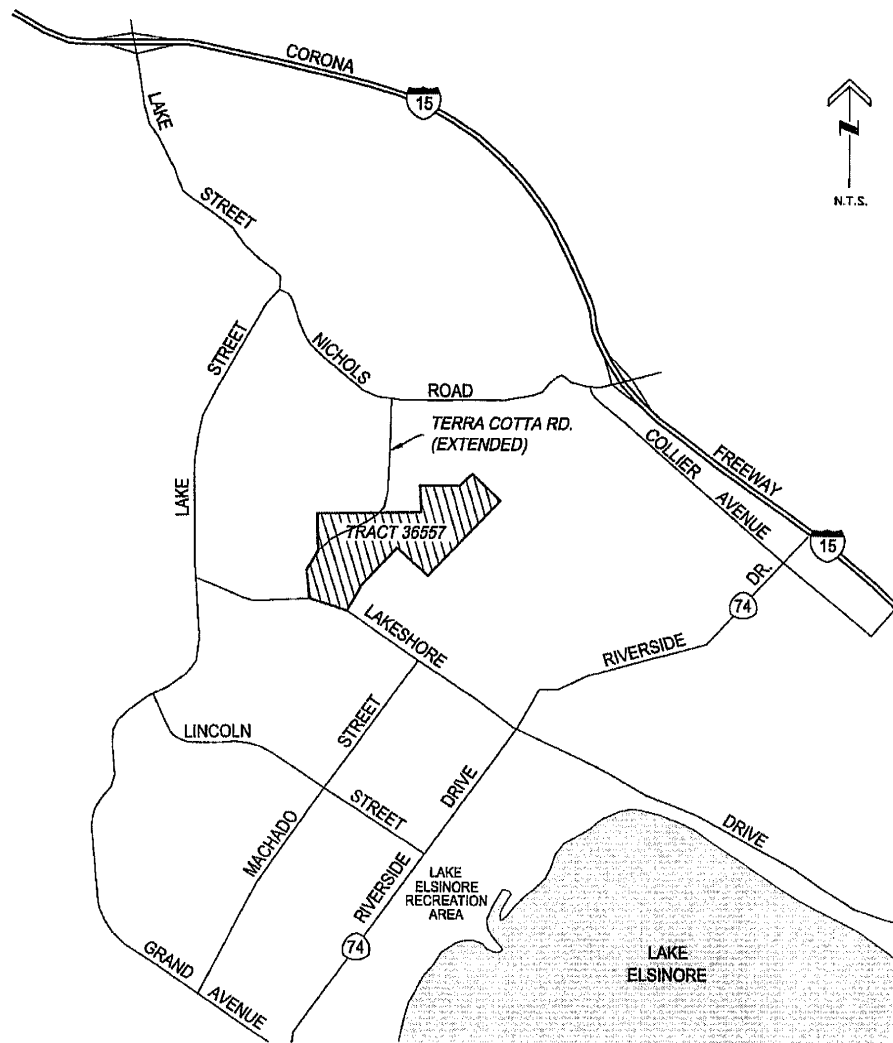
The spillways from these basins are designed for emergency use only in the case where outlet tower becomes plugged or where a flow greater than the 100-year design event occurs.

6. BASIN EMERGENCY OUTFLOW ANALYSIS

A GENERAL

All of the Basins within Tentative Tract 36557 use outlet structures per Standard Drawing No. WQ501. This outlet allows the Overflow Trash Rack to act as an emergency 100-year outlet if the structure's outlet holes become plugged. If this structure were to become completely plugged then an emergency spillway will be constructed to carry the flows. This spillway would be designed to carry the 100-year flows or if flows are greater than the 100-year flows could not be carried by the outlet structure and the downstream facilities, then the spillway would handle that occurrence.

II. VICINITY MAP





III. TABLES

- AREA 'A'** Unit Hydrograph Hydrology Analysis & Retarding Basin Flood Routing Analysis for Basin 'A'
- AREA 'B'** Unit Hydrograph Hydrology Analysis & Retarding Basin Flood Routing Analysis for Basin 'B'
- AREA 'C'** Unit Hydrograph Hydrology Analysis & Retarding Basin Flood Routing Analysis for Basin 'C'

Tract 36557 Basin "A"

This Table compares the Results of Flood Routing Onsite Hydrograph through Retarding Basin & Combining the Natural Offsite Hydrographs to the Point of Concentration of the Existing Hydrograph.

		Existing				Flood Routed			
		1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr
2-yr	Q	130	91.5	82.6	13.6	98.8	57.9	49.4	13.4
5-yr	Q	197.4	147.3	134.8	41.2	154.5	99.9	86.3	21.0
10-yr	Q	248.8	189.9	174.8	63.3	221.0	155.6	140.4	59.6

		Existing (Subarea 1)				Existing (Subarea 2)				Developed (Subarea 3)				Natural (Subarea 4)			
		1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr
2-yr	Q	32.0	16.0	13.3	2.6	57.9	33.7	29.7	8.1	42.0	25.5	22.9	8.0	16.5	8.9	7.4	0.7
5-yr	Q	50.2	29.4	26.2	3.7	87.0	55.3	50.3	11.9	61.1	39.6	36.3	11.4	17.9	15.2	12.8	2.4
10-yr	Q	72.8	48.0	44.2	13.8	120.3	82.5	76.5	27.1	81.2	55.6	51.6	19.4	22.6	24.2	21.1	8.2

Tract 36557 Basin “B”

Results of Hydrographs Flood Routing

Taking Developed Area (Subarea 1) Routed through Retention Basin and Combining it with Natural Areas (Subarea 2 & 3) and then Comparing that Hydrograph to the Hydrograph of the Existing Area

	Existing				Flood Routed			
	1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr
2-yr Q	72.0	48.1	42.1	7.3	26.8	15.3	13.1	2.6
5-yr Q	112.8	81.1	72.9	16.0	41.3	25.9	23.3	6.3
10-yr Q	166.2	129.8	119.7	48.5	59.4	43.2	41.7	31.2

	Developed Area (Subarea 1)				Natural Area (Subarea 2)				Natural Area (Subarea 3)			
	1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr
2-yr Q	71.3	43.9	38.6	10.4	23.3	13.0	11.1	1.1	3.0	1.7	1.5	0.1
5-yr Q	106.1	69.6	61.8	16.8	36.0	22.3	19.4	3.5	4.6	2.8	2.6	0.4
10-yr Q	145.8	102.6	92.5	37.5	52.0	35.8	32.1	12.4	6.6	4.5	4.2	1.5

Tract 36557 Basin "C"

Results of Hydrographs Flood Routing

Taking Developed Area (Subarea 1) through Retention Basin and
Combining it with Natural Area (Subarea 2) and then Comparing that
Hydrograph with the Hydrograph of the Existing Area

		Existing				Flood Routed			
		1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr
2-yr	Q	23.2	13.6	11.9	2.8	12.2	8.0	7.4	2.8
5-yr	Q	35.9	23.2	20.9	4.0	17.9	12.4	11.6	4.0
10-yr	Q	50.7	35.5	32.8	10.9	23.8	17.2	16.3	6.7

		Developed Area (Subarea 1)				Natural Area (Subarea 2)			
		1-hr	3-hr	6-hr	24-hr	1-hr	3-hr	6-hr	24-hr
2-yr	Q	16.2	9.7	8.8	2.9	12.2	7.9	7.1	2.3
5-yr	Q	23.8	15.2	13.9	4.1	17.9	12.2	11.2	3.2
10-yr	Q	27.9	18.7	17.4	6.0	23.8	17.0	15.8	5.9

IV. APPENDICES

Area "A" is the most northern portion of the site has two offsite subareas that drain through this area. These offsite areas were carried through the site and outlet into the downstream channel without retarding or water quality treatment. The areas within Area "A" that are to be developed are proposed to be directed into the Water Quality and Retarding Basin. From there all of the flows are outlet into the downstream canyon and allowed to drain offsite.

Subarea "A" is the most westerly and has an existing residential community within it. We were able to use a portion of CSL Engineering, Inc.'s Hydrology Calculations for Tract 36557, which as been included in this report, to determine the amount of flow that this offsite area will be directed into the subject site. Subarea "B" is north and has been graded in preparation for residential development. We were able to obtain a copy of KWC Engineers' Hydrology Map for Tract 28214-7, which as been included in this report, to determine the amount of flow that this offsite area will be directed into the subject site.

Both of these offsite areas flow rates were used as User Input in the hydrology study where they were combined with undeveloped onsite areas and then outlet into the downstream natural channel and combined with the flow from Basin "A" and then carried downstream and offsite.

Area "B" Is the largest portion of the onsite developed area and outlets to the east side of the tract it has three subareas. There are two natural offsite drainage areas. The largest of these areas consist of several natural canyons east of the site that drains to the west. They are collected in a storm drain system and conveyed around the site to the outlet into the natural canyon. The smaller subarea is located north and drains south and east in natural and graded flow lines where it outlets in the natural canyon. The proposed development flows start by collecting an offsite development to the south and west of the site. This flow and the development flows are conveyed through the site by way of a storm drain system into Basin "B" where the flows are treated for water quality and retained to mitigate to reduce the peak flow rate below that of the natural flow rate.

Area "C" the smallest of the drainage areas is located on the south west side of the tract if has two subareas. The Natural Area consists of two natural slopes that are conveyed to their outlet by a storm drain systems. The proposed development flows are conveyed to Basin "C" where the flows are treated for water quality and retained to mitigate to reduce the peak flow rate below that of the natural flow rate and then it is conveyed by a storm drain to the existing storm drain.



APPENDIX A RATIONAL HYDROLOGY ANALYSIS

Drainage Area "A" Calculation

Drainage Area "B" Calculation

Drainage Area "C" Calculation

APPENDIX B UNIT HYDROGRAPH ANALYSIS

AREA 'A' CALCULATION

- 1) Subarea '1' – 2-yr, 5-yr, 10-yr
- 2) Subarea '2' – 2-yr, 5-yr, 10-yr
- 3) Developed Subarea '3' – 2-yr, 5-yr, 10-yr
- 4) Subarea '4' – 2-yr, 5-yr, 10-yr
- 5) Existing – 2-yr, 5-yr, 10-yr

AREA 'B' CALCULATION

- 1) Developed Subarea '1' – 2-yr, 5-yr, 10-yr
- 2) Subarea '2' – 2-yr, 5-yr, 10-yr
- 3) Subarea '3' – 2-yr, 5-yr, 10-yr
- 4) Existing – 2-yr, 5-yr, 10-yr

AREA 'C' CALCULATION

- 1) Developed Subarea '1' – 2-yr, 5-yr, 10-yr
- 2) Subarea '2' – 2-yr, 5-yr, 10-yr
- 3) Existing – 2-yr, 5-yr, 10-yr

APPENDIX C FLOOD HYDROGRAPH ROUTING

AREA 'A'

Basin "A" – 2-yr, 5-yr, 10-yr for 1-hr, 3-hr, 6-hr, 24-hr

AREA 'B'

Basin "B" – 2-yr, 5-yr, 10-yr for 1-hr, 3-hr, 6-hr, 24-hr

AREA 'C'

Basin "C" – 2-yr, 5-yr, 10-yr for 1-hr, 3-hr, 6-hr, 24-hr

APPENDIX D REFERENCE HYDROLOGY FOR USER INPUTS

SUBAREA 'A' – CSL ENGINEERING, INC.

SUBAREA 'B' – KWC ENGINEERS

APPENDIX "A"

RATIONAL HYDROLOGY ANALYSIS

DRAINAGE AREA "A" CALCULATION

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 04/28/14 File:32786A10.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557

10-Year Rational Hydrology Area "A"

Proposed Condition

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 10.0

Calculated rainfall intensity data:

1 hour intensity = 0.880(In/Hr)

Slope of intensity duration curve = 0.5500

+++++
 Process from Point/Station 301.100 to Point/Station 301.200
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 565.000(Ft.)

Top (of initial area) elevation = 501.700(Ft.)

Bottom (of initial area) elevation = 495.600(Ft.)

Difference in elevation = 6.100(Ft.)

Slope = 0.01080 s(percent)= 1.08

$TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 12.168 min.

Rainfall intensity = 2.116(In/Hr) for a 10.0 year storm

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.801

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.542(CFS)
 Total initial stream area = 1.500(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 301.200 to Point/Station 303.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 495.600(Ft.)
 Downstream point/station elevation = 443.000(Ft.)
 Pipe length = 645.00(Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 2.542(CFS)
 Nearest computed pipe diameter = 9.00(In.)
 Calculated individual pipe flow = 2.542(CFS)
 Normal flow depth in pipe = 5.13(In.)
 Flow top width inside pipe = 8.91(In.)
 Critical Depth = 8.35(In.)
 Pipe flow velocity = 9.76(Ft/s)
 Travel time through pipe = 1.10 min.
 Time of concentration (TC) = 13.27 min.

++++++
 Process from Point/Station 303.000 to Point/Station 303.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 1.500(Ac.)
 Runoff from this stream = 2.542(CFS)
 Time of concentration = 13.27 min.
 Rainfall intensity = 2.018(In/Hr)

++++++
 Process from Point/Station 301.000 to Point/Station 302.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 620.000(Ft.)
 Top (of initial area) elevation = 502.000(Ft.)
 Bottom (of initial area) elevation = 492.000(Ft.)
 Difference in elevation = 10.000(Ft.)
 Slope = 0.01613 s(percent) = 1.61
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.655 min.
 Rainfall intensity = 2.167(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.803

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.131(CFS)
 Total initial stream area = 1.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 302.000 to Point/Station 303.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 492.000(Ft.)
 End of street segment elevation = 448.000(Ft.)
 Length of street segment = 500.000(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 18.000(Ft.)
 Distance from crown to crossfall grade break = 10.000(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 10.000(Ft.)
 Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 3.826(CFS)
 Depth of flow = 0.273(Ft.), Average velocity = 5.777(Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 7.319(Ft.)
 Flow velocity = 5.78(Ft/s)
 Travel time = 1.44 min. TC = 13.10 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.798
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 2.032(In/Hr) for a 10.0 year storm
 Subarea runoff = 1.297(CFS) for 0.800(Ac.)
 Total runoff = 4.427(CFS) Total area = 2.600(Ac.)
 Street flow at end of street = 4.427(CFS)
 Half street flow at end of street = 4.427(CFS)
 Depth of flow = 0.284(Ft.), Average velocity = 5.957(Ft/s)
 Flow width (from curb towards crown) = 7.852(Ft.)

+++++
 Process from Point/Station 303.000 to Point/Station 303.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 2.600 (Ac.)
 Runoff from this stream = 4.427 (CFS)
 Time of concentration = 13.10 min.
 Rainfall intensity = 2.032 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	2.542	13.27	2.018
2	4.427	13.10	2.032

Largest stream flow has longer or shorter time of concentration

Qp = 4.427 + sum of

$$Q_a \cdot \frac{T_b}{T_a}$$

$$2.542 * 0.987 = 2.509$$
 Qp = 6.936

Total of 2 streams to confluence:
 Flow rates before confluence point:

2.542 4.427

Area of streams before confluence:
 1.500 2.600

Results of confluence:

Total flow rate = 6.936 (CFS)
 Time of concentration = 13.097 min.
 Effective stream area after confluence = 4.100 (Ac.)

+++++
 Process from Point/Station 303.000 to Point/Station 305.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 448.000 (Ft.)
 Downstream point/station elevation = 405.000 (Ft.)
 Pipe length = 350.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 6.936 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 6.936 (CFS)
 Normal flow depth in pipe = 6.39 (In.)
 Flow top width inside pipe = 11.98 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 16.31 (Ft/s)
 Travel time through pipe = 0.36 min.
 Time of concentration (TC) = 13.45 min.

+++++

Process from Point/Station 305.000 to Point/Station 305.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 4.100 (Ac.)
 Runoff from this stream = 6.936 (CFS)
 Time of concentration = 13.45 min.
 Rainfall intensity = 2.003 (In/Hr)

+++++
 Process from Point/Station 304.000 to Point/Station 305.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 890.000 (Ft.)
 Top (of initial area) elevation = 495.000 (Ft.)
 Bottom (of initial area) elevation = 405.000 (Ft.)
 Difference in elevation = 90.000 (Ft.)
 Slope = 0.10112 s(percent) = 10.11
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.329 min.
 Rainfall intensity = 2.449 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.812
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.174 (CFS)
 Total initial stream area = 2.100 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 305.000 to Point/Station 305.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.100 (Ac.)
 Runoff from this stream = 4.174 (CFS)
 Time of concentration = 9.33 min.
 Rainfall intensity = 2.449 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	6.936	13.45	2.003
2	4.174	9.33	2.449

Largest stream flow has longer time of concentration
 Qp = 6.936 + sum of

$$Q_p = \frac{Q_b \cdot I_a/I_b}{10.349}$$

$$= \frac{4.174 \cdot 0.818}{10.349} = 3.413$$

Total of 2 streams to confluence:

Flow rates before confluence point:

6.936 4.174

Area of streams before confluence:

4.100 2.100

Results of confluence:

Total flow rate = 10.349(CFS)

Time of concentration = 13.455 min.

Effective stream area after confluence = 6.200(Ac.)

++++++
 Process from Point/Station 305.000 to Point/Station 307.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 405.000(Ft.)
 Downstream point/station elevation = 400.000(Ft.)
 Pipe length = 50.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 10.349(CFS)
 Nearest computed pipe diameter = 12.00(In.)
 Calculated individual pipe flow = 10.349(CFS)
 Normal flow depth in pipe = 9.06(In.)
 Flow top width inside pipe = 10.32(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 16.27(Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 13.51 min.

++++++
 Process from Point/Station 307.000 to Point/Station 307.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 6.200(Ac.)
 Runoff from this stream = 10.349(CFS)
 Time of concentration = 13.51 min.
 Rainfall intensity = 1.998(In/Hr)

++++++
 Process from Point/Station 306.000 to Point/Station 307.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 570.000(Ft.)
 Top (of initial area) elevation = 495.000(Ft.)
 Bottom (of initial area) elevation = 402.000(Ft.)
 Difference in elevation = 93.000(Ft.)
 Slope = 0.16316 s(percent)= 16.32
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 7.094 min.
 Rainfall intensity = 2.848(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.822
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.914(CFS)
 Total initial stream area = 2.100(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 307.000 to Point/Station 307.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.100(Ac.)
 Runoff from this stream = 4.914(CFS)
 Time of concentration = 7.09 min.
 Rainfall intensity = 2.848(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	10.349	13.51	1.998
2	4.914	7.09	2.848

Largest stream flow has longer time of concentration

$Q_p = 10.349 + \text{sum of}$
 $Q_b \quad I_a/I_b$
 $4.914 * 0.702 = 3.449$
 $Q_p = 13.798$

Total of 2 streams to confluence:
 Flow rates before confluence point:

10.349 4.914

Area of streams before confluence:
 6.200 2.100

Results of confluence:

Total flow rate = 13.798(CFS)
 Time of concentration = 13.506 min.
 Effective stream area after confluence = 8.300(Ac.)

++++++
 Process from Point/Station 307.000 to Point/Station 310.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 400.000(Ft.)

Downstream point/station elevation = 385.000 (Ft.)
 Pipe length = 140.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 13.798 (CFS)
 Nearest computed pipe diameter = 15.00 (In.)
 Calculated individual pipe flow = 13.798 (CFS)
 Normal flow depth in pipe = 8.84 (In.)
 Flow top width inside pipe = 14.76 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 18.36 (Ft/s)
 Travel time through pipe = 0.13 min.
 Time of concentration (TC) = 13.63 min.

++++++
 Process from Point/Station 310.000 to Point/Station 310.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 8.300 (Ac.)
 Runoff from this stream = 13.798 (CFS)
 Time of concentration = 13.63 min.
 Rainfall intensity = 1.988 (In/Hr)

++++++
 Process from Point/Station 308.000 to Point/Station 310.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 650.000 (Ft.)
 Top (of initial area) elevation = 446.000 (Ft.)
 Bottom (of initial area) elevation = 385.000 (Ft.)
 Difference in elevation = 61.000 (Ft.)
 Slope = $0.09385 \text{ s(percent)} = 9.38$
 $TC = k(0.390) * [(length^3) / (elevation \text{ change})]^{0.2}$
 Initial area time of concentration = 8.351 min.
 Rainfall intensity = 2.603 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.816
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.823 (CFS)
 Total initial stream area = 1.800 (Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 310.000 to Point/Station 310.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 1.800 (Ac.)
 Runoff from this stream = 3.823 (CFS)
 Time of concentration = 8.35 min.
 Rainfall intensity = 2.603 (In/Hr)

+++++
 Process from Point/Station 309.000 to Point/Station 310.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 670.000 (Ft.)
 Top (of initial area) elevation = 422.000 (Ft.)
 Bottom (of initial area) elevation = 385.000 (Ft.)
 Difference in elevation = 37.000 (Ft.)
 Slope = 0.05522 s(percent) = 5.52
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.399 min.
 Rainfall intensity = 2.439 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.811
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.166 (CFS)
 Total initial stream area = 1.600 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 310.000 to Point/Station 310.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3

Stream flow area = 1.600 (Ac.)
 Runoff from this stream = 3.166 (CFS)
 Time of concentration = 9.40 min.
 Rainfall intensity = 2.439 (In/Hr)

Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	13.798	13.63	1.988
2	3.823	8.35	2.603
3	3.166	9.40	2.439

Largest stream flow has longer time of concentration

Qp = 13.798 + sum of
 $\frac{Q_b}{Q_b} \frac{I_a}{I_b}$
 $3.823 * 0.764 = 2.919$
 $\frac{Q_b}{Q_b} \frac{I_a}{I_b}$

$3.166 * 0.815 = 2.581$
 $Q_p = 19.298$

Total of 3 streams to confluence:

Flow rates before confluence point:

13.798 3.823 3.166

Area of streams before confluence:

8.300 1.800 1.600

Results of confluence:

Total flow rate = 19.298(CFS)

Time of concentration = 13.633 min.

Effective stream area after confluence = 11.700(Ac.)

++++++
 Process from Point/Station 310.000 to Point/Station 317.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 385.000(Ft.)
 Downstream point/station elevation = 384.000(Ft.)
 Pipe length = 40.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 19.298(CFS)
 Nearest computed pipe diameter = 21.00(In.)
 Calculated individual pipe flow = 19.298(CFS)
 Normal flow depth in pipe = 13.83(In.)
 Flow top width inside pipe = 19.92(In.)
 Critical Depth = 18.98(In.)
 Pipe flow velocity = 11.49(Ft/s)
 Travel time through pipe = 0.06 min.
 Time of concentration (TC) = 13.69 min.

++++++
 Process from Point/Station 317.000 to Point/Station 317.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 11.700(Ac.)
 Runoff from this stream = 19.298(CFS)
 Time of concentration = 13.69 min.
 Rainfall intensity = 1.983(In/Hr)
 Program is now starting with Main Stream No. 2

++++++
 Process from Point/Station 350.000 to Point/Station 351.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 820.000(Ft.)
 Top (of initial area) elevation = 408.000(Ft.)
 Bottom (of initial area) elevation = 399.000(Ft.)
 Difference in elevation = 9.000(Ft.)
 Slope = 0.01098 s(percent)= 1.10

$TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 14.077 min.
 Rainfall intensity = 1.953(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.817
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.509(CFS)
 Total initial stream area = 2.200(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 351.000 to Point/Station 352.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 399.000(Ft.)
 End of street segment elevation = 394.000(Ft.)
 Length of street segment = 500.000(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 20.000(Ft.)
 Distance from crown to crossfall grade break = 10.000(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 10.000(Ft.)
 Slope from curb to property line (v/hz) = 0.020
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 4.310(CFS)
 Depth of flow = 0.376(Ft.), Average velocity = 2.555(Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 12.490(Ft.)
 Flow velocity = 2.56(Ft/s)
 Travel time = 3.26 min. TC = 17.34 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.809
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 1.742(In/Hr) for a 10.0 year storm
 Subarea runoff = 1.549(CFS) for 1.100(Ac.)
 Total runoff = 5.058(CFS) Total area = 3.300(Ac.)

Street flow at end of street = 5.058(CFS)
 Half street flow at end of street = 5.058(CFS)
 Depth of flow = 0.393(Ft.), Average velocity = 2.654(Ft/s)
 Flow width (from curb towards crown)= 13.338(Ft.)

+++++
 Process from Point/Station 352.000 to Point/Station 354.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 394.000(Ft.)
 End of street segment elevation = 380.000(Ft.)
 Length of street segment = 300.000(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 20.000(Ft.)
 Distance from crown to crossfall grade break = 10.000(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 10.000(Ft.)
 Slope from curb to property line (v/hz) = 0.020
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 8.246(CFS)
 Depth of flow = 0.364(Ft.), Average velocity = 5.364(Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 11.877(Ft.)
 Flow velocity = 5.36(Ft/s)
 Travel time = 0.93 min. TC = 18.27 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.806
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 1.692(In/Hr) for a 10.0 year storm
 Subarea runoff = 6.278(CFS) for 4.600(Ac.)
 Total runoff = 11.336(CFS) Total area = 7.900(Ac.)
 Street flow at end of street = 11.336(CFS)
 Half street flow at end of street = 11.336(CFS)
 Depth of flow = 0.397(Ft.), Average velocity = 5.785(Ft/s)
 Flow width (from curb towards crown)= 13.539(Ft.)

+++++
 Process from Point/Station 354.000 to Point/Station 354.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 7.900(Ac.)
 Runoff from this stream = 11.336(CFS)
 Time of concentration = 18.27 min.
 Rainfall intensity = 1.692(In/Hr)

 Process from Point/Station 353.000 to Point/Station 354.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 900.000(Ft.)
 Top (of initial area) elevation = 400.000(Ft.)
 Bottom (of initial area) elevation = 380.000(Ft.)
 Difference in elevation = 20.000(Ft.)
 Slope = 0.02222 s(percent)= 2.22
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.688 min.
 Rainfall intensity = 2.068(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.820
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.921(CFS)
 Total initial stream area = 2.900(Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 354.000 to Point/Station 354.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 2.900(Ac.)
 Runoff from this stream = 4.921(CFS)
 Time of concentration = 12.69 min.
 Rainfall intensity = 2.068(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	11.336	18.27	1.692
2	4.921	12.69	2.068

Largest stream flow has longer time of concentration

Qp = 11.336 + sum of
 Qb Ia/Ib
 4.921 * 0.818 = 4.027
 Qp = 15.363

Total of 2 streams to confluence:
 Flow rates before confluence point:
 11.336 4.921
 Area of streams before confluence:
 7.900 2.900
 Results of confluence:
 Total flow rate = 15.363 (CFS)
 Time of concentration = 18.270 min.
 Effective stream area after confluence = 10.800 (Ac.)

 Process from Point/Station 354.000 to Point/Station 357.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 380.000 (Ft.)
 Downstream point/station elevation = 379.000 (Ft.)
 Pipe length = 50.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 15.363 (CFS)
 Nearest computed pipe diameter = 21.00 (In.)
 Calculated individual pipe flow = 15.363 (CFS)
 Normal flow depth in pipe = 14.09 (In.)
 Flow top width inside pipe = 19.74 (In.)
 Critical Depth = 17.41 (In.)
 Pipe flow velocity = 8.95 (Ft/s)
 Travel time through pipe = 0.09 min.
 Time of concentration (TC) = 18.36 min.

 Process from Point/Station 357.000 to Point/Station 357.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 10.800 (Ac.)
 Runoff from this stream = 15.363 (CFS)
 Time of concentration = 18.36 min.
 Rainfall intensity = 1.688 (In/Hr)

 Process from Point/Station 356.000 to Point/Station 357.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 950.000 (Ft.)
 Top (of initial area) elevation = 437.000 (Ft.)
 Bottom (of initial area) elevation = 379.000 (Ft.)
 Difference in elevation = 58.000 (Ft.)
 Slope = 0.06105 s(percent) = 6.11
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.593 min.
 Rainfall intensity = 2.284 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.827
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 9.064(CFS)
 Total initial stream area = 4.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 357.000 to Point/Station 357.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 4.800(Ac.)
 Runoff from this stream = 9.064(CFS)
 Time of concentration = 10.59 min.
 Rainfall intensity = 2.284(In/Hr)

++++++
 Process from Point/Station 355.000 to Point/Station 357.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 310.000(Ft.)
 Top (of initial area) elevation = 381.000(Ft.)
 Bottom (of initial area) elevation = 379.000(Ft.)
 Difference in elevation = 2.000(Ft.)
 Slope = $0.00645 \text{ s(percent)} = 0.65$
 $TC = k(0.390) * [(length^3)/(elevation \text{ change})]^{0.2}$
 Initial area time of concentration = 10.609 min.
 Rainfall intensity = 2.282(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.827
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.321(CFS)
 Total initial stream area = 0.700(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 357.000 to Point/Station 357.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3
 Stream flow area = 0.700(Ac.)

Runoff from this stream = 1.321(CFS)
 Time of concentration = 10.61 min.
 Rainfall intensity = 2.282(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	15.363	18.36	1.688
2	9.064	10.59	2.284
3	1.321	10.61	2.282

Largest stream flow has longer time of concentration

Qp = 15.363 + sum of
 Qb Ia/Ib
 9.064 * 0.739 = 6.697
 Qb Ia/Ib
 1.321 * 0.740 = 0.977
 Qp = 23.037

Total of 3 streams to confluence:

Flow rates before confluence point:
 15.363 9.064 1.321

Area of streams before confluence:
 10.800 4.800 0.700

Results of confluence:

Total flow rate = 23.037(CFS)
 Time of concentration = 18.363 min.
 Effective stream area after confluence = 16.300(Ac.)

+++++
 Process from Point/Station 357.000 to Point/Station 360.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 379.000(Ft.)
 Downstream point/station elevation = 378.000(Ft.)
 Pipe length = 300.00(Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 23.037(CFS)
 Nearest computed pipe diameter = 33.00(In.)
 Calculated individual pipe flow = 23.037(CFS)
 Normal flow depth in pipe = 23.81(In.)
 Flow top width inside pipe = 29.58(In.)
 Critical Depth = 19.05(In.)
 Pipe flow velocity = 5.02(Ft/s)
 Travel time through pipe = 1.00 min.
 Time of concentration (TC) = 19.36 min.

+++++
 Process from Point/Station 360.000 to Point/Station 360.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1

Stream flow area = 16.300(Ac.)
 Runoff from this stream = 23.037(CFS)
 Time of concentration = 19.36 min.
 Rainfall intensity = 1.639(In/Hr)

+++++
 Process from Point/Station 358.000 to Point/Station 360.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 950.000(Ft.)
 Top (of initial area) elevation = 450.000(Ft.)
 Bottom (of initial area) elevation = 378.000(Ft.)
 Difference in elevation = 72.000(Ft.)
 Slope = 0.07579 s(percent)= 7.58
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.145 min.
 Rainfall intensity = 2.339(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.810
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.900
 Decimal fraction soil group D = 0.100
 RI index for soil(AMC 2) = 69.60
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.686(CFS)
 Total initial stream area = 3.000(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 360.000 to Point/Station 360.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 3.000(Ac.)
 Runoff from this stream = 5.686(CFS)
 Time of concentration = 10.14 min.
 Rainfall intensity = 2.339(In/Hr)

+++++
 Process from Point/Station 359.000 to Point/Station 360.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 400.000(Ft.)
 Top (of initial area) elevation = 399.000(Ft.)
 Bottom (of initial area) elevation = 379.000(Ft.)
 Difference in elevation = 20.000(Ft.)
 Slope = 0.05000 s(percent)= 5.00
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 18.800 min.
 Rainfall intensity = 1.666(In/Hr) for a 10.0 year storm

UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.731
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.400
 Decimal fraction soil group D = 0.600
 RI index for soil(AMC 2) = 77.60
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 0.122(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 1.000

+++++
 Process from Point/Station 360.000 to Point/Station 360.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3
 Stream flow area = 0.100(Ac.)
 Runoff from this stream = 0.122(CFS)
 Time of concentration = 18.80 min.
 Rainfall intensity = 1.666(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	23.037	19.36	1.639
2	5.686	10.14	2.339
3	0.122	18.80	1.666

Largest stream flow has longer time of concentration

Qp = 23.037 + sum of
 Qb Ia/Ib
 5.686 * 0.701 = 3.985
 Qb Ia/Ib
 0.122 * 0.984 = 0.120
 Qp = 27.141

Total of 3 streams to confluence:

Flow rates before confluence point:
 23.037 5.686 0.122

Area of streams before confluence:
 16.300 3.000 0.100

Results of confluence:

Total flow rate = 27.141(CFS)
 Time of concentration = 19.359 min.
 Effective stream area after confluence = 19.400(Ac.)

+++++
 Process from Point/Station 360.000 to Point/Station 313.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 378.000(Ft.)
 Downstream point/station elevation = 377.000(Ft.)
 Pipe length = 40.00(Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 27.141(CFS)
 Nearest computed pipe diameter = 24.00(In.)
 Calculated individual pipe flow = 27.141(CFS)
 Normal flow depth in pipe = 17.39(In.)
 Flow top width inside pipe = 21.44(In.)
 Critical Depth = 21.73(In.)
 Pipe flow velocity = 11.12(Ft/s)
 Travel time through pipe = 0.06 min.
 Time of concentration (TC) = 19.42 min.

++++++
 Process from Point/Station 313.000 to Point/Station 313.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 19.400(Ac.)
 Runoff from this stream = 27.141(CFS)
 Time of concentration = 19.42 min.
 Rainfall intensity = 1.637(In/Hr)

++++++
 Process from Point/Station 311.000 to Point/Station 313.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 420.000(Ft.)
 Top (of initial area) elevation = 405.000(Ft.)
 Bottom (of initial area) elevation = 384.000(Ft.)
 Difference in elevation = 21.000(Ft.)
 Slope = 0.05000 s(percent)= 5.00
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.954 min.
 Rainfall intensity = 2.674(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.833
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.150
 Decimal fraction soil group D = 0.850
 RI index for soil(AMC 2) = 74.10
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.684(CFS)
 Total initial stream area = 3.000(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 313.000 to Point/Station 313.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 3.000 (Ac.)
 Runoff from this stream = 6.684 (CFS)
 Time of concentration = 7.95 min.
 Rainfall intensity = 2.674 (In/Hr)

+++++
 Process from Point/Station 312.000 to Point/Station 313.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 560.000 (Ft.)
 Top (of initial area) elevation = 390.000 (Ft.)
 Bottom (of initial area) elevation = 386.000 (Ft.)
 Difference in elevation = 4.000 (Ft.)
 Slope = 0.00714 s(percent) = 0.71
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 13.169 min.
 Rainfall intensity = 2.026 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.819
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.992 (CFS)
 Total initial stream area = 1.200 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 313.000 to Point/Station 313.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3
 Stream flow area = 1.200 (Ac.)
 Runoff from this stream = 1.992 (CFS)
 Time of concentration = 13.17 min.
 Rainfall intensity = 2.026 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	27.141	19.42	1.637
2	6.684	7.95	2.674
3	1.992	13.17	2.026

Largest stream flow has longer time of concentration

Qp = 27.141 + sum of
 Qb Ia/Ib
 6.684 * 0.612 = 4.091

$$Q_p = \frac{Q_b}{I_a/I_b} = \frac{1.992 * 32.841}{0.808} = 1.609$$

Total of 3 streams to confluence:

Flow rates before confluence point:

27.141 6.684 1.992

Area of streams before confluence:

19.400 3.000 1.200

Results of confluence:

Total flow rate = 32.841(CFS)

Time of concentration = 19.419 min.

Effective stream area after confluence = 23.600(Ac.)

++++++
 Process from Point/Station 313.000 to Point/Station 316.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 389.000(Ft.)
 Downstream point/station elevation = 386.000(Ft.)
 Pipe length = 490.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 32.841(CFS)
 Nearest computed pipe diameter = 30.00(In.)
 Calculated individual pipe flow = 32.841(CFS)
 Normal flow depth in pipe = 25.27(In.)
 Flow top width inside pipe = 21.87(In.)
 Critical Depth = 23.41(In.)
 Pipe flow velocity = 7.44(Ft/s)
 Travel time through pipe = 1.10 min.
 Time of concentration (TC) = 20.52 min.

++++++
 Process from Point/Station 316.000 to Point/Station 316.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 23.600(Ac.)
 Runoff from this stream = 32.841(CFS)
 Time of concentration = 20.52 min.
 Rainfall intensity = 1.588(In/Hr)

++++++
 Process from Point/Station 314.000 to Point/Station 316.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 210.000(Ft.)
 Top (of initial area) elevation = 390.000(Ft.)
 Bottom (of initial area) elevation = 386.000(Ft.)
 Difference in elevation = 4.000(Ft.)
 Slope = 0.01905 s(percent)= 1.90
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 7.311 min.
 Rainfall intensity = 2.801(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.838
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 0.470(CFS)
 Total initial stream area = 0.200(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 316.000 to Point/Station 316.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 0.200(Ac.)
 Runoff from this stream = 0.470(CFS)
 Time of concentration = 7.31 min.
 Rainfall intensity = 2.801(In/Hr)

++++++
 Process from Point/Station 315.000 to Point/Station 316.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 100.000(Ft.)
 Top (of initial area) elevation = 395.000(Ft.)
 Bottom (of initial area) elevation = 386.000(Ft.)
 Difference in elevation = 9.000(Ft.)
 Slope = 0.09000 s(percent)= 9.00
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Warning: TC computed to be less than 5 min.; program is assuming the
 time of concentration is 5 minutes.
 Initial area time of concentration = 5.000 min.
 Rainfall intensity = 3.452(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.833
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 0.288(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 0.500

+++++

Process from Point/Station 316.000 to Point/Station 316.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3

Stream flow area = 0.100 (Ac.)
 Runoff from this stream = 0.288 (CFS)
 Time of concentration = 5.00 min.
 Rainfall intensity = 3.452 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	32.841	20.52	1.588
2	0.470	7.31	2.801
3	0.288	5.00	3.452

Largest stream flow has longer time of concentration

Qp = 32.841 + sum of
 Qb Ia/Ib
 0.470 * 0.567 = 0.266
 Qb Ia/Ib
 0.288 * 0.460 = 0.132
 Qp = 33.239

Total of 3 streams to confluence:

Flow rates before confluence point:

32.841 0.470 0.288

Area of streams before confluence:

23.600 0.200 0.100

Results of confluence:

Total flow rate = 33.239 (CFS)

Time of concentration = 20.517 min.

Effective stream area after confluence = 23.900 (Ac.)

 Process from Point/Station 316.000 to Point/Station 317.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 386.000 (Ft.)
 Downstream point/station elevation = 384.000 (Ft.)
 Pipe length = 50.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 33.239 (CFS)
 Nearest computed pipe diameter = 24.00 (In.)
 Calculated individual pipe flow = 33.239 (CFS)
 Normal flow depth in pipe = 15.28 (In.)
 Flow top width inside pipe = 23.09 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 15.74 (Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 20.57 min.

+++++
 Process from Point/Station 317.000 to Point/Station 317.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 23.900 (Ac.)
 Runoff from this stream = 33.239 (CFS)
 Time of concentration = 20.57 min.
 Rainfall intensity = 1.586 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	19.298	13.69	1.983
2	33.239	20.57	1.586

Largest stream flow has longer time of concentration
 $Q_p = 33.239 + \text{sum of}$
 $\quad Q_b \quad I_a/I_b$
 $19.298 * 0.799 = 15.427$
 $Q_p = 48.667$

Total of 2 main streams to confluence:

Flow rates before confluence point:

19.298 33.239

Area of streams before confluence:

11.700 23.900

Results of confluence:

Total flow rate = 48.667 (CFS)
 Time of concentration = 20.570 min.
 Effective stream area after confluence = 35.600 (Ac.)

+++++
 Process from Point/Station 317.000 to Point/Station 319.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 384.000 (Ft.)
 Downstream point/station elevation = 383.000 (Ft.)
 Pipe length = 220.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 48.667 (CFS)
 Nearest computed pipe diameter = 39.00 (In.)
 Calculated individual pipe flow = 48.667 (CFS)
 Normal flow depth in pipe = 28.24 (In.)
 Flow top width inside pipe = 34.86 (In.)
 Critical Depth = 26.72 (In.)
 Pipe flow velocity = 7.56 (Ft/s)
 Travel time through pipe = 0.48 min.
 Time of concentration (TC) = 21.05 min.


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+++++
Process from Point/Station      319.000 to Point/Station      319.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 35.600 (Ac.)
 Runoff from this stream = 48.667 (CFS)
 Time of concentration = 21.05 min.
 Rainfall intensity = 1.565 (In/Hr)

```

+++++
Process from Point/Station      318.000 to Point/Station      319.000
**** INITIAL AREA EVALUATION ****

```

Initial area flow distance = 320.000 (Ft.)
 Top (of initial area) elevation = 384.000 (Ft.)
 Bottom (of initial area) elevation = 383.000 (Ft.)
 Difference in elevation = 1.000 (Ft.)
 Slope = 0.00313 s(percent) = 0.31
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.421 min.
 Rainfall intensity = 2.093 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.811
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.500
 Decimal fraction soil group D = 0.500
 RI index for soil (AMC 2) = 72.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.018 (CFS)
 Total initial stream area = 0.600 (Ac.)
 Pervious area fraction = 0.500

```

+++++
Process from Point/Station      319.000 to Point/Station      319.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.600 (Ac.)
 Runoff from this stream = 1.018 (CFS)
 Time of concentration = 12.42 min.
 Rainfall intensity = 2.093 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	48.667	21.05	1.565
2	1.018	12.42	2.093

Largest stream flow has longer time of concentration

Qp = 48.667 + sum of
 Qb Ia/Ib
 1.018 * 0.748 = 0.761
 Qp = 49.428

Total of 2 streams to confluence:

Flow rates before confluence point:

48.667 1.018

Area of streams before confluence:

35.600 0.600

Results of confluence:

Total flow rate = 49.428 (CFS)

Time of concentration = 21.054 min.

Effective stream area after confluence = 36.200 (Ac.)

+++++
 Process from Point/Station 319.000 to Point/Station 321.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 383.000 (Ft.)
 Downstream point/station elevation = 382.000 (Ft.)
 Pipe length = 20.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 49.428 (CFS)
 Nearest computed pipe diameter = 24.00 (In.)
 Calculated individual pipe flow = 49.428 (CFS)
 Normal flow depth in pipe = 19.20 (In.)
 Flow top width inside pipe = 19.21 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 18.35 (Ft/s)
 Travel time through pipe = 0.02 min.
 Time of concentration (TC) = 21.07 min.

+++++
 Process from Point/Station 321.000 to Point/Station 321.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 36.200 (Ac.)
 Runoff from this stream = 49.428 (CFS)
 Time of concentration = 21.07 min.
 Rainfall intensity = 1.565 (In/Hr)

+++++
 Process from Point/Station 320.000 to Point/Station 321.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 590.000 (Ft.)
 Top (of initial area) elevation = 408.000 (Ft.)
 Bottom (of initial area) elevation = 383.000 (Ft.)
 Difference in elevation = 25.000 (Ft.)

Slope = 0.04237 s(percent)= 4.24
 TC = $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
 Initial area time of concentration = 9.419 min.
 Rainfall intensity = 2.437(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.782
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.650
 Decimal fraction soil group C = 0.350
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 60.55
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.905(CFS)
 Total initial stream area = 1.000(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 321.000 to Point/Station 321.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 1.000(Ac.)
 Runoff from this stream = 1.905(CFS)
 Time of concentration = 9.42 min.
 Rainfall intensity = 2.437(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	49.428	21.07	1.565
2	1.905	9.42	2.437

Largest stream flow has longer time of concentration

Qp = 49.428 + sum of
 Qb Ia/Ib
 1.905 * 0.642 = 1.223
 Qp = 50.651

Total of 2 streams to confluence:
 Flow rates before confluence point:
 49.428 1.905

Area of streams before confluence:
 36.200 1.000

Results of confluence:
 Total flow rate = 50.651(CFS)
 Time of concentration = 21.072 min.
 Effective stream area after confluence = 37.200(Ac.)

++++++
 Process from Point/Station 321.000 to Point/Station 329.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 383.000(Ft.)
 Downstream point/station elevation = 380.000(Ft.)
 Pipe length = 100.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 50.651(CFS)
 Nearest computed pipe diameter = 27.00(In.)
 Calculated individual pipe flow = 50.651(CFS)
 Normal flow depth in pipe = 20.91(In.)
 Flow top width inside pipe = 22.57(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 15.35(Ft/s)
 Travel time through pipe = 0.11 min.
 Time of concentration (TC) = 21.18 min.

++++++
 Process from Point/Station 329.000 to Point/Station 329.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 37.200(Ac.)
 Runoff from this stream = 50.651(CFS)
 Time of concentration = 21.18 min.
 Rainfall intensity = 1.560(In/Hr)
 Program is now starting with Main Stream No. 2

++++++
 Process from Point/Station 322.000 to Point/Station 324.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 970.000(Ft.)
 Top (of initial area) elevation = 416.000(Ft.)
 Bottom (of initial area) elevation = 408.000(Ft.)
 Difference in elevation = 8.000(Ft.)
 Slope = 0.00825 s(percent)= 0.82
 $TC = k(0.300) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.262 min.
 Rainfall intensity = 2.107(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.879
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.080
 Decimal fraction soil group C = 0.920
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 67.96
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.853(CFS)
 Total initial stream area = 1.000(Ac.)
 Pervious area fraction = 0.100

+++++

Process from Point/Station 324.000 to Point/Station 324.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1

Stream flow area = 1.000 (Ac.)
 Runoff from this stream = 1.853 (CFS)
 Time of concentration = 12.26 min.
 Rainfall intensity = 2.107 (In/Hr)

 Process from Point/Station 323.000 to Point/Station 324.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 920.000 (Ft.)
 Top (of initial area) elevation = 416.000 (Ft.)
 Bottom (of initial area) elevation = 408.000 (Ft.)
 Difference in elevation = 8.000 (Ft.)
 Slope = 0.00870 s(percent) = 0.87
 $TC = k(0.300) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.879 min.
 Rainfall intensity = 2.145 (In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.950
 Decimal fraction soil group C = 0.050
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.65
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.868 (CFS)
 Total initial stream area = 1.000 (Ac.)
 Pervious area fraction = 0.100

 Process from Point/Station 324.000 to Point/Station 324.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 1.000 (Ac.)
 Runoff from this stream = 1.868 (CFS)
 Time of concentration = 11.88 min.
 Rainfall intensity = 2.145 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	1.853	12.26	2.107
2	1.868	11.88	2.145

Largest stream flow has longer or shorter time of concentration

Qp = 1.868 + sum of

Q_a T_b/T_a
 1.853 * 0.969 = 1.795
 $Q_p =$ 3.663

Total of 2 streams to confluence:

Flow rates before confluence point:

 1.853 1.868

Area of streams before confluence:

 1.000 1.000

Results of confluence:

Total flow rate = 3.663 (CFS)

Time of concentration = 11.879 min.

Effective stream area after confluence = 2.000 (Ac.)

++++++
 Process from Point/Station 324.000 to Point/Station 329.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 408.000 (Ft.)
 Downstream point/station elevation = 380.000 (Ft.)
 Pipe length = 680.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 3.663 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 3.663 (CFS)
 Normal flow depth in pipe = 6.05 (In.)
 Flow top width inside pipe = 12.00 (In.)
 Critical Depth = 9.80 (In.)
 Pipe flow velocity = 9.24 (Ft/s)
 Travel time through pipe = 1.23 min.
 Time of concentration (TC) = 13.11 min.

++++++
 Process from Point/Station 329.000 to Point/Station 329.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2

Stream flow area = 2.000 (Ac.)

Runoff from this stream = 3.663 (CFS)

Time of concentration = 13.11 min.

Rainfall intensity = 2.032 (In/Hr)

Program is now starting with Main Stream No. 3

++++++
 Process from Point/Station 325.000 to Point/Station 326.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 560.000 (Ft.)
 Top (of initial area) elevation = 384.000 (Ft.)
 Bottom (of initial area) elevation = 362.000 (Ft.)
 Difference in elevation = 22.000 (Ft.)

Slope = 0.03929 s(percent)= 3.93
 TC = $k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.204 min.
 Rainfall intensity = 2.824(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.876
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.731(CFS)
 Total initial stream area = 0.700(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 326.000 to Point/Station 327.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 362.000(Ft.)
 Downstream point/station elevation = 361.000(Ft.)
 Pipe length = 100.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 1.731(CFS)
 Nearest computed pipe diameter = 12.00(In.)
 Calculated individual pipe flow = 1.731(CFS)
 Normal flow depth in pipe = 5.90(In.)
 Flow top width inside pipe = 12.00(In.)
 Critical Depth = 6.71(In.)
 Pipe flow velocity = 4.50(Ft/s)
 Travel time through pipe = 0.37 min.
 Time of concentration (TC) = 7.57 min.

++++++
 Process from Point/Station 327.000 to Point/Station 327.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 1
 Stream flow area = 0.700(Ac.)
 Runoff from this stream = 1.731(CFS)
 Time of concentration = 7.57 min.
 Rainfall intensity = 2.747(In/Hr)

++++++
 Process from Point/Station 328.000 to Point/Station 327.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 407.000(Ft.)
 Bottom (of initial area) elevation = 362.000(Ft.)
 Difference in elevation = 45.000(Ft.)

Slope = 0.04500 s(percent)= 4.50
 TC = $k(0.300)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
 Initial area time of concentration = 8.841 min.
 Rainfall intensity = 2.523(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.874
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 3.526(CFS)
 Total initial stream area = 1.600(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 327.000 to Point/Station 327.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 2

Stream flow area = 1.600(Ac.)
 Runoff from this stream = 3.526(CFS)
 Time of concentration = 8.84 min.
 Rainfall intensity = 2.523(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	1.731	7.57	2.747
2	3.526	8.84	2.523

Largest stream flow has longer time of concentration

Qp = 3.526 + sum of
 Qb Ia/Ib
 1.731 * 0.918 = 1.590
 Qp = 5.116

Total of 2 streams to confluence:
 Flow rates before confluence point:

1.731 3.526

Area of streams before confluence:

0.700 1.600

Results of confluence:

Total flow rate = 5.116(CFS)
 Time of concentration = 8.841 min.
 Effective stream area after confluence = 2.300(Ac.)

++++++
 Process from Point/Station 327.000 to Point/Station 329.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 362.000 (Ft.)
 Downstream point/station elevation = 359.000 (Ft.)
 Pipe length = 290.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 5.116 (CFS)
 Nearest computed pipe diameter = 15.00 (In.)
 Calculated individual pipe flow = 5.116 (CFS)
 Normal flow depth in pipe = 9.95 (In.)
 Flow top width inside pipe = 14.18 (In.)
 Critical Depth = 11.00 (In.)
 Pipe flow velocity = 5.92 (Ft/s)
 Travel time through pipe = 0.82 min.
 Time of concentration (TC) = 9.66 min.

++++++
 Process from Point/Station 329.000 to Point/Station 329.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 3
 Stream flow area = 2.300 (Ac.)
 Runoff from this stream = 5.116 (CFS)
 Time of concentration = 9.66 min.
 Rainfall intensity = 2.403 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	50.651	21.18	1.560
2	3.663	13.11	2.032
3	5.116	9.66	2.403

Largest stream flow has longer time of concentration

$Q_p = 50.651 + \text{sum of}$
 $Q_b \quad I_a/I_b$
 $3.663 * 0.768 = 2.813$
 $Q_b \quad I_a/I_b$
 $5.116 * 0.649 = 3.321$
 $Q_p = 56.786$

Total of 3 main streams to confluence:

Flow rates before confluence point:

50.651 3.663 5.116

Area of streams before confluence:

37.200 2.000 2.300

Results of confluence:

Total flow rate = 56.786 (CFS)

Time of concentration = 21.181 min.

Effective stream area after confluence = 41.500 (Ac.)

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Process from Point/Station      329.000 to Point/Station      333.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

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Upstream point/station elevation = 380.000(Ft.)
Downstream point/station elevation = 370.000(Ft.)
Pipe length = 210.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 56.786(CFS)
Nearest computed pipe diameter = 27.00(In.)
Calculated individual pipe flow = 56.786(CFS)
Normal flow depth in pipe = 18.94(In.)
Flow top width inside pipe = 24.71(In.)
Critical depth could not be calculated.
Pipe flow velocity = 19.04(Ft/s)
Travel time through pipe = 0.18 min.
Time of concentration (TC) = 21.36 min.

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Process from Point/Station      333.000 to Point/Station      333.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 1 in normal stream number 1
Stream flow area = 41.500(Ac.)
Runoff from this stream = 56.786(CFS)
Time of concentration = 21.36 min.
Rainfall intensity = 1.553(In/Hr)

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Process from Point/Station      330.000 to Point/Station      331.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 870.000(Ft.)
Top (of initial area) elevation = 415.000(Ft.)
Bottom (of initial area) elevation = 406.000(Ft.)
Difference in elevation = 9.000(Ft.)
Slope = 0.01034 s(percent)= 1.03
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.586 min.
Rainfall intensity = 1.916(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.746
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 57.30
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 6.290(CFS)
Total initial stream area = 4.400(Ac.)
Pervious area fraction = 0.500

```

 Process from Point/Station 331.000 to Point/Station 332.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 406.000 (Ft.)
 End of street segment elevation = 403.000 (Ft.)
 Length of street segment = 380.000 (Ft.)
 Height of curb above gutter flowline = 6.0 (In.)
 Width of half street (curb to crown) = 18.000 (Ft.)
 Distance from crown to crossfall grade break = 10.000 (Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 10.000 (Ft.)
 Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000 (Ft.)
 Gutter hike from flowline = 2.000 (In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 7.750 (CFS)
 Depth of flow = 0.459 (Ft.), Average velocity = 2.689 (Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 16.599 (Ft.)
 Flow velocity = 2.69 (Ft/s)
 Travel time = 2.36 min. TC = 16.94 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.732
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 1.764 (In/Hr) for a 10.0 year storm
 Subarea runoff = 2.842 (CFS) for 2.200 (Ac.)
 Total runoff = 9.133 (CFS) Total area = 6.600 (Ac.)
 Street flow at end of street = 9.133 (CFS)
 Half street flow at end of street = 9.133 (CFS)
 Depth of flow = 0.481 (Ft.), Average velocity = 2.799 (Ft/s)
 Flow width (from curb towards crown) = 17.710 (Ft.)

 Process from Point/Station 332.000 to Point/Station 333.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 403.000 (Ft.)
 Downstream point/station elevation = 370.000 (Ft.)
 Pipe length = 140.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 9.133 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)

Calculated individual pipe flow = 9.133 (CFS)
 Normal flow depth in pipe = 6.20 (In.)
 Flow top width inside pipe = 11.99 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 22.33 (Ft/s)
 Travel time through pipe = 0.10 min.
 Time of concentration (TC) = 17.05 min.

++++++
 Process from Point/Station 333.000 to Point/Station 333.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 6.600 (Ac.)
 Runoff from this stream = 9.133 (CFS)
 Time of concentration = 17.05 min.
 Rainfall intensity = 1.758 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	56.786	21.36	1.553
2	9.133	17.05	1.758

Largest stream flow has longer time of concentration

Qp = 56.786 + sum of
 Qb Ia/Ib
 9.133 * 0.883 = 8.066
 Qp = 64.852

Total of 2 streams to confluence:
 Flow rates before confluence point:

56.786 9.133

Area of streams before confluence:

41.500 6.600

Results of confluence:

Total flow rate = 64.852 (CFS)

Time of concentration = 21.365 min.

Effective stream area after confluence = 48.100 (Ac.)

++++++
 Process from Point/Station 333.000 to Point/Station 334.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 361.000 (Ft.)
 Downstream point elevation = 359.700 (Ft.)
 Channel length thru subarea = 160.000 (Ft.)
 Channel base width = 50.000 (Ft.)
 Slope or 'Z' of left channel bank = 4.000
 Slope or 'Z' of right channel bank = 4.000
 Estimated mean flow rate at midpoint of channel = 65.744 (CFS)

Manning's 'N' = 0.030
 Maximum depth of channel = 2.000(Ft.)
 Flow(q) thru subarea = 65.744(CFS)
 Depth of flow = 0.477(Ft.), Average velocity = 2.656(Ft/s)
 Channel flow top width = 53.814(Ft.)
 Flow Velocity = 2.66(Ft/s)
 Travel time = 1.00 min.
 Time of concentration = 22.37 min.

Sub-Channel No. 1 Critical depth = 0.375(Ft.)
 ' ' ' Critical flow top width = 53.000(Ft.)
 ' ' ' Critical flow velocity = 3.404(Ft/s)
 ' ' ' Critical flow area = 19.313(Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.621
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.600
 Decimal fraction soil group C = 0.400
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 66.20
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.514(In/Hr) for a 10.0 year storm
 Subarea runoff = 1.692(CFS) for 1.800(Ac.)
 Total runoff = 66.544(CFS) Total area = 49.900(Ac.)
 Depth of flow = 0.480(Ft.), Average velocity = 2.669(Ft/s)

Sub-Channel No. 1 Critical depth = 0.375(Ft.)
 ' ' ' Critical flow top width = 53.000(Ft.)
 ' ' ' Critical flow velocity = 3.446(Ft/s)
 ' ' ' Critical flow area = 19.313(Sq.Ft)

++++++
 Process from Point/Station 334.000 to Point/Station 337.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 359.700(Ft.)
 Downstream point/station elevation = 357.000(Ft.)
 Pipe length = 175.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 66.544(CFS)
 Nearest computed pipe diameter = 33.00(In.)
 Calculated individual pipe flow = 66.544(CFS)
 Normal flow depth in pipe = 27.47(In.)
 Flow top width inside pipe = 24.65(In.)
 Critical Depth = 30.73(In.)
 Pipe flow velocity = 12.60(Ft/s)
 Travel time through pipe = 0.23 min.
 Time of concentration (TC) = 22.60 min.

+++++

Process from Point/Station 337.000 to Point/Station 337.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 49.900(Ac.)
 Runoff from this stream = 66.544(CFS)
 Time of concentration = 22.60 min.
 Rainfall intensity = 1.506(In/Hr)

+++++
 Process from Point/Station 335.000 to Point/Station 336.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 860.000(Ft.)
 Top (of initial area) elevation = 465.000(Ft.)
 Bottom (of initial area) elevation = 365.000(Ft.)
 Difference in elevation = 100.000(Ft.)
 Slope = 0.11628 s(percent)= 11.63
 $TC = k(0.530) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.161 min.
 Rainfall intensity = 2.117(In/Hr) for a 10.0 year storm
 UNDEVELOPED (poor cover) subarea
 Runoff Coefficient = 0.835
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 89.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 6.187(CFS)
 Total initial stream area = 3.500(Ac.)
 Pervious area fraction = 1.000

+++++
 Process from Point/Station 336.000 to Point/Station 337.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 365.000(Ft.)
 Downstream point/station elevation = 363.000(Ft.)
 Pipe length = 80.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 6.187(CFS)
 Nearest computed pipe diameter = 15.00(In.)
 Calculated individual pipe flow = 6.187(CFS)
 Normal flow depth in pipe = 8.43(In.)
 Flow top width inside pipe = 14.89(In.)
 Critical Depth = 12.06(In.)
 Pipe flow velocity = 8.72(Ft/s)
 Travel time through pipe = 0.15 min.
 Time of concentration (TC) = 12.31 min.

+++++

Process from Point/Station 337.000 to Point/Station 337.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 3.500 (Ac.)
 Runoff from this stream = 6.187 (CFS)
 Time of concentration = 12.31 min.
 Rainfall intensity = 2.103 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	66.544	22.60	1.506
2	6.187	12.31	2.103

Largest stream flow has longer time of concentration

Qp = 66.544 + sum of
 Qb Ia/Ib
 6.187 * 0.716 = 4.430
 Qp = 70.974

Total of 2 streams to confluence:
 Flow rates before confluence point:

66.544 6.187

Area of streams before confluence:

49.900 3.500

Results of confluence:

Total flow rate = 70.974 (CFS)
 Time of concentration = 22.600 min.
 Effective stream area after confluence = 53.400 (Ac.)

 Process from Point/Station 337.000 to Point/Station 342.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 366.000 (Ft.)
 Downstream point/station elevation = 365.000 (Ft.)
 Pipe length = 50.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 70.974 (CFS)
 Nearest computed pipe diameter = 33.00 (In.)
 Calculated individual pipe flow = 70.974 (CFS)
 Normal flow depth in pipe = 25.64 (In.)
 Flow top width inside pipe = 27.47 (In.)
 Critical Depth = 31.17 (In.)
 Pipe flow velocity = 14.33 (Ft/s)
 Travel time through pipe = 0.06 min.
 Time of concentration (TC) = 22.66 min.

 Process from Point/Station 342.000 to Point/Station 342.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 53.400 (Ac.)
 Runoff from this stream = 70.974 (CFS)
 Time of concentration = 22.66 min.
 Rainfall intensity = 1.503 (In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 338.000 to Point/Station 338.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 1.796 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.802
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.380
 Decimal fraction soil group D = 0.620
 RI index for soil (AMC 2) = 72.72
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 User specified values are as follows:
 TC = 16.40 min. Rain intensity = 1.80 (In/Hr)
 Total area = 67.70 (Ac.) Total runoff = 101.40 (CFS)

+++++
 Process from Point/Station 338.000 to Point/Station 339.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 105.642 (CFS)
 Depth of flow = 1.676 (Ft.), Average velocity = 17.143 (Ft/s)
 ***** Irregular Channel Data *****

 Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	4.00
2	4.00	0.00
3	6.00	0.00
4	10.00	4.00

 Manning's 'N' friction factor = 0.030

Sub-Channel flow = 105.642 (CFS)

'	'	flow top width = 5.353 (Ft.)
'	'	velocity = 17.143 (Ft/s)
'	'	area = 6.163 (Sq.Ft)
'	'	Froude number = 2.815

Upstream point elevation = 395.000 (Ft.)
 Downstream point elevation = 368.000 (Ft.)
 Flow length = 200.000 (Ft.)
 Travel time = 0.19 min.

Time of concentration = 16.59 min.
 Depth of flow = 1.676(Ft.)
 Average velocity = 17.143(Ft/s)
 Total irregular channel flow = 105.642(CFS)
 Irregular channel normal depth above invert elev. = 1.676(Ft.)
 Average velocity of channel(s) = 17.143(Ft/s)
 Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.762
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.100
 Decimal fraction soil group C = 0.400
 Decimal fraction soil group D = 0.500
 RI index for soil(AMC 2) = 80.50
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.784(In/Hr) for a 10.0 year storm
 Subarea runoff = 8.431(CFS) for 6.200(Ac.)
 Total runoff = 109.831(CFS) Total area = 73.900(Ac.)
 Depth of flow = 1.710(Ft.), Average velocity = 17.314(Ft/s)

++++++
 Process from Point/Station 339.000 to Point/Station 342.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 368.000(Ft.)
 Downstream point/station elevation = 360.000(Ft.)
 Pipe length = 500.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 109.831(CFS)
 Nearest computed pipe diameter = 39.00(In.)
 Calculated individual pipe flow = 109.831(CFS)
 Normal flow depth in pipe = 34.13(In.)
 Flow top width inside pipe = 25.80(In.)
 Critical Depth = 36.99(In.)
 Pipe flow velocity = 14.26(Ft/s)
 Travel time through pipe = 0.58 min.
 Time of concentration (TC) = 17.18 min.

++++++
 Process from Point/Station 342.000 to Point/Station 342.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 73.900(Ac.)
 Runoff from this stream = 109.831(CFS)
 Time of concentration = 17.18 min.
 Rainfall intensity = 1.751(In/Hr)
 Program is now starting with Main Stream No. 3

++++++
 Process from Point/Station 340.000 to Point/Station 340.000

**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 1.581(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1 Acre Lot)
 Runoff Coefficient = 0.643
 Decimal fraction soil group A = 0.200
 Decimal fraction soil group B = 0.100
 Decimal fraction soil group C = 0.700
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 60.30
 Pervious area fraction = 0.800; Impervious fraction = 0.200
 User specified values are as follows:
 TC = 20.68 min. Rain intensity = 1.58(In/Hr)
 Total area = 49.60(Ac.) Total runoff = 61.84(CFS)

++++++
 Process from Point/Station 340.000 to Point/Station 341.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 416.000(Ft.)
 Downstream point/station elevation = 405.000(Ft.)
 Pipe length = 890.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 61.840(CFS)
 Nearest computed pipe diameter = 33.00(In.)
 Calculated individual pipe flow = 61.840(CFS)
 Normal flow depth in pipe = 28.88(In.)
 Flow top width inside pipe = 21.83(In.)
 Critical Depth = 30.14(In.)
 Pipe flow velocity = 11.21(Ft/s)
 Travel time through pipe = 1.32 min.
 Time of concentration (TC) = 22.00 min.

++++++
 Process from Point/Station 341.000 to Point/Station 341.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 1
 Stream flow area = 49.600(Ac.)
 Runoff from this stream = 61.840(CFS)
 Time of concentration = 22.00 min.
 Rainfall intensity = 1.528(In/Hr)

++++++
 Process from Point/Station 341.100 to Point/Station 341.200
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 940.000(Ft.)
 Top (of initial area) elevation = 461.000(Ft.)
 Bottom (of initial area) elevation = 395.000(Ft.)
 Difference in elevation = 66.000(Ft.)
 Slope = 0.07021 s(percent)= 7.02

$TC = k(0.940) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 24.723 min.
 Rainfall intensity = 1.433 (In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.678
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 74.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 2.722 (CFS)
 Total initial stream area = 2.800 (Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 341.200 to Point/Station 341.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 395.000 (Ft.)
 Downstream point elevation = 390.000 (Ft.)
 Channel length thru subarea = 180.000 (Ft.)
 Channel base width = 1.000 (Ft.)
 Slope or 'Z' of left channel bank = 2.000
 Slope or 'Z' of right channel bank = 2.000
 Estimated mean flow rate at midpoint of channel = 3.256 (CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 2.000 (Ft.)
 Flow(q) thru subarea = 3.256 (CFS)
 Depth of flow = 0.327 (Ft.), Average velocity = 6.013 (Ft/s)
 Channel flow top width = 2.309 (Ft.)
 Flow Velocity = 6.01 (Ft/s)
 Travel time = 0.50 min.
 Time of concentration = 25.22 min.

Sub-Channel No. 1 Critical depth = 0.500 (Ft.)
 ' ' ' Critical flow top width = 3.000 (Ft.)
 ' ' ' Critical flow velocity = 3.256 (Ft/s)
 ' ' ' Critical flow area = 1.000 (Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.676
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 74.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.417 (In/Hr) for a 10.0 year storm
 Subarea runoff = 1.055 (CFS) for 1.100 (Ac.)
 Total runoff = 3.776 (CFS) Total area = 3.900 (Ac.)
 Depth of flow = 0.353 (Ft.), Average velocity = 6.264 (Ft/s)

Sub-Channel No. 1 Critical depth = 0.539 (Ft.)
 ' ' ' Critical flow top width = 3.156 (Ft.)
 ' ' ' Critical flow velocity = 3.371 (Ft/s)
 ' ' ' Critical flow area = 1.120 (Sq.Ft)

+++++
 Process from Point/Station 341.000 to Point/Station 341.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 2

Stream flow area = 3.900 (Ac.)
 Runoff from this stream = 3.776 (CFS)
 Time of concentration = 25.22 min.
 Rainfall intensity = 1.417 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	61.840	22.00	1.528
2	3.776	25.22	1.417

Largest stream flow has longer or shorter time of concentration

Qp = 61.840 + sum of
 Qa Tb/Ta
 3.776 * 0.872 = 3.294
 Qp = 65.134

Total of 2 streams to confluence:

Flow rates before confluence point:

61.840 3.776

Area of streams before confluence:

49.600 3.900

Results of confluence:

Total flow rate = 65.134 (CFS)

Time of concentration = 22.003 min.

Effective stream area after confluence = 53.500 (Ac.)

+++++
 Process from Point/Station 341.000 to Point/Station 342.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 390.000 (Ft.)
 Downstream point/station elevation = 360.000 (Ft.)
 Pipe length = 635.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 65.134 (CFS)
 Nearest computed pipe diameter = 27.00 (In.)
 Calculated individual pipe flow = 65.134 (CFS)
 Normal flow depth in pipe = 21.38 (In.)
 Flow top width inside pipe = 21.93 (In.)

Critical depth could not be calculated.
 Pipe flow velocity = 19.29 (Ft/s)
 Travel time through pipe = 0.55 min.
 Time of concentration (TC) = 22.55 min.

+++++
 Process from Point/Station 342.000 to Point/Station 342.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 3
 Stream flow area = 53.500 (Ac.)
 Runoff from this stream = 65.134 (CFS)
 Time of concentration = 22.55 min.
 Rainfall intensity = 1.507 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	70.974	22.66	1.503
2	109.831	17.18	1.751
3	65.134	22.55	1.507

Largest stream flow has longer or shorter time of concentration

Qp = 109.831 + sum of
 Qa Tb/Ta
 70.974 * 0.758 = 53.811
 Qa Tb/Ta
 65.134 * 0.762 = 49.616
 Qp = 213.258

Total of 3 main streams to confluence:

Flow rates before confluence point:

70.974 109.831 65.134

Area of streams before confluence:

53.400 73.900 53.500

Results of confluence:

Total flow rate = 213.258 (CFS)

Time of concentration = 17.179 min.

Effective stream area after confluence = 180.800 (Ac.)

+++++
 Process from Point/Station 342.000 to Point/Station 344.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 223.947 (CFS)

Depth of flow = 4.204 (Ft.), Average velocity = 8.601 (Ft/s)

!!Warning: Water is above left or right bank elevations

***** Irregular Channel Data *****

 Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	4.00
2	4.00	0.00
3	6.00	0.00
4	10.00	4.00

Manning's 'N' friction factor = 0.040

Sub-Channel flow = 223.947(CFS)
 ' ' flow top width = 10.000(Ft.)
 ' ' velocity = 8.601(Ft/s)
 ' ' area = 26.037(Sq.Ft)
 ' ' Froude number = 0.939

Upstream point elevation = 360.000(Ft.)
 Downstream point elevation = 320.000(Ft.)
 Flow length = 1825.000(Ft.)
 Travel time = 3.54 min.
 Time of concentration = 20.72 min.
 Depth of flow = 4.204(Ft.)
 Average velocity = 8.601(Ft/s)
 Total irregular channel flow = 223.947(CFS)
 Irregular channel normal depth above invert elev. = 4.204(Ft.)
 Average velocity of channel(s) = 8.601(Ft/s)
 !!Warning: Water is above left or right bank elevations
 Adding area flow to channel
 UNDEVELOPED (poor cover) subarea
 Runoff Coefficient = 0.808
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.085
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.915
 RI index for soil(AMC 2) = 88.06
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.579(In/Hr) for a 10.0 year storm
 Subarea runoff = 21.430(CFS) for 16.800(Ac.)
 Total runoff = 234.687(CFS) Total area = 197.600(Ac.)
 Depth of flow = 4.278(Ft.), Average velocity = 8.764(Ft/s)
 !!Warning: Water is above left or right bank elevations

++++
 Process from Point/Station 344.000 to Point/Station 344.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 197.600(Ac.)
 Runoff from this stream = 234.687(CFS)
 Time of concentration = 20.72 min.
 Rainfall intensity = 1.579(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	234.687	20.72	1.579

Largest stream flow has longer time of concentration
 $Q_p = 234.687 + \text{sum of}$
 $Q_p = 234.687$

Total of 1 main streams to confluence:
 Flow rates before confluence point:
 234.687
 Area of streams before confluence:
 197.600

Results of confluence:
 Total flow rate = 234.687(CFS)
 Time of concentration = 20.715 min.
 Effective stream area after confluence = 197.600(Ac.)

 Process from Point/Station 350.000 to Point/Station 351.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 1470.000(Ft.)
 Bottom (of initial area) elevation = 1353.000(Ft.)
 Difference in elevation = 117.000(Ft.)
 Slope = 0.11700 s(percent)= 11.70
 $TC = k(0.710) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 17.283 min.
 Rainfall intensity = 1.745(In/Hr) for a 10.0 year storm
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.786
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 84.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 5.209(CFS)
 Total initial stream area = 3.800(Ac.)
 Pervious area fraction = 1.000

 Process from Point/Station 351.000 to Point/Station 352.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1353.000(Ft.)
 Downstream point elevation = 1342.000(Ft.)
 Channel length thru subarea = 400.000(Ft.)

Channel base width = 1.000 (Ft.)
 Slope or 'Z' of left channel bank = 1.000
 Slope or 'Z' of right channel bank = 1.000
 Estimated mean flow rate at midpoint of channel = 11.867 (CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 2.000 (Ft.)
 Flow (q) thru subarea = 11.867 (CFS)
 Depth of flow = 0.742 (Ft.), Average velocity = 9.174 (Ft/s)
 Channel flow top width = 2.485 (Ft.)
 Flow Velocity = 9.17 (Ft/s)
 Travel time = 0.73 min.
 Time of concentration = 18.01 min.

Sub-Channel No. 1 Critical depth = 1.141 (Ft.)
 ' ' Critical flow top width = 3.281 (Ft.)
 ' ' Critical flow velocity = 4.860 (Ft/s)
 ' ' Critical flow area = 2.442 (Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.783
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 2) = 84.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.706 (In/Hr) for a 10.0 year storm
 Subarea runoff = 13.229 (CFS) for 9.900 (Ac.)
 Total runoff = 18.439 (CFS) Total area = 13.700 (Ac.)
 Depth of flow = 0.930 (Ft.), Average velocity = 10.272 (Ft/s)

Sub-Channel No. 1 Critical depth = 1.422 (Ft.)
 ' ' Critical flow top width = 3.844 (Ft.)
 ' ' Critical flow velocity = 5.354 (Ft/s)
 ' ' Critical flow area = 3.444 (Sq.Ft)

++++++
 Process from Point/Station 352.000 to Point/Station 352.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 13.700 (Ac.)
 Runoff from this stream = 18.439 (CFS)
 Time of concentration = 18.01 min.
 Rainfall intensity = 1.706 (In/Hr)

++++++
 Process from Point/Station 352.100 to Point/Station 352.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 1364.000(Ft.)
 Bottom (of initial area) elevation = 1342.000(Ft.)
 Difference in elevation = 22.000(Ft.)
 Slope = 0.02200 s(percent)= 2.20
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.201 min.
 Rainfall intensity = 2.332(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.885
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.050
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.950
 RI index for soil(AMC 2) = 74.05
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.238(CFS)
 Total initial stream area = 0.600(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 352.000 to Point/Station 352.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.600(Ac.)
 Runoff from this stream = 1.238(CFS)
 Time of concentration = 10.20 min.
 Rainfall intensity = 2.332(In/Hr)

++++++
 Process from Point/Station 352.200 to Point/Station 352.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 1364.000(Ft.)
 Bottom (of initial area) elevation = 1342.000(Ft.)
 Difference in elevation = 22.000(Ft.)
 Slope = 0.02200 s(percent)= 2.20
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.201 min.
 Rainfall intensity = 2.332(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.885
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.050
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.950
 RI index for soil(AMC 2) = 74.05
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.032(CFS)
 Total initial stream area = 0.500(Ac.)

Pervious area fraction = 0.100

```

+++++
Process from Point/Station      352.000 to Point/Station      352.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 3

Stream flow area = 0.500(Ac.)
 Runoff from this stream = 1.032(CFS)
 Time of concentration = 10.20 min.
 Rainfall intensity = 2.332(In/Hr)

```

+++++
Process from Point/Station      352.300 to Point/Station      352.000
**** INITIAL AREA EVALUATION ****

```

Initial area flow distance = 255.000(Ft.)
 Top (of initial area) elevation = 1343.000(Ft.)
 Bottom (of initial area) elevation = 1342.000(Ft.)
 Difference in elevation = 1.000(Ft.)
 Slope = 0.00392 s(percent)= 0.39
 $TC = k(0.300) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.338 min.
 Rainfall intensity = 2.605(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.887
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.231(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 0.100

```

+++++
Process from Point/Station      352.000 to Point/Station      352.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 4

Stream flow area = 0.100(Ac.)
 Runoff from this stream = 0.231(CFS)
 Time of concentration = 8.34 min.
 Rainfall intensity = 2.605(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	18.439	18.01	1.706
2	1.238	10.20	2.332
3	1.032	10.20	2.332
4	0.231	8.34	2.605

Largest stream flow has longer time of concentration

Qp = 18.439 + sum of

Qb	Ia/Ib	
1.238 *	0.732 =	0.906
Qb	Ia/Ib	
1.032 *	0.732 =	0.755
Qb	Ia/Ib	
0.231 *	0.655 =	0.151

Qp = 20.251

Total of 4 streams to confluence:

Flow rates before confluence point:

18.439	1.238	1.032	0.231

Area of streams before confluence:

13.700	0.600	0.500	0.100

Results of confluence:

Total flow rate = 20.251(CFS)

Time of concentration = 18.010 min.

Effective stream area after confluence = 14.900(Ac.)

Process from Point/Station	352.000 to Point/Station	344.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1342.000(Ft.)
 Downstream point/station elevation = 1320.000(Ft.)
 Pipe length = 585.00(Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 20.251(CFS)
 Nearest computed pipe diameter = 21.00(In.)
 Calculated individual pipe flow = 20.251(CFS)
 Normal flow depth in pipe = 13.70(In.)
 Flow top width inside pipe = 20.00(In.)
 Critical Depth = 19.24(In.)
 Pipe flow velocity = 12.18(Ft/s)
 Travel time through pipe = 0.80 min.
 Time of concentration (TC) = 18.81 min.

Process from Point/Station	344.000 to Point/Station	344.000

**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 14.900(Ac.)
 Runoff from this stream = 20.251(CFS)
 Time of concentration = 18.81 min.
 Rainfall intensity = 1.666(In/Hr)
 Program is now starting with Main Stream No. 3

```

+++++
Process from Point/Station      344.100 to Point/Station      344.000
**** INITIAL AREA EVALUATION ****

```

```

Initial area flow distance = 585.000(Ft.)
Top (of initial area) elevation = 1342.000(Ft.)
Bottom (of initial area) elevation = 1320.000(Ft.)
Difference in elevation = 22.000(Ft.)
Slope = 0.03761 s(percent)= 3.76
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.395 min.
Rainfall intensity = 2.783(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 0.494(CFS)
Total initial stream area = 0.200(Ac.)
Pervious area fraction = 0.100

```

```

+++++
Process from Point/Station      344.000 to Point/Station      344.000
**** CONFLUENCE OF MAIN STREAMS ****

```

```

The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area = 0.200(Ac.)
Runoff from this stream = 0.494(CFS)
Time of concentration = 7.39 min.
Rainfall intensity = 2.783(In/Hr)
Program is now starting with Main Stream No. 4

```

```

+++++
Process from Point/Station      344.200 to Point/Station      344.000
**** INITIAL AREA EVALUATION ****

```

```

Initial area flow distance = 585.000(Ft.)
Top (of initial area) elevation = 1342.000(Ft.)
Bottom (of initial area) elevation = 1320.000(Ft.)
Difference in elevation = 22.000(Ft.)
Slope = 0.03761 s(percent)= 3.76
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.395 min.
Rainfall intensity = 2.783(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.888

```

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.494(CFS)
 Total initial stream area = 0.200(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 344.000 to Point/Station 344.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 4
 Stream flow area = 0.200(Ac.)
 Runoff from this stream = 0.494(CFS)
 Time of concentration = 7.39 min.
 Rainfall intensity = 2.783(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	234.687	20.72	1.579
2	20.251	18.81	1.666
3	0.494	7.39	2.783
4	0.494	7.39	2.783

Largest stream flow has longer time of concentration

$Q_p = 234.687 + \text{sum of}$
 $Q_b \quad I_a/I_b$
 $20.251 * 0.948 = 19.204$
 $Q_b \quad I_a/I_b$
 $0.494 * 0.567 = 0.280$
 $Q_b \quad I_a/I_b$
 $0.494 * 0.567 = 0.280$
 $Q_p = 254.452$

Total of 4 main streams to confluence:

Flow rates before confluence point:
 234.687 20.251 0.494 0.494

Area of streams before confluence:
 197.600 14.900 0.200 0.200

Results of confluence:

Total flow rate = 254.452(CFS)
 Time of concentration = 20.715 min.
 Effective stream area after confluence = 212.900(Ac.)

```

+++++
Process from Point/Station      344.000 to Point/Station      355.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

```

Estimated mean flow rate at midpoint of channel = 258.096 (CFS)

Depth of flow = 5.206 (Ft.), Average velocity = 12.272 (Ft/s)

!!Warning: Water is above left or right bank elevations

***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	3.00
2	2.00	0.00
3	3.00	0.00
4	5.00	2.00

Manning's 'N' friction factor = 0.040

Sub-Channel flow = 258.096 (CFS)

' ' flow top width = 5.000 (Ft.)

' ' velocity = 12.272 (Ft/s)

' ' area = 21.031 (Sq.Ft)

' ' Froude number = 1.054

Upstream point elevation = 1320.000 (Ft.)

Downstream point elevation = 1308.000 (Ft.)

Flow length = 440.000 (Ft.)

Travel time = 0.60 min.

Time of concentration = 21.31 min.

Depth of flow = 5.206 (Ft.)

Average velocity = 12.272 (Ft/s)

Total irregular channel flow = 258.096 (CFS)

Irregular channel normal depth above invert elev. = 5.206 (Ft.)

Average velocity of channel(s) = 12.272 (Ft/s)

!!Warning: Water is above left or right bank elevations

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

Runoff Coefficient = 0.814

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil (AMC 2) = 89.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 1.555 (In/Hr) for a 10.0 year storm

Subarea runoff = 7.339 (CFS) for 5.800 (Ac.)

Total runoff = 261.791 (CFS) Total area = 218.700 (Ac.)

Depth of flow = 5.242 (Ft.), Average velocity = 12.342 (Ft/s)

!!Warning: Water is above left or right bank elevations

End of computations, total study area = 218.70 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction (Ap) = 0.676

Area averaged RI index number = 71.8

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 04/28/14 File:32786A100.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557

100-Year Rational Hydrology Area "A"

Proposed Condition

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.300(In/Hr)

Slope of intensity duration curve = 0.5500

+++++
 Process from Point/Station 301.100 to Point/Station 301.200
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 565.000(Ft.)

Top (of initial area) elevation = 501.700(Ft.)

Bottom (of initial area) elevation = 495.600(Ft.)

Difference in elevation = 6.100(Ft.)

Slope = 0.01080 s(percent)= 1.08

TC = $k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 12.168 min.

Rainfall intensity = 3.126(In/Hr) for a 100.0 year storm

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.867

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.067(CFS)
 Total initial stream area = 1.500(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 301.200 to Point/Station 303.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 495.600(Ft.)
 Downstream point/station elevation = 443.000(Ft.)
 Pipe length = 645.00(Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 4.067(CFS)
 Nearest computed pipe diameter = 9.00(In.)
 Calculated individual pipe flow = 4.067(CFS)
 Normal flow depth in pipe = 7.32(In.)
 Flow top width inside pipe = 7.01(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 10.57(Ft/s)
 Travel time through pipe = 1.02 min.
 Time of concentration (TC) = 13.19 min.

++++++
 Process from Point/Station 303.000 to Point/Station 303.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 1.500(Ac.)
 Runoff from this stream = 4.067(CFS)
 Time of concentration = 13.19 min.
 Rainfall intensity = 2.991(In/Hr)

++++++
 Process from Point/Station 301.000 to Point/Station 302.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 620.000(Ft.)
 Top (of initial area) elevation = 502.000(Ft.)
 Bottom (of initial area) elevation = 492.000(Ft.)
 Difference in elevation = 10.000(Ft.)
 Slope = 0.01613 s(percent)= 1.61
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.655 min.
 Rainfall intensity = 3.201(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.868

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.001(CFS)
 Total initial stream area = 1.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 302.000 to Point/Station 303.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 492.000(Ft.)
 End of street segment elevation = 448.000(Ft.)
 Length of street segment = 500.000(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 18.000(Ft.)
 Distance from crown to crossfall grade break = 10.000(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 10.000(Ft.)
 Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 6.080(CFS)
 Depth of flow = 0.308(Ft.), Average velocity = 6.385(Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 9.086(Ft.)
 Flow velocity = 6.38(Ft/s)
 Travel time = 1.31 min. TC = 12.96 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.866
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 3.020(In/Hr) for a 100.0 year storm
 Subarea runoff = 2.092(CFS) for 0.800(Ac.)
 Total runoff = 7.093(CFS) Total area = 2.600(Ac.)
 Street flow at end of street = 7.093(CFS)
 Half street flow at end of street = 7.093(CFS)
 Depth of flow = 0.321(Ft.), Average velocity = 6.611(Ft/s)
 Flow width (from curb towards crown)= 9.728(Ft.)

+++++
 Process from Point/Station 303.000 to Point/Station 303.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 2.600 (Ac.)
 Runoff from this stream = 7.093 (CFS)
 Time of concentration = 12.96 min.
 Rainfall intensity = 3.020 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	4.067	13.19	2.991
2	7.093	12.96	3.020

Largest stream flow has longer or shorter time of concentration

Qp = 7.093 + sum of

$$Q_a \quad T_b/T_a$$

$$4.067 * 0.983 = 3.997$$
 Qp = 11.090

Total of 2 streams to confluence:
 Flow rates before confluence point:

4.067 7.093

Area of streams before confluence:
 1.500 2.600

Results of confluence:

Total flow rate = 11.090 (CFS)
 Time of concentration = 12.960 min.
 Effective stream area after confluence = 4.100 (Ac.)

+++++
 Process from Point/Station 303.000 to Point/Station 305.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 448.000 (Ft.)
 Downstream point/station elevation = 405.000 (Ft.)
 Pipe length = 350.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 11.090 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 11.090 (CFS)
 Normal flow depth in pipe = 8.80 (In.)
 Flow top width inside pipe = 10.61 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 17.96 (Ft/s)
 Travel time through pipe = 0.32 min.
 Time of concentration (TC) = 13.28 min.

+++++

Process from Point/Station 305.000 to Point/Station 305.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 4.100 (Ac.)
 Runoff from this stream = 11.090 (CFS)
 Time of concentration = 13.28 min.
 Rainfall intensity = 2.979 (In/Hr)

+++++
 Process from Point/Station 304.000 to Point/Station 305.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 890.000 (Ft.)
 Top (of initial area) elevation = 495.000 (Ft.)
 Bottom (of initial area) elevation = 405.000 (Ft.)
 Difference in elevation = 90.000 (Ft.)
 Slope = 0.10112 s(percent) = 10.11
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.329 min.
 Rainfall intensity = 3.618 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.621 (CFS)
 Total initial stream area = 2.100 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 305.000 to Point/Station 305.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.100 (Ac.)
 Runoff from this stream = 6.621 (CFS)
 Time of concentration = 9.33 min.
 Rainfall intensity = 3.618 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	11.090	13.28	2.979
2	6.621	9.33	3.618

Largest stream flow has longer time of concentration
 Qp = 11.090 + sum of

$$Q_p = \frac{Q_b}{I_a/I_b} = \frac{6.621}{0.823} = 5.451$$

Total of 2 streams to confluence:

Flow rates before confluence point:

11.090 6.621

Area of streams before confluence:

4.100 2.100

Results of confluence:

Total flow rate = 16.541 (CFS)

Time of concentration = 13.285 min.

Effective stream area after confluence = 6.200 (Ac.)

++++++
 Process from Point/Station 305.000 to Point/Station 307.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 405.000 (Ft.)
 Downstream point/station elevation = 400.000 (Ft.)
 Pipe length = 50.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 16.541 (CFS)
 Nearest computed pipe diameter = 15.00 (In.)
 Calculated individual pipe flow = 16.541 (CFS)
 Normal flow depth in pipe = 10.24 (In.)
 Flow top width inside pipe = 13.96 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 18.53 (Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 13.33 min.

++++++
 Process from Point/Station 307.000 to Point/Station 307.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 6.200 (Ac.)
 Runoff from this stream = 16.541 (CFS)
 Time of concentration = 13.33 min.
 Rainfall intensity = 2.974 (In/Hr)

++++++
 Process from Point/Station 306.000 to Point/Station 307.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 570.000 (Ft.)
 Top (of initial area) elevation = 495.000 (Ft.)
 Bottom (of initial area) elevation = 402.000 (Ft.)
 Difference in elevation = 93.000 (Ft.)
 Slope = 0.16316 s(percent) = 16.32
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 7.094 min.
 Rainfall intensity = 4.207(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.875
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 7.731(CFS)
 Total initial stream area = 2.100(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 307.000 to Point/Station 307.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.100(Ac.)
 Runoff from this stream = 7.731(CFS)
 Time of concentration = 7.09 min.
 Rainfall intensity = 4.207(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	16.541	13.33	2.974
2	7.731	7.09	4.207

Largest stream flow has longer time of concentration

Qp = 16.541 + sum of
 Qb Ia/Ib
 7.731 * 0.707 = 5.465
 Qp = 22.006

Total of 2 streams to confluence:
 Flow rates before confluence point:

16.541 7.731

Area of streams before confluence:

6.200 2.100

Results of confluence:

Total flow rate = 22.006(CFS)

Time of concentration = 13.330 min.

Effective stream area after confluence = 8.300(Ac.)

++++++
 Process from Point/Station 307.000 to Point/Station 310.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 400.000(Ft.)

Downstream point/station elevation = 385.000(Ft.)
 Pipe length = 140.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 22.006(CFS)
 Nearest computed pipe diameter = 18.00(In.)
 Calculated individual pipe flow = 22.006(CFS)
 Normal flow depth in pipe = 10.46(In.)
 Flow top width inside pipe = 17.76(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 20.64(Ft/s)
 Travel time through pipe = 0.11 min.
 Time of concentration (TC) = 13.44 min.

++++++
 Process from Point/Station 310.000 to Point/Station 310.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 8.300(Ac.)
 Runoff from this stream = 22.006(CFS)
 Time of concentration = 13.44 min.
 Rainfall intensity = 2.960(In/Hr)

++++++
 Process from Point/Station 308.000 to Point/Station 310.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 650.000(Ft.)
 Top (of initial area) elevation = 446.000(Ft.)
 Bottom (of initial area) elevation = 385.000(Ft.)
 Difference in elevation = 61.000(Ft.)
 Slope = 0.09385 s(percent)= 9.38
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.351 min.
 Rainfall intensity = 3.846(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.873
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.042(CFS)
 Total initial stream area = 1.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 310.000 to Point/Station 310.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 1.800 (Ac.)
 Runoff from this stream = 6.042 (CFS)
 Time of concentration = 8.35 min.
 Rainfall intensity = 3.846 (In/Hr)

+++++
 Process from Point/Station 309.000 to Point/Station 310.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 670.000 (Ft.)
 Top (of initial area) elevation = 422.000 (Ft.)
 Bottom (of initial area) elevation = 385.000 (Ft.)
 Difference in elevation = 37.000 (Ft.)
 Slope = 0.05522 s(percent) = 5.52
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.399 min.
 Rainfall intensity = 3.604 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.023 (CFS)
 Total initial stream area = 1.600 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 310.000 to Point/Station 310.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3

Stream flow area = 1.600 (Ac.)
 Runoff from this stream = 5.023 (CFS)
 Time of concentration = 9.40 min.
 Rainfall intensity = 3.604 (In/Hr)

Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	22.006	13.44	2.960
2	6.042	8.35	3.846
3	5.023	9.40	3.604

Largest stream flow has longer time of concentration

Qp = 22.006 + sum of

$$\frac{Q_b}{Q_b} \frac{I_a}{I_b}$$

$$6.042 * 0.770 = 4.650$$

$$\frac{Q_b}{Q_b} \frac{I_a}{I_b}$$

$5.023 * 0.821 = 4.126$
 $Q_p = 30.782$

Total of 3 streams to confluence:

Flow rates before confluence point:

22.006 6.042 5.023

Area of streams before confluence:

8.300 1.800 1.600

Results of confluence:

Total flow rate = 30.782(CFS)

Time of concentration = 13.443 min.

Effective stream area after confluence = 11.700(Ac.)

++++++
 Process from Point/Station 310.000 to Point/Station 317.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 385.000(Ft.)
 Downstream point/station elevation = 384.000(Ft.)
 Pipe length = 40.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 30.782(CFS)
 Nearest computed pipe diameter = 24.00(In.)
 Calculated individual pipe flow = 30.782(CFS)
 Normal flow depth in pipe = 17.16(In.)
 Flow top width inside pipe = 21.67(In.)
 Critical Depth = 22.48(In.)
 Pipe flow velocity = 12.80(Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 13.49 min.

++++++
 Process from Point/Station 317.000 to Point/Station 317.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 11.700(Ac.)
 Runoff from this stream = 30.782(CFS)
 Time of concentration = 13.49 min.
 Rainfall intensity = 2.954(In/Hr)
 Program is now starting with Main Stream No. 2

++++++
 Process from Point/Station 350.000 to Point/Station 351.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 820.000(Ft.)
 Top (of initial area) elevation = 408.000(Ft.)
 Bottom (of initial area) elevation = 399.000(Ft.)
 Difference in elevation = 9.000(Ft.)
 Slope = 0.01098 s(percent)= 1.10

$TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 14.077 min.
 Rainfall intensity = 2.886 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.873
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.544 (CFS)
 Total initial stream area = 2.200 (Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 351.000 to Point/Station 352.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 399.000 (Ft.)
 End of street segment elevation = 394.000 (Ft.)
 Length of street segment = 500.000 (Ft.)
 Height of curb above gutter flowline = 6.0 (In.)
 Width of half street (curb to crown) = 20.000 (Ft.)
 Distance from crown to crossfall grade break = 10.000 (Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 10.000 (Ft.)
 Slope from curb to property line (v/hz) = 0.020
 Gutter width = 2.000 (Ft.)
 Gutter hike from flowline = 2.000 (In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 6.825 (CFS)
 Depth of flow = 0.428 (Ft.), Average velocity = 2.852 (Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 15.055 (Ft.)
 Flow velocity = 2.85 (Ft/s)
 Travel time = 2.92 min. TC = 17.00 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 2.601 (In/Hr) for a 100.0 year storm
 Subarea runoff = 2.491 (CFS) for 1.100 (Ac.)
 Total runoff = 8.036 (CFS) Total area = 3.300 (Ac.)

Street flow at end of street = 8.036(CFS)
 Half street flow at end of street = 8.036(CFS)
 Depth of flow = 0.448(Ft.), Average velocity = 2.967(Ft/s)
 Flow width (from curb towards crown)= 16.068(Ft.)

+++++
 Process from Point/Station 352.000 to Point/Station 354.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 394.000(Ft.)
 End of street segment elevation = 380.000(Ft.)
 Length of street segment = 300.000(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 20.000(Ft.)
 Distance from crown to crossfall grade break = 10.000(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 10.000(Ft.)
 Slope from curb to property line (v/hz) = 0.020
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 13.138(CFS)
 Depth of flow = 0.414(Ft.), Average velocity = 5.993(Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 14.373(Ft.)
 Flow velocity = 5.99(Ft/s)
 Travel time = 0.83 min. TC = 17.83 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.870
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 2.534(In/Hr) for a 100.0 year storm
 Subarea runoff = 10.138(CFS) for 4.600(Ac.)
 Total runoff = 18.174(CFS) Total area = 7.900(Ac.)
 Street flow at end of street = 18.174(CFS)
 Half street flow at end of street = 18.174(CFS)
 Depth of flow = 0.454(Ft.), Average velocity = 6.481(Ft/s)
 Flow width (from curb towards crown)= 16.363(Ft.)

+++++
 Process from Point/Station 354.000 to Point/Station 354.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 7.900 (Ac.)
 Runoff from this stream = 18.174 (CFS)
 Time of concentration = 17.83 min.
 Rainfall intensity = 2.534 (In/Hr)

 Process from Point/Station 353.000 to Point/Station 354.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 900.000 (Ft.)
 Top (of initial area) elevation = 400.000 (Ft.)
 Bottom (of initial area) elevation = 380.000 (Ft.)
 Difference in elevation = 20.000 (Ft.)
 Slope = 0.02222 s(percent) = 2.22
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.688 min.
 Rainfall intensity = 3.055 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.875
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 7.750 (CFS)
 Total initial stream area = 2.900 (Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 354.000 to Point/Station 354.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 2.900 (Ac.)
 Runoff from this stream = 7.750 (CFS)
 Time of concentration = 12.69 min.
 Rainfall intensity = 3.055 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	18.174	17.83	2.534
2	7.750	12.69	3.055

Largest stream flow has longer time of concentration

Qp = 18.174 + sum of
 Qb Ia/Ib
 7.750 * 0.829 = 6.427
 Qp = 24.601

Total of 2 streams to confluence:
 Flow rates before confluence point:
 18.174 7.750
 Area of streams before confluence:
 7.900 2.900
 Results of confluence:
 Total flow rate = 24.601(CFS)
 Time of concentration = 17.833 min.
 Effective stream area after confluence = 10.800(Ac.)

+++++
 Process from Point/Station 354.000 to Point/Station 357.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 380.000(Ft.)
 Downstream point/station elevation = 379.000(Ft.)
 Pipe length = 50.00(Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 24.601(CFS)
 Nearest computed pipe diameter = 24.00(In.)
 Calculated individual pipe flow = 24.601(CFS)
 Normal flow depth in pipe = 17.58(In.)
 Flow top width inside pipe = 21.25(In.)
 Critical Depth = 21.02(In.)
 Pipe flow velocity = 9.97(Ft/s)
 Travel time through pipe = 0.08 min.
 Time of concentration (TC) = 17.92 min.

+++++
 Process from Point/Station 357.000 to Point/Station 357.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 10.800(Ac.)
 Runoff from this stream = 24.601(CFS)
 Time of concentration = 17.92 min.
 Rainfall intensity = 2.527(In/Hr)

+++++
 Process from Point/Station 356.000 to Point/Station 357.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 950.000(Ft.)
 Top (of initial area) elevation = 437.000(Ft.)
 Bottom (of initial area) elevation = 379.000(Ft.)
 Difference in elevation = 58.000(Ft.)
 Slope = 0.06105 s(percent)= 6.11
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.593 min.
 Rainfall intensity = 3.374(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.877
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 14.204(CFS)
 Total initial stream area = 4.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 357.000 to Point/Station 357.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 4.800(Ac.)
 Runoff from this stream = 14.204(CFS)
 Time of concentration = 10.59 min.
 Rainfall intensity = 3.374(In/Hr)

++++++
 Process from Point/Station 355.000 to Point/Station 357.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 310.000(Ft.)
 Top (of initial area) elevation = 381.000(Ft.)
 Bottom (of initial area) elevation = 379.000(Ft.)
 Difference in elevation = 2.000(Ft.)
 Slope = 0.00645 s(percent) = 0.65
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.609 min.
 Rainfall intensity = 3.371(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.877
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.070(CFS)
 Total initial stream area = 0.700(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 357.000 to Point/Station 357.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3
 Stream flow area = 0.700(Ac.)

Runoff from this stream = 2.070 (CFS)
 Time of concentration = 10.61 min.
 Rainfall intensity = 3.371 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	24.601	17.92	2.527
2	14.204	10.59	3.374
3	2.070	10.61	3.371

Largest stream flow has longer time of concentration

Qp = 24.601 + sum of

$$Q_b \cdot \frac{I_a}{I_b}$$

$$14.204 * 0.749 = 10.638$$

$$2.070 * 0.750 = 1.551$$
 Qp = 36.791

Total of 3 streams to confluence:

Flow rates before confluence point:

24.601 14.204 2.070

Area of streams before confluence:

10.800 4.800 0.700

Results of confluence:

Total flow rate = 36.791 (CFS)

Time of concentration = 17.917 min.

Effective stream area after confluence = 16.300 (Ac.)

 Process from Point/Station 357.000 to Point/Station 360.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 379.000 (Ft.)
 Downstream point/station elevation = 378.000 (Ft.)
 Pipe length = 300.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 36.791 (CFS)
 Nearest computed pipe diameter = 39.00 (In.)
 Calculated individual pipe flow = 36.791 (CFS)
 Normal flow depth in pipe = 28.69 (In.)
 Flow top width inside pipe = 34.40 (In.)
 Critical Depth = 23.13 (In.)
 Pipe flow velocity = 5.63 (Ft/s)
 Travel time through pipe = 0.89 min.
 Time of concentration (TC) = 18.80 min.

 Process from Point/Station 360.000 to Point/Station 360.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1

Stream flow area = 16.300 (Ac.)
 Runoff from this stream = 36.791 (CFS)
 Time of concentration = 18.80 min.
 Rainfall intensity = 2.461 (In/Hr)

+++++
 Process from Point/Station 358.000 to Point/Station 360.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 950.000 (Ft.)
 Top (of initial area) elevation = 450.000 (Ft.)
 Bottom (of initial area) elevation = 378.000 (Ft.)
 Difference in elevation = 72.000 (Ft.)
 Slope = 0.07579 s(percent) = 7.58
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.145 min.
 Rainfall intensity = 3.455 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.900
 Decimal fraction soil group D = 0.100
 RI index for soil (AMC 3) = 84.76
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 9.027 (CFS)
 Total initial stream area = 3.000 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 360.000 to Point/Station 360.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 3.000 (Ac.)
 Runoff from this stream = 9.027 (CFS)
 Time of concentration = 10.14 min.
 Rainfall intensity = 3.455 (In/Hr)

+++++
 Process from Point/Station 359.000 to Point/Station 360.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 400.000 (Ft.)
 Top (of initial area) elevation = 399.000 (Ft.)
 Bottom (of initial area) elevation = 379.000 (Ft.)
 Difference in elevation = 20.000 (Ft.)
 Slope = 0.05000 s(percent) = 5.00
 $TC = k(0.940) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 18.800 min.
 Rainfall intensity = 2.461 (In/Hr) for a 100.0 year storm

UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.847
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.400
 Decimal fraction soil group D = 0.600
 RI index for soil(AMC 3) = 89.56
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 0.208(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 1.000

+++++
 Process from Point/Station 360.000 to Point/Station 360.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3
 Stream flow area = 0.100(Ac.)
 Runoff from this stream = 0.208(CFS)
 Time of concentration = 18.80 min.
 Rainfall intensity = 2.461(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	36.791	18.80	2.461
2	9.027	10.14	3.455
3	0.208	18.80	2.461

Largest stream flow has longer time of concentration

Qp = 36.791 + sum of

$$\begin{array}{l} Q_b \quad I_a/I_b \\ 9.027 * 0.712 = 6.429 \\ Q_b \quad I_a/I_b \\ 0.208 * 1.000 = 0.208 \end{array}$$

 Qp = 43.428

Total of 3 streams to confluence:
 Flow rates before confluence point:
 36.791 9.027 0.208
 Area of streams before confluence:
 16.300 3.000 0.100

Results of confluence:
 Total flow rate = 43.428(CFS)
 Time of concentration = 18.805 min.
 Effective stream area after confluence = 19.400(Ac.)

+++++
 Process from Point/Station 360.000 to Point/Station 313.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 378.000 (Ft.)
 Downstream point/station elevation = 377.000 (Ft.)
 Pipe length = 40.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 43.428 (CFS)
 Nearest computed pipe diameter = 27.00 (In.)
 Calculated individual pipe flow = 43.428 (CFS)
 Normal flow depth in pipe = 22.73 (In.)
 Flow top width inside pipe = 19.70 (In.)
 Critical Depth = 25.57 (In.)
 Pipe flow velocity = 12.15 (Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 18.86 min.

++++++
 Process from Point/Station 313.000 to Point/Station 313.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 19.400 (Ac.)
 Runoff from this stream = 43.428 (CFS)
 Time of concentration = 18.86 min.
 Rainfall intensity = 2.457 (In/Hr)

++++++
 Process from Point/Station 311.000 to Point/Station 313.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 420.000 (Ft.)
 Top (of initial area) elevation = 405.000 (Ft.)
 Bottom (of initial area) elevation = 384.000 (Ft.)
 Difference in elevation = 21.000 (Ft.)
 Slope = 0.05000 s(percent) = 5.00
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.954 min.
 Rainfall intensity = 3.950 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.879
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.150
 Decimal fraction soil group D = 0.850
 RI index for soil (AMC 3) = 87.46
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 10.419 (CFS)
 Total initial stream area = 3.000 (Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 313.000 to Point/Station 313.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 3.000 (Ac.)
 Runoff from this stream = 10.419 (CFS)
 Time of concentration = 7.95 min.
 Rainfall intensity = 3.950 (In/Hr)

+++++
 Process from Point/Station 312.000 to Point/Station 313.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 560.000 (Ft.)
 Top (of initial area) elevation = 390.000 (Ft.)
 Bottom (of initial area) elevation = 386.000 (Ft.)
 Difference in elevation = 4.000 (Ft.)
 Slope = 0.00714 s(percent) = 0.71
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 13.169 min.
 Rainfall intensity = 2.993 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.874
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.140 (CFS)
 Total initial stream area = 1.200 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 313.000 to Point/Station 313.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3
 Stream flow area = 1.200 (Ac.)
 Runoff from this stream = 3.140 (CFS)
 Time of concentration = 13.17 min.
 Rainfall intensity = 2.993 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	43.428	18.86	2.457
2	10.419	7.95	3.950
3	3.140	13.17	2.993

Largest stream flow has longer time of concentration
 $Q_p = Q_b + \text{sum of } Ia/Ib$
 $10.419 * 0.622 = 6.480$

Q_b I_a/I_b
 3.140 * 0.821 = 2.577
 $Q_p =$ 52.486

Total of 3 streams to confluence:

Flow rates before confluence point:

43.428 10.419 3.140

Area of streams before confluence:

19.400 3.000 1.200

Results of confluence:

Total flow rate = 52.486 (CFS)

Time of concentration = 18.860 min.

Effective stream area after confluence = 23.600 (Ac.)

++++++
 Process from Point/Station 313.000 to Point/Station 316.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 389.000 (Ft.)
 Downstream point/station elevation = 386.000 (Ft.)
 Pipe length = 490.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 52.486 (CFS)
 Nearest computed pipe diameter = 36.00 (In.)
 Calculated individual pipe flow = 52.486 (CFS)
 Normal flow depth in pipe = 29.72 (In.)
 Flow top width inside pipe = 27.33 (In.)
 Critical Depth = 28.27 (In.)
 Pipe flow velocity = 8.41 (Ft/s)
 Travel time through pipe = 0.97 min.
 Time of concentration (TC) = 19.83 min.

++++++
 Process from Point/Station 316.000 to Point/Station 316.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 23.600 (Ac.)
 Runoff from this stream = 52.486 (CFS)
 Time of concentration = 19.83 min.
 Rainfall intensity = 2.390 (In/Hr)

++++++
 Process from Point/Station 314.000 to Point/Station 316.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 210.000 (Ft.)
 Top (of initial area) elevation = 390.000 (Ft.)
 Bottom (of initial area) elevation = 386.000 (Ft.)
 Difference in elevation = 4.000 (Ft.)
 Slope = 0.01905 s(percent) = 1.90
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 7.311 min.
 Rainfall intensity = 4.137(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.881
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 0.729(CFS)
 Total initial stream area = 0.200(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 316.000 to Point/Station 316.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 0.200(Ac.)
 Runoff from this stream = 0.729(CFS)
 Time of concentration = 7.31 min.
 Rainfall intensity = 4.137(In/Hr)

++++++
 Process from Point/Station 315.000 to Point/Station 316.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 100.000(Ft.)
 Top (of initial area) elevation = 395.000(Ft.)
 Bottom (of initial area) elevation = 386.000(Ft.)
 Difference in elevation = 9.000(Ft.)
 Slope = 0.09000 s(percent)= 9.00
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Warning: TC computed to be less than 5 min.; program is assuming the
 time of concentration is 5 minutes.
 Initial area time of concentration = 5.000 min.
 Rainfall intensity = 5.099(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.879
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 0.448(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 0.500

+++++

Process from Point/Station 316.000 to Point/Station 316.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3

Stream flow area = 0.100 (Ac.)
 Runoff from this stream = 0.448 (CFS)
 Time of concentration = 5.00 min.
 Rainfall intensity = 5.099 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	52.486	19.83	2.390
2	0.729	7.31	4.137
3	0.448	5.00	5.099

Largest stream flow has longer time of concentration

Qp = 52.486 + sum of

$$Q_b \cdot \frac{I_a}{I_b} = 0.729 \cdot 0.578 = 0.421$$

$$Q_b \cdot \frac{I_a}{I_b} = 0.448 \cdot 0.469 = 0.210$$

 Qp = 53.117

Total of 3 streams to confluence:

Flow rates before confluence point:
 52.486 0.729 0.448

Area of streams before confluence:
 23.600 0.200 0.100

Results of confluence:

Total flow rate = 53.117 (CFS)
 Time of concentration = 19.830 min.
 Effective stream area after confluence = 23.900 (Ac.)

 Process from Point/Station 316.000 to Point/Station 317.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 386.000 (Ft.)
 Downstream point/station elevation = 384.000 (Ft.)
 Pipe length = 50.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 53.117 (CFS)
 Nearest computed pipe diameter = 27.00 (In.)
 Calculated individual pipe flow = 53.117 (CFS)
 Normal flow depth in pipe = 19.27 (In.)
 Flow top width inside pipe = 24.41 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 17.51 (Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 19.88 min.

+++++
 Process from Point/Station 317.000 to Point/Station 317.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 23.900 (Ac.)
 Runoff from this stream = 53.117 (CFS)
 Time of concentration = 19.88 min.
 Rainfall intensity = 2.387 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	30.782	13.49	2.954
2	53.117	19.88	2.387

Largest stream flow has longer time of concentration

Qp = 53.117 + sum of
 Qb Ia/Ib
 30.782 * 0.808 = 24.876
 Qp = 77.993

Total of 2 main streams to confluence:

Flow rates before confluence point:

30.782 53.117

Area of streams before confluence:

11.700 23.900

Results of confluence:

Total flow rate = 77.993 (CFS)

Time of concentration = 19.878 min.

Effective stream area after confluence = 35.600 (Ac.)

+++++
 Process from Point/Station 317.000 to Point/Station 319.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 384.000 (Ft.)
 Downstream point/station elevation = 383.000 (Ft.)
 Pipe length = 220.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 77.993 (CFS)
 Nearest computed pipe diameter = 45.00 (In.)
 Calculated individual pipe flow = 77.993 (CFS)
 Normal flow depth in pipe = 35.25 (In.)
 Flow top width inside pipe = 37.08 (In.)
 Critical Depth = 32.66 (In.)
 Pipe flow velocity = 8.40 (Ft/s)
 Travel time through pipe = 0.44 min.
 Time of concentration (TC) = 20.31 min.


```

+++++
Process from Point/Station      319.000 to Point/Station      319.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 35.600 (Ac.)
 Runoff from this stream = 77.993 (CFS)
 Time of concentration = 20.31 min.
 Rainfall intensity = 2.359 (In/Hr)

```

+++++
Process from Point/Station      318.000 to Point/Station      319.000
**** INITIAL AREA EVALUATION ****

```

Initial area flow distance = 320.000 (Ft.)
 Top (of initial area) elevation = 384.000 (Ft.)
 Bottom (of initial area) elevation = 383.000 (Ft.)
 Difference in elevation = 1.000 (Ft.)
 Slope = 0.00313 s(percent) = 0.31
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.421 min.
 Rainfall intensity = 3.091 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.500
 Decimal fraction soil group D = 0.500
 RI index for soil (AMC 3) = 86.20
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.615 (CFS)
 Total initial stream area = 0.600 (Ac.)
 Pervious area fraction = 0.500

```

+++++
Process from Point/Station      319.000 to Point/Station      319.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.600 (Ac.)
 Runoff from this stream = 1.615 (CFS)
 Time of concentration = 12.42 min.
 Rainfall intensity = 3.091 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	77.993	20.31	2.359
2	1.615	12.42	3.091

Largest stream flow has longer time of concentration

$$Q_p = \frac{Q_b}{I_a/I_b} = \frac{1.615}{0.763} = 1.232$$

$$Q_p = 79.225$$

Total of 2 streams to confluence:

Flow rates before confluence point:

77.993 1.615

Area of streams before confluence:

35.600 0.600

Results of confluence:

Total flow rate = 79.225 (CFS)

Time of concentration = 20.314 min.

Effective stream area after confluence = 36.200 (Ac.)

++++++
 Process from Point/Station 319.000 to Point/Station 321.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 383.000 (Ft.)
 Downstream point/station elevation = 382.000 (Ft.)
 Pipe length = 20.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 79.225 (CFS)
 Nearest computed pipe diameter = 30.00 (In.)
 Calculated individual pipe flow = 79.225 (CFS)
 Normal flow depth in pipe = 21.52 (In.)
 Flow top width inside pipe = 27.02 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 21.03 (Ft/s)
 Travel time through pipe = 0.02 min.
 Time of concentration (TC) = 20.33 min.

++++++
 Process from Point/Station 321.000 to Point/Station 321.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 36.200 (Ac.)
 Runoff from this stream = 79.225 (CFS)
 Time of concentration = 20.33 min.
 Rainfall intensity = 2.357 (In/Hr)

++++++
 Process from Point/Station 320.000 to Point/Station 321.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 590.000 (Ft.)
 Top (of initial area) elevation = 408.000 (Ft.)
 Bottom (of initial area) elevation = 383.000 (Ft.)
 Difference in elevation = 25.000 (Ft.)

Slope = 0.04237 s(percent)= 4.24
 TC = $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
 Initial area time of concentration = 9.419 min.
 Rainfall intensity = 3.599(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.858
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.650
 Decimal fraction soil group C = 0.350
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 78.44
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.090(CFS)
 Total initial stream area = 1.000(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 321.000 to Point/Station 321.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 1.000(Ac.)
 Runoff from this stream = 3.090(CFS)
 Time of concentration = 9.42 min.
 Rainfall intensity = 3.599(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	79.225	20.33	2.357
2	3.090	9.42	3.599

Largest stream flow has longer time of concentration

Qp = 79.225 + sum of
 Qb Ia/Ib
 3.090 * 0.655 = 2.024
 Qp = 81.249

Total of 2 streams to confluence:

Flow rates before confluence point:

79.225 3.090

Area of streams before confluence:

36.200 1.000

Results of confluence:

Total flow rate = 81.249(CFS)

Time of concentration = 20.330 min.

Effective stream area after confluence = 37.200(Ac.)

++++++
 Process from Point/Station 321.000 to Point/Station 329.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 383.000(Ft.)
 Downstream point/station elevation = 380.000(Ft.)
 Pipe length = 100.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 81.249(CFS)
 Nearest computed pipe diameter = 33.00(In.)
 Calculated individual pipe flow = 81.249(CFS)
 Normal flow depth in pipe = 24.19(In.)
 Flow top width inside pipe = 29.20(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 17.42(Ft/s)
 Travel time through pipe = 0.10 min.
 Time of concentration (TC) = 20.43 min.

++++++
 Process from Point/Station 329.000 to Point/Station 329.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 37.200(Ac.)
 Runoff from this stream = 81.249(CFS)
 Time of concentration = 20.43 min.
 Rainfall intensity = 2.351(In/Hr)
 Program is now starting with Main Stream No. 2

++++++
 Process from Point/Station 322.000 to Point/Station 324.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 970.000(Ft.)
 Top (of initial area) elevation = 416.000(Ft.)
 Bottom (of initial area) elevation = 408.000(Ft.)
 Difference in elevation = 8,000(Ft.)
 Slope = 0.00825 s(percent)= 0.82
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.262 min.
 Rainfall intensity = 3.113(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.893
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.080
 Decimal fraction soil group C = 0.920
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 83.78
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 2.780(CFS)
 Total initial stream area = 1.000(Ac.)
 Pervious area fraction = 0.100

+++++

Process from Point/Station 324.000 to Point/Station 324.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1

Stream flow area = 1.000(Ac.)
 Runoff from this stream = 2.780(CFS)
 Time of concentration = 12.26 min.
 Rainfall intensity = 3.113(In/Hr)

+++++
 Process from Point/Station 323.000 to Point/Station 324.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 920.000(Ft.)
 Top (of initial area) elevation = 416.000(Ft.)
 Bottom (of initial area) elevation = 408.000(Ft.)
 Difference in elevation = 8.000(Ft.)
 Slope = 0.00870 s(percent)= 0.87
 $TC = k(0.300) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.879 min.
 Rainfall intensity = 3.168(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.889
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.950
 Decimal fraction soil group C = 0.050
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 75.32
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 2.817(CFS)
 Total initial stream area = 1.000(Ac.)
 Pervious area fraction = 0.100

+++++
 Process from Point/Station 324.000 to Point/Station 324.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 1.000(Ac.)
 Runoff from this stream = 2.817(CFS)
 Time of concentration = 11.88 min.
 Rainfall intensity = 3.168(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	2.780	12.26	3.113
2	2.817	11.88	3.168

Largest stream flow has longer or shorter time of concentration
 Qp = 2.817 + sum of

Q_a T_b/T_a
 2.780 * 0.969 = 2.694
 $Q_p =$ 5.510

Total of 2 streams to confluence:
 Flow rates before confluence point:

 2.780 2.817

Area of streams before confluence:

 1.000 1.000

Results of confluence:

Total flow rate = 5.510 (CFS)

Time of concentration = 11.879 min.

Effective stream area after confluence = 2.000 (Ac.)

++++++
 Process from Point/Station 324.000 to Point/Station 329.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 408.000 (Ft.)
 Downstream point/station elevation = 380.000 (Ft.)
 Pipe length = 680.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 5.510 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 5.510 (CFS)
 Normal flow depth in pipe = 7.84 (In.)
 Flow top width inside pipe = 11.42 (In.)
 Critical Depth = 11.27 (In.)
 Pipe flow velocity = 10.13 (Ft/s)
 Travel time through pipe = 1.12 min.
 Time of concentration (TC) = 13.00 min.

++++++
 Process from Point/Station 329.000 to Point/Station 329.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 2.000 (Ac.)
 Runoff from this stream = 5.510 (CFS)
 Time of concentration = 13.00 min.
 Rainfall intensity = 3.015 (In/Hr)
 Program is now starting with Main Stream No. 3

++++++
 Process from Point/Station 325.000 to Point/Station 326.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 560.000 (Ft.)
 Top (of initial area) elevation = 384.000 (Ft.)
 Bottom (of initial area) elevation = 362.000 (Ft.)
 Difference in elevation = 22.000 (Ft.)

Slope = 0.03929 s(percent)= 3.93
 TC = $k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.204 min.
 Rainfall intensity = 4.171(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.891
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 2.602(CFS)
 Total initial stream area = 0.700(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 326.000 to Point/Station 327.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 362.000(Ft.)
 Downstream point/station elevation = 361.000(Ft.)
 Pipe length = 100.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 2.602(CFS)
 Nearest computed pipe diameter = 12.00(In.)
 Calculated individual pipe flow = 2.602(CFS)
 Normal flow depth in pipe = 7.62(In.)
 Flow top width inside pipe = 11.56(In.)
 Critical Depth = 8.30(In.)
 Pipe flow velocity = 4.95(Ft/s)
 Travel time through pipe = 0.34 min.
 Time of concentration (TC) = 7.54 min.

++++++
 Process from Point/Station 327.000 to Point/Station 327.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 1
 Stream flow area = 0.700(Ac.)
 Runoff from this stream = 2.602(CFS)
 Time of concentration = 7.54 min.
 Rainfall intensity = 4.068(In/Hr)

++++++
 Process from Point/Station 328.000 to Point/Station 327.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 407.000(Ft.)
 Bottom (of initial area) elevation = 362.000(Ft.)
 Difference in elevation = 45.000(Ft.)

Slope = 0.04500 s(percent)= 4.50
 TC = $k(0.300) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.841 min.
 Rainfall intensity = 3.727(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.890
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 5.309(CFS)
 Total initial stream area = 1.600(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 327.000 to Point/Station 327.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 2

Stream flow area = 1.600(Ac.)
 Runoff from this stream = 5.309(CFS)
 Time of concentration = 8.84 min.
 Rainfall intensity = 3.727(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	2.602	7.54	4.068
2	5.309	8.84	3.727

Largest stream flow has longer time of concentration

Qp = 5.309 + sum of
 Qb Ia/Ib
 2.602 * 0.916 = 2.384
 Qp = 7.694

Total of 2 streams to confluence:

Flow rates before confluence point:

2.602 5.309

Area of streams before confluence:

0.700 1.600

Results of confluence:

Total flow rate = 7.694(CFS)

Time of concentration = 8.841 min.

Effective stream area after confluence = 2.300(Ac.)

++++++
 Process from Point/Station 327.000 to Point/Station 329.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 362.000 (Ft.)
 Downstream point/station elevation = 359.000 (Ft.)
 Pipe length = 290.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 7.694 (CFS)
 Nearest computed pipe diameter = 18.00 (In.)
 Calculated individual pipe flow = 7.694 (CFS)
 Normal flow depth in pipe = 11.31 (In.)
 Flow top width inside pipe = 17.40 (In.)
 Critical Depth = 12.90 (In.)
 Pipe flow velocity = 6.58 (Ft/s)
 Travel time through pipe = 0.73 min.
 Time of concentration (TC) = 9.58 min.

++++++
 Process from Point/Station 329.000 to Point/Station 329.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 3
 Stream flow area = 2.300 (Ac.)
 Runoff from this stream = 7.694 (CFS)
 Time of concentration = 9.58 min.
 Rainfall intensity = 3.567 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	81.249	20.43	2.351
2	5.510	13.00	3.015
3	7.694	9.58	3.567

Largest stream flow has longer time of concentration

Qp = 81.249 + sum of
 Qb Ia/Ib
 5.510 * 0.780 = 4.297
 Qb Ia/Ib
 7.694 * 0.659 = 5.072
 Qp = 90.618

Total of 3 main streams to confluence:

Flow rates before confluence point:

81.249 5.510 7.694

Area of streams before confluence:

37.200 2.000 2.300

Results of confluence:

Total flow rate = 90.618 (CFS)

Time of concentration = 20.426 min.

Effective stream area after confluence = 41.500 (Ac.)

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Process from Point/Station      329.000 to Point/Station      333.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

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Upstream point/station elevation = 380.000(Ft.)
Downstream point/station elevation = 370.000(Ft.)
Pipe length = 210.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 90.618(CFS)
Nearest computed pipe diameter = 30.00(In.)
Calculated individual pipe flow = 90.618(CFS)
Normal flow depth in pipe = 24.94(In.)
Flow top width inside pipe = 22.47(In.)
Critical depth could not be calculated.
Pipe flow velocity = 20.78(Ft/s)
Travel time through pipe = 0.17 min.
Time of concentration (TC) = 20.59 min.

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Process from Point/Station      333.000 to Point/Station      333.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 1 in normal stream number 1
Stream flow area = 41.500(Ac.)
Runoff from this stream = 90.618(CFS)
Time of concentration = 20.59 min.
Rainfall intensity = 2.341(In/Hr)

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Process from Point/Station      330.000 to Point/Station      331.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 870.000(Ft.)
Top (of initial area) elevation = 415.000(Ft.)
Bottom (of initial area) elevation = 406.000(Ft.)
Difference in elevation = 9.000(Ft.)
Slope = 0.01034 s(percent)= 1.03
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.586 min.
Rainfall intensity = 2.830(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.841
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 75.84
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 10.475(CFS)
Total initial stream area = 4.400(Ac.)
Pervious area fraction = 0.500

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Process from Point/Station      331.000 to Point/Station      332.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

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Top of street segment elevation = 406.000(Ft.)
End of street segment elevation = 403.000(Ft.)
Length of street segment = 380.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 18.000(Ft.)
Distance from crown to crossfall grade break = 10.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 12.918(CFS)
Depth of flow = 0.529(Ft.), Average velocity = 3.117(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 1.16(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 18.000(Ft.)
Flow velocity = 3.12(Ft/s)
Travel time = 2.03 min. TC = 16.62 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.834
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 74.80
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 2.634(In/Hr) for a 100.0 year storm
Subarea runoff = 4.835(CFS) for 2.200(Ac.)
Total runoff = 15.310(CFS) Total area = 6.600(Ac.)
Street flow at end of street = 15.310(CFS)
Half street flow at end of street = 15.310(CFS)
Depth of flow = 0.557(Ft.), Average velocity = 3.264(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 2.27(Ft.)
Flow width (from curb towards crown)= 18.000(Ft.)

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Process from Point/Station      332.000 to Point/Station      333.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

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Upstream point/station elevation = 403.000 (Ft.)
 Downstream point/station elevation = 370.000 (Ft.)
 Pipe length = 140.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 15.310 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 15.310 (CFS)
 Normal flow depth in pipe = 8.78 (In.)
 Flow top width inside pipe = 10.64 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 24.87 (Ft/s)
 Travel time through pipe = 0.09 min.
 Time of concentration (TC) = 16.71 min.

++++++
 Process from Point/Station 333.000 to Point/Station 333.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 6.600 (Ac.)
 Runoff from this stream = 15.310 (CFS)
 Time of concentration = 16.71 min.
 Rainfall intensity = 2.626 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	90.618	20.59	2.341
2	15.310	16.71	2.626

Largest stream flow has longer time of concentration

Qp = 90.618 + sum of
 Qb Ia/Ib
 15.310 * 0.891 = 13.649
 Qp = 104.267

Total of 2 streams to confluence:

Flow rates before confluence point:

90.618 15.310

Area of streams before confluence:

41.500 6.600

Results of confluence:

Total flow rate = 104.267 (CFS)

Time of concentration = 20.594 min.

Effective stream area after confluence = 48.100 (Ac.)

++++++
 Process from Point/Station 333.000 to Point/Station 334.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 361.000 (Ft.)

Downstream point elevation = 359.700(Ft.)
 Channel length thru subarea = 160.000(Ft.)
 Channel base width = 50.000(Ft.)
 Slope or 'Z' of left channel bank = 4.000
 Slope or 'Z' of right channel bank = 4.000
 Estimated mean flow rate at midpoint of channel = 105.958(CFS)
 Manning's 'N' = 0.030
 Maximum depth of channel = 2.000(Ft.)
 Flow(q) thru subarea = 105.958(CFS)
 Depth of flow = 0.633(Ft.), Average velocity = 3.185(Ft/s)
 Channel flow top width = 55.066(Ft.)
 Flow Velocity = 3.18(Ft/s)
 Travel time = 0.84 min.
 Time of concentration = 21.43 min.

Sub-Channel No. 1 Critical depth = 0.512(Ft.)
 ' ' ' Critical flow top width = 54.094(Ft.)
 ' ' ' Critical flow velocity= 3.978(Ft/s)
 ' ' ' Critical flow area = 26.633(Sq.Ft)

Adding area flow to channel

UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.802
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.600
 Decimal fraction soil group C = 0.400
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 82.72
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.290(In/Hr) for a 100.0 year storm
 Subarea runoff = 3.308(CFS) for 1.800(Ac.)
 Total runoff = 107.574(CFS) Total area = 49.900(Ac.)
 Depth of flow = 0.639(Ft.), Average velocity = 3.203(Ft/s)

Sub-Channel No. 1 Critical depth = 0.516(Ft.)
 ' ' ' Critical flow top width = 54.125(Ft.)
 ' ' ' Critical flow velocity= 4.007(Ft/s)
 ' ' ' Critical flow area = 26.845(Sq.Ft)

++++++
 Process from Point/Station 334.000 to Point/Station 337.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 359.700(Ft.)
 Downstream point/station elevation = 357.000(Ft.)
 Pipe length = 175.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 107.574(CFS)
 Nearest computed pipe diameter = 39.00(In.)
 Calculated individual pipe flow = 107.574(CFS)
 Normal flow depth in pipe = 34.03(In.)
 Flow top width inside pipe = 26.01(In.)
 Critical Depth = 36.84(In.)

Pipe flow velocity = 14.01(Ft/s)
 Travel time through pipe = 0.21 min.
 Time of concentration (TC) = 21.64 min.

+++++
 Process from Point/Station 337.000 to Point/Station 337.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 49.900(Ac.)
 Runoff from this stream = 107.574(CFS)
 Time of concentration = 21.64 min.
 Rainfall intensity = 2.278(In/Hr)

+++++
 Process from Point/Station 335.000 to Point/Station 336.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 860.000(Ft.)
 Top (of initial area) elevation = 465.000(Ft.)
 Bottom (of initial area) elevation = 365.000(Ft.)
 Difference in elevation = 100.000(Ft.)
 Slope = 0.11628 s(percent)= 11.63
 $TC = k(0.530)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.161 min.
 Rainfall intensity = 3.127(In/Hr) for a 100.0 year storm
 UNDEVELOPED (poor cover) subarea
 Runoff Coefficient = 0.883
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 95.60
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 9.662(CFS)
 Total initial stream area = 3.500(Ac.)
 Pervious area fraction = 1.000

+++++
 Process from Point/Station 336.000 to Point/Station 337.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 365.000(Ft.)
 Downstream point/station elevation = 363.000(Ft.)
 Pipe length = 80.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 9.662(CFS)
 Nearest computed pipe diameter = 15.00(In.)
 Calculated individual pipe flow = 9.662(CFS)
 Normal flow depth in pipe = 11.63(In.)
 Flow top width inside pipe = 12.53(In.)
 Critical Depth = 14.10(In.)

Pipe flow velocity = 9.47(Ft/s)
 Travel time through pipe = 0.14 min.
 Time of concentration (TC) = 12.30 min.

+++++
 Process from Point/Station 337.000 to Point/Station 337.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 3.500(Ac.)
 Runoff from this stream = 9.662(CFS)
 Time of concentration = 12.30 min.
 Rainfall intensity = 3.108(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	107.574	21.64	2.278
2	9.662	12.30	3.108

Largest stream flow has longer time of concentration

Qp = 107.574 + sum of
 Qb Ia/Ib
 9.662 * 0.733 = 7.082

Qp = 114.656

Total of 2 streams to confluence:

Flow rates before confluence point:

107.574	9.662

Area of streams before confluence:

49.900	3.500

Results of confluence:

Total flow rate = 114.656(CFS)

Time of concentration = 21.640 min.

Effective stream area after confluence = 53.400(Ac.)

+++++
 Process from Point/Station 337.000 to Point/Station 342.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 366.000(Ft.)
 Downstream point/station elevation = 365.000(Ft.)
 Pipe length = 50.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 114.656(CFS)
 Nearest computed pipe diameter = 39.00(In.)
 Calculated individual pipe flow = 114.656(CFS)
 Normal flow depth in pipe = 31.36(In.)
 Flow top width inside pipe = 30.96(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 16.04(Ft/s)
 Travel time through pipe = 0.05 min.

Time of concentration (TC) = 21.69 min.

+++++
 Process from Point/Station 342.000 to Point/Station 342.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 53.400 (Ac.)
 Runoff from this stream = 114.656 (CFS)
 Time of concentration = 21.69 min.
 Rainfall intensity = 2.275 (In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 338.000 to Point/Station 338.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 2.708 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.868
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.380
 Decimal fraction soil group D = 0.620
 RI index for soil (AMC 3) = 86.63
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 User specified values are as follows:
 TC = 15.80 min. Rain intensity = 2.71 (In/Hr)
 Total area = 67.70 (Ac.) Total runoff = 161.00 (CFS)

+++++
 Process from Point/Station 338.000 to Point/Station 339.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 168.197 (CFS)
 Depth of flow = 2.117 (Ft.), Average velocity = 19.291 (Ft/s)
 ***** Irregular Channel Data *****

 Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	4.00
2	4.00	0.00
3	6.00	0.00
4	10.00	4.00

Manning's 'N' friction factor = 0.030

Sub-Channel flow = 168.197 (CFS)
 ' ' flow top width = 6.235 (Ft.)
 ' ' velocity = 19.291 (Ft/s)
 ' ' area = 8.719 (Sq.Ft)

Froude number = 2.875
 Upstream point elevation = 395.000(Ft.)
 Downstream point elevation = 368.000(Ft.)
 Flow length = 200.000(Ft.)
 Travel time = 0.17 min.
 Time of concentration = 15.97 min.
 Depth of flow = 2.117(Ft.)
 Average velocity = 19.291(Ft/s)
 Total irregular channel flow = 168.197(CFS)
 Irregular channel normal depth above invert elev. = 2.117(Ft.)
 Average velocity of channel(s) = 19.291(Ft/s)
 Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.859
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.100
 Decimal fraction soil group C = 0.400
 Decimal fraction soil group D = 0.500
 RI index for soil(AMC 3) = 91.30
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.692(In/Hr) for a 100.0 year storm
 Subarea runoff = 14.344(CFS) for 6.200(Ac.)
 Total runoff = 175.344(CFS) Total area = 73.900(Ac.)
 Depth of flow = 2.161(Ft.), Average velocity = 19.495(Ft/s)

++++++
 Process from Point/Station 339.000 to Point/Station 342.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 368.000(Ft.)
 Downstream point/station elevation = 360.000(Ft.)
 Pipe length = 500.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 175.344(CFS)
 Nearest computed pipe diameter = 48.00(In.)
 Calculated individual pipe flow = 175.344(CFS)
 Normal flow depth in pipe = 37.92(In.)
 Flow top width inside pipe = 39.10(In.)
 Critical Depth = 45.04(In.)
 Pipe flow velocity = 16.47(Ft/s)
 Travel time through pipe = 0.51 min.
 Time of concentration (TC) = 16.48 min.

++++++
 Process from Point/Station 342.000 to Point/Station 342.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 2
 Stream flow area = 73.900(Ac.)
 Runoff from this stream = 175.344(CFS)
 Time of concentration = 16.48 min.

Rainfall intensity = 2.646(In/Hr)
 Program is now starting with Main Stream No. 3

+++++
 Process from Point/Station 340.000 to Point/Station 340.000
 **** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 2.380(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1 Acre Lot)
 Runoff Coefficient = 0.803
 Decimal fraction soil group A = 0.200
 Decimal fraction soil group B = 0.100
 Decimal fraction soil group C = 0.700
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 78.24
 Pervious area fraction = 0.800; Impervious fraction = 0.200
 User specified values are as follows:
 TC = 19.98 min. Rain intensity = 2.38(In/Hr)
 Total area = 49.60(Ac.) Total runoff = 101.33(CFS)

+++++
 Process from Point/Station 340.000 to Point/Station 341.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 416.000(Ft.)
 Downstream point/station elevation = 405.000(Ft.)
 Pipe length = 890.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 101.330(CFS)
 Nearest computed pipe diameter = 42.00(In.)
 Calculated individual pipe flow = 101.330(CFS)
 Normal flow depth in pipe = 31.31(In.)
 Flow top width inside pipe = 36.59(In.)
 Critical Depth = 36.98(In.)
 Pipe flow velocity = 13.17(Ft/s)
 Travel time through pipe = 1.13 min.
 Time of concentration (TC) = 21.11 min.

+++++
 Process from Point/Station 341.000 to Point/Station 341.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 1
 Stream flow area = 49.600(Ac.)
 Runoff from this stream = 101.330(CFS)
 Time of concentration = 21.11 min.
 Rainfall intensity = 2.309(In/Hr)

+++++
 Process from Point/Station 341.100 to Point/Station 341.200
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 940.000(Ft.)
 Top (of initial area) elevation = 461.000(Ft.)
 Bottom (of initial area) elevation = 395.000(Ft.)
 Difference in elevation = 66.000(Ft.)
 Slope = 0.07021 s(percent)= 7.02
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 24.723 min.
 Rainfall intensity = 2.117(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.825
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 87.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 4.891(CFS)
 Total initial stream area = 2.800(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 341.200 to Point/Station 341.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 395.000(Ft.)
 Downstream point elevation = 390.000(Ft.)
 Channel length thru subarea = 180.000(Ft.)
 Channel base width = 1.000(Ft.)
 Slope or 'Z' of left channel bank = 2.000
 Slope or 'Z' of right channel bank = 2.000
 Estimated mean flow rate at midpoint of channel = 5.851(CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 2.000(Ft.)
 Flow(q) thru subarea = 5.851(CFS)
 Depth of flow = 0.441(Ft.), Average velocity = 7.053(Ft/s)
 Channel flow top width = 2.764(Ft.)
 Flow Velocity = 7.05(Ft/s)
 Travel time = 0.43 min.
 Time of concentration = 25.15 min.

Sub-Channel No. 1 Critical depth = 0.672(Ft.)
 ' ' ' Critical flow top width = 3.688(Ft.)
 ' ' ' Critical flow velocity= 3.716(Ft/s)
 ' ' ' Critical flow area = 1.575(Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.824
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000

RI index for soil(AMC 3) = 87.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.097(In/Hr) for a 100.0 year storm
 Subarea runoff = 1.902(CFS) for 1.100(Ac.)
 Total runoff = 6.793(CFS) Total area = 3.900(Ac.)
 Depth of flow = 0.475(Ft.), Average velocity = 7.339(Ft/s)

Sub-Channel No. 1 Critical depth = 0.727(Ft.)
 ' ' ' Critical flow top width = 3.906(Ft.)
 ' ' ' Critical flow velocity = 3.811(Ft/s)
 ' ' ' Critical flow area = 1.782(Sq.Ft)

++++++
 Process from Point/Station 341.000 to Point/Station 341.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 3 in normal stream number 2

Stream flow area = 3.900(Ac.)
 Runoff from this stream = 6.793(CFS)
 Time of concentration = 25.15 min.
 Rainfall intensity = 2.097(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	101.330	21.11	2.309
2	6.793	25.15	2.097

Largest stream flow has longer or shorter time of concentration

Qp = 101.330 + sum of
 Qa Tb/Ta
 6.793 * 0.839 = 5.701
 Qp = 107.031

Total of 2 streams to confluence:
 Flow rates before confluence point:

101.330 6.793

Area of streams before confluence:

49.600 3.900

Results of confluence:

Total flow rate = 107.031(CFS)
 Time of concentration = 21.107 min.
 Effective stream area after confluence = 53.500(Ac.)

++++++
 Process from Point/Station 341.000 to Point/Station 342.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 390.000(Ft.)
 Downstream point/station elevation = 360.000(Ft.)

Pipe length = 635.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 107.031(CFS)
 Nearest computed pipe diameter = 33.00(In.)
 Calculated individual pipe flow = 107.031(CFS)
 Normal flow depth in pipe = 25.22(In.)
 Flow top width inside pipe = 28.02(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 21.99(Ft/s)
 Travel time through pipe = 0.48 min.
 Time of concentration (TC) = 21.59 min.

++++++
 Process from Point/Station 342.000 to Point/Station 342.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 3
 Stream flow area = 53.500(Ac.)
 Runoff from this stream = 107.031(CFS)
 Time of concentration = 21.59 min.
 Rainfall intensity = 2.281(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	114.656	21.69	2.275
2	175.344	16.48	2.646
3	107.031	21.59	2.281

Largest stream flow has longer or shorter time of concentration

Qp = 175.344 + sum of
 Qa Tb/Ta
 114.656 * 0.760 = 87.103
 Qa Tb/Ta
 107.031 * 0.763 = 81.700
 Qp = 344.147

Total of 3 main streams to confluence:

Flow rates before confluence point:

114.656 175.344 107.031

Area of streams before confluence:

53.400 73.900 53.500

Results of confluence:

Total flow rate = 344.147(CFS)

Time of concentration = 16.479 min.

Effective stream area after confluence = 180.800(Ac.)

++++++
 Process from Point/Station 342.000 to Point/Station 344.000

**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 361.916(CFS)
 Depth of flow = 5.073(Ft.), Average velocity = 10.422(Ft/s)

!!Warning: Water is above left or right bank elevations

***** Irregular Channel Data *****

 Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	4.00
2	4.00	0.00
3	6.00	0.00
4	10.00	4.00

Manning's 'N' friction factor = 0.040

Sub-Channel flow = 361.916(CFS)
 ' ' flow top width = 10.000(Ft.)
 ' ' velocity = 10.422(Ft/s)
 ' ' area = 34.727(Sq.Ft)
 ' ' Froude number = 0.986

Upstream point elevation = 360.000(Ft.)

Downstream point elevation = 320.000(Ft.)

Flow length = 1825.000(Ft.)

Travel time = 2.92 min.

Time of concentration = 19.40 min.

Depth of flow = 5.073(Ft.)

Average velocity = 10.422(Ft/s)

Total irregular channel flow = 361.916(CFS)

Irregular channel normal depth above invert elev. = 5.073(Ft.)

Average velocity of channel(s) = 10.422(Ft/s)

!!Warning: Water is above left or right bank elevations

Adding area flow to channel

UNDEVELOPED (poor cover) subarea

Runoff Coefficient = 0.876

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.085

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 0.915

RI index for soil(AMC 3) = 95.23

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 2.419(In/Hr) for a 100.0 year storm

Subarea runoff = 35.595(CFS) for 16.800(Ac.)

Total runoff = 379.741(CFS) Total area = 197.600(Ac.)

Depth of flow = 5.174(Ft.), Average velocity = 10.624(Ft/s)

!!Warning: Water is above left or right bank elevations

+++++
 Process from Point/Station 344.000 to Point/Station 344.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1

Stream flow area = 197.600 (Ac.)
 Runoff from this stream = 379.741 (CFS)
 Time of concentration = 19.40 min.
 Rainfall intensity = 2.419 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	379.741	19.40	2.419

Largest stream flow has longer time of concentration
 Qp = 379.741 + sum of
 Qp = 379.741

Total of 1 main streams to confluence:
 Flow rates before confluence point:
 379.741
 Area of streams before confluence:
 197.600

Results of confluence:
 Total flow rate = 379.741 (CFS)
 Time of concentration = 19.397 min.
 Effective stream area after confluence = 197.600 (Ac.)

+++++
 Process from Point/Station 350.000 to Point/Station 351.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000 (Ft.)
 Top (of initial area) elevation = 1470.000 (Ft.)
 Bottom (of initial area) elevation = 1353.000 (Ft.)
 Difference in elevation = 117.000 (Ft.)
 Slope = 0.11700 s(percent) = 11.70
 $TC = k(0.710) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 17.283 min.
 Rainfall intensity = 2.578 (In/Hr) for a 100.0 year storm
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.868
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 8.505 (CFS)
 Total initial stream area = 3.800 (Ac.)
 Pervious area fraction = 1.000

+++++

Process from Point/Station 351.000 to Point/Station 352.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1353.000 (Ft.)
 Downstream point elevation = 1342.000 (Ft.)
 Channel length thru subarea = 400.000 (Ft.)
 Channel base width = 1.000 (Ft.)
 Slope or 'Z' of left channel bank = 1.000
 Slope or 'Z' of right channel bank = 1.000
 Estimated mean flow rate at midpoint of channel = 19.385 (CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 2.000 (Ft.)
 Flow (q) thru subarea = 19.385 (CFS)
 Depth of flow = 0.954 (Ft.), Average velocity = 10.403 (Ft/s)
 Channel flow top width = 2.907 (Ft.)
 Flow Velocity = 10.40 (Ft/s)
 Travel time = 0.64 min.
 Time of concentration = 17.92 min.

Sub-Channel No. 1 Critical depth = 1.453 (Ft.)
 ' ' ' Critical flow top width = 3.906 (Ft.)
 ' ' ' Critical flow velocity = 5.438 (Ft/s)
 ' ' ' Critical flow area = 3.565 (Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.868
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.527 (In/Hr) for a 100.0 year storm
 Subarea runoff = 21.703 (CFS) for 9.900 (Ac.)
 Total runoff = 30.208 (CFS) Total area = 13.700 (Ac.)
 Depth of flow = 1.187 (Ft.), Average velocity = 11.633 (Ft/s)

Sub-Channel No. 1 Critical depth = 1.813 (Ft.)
 ' ' ' Critical flow top width = 4.625 (Ft.)
 ' ' ' Critical flow velocity = 5.926 (Ft/s)
 ' ' ' Critical flow area = 5.098 (Sq.Ft)

+++++
 Process from Point/Station 352.000 to Point/Station 352.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 13.700 (Ac.)
 Runoff from this stream = 30.208 (CFS)
 Time of concentration = 17.92 min.
 Rainfall intensity = 2.527 (In/Hr)


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+++++
Process from Point/Station      352.100 to Point/Station      352.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1364.000(Ft.)
Bottom (of initial area) elevation = 1342.000(Ft.)
Difference in elevation = 22.000(Ft.)
Slope = 0.02200 s(percent)= 2.20
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.201 min.
Rainfall intensity = 3.445(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.895
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.050
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.950
RI index for soil(AMC 3) = 87.43
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 1.850(CFS)
Total initial stream area = 0.600(Ac.)
Pervious area fraction = 0.100

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+++++
Process from Point/Station      352.000 to Point/Station      352.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 1 in normal stream number 2
Stream flow area = 0.600(Ac.)
Runoff from this stream = 1.850(CFS)
Time of concentration = 10.20 min.
Rainfall intensity = 3.445(In/Hr)

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+++++
Process from Point/Station      352.200 to Point/Station      352.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1364.000(Ft.)
Bottom (of initial area) elevation = 1342.000(Ft.)
Difference in elevation = 22.000(Ft.)
Slope = 0.02200 s(percent)= 2.20
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.201 min.
Rainfall intensity = 3.445(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.895
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.050

```

Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.950
 RI index for soil(AMC 3) = 87.43
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.542(CFS)
 Total initial stream area = 0.500(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 352.000 to Point/Station 352.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
 Stream flow area = 0.500(Ac.)
 Runoff from this stream = 1.542(CFS)
 Time of concentration = 10.20 min.
 Rainfall intensity = 3.445(In/Hr)

++++++
 Process from Point/Station 352.300 to Point/Station 352.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 255.000(Ft.)
 Top (of initial area) elevation = 1343.000(Ft.)
 Bottom (of initial area) elevation = 1342.000(Ft.)
 Difference in elevation = 1.000(Ft.)
 Slope = 0.00392 s(percent)= 0.39
 $TC = k(0.300) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.338 min.
 Rainfall intensity = 3.849(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.896
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.345(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 352.000 to Point/Station 352.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 4
 Stream flow area = 0.100(Ac.)
 Runoff from this stream = 0.345(CFS)
 Time of concentration = 8.34 min.
 Rainfall intensity = 3.849(In/Hr)

Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	30.208	17.92	2.527
2	1.850	10.20	3.445
3	1.542	10.20	3.445
4	0.345	8.34	3.849

Largest stream flow has longer time of concentration

Qp = 30.208 + sum of

Qb	Ia/Ib	
1.850 *	0.733 =	1.357
Qb	Ia/Ib	
1.542 *	0.733 =	1.131
Qb	Ia/Ib	
0.345 *	0.656 =	0.226

Qp = 32.922

Total of 4 streams to confluence:

Flow rates before confluence point:

30.208	1.850	1.542	0.345

Area of streams before confluence:

13.700	0.600	0.500	0.100

Results of confluence:

Total flow rate = 32.922 (CFS)

Time of concentration = 17.924 min.

Effective stream area after confluence = 14.900 (Ac.)

 Process from Point/Station 352.000 to Point/Station 344.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1342.000 (Ft.)
 Downstream point/station elevation = 1320.000 (Ft.)
 Pipe length = 585.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 32.922 (CFS)
 Nearest computed pipe diameter = 24.00 (In.)
 Calculated individual pipe flow = 32.922 (CFS)
 Normal flow depth in pipe = 17.25 (In.)
 Flow top width inside pipe = 21.58 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 13.62 (Ft/s)
 Travel time through pipe = 0.72 min.
 Time of concentration (TC) = 18.64 min.

 Process from Point/Station 344.000 to Point/Station 344.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 14.900 (Ac.)
 Runoff from this stream = 32.922 (CFS)
 Time of concentration = 18.64 min.
 Rainfall intensity = 2.473 (In/Hr)
 Program is now starting with Main Stream No. 3

+++++
 Process from Point/Station 344.100 to Point/Station 344.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 585.000 (Ft.)
 Top (of initial area) elevation = 1342.000 (Ft.)
 Bottom (of initial area) elevation = 1320.000 (Ft.)
 Difference in elevation = 22.000 (Ft.)
 Slope = 0.03761 s(percent) = 3.76
 $TC = k(0.300) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.395 min.
 Rainfall intensity = 4.112 (In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.896
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.737 (CFS)
 Total initial stream area = 0.200 (Ac.)
 Pervious area fraction = 0.100

+++++
 Process from Point/Station 344.000 to Point/Station 344.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 3
 Stream flow area = 0.200 (Ac.)
 Runoff from this stream = 0.737 (CFS)
 Time of concentration = 7.39 min.
 Rainfall intensity = 4.112 (In/Hr)
 Program is now starting with Main Stream No. 4

+++++
 Process from Point/Station 344.200 to Point/Station 344.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 585.000 (Ft.)
 Top (of initial area) elevation = 1342.000 (Ft.)
 Bottom (of initial area) elevation = 1320.000 (Ft.)
 Difference in elevation = 22.000 (Ft.)

Slope = 0.03761 s(percent)= 3.76
 TC = $k(0.300) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.395 min.
 Rainfall intensity = 4.112 (In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.896
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.737 (CFS)
 Total initial stream area = 0.200 (Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 344.000 to Point/Station 344.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 4
 Stream flow area = 0.200 (Ac.)
 Runoff from this stream = 0.737 (CFS)
 Time of concentration = 7.39 min.
 Rainfall intensity = 4.112 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	379.741	19.40	2.419
2	32.922	18.64	2.473
3	0.737	7.39	4.112
4	0.737	7.39	4.112

Largest stream flow has longer time of concentration

Qp = 379.741 + sum of
 Qb Ia/Ib
 32.922 * 0.978 = 32.209
 Qb Ia/Ib
 0.737 * 0.588 = 0.434
 Qb Ia/Ib
 0.737 * 0.588 = 0.434
 Qp = 412.817

Total of 4 main streams to confluence:

Flow rates before confluence point:

379.741	32.922	0.737	0.737

Area of streams before confluence:

197.600	14.900	0.200	0.200

Results of confluence:

Total flow rate = 412.817(CFS)
 Time of concentration = 19.397 min.
 Effective stream area after confluence = 212.900(Ac.)

+++++
 Process from Point/Station 344.000 to Point/Station 355.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

 Estimated mean flow rate at midpoint of channel = 418.861(CFS)
 Depth of flow = 6.624(Ft.), Average velocity = 14.895(Ft/s)
 !!Warning: Water is above left or right bank elevations
 ***** Irregular Channel Data *****

 Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	3.00
2	2.00	0.00
3	3.00	0.00
4	5.00	2.00

Manning's 'N' friction factor = 0.040

Sub-Channel flow = 418.861(CFS)
 ' ' flow top width = 5.000(Ft.)
 ' ' velocity= 14.895(Ft/s)
 ' ' area = 28.121(Sq.Ft)
 ' ' Froude number = 1.107

Upstream point elevation = 1320.000(Ft.)
 Downstream point elevation = 1308.000(Ft.)
 Flow length = 440.000(Ft.)
 Travel time = 0.49 min.
 Time of concentration = 19.89 min.
 Depth of flow = 6.624(Ft.)
 Average velocity = 14.895(Ft/s)
 Total irregular channel flow = 418.861(CFS)
 Irregular channel normal depth above invert elev. = 6.624(Ft.)
 Average velocity of channel(s) = 14.895(Ft/s)
 !!Warning: Water is above left or right bank elevations
 Adding area flow to channel
 UNDEVELOPED (poor cover) subarea
 Runoff Coefficient = 0.877
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 95.60
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.386(In/Hr) for a 100.0 year storm
 Subarea runoff = 12.143(CFS) for 5.800(Ac.)
 Total runoff = 424.960(CFS) Total area = 218.700(Ac.)
 Depth of flow = 6.673(Ft.), Average velocity = 14.981(Ft/s)
 !!Warning: Water is above left or right bank elevations

End of computations, total study area = 218.70 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.676
Area averaged RI index number = 71.8



MAYERS & ASSOCIATES
Civil Engineering, Inc.
PLANNING • ENGINEERING • SURVEYING

Preliminary Hydrology Analysis
VTTM 36557, "TERRACINA"
City of Lake Elsinore / Riverside County

DRAINAGE AREA "B" CALCULATION

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 04/29/14 File:32786B10.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557

10-Year Rational Hydrology Area "B"

Proposed Condition

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 10.0

Calculated rainfall intensity data:

1 hour intensity = 0.880(In/Hr)

Slope of intensity duration curve = 0.5500

 Process from Point/Station 204.000 to Point/Station 206.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 700.000(Ft.)

Top (of initial area) elevation = 511.000(Ft.)

Bottom (of initial area) elevation = 408.000(Ft.)

Difference in elevation = 103.000(Ft.)

Slope = 0.14714 s(percent)= 14.71

TC = $k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 7.862 min.

Rainfall intensity = 2.691(In/Hr) for a 10.0 year storm

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.836

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 10.126(CFS)
 Total initial stream area = 4.500(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 206.000 to Point/Station 206.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 4.500(Ac.)
 Runoff from this stream = 10.126(CFS)
 Time of concentration = 7.86 min.
 Rainfall intensity = 2.691(In/Hr)

++++++
 Process from Point/Station 205.000 to Point/Station 206.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 800.000(Ft.)
 Top (of initial area) elevation = 482.000(Ft.)
 Bottom (of initial area) elevation = 408.000(Ft.)
 Difference in elevation = 74.000(Ft.)
 Slope = 0.09250 s(percent)= 9.25
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.101 min.
 Rainfall intensity = 2.483(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.832
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 17.140(CFS)
 Total initial stream area = 8.300(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 206.000 to Point/Station 206.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 8.300(Ac.)
 Runoff from this stream = 17.140(CFS)

Time of concentration = 9.10 min.
 Rainfall intensity = 2.483 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	10.126	7.86	2.691
2	17.140	9.10	2.483

Largest stream flow has longer time of concentration

Qp = 17.140 + sum of
 Qb Ia/Ib
 10.126 * 0.923 = 9.343
 Qp = 26.483

Total of 2 streams to confluence:
 Flow rates before confluence point:

10.126 17.140

Area of streams before confluence:

4.500 8.300

Results of confluence:

Total flow rate = 26.483 (CFS)
 Time of concentration = 9.101 min.
 Effective stream area after confluence = 12.800 (Ac.)

 Process from Point/Station 206.000 to Point/Station 203.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 408.000 (Ft.)
 End of street segment elevation = 398.000 (Ft.)
 Length of street segment = 150.000 (Ft.)
 Height of curb above gutter flowline = 6.0 (In.)
 Width of half street (curb to crown) = 18.000 (Ft.)
 Distance from crown to crossfall grade break = 10.000 (Ft.)
 Slope from gutter to grade break (v/hz) = 0.025
 Slope from grade break to crown (v/hz) = 0.025
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 20.000 (Ft.)
 Slope from curb to property line (v/hz) = 0.020
 Gutter width = 2.000 (Ft.)
 Gutter hike from flowline = 2.000 (In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 26.587 (CFS)
 Depth of flow = 0.504 (Ft.), Average velocity = 8.524 (Ft/s)
 Warning: depth of flow exceeds top of curb
 Distance that curb overflow reaches into property = 0.20 (Ft.)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 15.497 (Ft.)
 Flow velocity = 8.52 (Ft/s)

Travel time = 0.29 min. TC = 9.39 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.831
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 2.440(In/Hr) for a 10.0 year storm
 Subarea runoff = 0.203(CFS) for 0.100(Ac.)
 Total runoff = 26.686(CFS) Total area = 12.900(Ac.)
 Street flow at end of street = 26.686(CFS)
 Half street flow at end of street = 26.686(CFS)
 Depth of flow = 0.505(Ft.), Average velocity = 8.522(Ft/s)
 Warning: depth of flow exceeds top of curb
 Distance that curb overflow reaches into property = 0.24(Ft.)
 Flow width (from curb towards crown)= 15.528(Ft.)

++++++
 Process from Point/Station 203.000 to Point/Station 203.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 12.900(Ac.)
 Runoff from this stream = 26.686(CFS)
 Time of concentration = 9.39 min.
 Rainfall intensity = 2.440(In/Hr)

++++++
 Process from Point/Station 201.000 to Point/Station 202.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 940.000(Ft.)
 Top (of initial area) elevation = 1450.000(Ft.)
 Bottom (of initial area) elevation = 1400.000(Ft.)
 Difference in elevation = 50.000(Ft.)
 Slope = 0.05319 s(percent)= 5.32
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.843 min.
 Rainfall intensity = 2.255(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.808
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.250
 Decimal fraction soil group C = 0.080
 Decimal fraction soil group D = 0.670
 RI index for soil(AMC 2) = 69.77
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 15.491(CFS)
 Total initial stream area = 8.500(Ac.)

Pervious area fraction = 0.500

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Process from Point/Station      202.000 to Point/Station      203.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

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Top of street segment elevation = 400.000(Ft.)
End of street segment elevation = 398.000(Ft.)
Length of street segment = 280.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 10.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 17.078(CFS)
Depth of flow = 0.478(Ft.), Average velocity = 2.651(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 17.591(Ft.)
Flow velocity = 2.65(Ft/s)
Travel time = 1.76 min. TC = 12.60 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.821
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 2.076(In/Hr) for a 10.0 year storm
Subarea runoff = 3.066(CFS) for 1.800(Ac.)
Total runoff = 18.558(CFS) Total area = 10.300(Ac.)
Street flow at end of street = 18.558(CFS)
Half street flow at end of street = 9.279(CFS)
Depth of flow = 0.490(Ft.), Average velocity = 2.705(Ft/s)
Flow width (from curb towards crown)= 18.175(Ft.)

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Process from Point/Station      203.000 to Point/Station      203.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 1 in normal stream number 2
Stream flow area = 10.300(Ac.)
Runoff from this stream = 18.558(CFS)

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Time of concentration = 12.60 min.
 Rainfall intensity = 2.076 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	26.686	9.39	2.440
2	18.558	12.60	2.076

Largest stream flow has longer or shorter time of concentration

Qp = 26.686 + sum of
 Qa Tb/Ta
 18.558 * 0.745 = 13.832
 Qp = 40.518

Total of 2 streams to confluence:

Flow rates before confluence point:

26.686 18.558

Area of streams before confluence:

12.900 10.300

Results of confluence:

Total flow rate = 40.518 (CFS)

Time of concentration = 9.394 min.

Effective stream area after confluence = 23.200 (Ac.)

+++++
 Process from Point/Station 203.000 to Point/Station 207.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 398.000 (Ft.)
 Downstream point/station elevation = 396.000 (Ft.)
 Pipe length = 40.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 40.518 (CFS)
 Nearest computed pipe diameter = 24.00 (In.)
 Calculated individual pipe flow = 40.518 (CFS)
 Normal flow depth in pipe = 18.21 (In.)
 Flow top width inside pipe = 20.54 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 15.84 (Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 9.44 min.

+++++
 Process from Point/Station 207.000 to Point/Station 207.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 23.200 (Ac.)
 Runoff from this stream = 40.518 (CFS)
 Time of concentration = 9.44 min.
 Rainfall intensity = 2.434 (In/Hr)

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Process from Point/Station      208.000 to Point/Station      207.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 950.000(Ft.)
Top (of initial area) elevation = 408.000(Ft.)
Bottom (of initial area) elevation = 396.000(Ft.)
Difference in elevation = 12.000(Ft.)
Slope = 0.01263 s(percent)= 1.26
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.517 min.
Rainfall intensity = 1.921(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.815
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 5.325(CFS)
Total initial stream area = 3.400(Ac.)
Pervious area fraction = 0.500

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Process from Point/Station      207.000 to Point/Station      207.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 1 in normal stream number 2
Stream flow area = 3.400(Ac.)
Runoff from this stream = 5.325(CFS)
Time of concentration = 14.52 min.
Rainfall intensity = 1.921(In/Hr)

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Process from Point/Station      209.000 to Point/Station      207.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 350.000(Ft.)
Top (of initial area) elevation = 410.000(Ft.)
Bottom (of initial area) elevation = 396.000(Ft.)
Difference in elevation = 14.000(Ft.)
Slope = 0.04000 s(percent)= 4.00
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.732 min.
Rainfall intensity = 2.716(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.837
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000

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Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.272(CFS)
 Total initial stream area = 1.000(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 207.000 to Point/Station 207.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
 Stream flow area = 1.000(Ac.)
 Runoff from this stream = 2.272(CFS)
 Time of concentration = 7.73 min.
 Rainfall intensity = 2.716(In/Hr)

++++++
 Process from Point/Station 214.000 to Point/Station 207.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 450.000(Ft.)
 Top (of initial area) elevation = 410.000(Ft.)
 Bottom (of initial area) elevation = 396.000(Ft.)
 Difference in elevation = 14.000(Ft.)
 Slope = 0.03111 s(percent)= 3.11
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.990 min.
 Rainfall intensity = 2.500(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.832
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.664(CFS)
 Total initial stream area = 0.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 207.000 to Point/Station 207.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 4
 Stream flow area = 0.800(Ac.)
 Runoff from this stream = 1.664(CFS)
 Time of concentration = 8.99 min.
 Rainfall intensity = 2.500(In/Hr)

Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	40.518	9.44	2.434
2	5.325	14.52	1.921
3	2.272	7.73	2.716
4	1.664	8.99	2.500

Largest stream flow has longer or shorter time of concentration

Qp = 40.518 + sum of

Qa	Tb/Ta	
5.325 *	0.650 =	3.461
Qb	Ia/Ib	
2.272 *	0.896 =	2.037
Qb	Ia/Ib	
1.664 *	0.974 =	1.620

Qp = 47.636

Total of 4 streams to confluence:

Flow rates before confluence point:

40.518	5.325	2.272	1.664

Area of streams before confluence:

23.200	3.400	1.000	0.800

Results of confluence:

Total flow rate = 47.636(CFS)

Time of concentration = 9.436 min.

Effective stream area after confluence = 28.400(Ac.)

+++++

Process from Point/Station 207.000 to Point/Station 215.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 396.000(Ft.)

Downstream point/station elevation = 395.000(Ft.)

Pipe length = 550.00(Ft.) Manning's N = 0.015

No. of pipes = 1 Required pipe flow = 47.636(CFS)

Nearest computed pipe diameter = 45.00(In.)

Calculated individual pipe flow = 47.636(CFS)

Normal flow depth in pipe = 40.50(In.)

Flow top width inside pipe = 27.00(In.)

Critical Depth = 25.31(In.)

Pipe flow velocity = 4.55(Ft/s)

Travel time through pipe = 2.01 min.

Time of concentration (TC) = 11.45 min.

+++++

Process from Point/Station 215.000 to Point/Station 215.000

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1

Stream flow area = 28.400 (Ac.)
 Runoff from this stream = 47.636 (CFS)
 Time of concentration = 11.45 min.
 Rainfall intensity = 2.188 (In/Hr)

 Process from Point/Station 211.000 to Point/Station 215.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 400.000 (Ft.)
 Top (of initial area) elevation = 435.000 (Ft.)
 Bottom (of initial area) elevation = 395.000 (Ft.)
 Difference in elevation = 40.000 (Ft.)
 Slope = 0.10000 s(percent) = 10.00
 $TC = k(0.940) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 16.366 min.
 Rainfall intensity = 1.798 (In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.759
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 2) = 80.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 0.273 (CFS)
 Total initial stream area = 0.200 (Ac.)
 Pervious area fraction = 1.000

 Process from Point/Station 215.000 to Point/Station 215.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 0.200 (Ac.)
 Runoff from this stream = 0.273 (CFS)
 Time of concentration = 16.37 min.
 Rainfall intensity = 1.798 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	47.636	11.45	2.188
2	0.273	16.37	1.798

Largest stream flow has longer or shorter time of concentration

Qp = 47.636 + sum of
 $Qa \cdot Tb/Ta$
 $0.273 * 0.700 = 0.191$
 Qp = 47.827

Total of 2 streams to confluence:
 Flow rates before confluence point:
 47.636 0.273
 Area of streams before confluence:
 28.400 0.200
 Results of confluence:
 Total flow rate = 47.827(CFS)
 Time of concentration = 11.451 min.
 Effective stream area after confluence = 28.600(Ac.)

+++++
 Process from Point/Station 215.000 to Point/Station 224.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 395.000(Ft.)
 Downstream point/station elevation = 370.000(Ft.)
 Pipe length = 1050.00(Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 47.827(CFS)
 Nearest computed pipe diameter = 30.00(In.)
 Calculated individual pipe flow = 47.827(CFS)
 Normal flow depth in pipe = 21.68(In.)
 Flow top width inside pipe = 26.86(In.)
 Critical Depth = 27.25(In.)
 Pipe flow velocity = 12.59(Ft/s)
 Travel time through pipe = 1.39 min.
 Time of concentration (TC) = 12.84 min.

+++++
 Process from Point/Station 224.000 to Point/Station 224.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 28.600(Ac.)
 Runoff from this stream = 47.827(CFS)
 Time of concentration = 12.84 min.
 Rainfall intensity = 2.055(In/Hr)

+++++
 Process from Point/Station 222.000 to Point/Station 224.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 950.000(Ft.)
 Top (of initial area) elevation = 379.000(Ft.)
 Bottom (of initial area) elevation = 370.000(Ft.)
 Difference in elevation = 9.000(Ft.)
 Slope = 0.00947 s(percent)= 0.95
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 15.376 min.
 Rainfall intensity = 1.861(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.813

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.329(CFS)
 Total initial stream area = 2.200(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 224.000 to Point/Station 224.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.200(Ac.)
 Runoff from this stream = 3.329(CFS)
 Time of concentration = 15.38 min.
 Rainfall intensity = 1.861(In/Hr)

++++++
 Process from Point/Station 223.000 to Point/Station 224.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 900.000(Ft.)
 Top (of initial area) elevation = 378.000(Ft.)
 Bottom (of initial area) elevation = 370.000(Ft.)
 Difference in elevation = 8.000(Ft.)
 Slope = 0.00889 s(percent)= 0.89
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 15.240 min.
 Rainfall intensity = 1.870(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.814
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.803(CFS)
 Total initial stream area = 2.500(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 224.000 to Point/Station 224.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
 Stream flow area = 2.500(Ac.)
 Runoff from this stream = 3.803(CFS)

Time of concentration = 15.24 min.
 Rainfall intensity = 1.870 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	47.827	12.84	2.055
2	3.329	15.38	1.861
3	3.803	15.24	1.870

Largest stream flow has longer or shorter time of concentration

Qp = 47.827 + sum of

Qa	Tb/Ta	
3.329 *	0.835 =	2.780
Qa	Tb/Ta	
3.803 *	0.843 =	3.204

Qp = 53.812

Total of 3 streams to confluence:

Flow rates before confluence point:

47.827 3.329 3.803

Area of streams before confluence:

28.600 2.200 2.500

Results of confluence:

Total flow rate = 53.812 (CFS)

Time of concentration = 12.841 min.

Effective stream area after confluence = 33.300 (Ac.)

+++++
 Process from Point/Station 224.000 to Point/Station 232.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 370.000 (Ft.)
 Downstream point/station elevation = 369.000 (Ft.)
 Pipe length = 40.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 53.812 (CFS)
 Nearest computed pipe diameter = 30.00 (In.)
 Calculated individual pipe flow = 53.812 (CFS)
 Normal flow depth in pipe = 20.86 (In.)
 Flow top width inside pipe = 27.62 (In.)
 Critical Depth = 28.10 (In.)
 Pipe flow velocity = 14.77 (Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 12.89 min.

+++++
 Process from Point/Station 232.000 to Point/Station 232.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 1

Stream flow area = 33.300 (Ac.)
 Runoff from this stream = 53.812 (CFS)
 Time of concentration = 12.89 min.
 Rainfall intensity = 2.051 (In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 225.000 to Point/Station 227.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 850.000 (Ft.)
 Top (of initial area) elevation = 382.000 (Ft.)
 Bottom (of initial area) elevation = 375.000 (Ft.)
 Difference in elevation = 7.000 (Ft.)
 Slope = 0.00824 s(percent) = 0.82
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 15.125 min.
 Rainfall intensity = 1.878 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.814
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.807 (CFS)
 Total initial stream area = 3.800 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 227.000 to Point/Station 229.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 375.000 (Ft.)
 End of street segment elevation = 374.000 (Ft.)
 Length of street segment = 200.000 (Ft.)
 Height of curb above gutter flowline = 6.0 (In.)
 Width of half street (curb to crown) = 20.000 (Ft.)
 Distance from crown to crossfall grade break = 10.000 (Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [2] side(s) of the street
 Distance from curb to property line = 10.000 (Ft.)
 Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000 (Ft.)
 Gutter hike from flowline = 2.000 (In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 6.189 (CFS)
 Depth of flow = 0.378 (Ft.), Average velocity = 1.813 (Ft/s)

Streetflow hydraulics at midpoint of street travel:

Halfstreet flow width = 12.569(Ft.)

Flow velocity = 1.81(Ft/s)

Travel time = 1.84 min. TC = 16.96 min.

Adding area flow to street

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.809

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil(AMC 2) = 75.00

Pervious area fraction = 0.500; Impervious fraction = 0.500

Rainfall intensity = 1.763(In/Hr) for a 10.0 year storm

Subarea runoff = 0.713(CFS) for 0.500(Ac.)

Total runoff = 6.521(CFS) Total area = 4.300(Ac.)

Street flow at end of street = 6.521(CFS)

Half street flow at end of street = 3.260(CFS)

Depth of flow = 0.384(Ft.), Average velocity = 1.836(Ft/s)

Flow width (from curb towards crown)= 12.842(Ft.)

+++++
Process from Point/Station 229.000 to Point/Station 229.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1

Stream flow area = 4.300(Ac.)

Runoff from this stream = 6.521(CFS)

Time of concentration = 16.96 min.

Rainfall intensity = 1.763(In/Hr)

+++++
Process from Point/Station 226.000 to Point/Station 228.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 830.000(Ft.)

Top (of initial area) elevation = 386.000(Ft.)

Bottom (of initial area) elevation = 375.000(Ft.)

Difference in elevation = 11.000(Ft.)

Slope = 0.01325 s(percent)= 1.33

TC = $k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 13.622 min.

Rainfall intensity = 1.989(In/Hr) for a 10.0 year storm

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.818

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil(AMC 2) = 75.00

Pervious area fraction = 0.500; Impervious fraction = 0.500

Initial subarea runoff = 3.416(CFS)

Total initial stream area = 2.100 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 228.000 to Point/Station 229.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 375.000 (Ft.)
 End of street segment elevation = 374.000 (Ft.)
 Length of street segment = 235.000 (Ft.)
 Height of curb above gutter flowline = 6.0 (In.)
 Width of half street (curb to crown) = 20.000 (Ft.)
 Distance from crown to crossfall grade break = 10.000 (Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [2] side(s) of the street
 Distance from curb to property line = 10.000 (Ft.)
 Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000 (Ft.)
 Gutter hike from flowline = 2.000 (In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 4.067 (CFS)
 Depth of flow = 0.345 (Ft.), Average velocity = 1.545 (Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 10.906 (Ft.)
 Flow velocity = 1.54 (Ft/s)
 Travel time = 2.54 min. TC = 16.16 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.811
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 1.811 (In/Hr) for a 10.0 year storm
 Subarea runoff = 1.175 (CFS) for 0.800 (Ac.)
 Total runoff = 4.591 (CFS) Total area = 2.900 (Ac.)
 Street flow at end of street = 4.591 (CFS)
 Half street flow at end of street = 2.296 (CFS)
 Depth of flow = 0.356 (Ft.), Average velocity = 1.589 (Ft/s)
 Flow width (from curb towards crown) = 11.480 (Ft.)

+++++
 Process from Point/Station 229.000 to Point/Station 229.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 2.900 (Ac.)

Runoff from this stream = 4.591(CFS)
 Time of concentration = 16.16 min.
 Rainfall intensity = 1.811(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	6.521	16.96	1.763
2	4.591	16.16	1.811

Largest stream flow has longer time of concentration

Qp = 6.521 + sum of
 Qb Ia/Ib
 4.591 * 0.974 = 4.470
 Qp = 10.991

Total of 2 streams to confluence:

Flow rates before confluence point:

6.521 4.591

Area of streams before confluence:

4.300 2.900

Results of confluence:

Total flow rate = 10.991(CFS)

Time of concentration = 16.963 min.

Effective stream area after confluence = 7.200(Ac.)

 Process from Point/Station 229.000 to Point/Station 231.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 374.000(Ft.)
 Downstream point/station elevation = 371.000(Ft.)
 Pipe length = 190.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 10.991(CFS)
 Nearest computed pipe diameter = 18.00(In.)
 Calculated individual pipe flow = 10.991(CFS)
 Normal flow depth in pipe = 12.54(In.)
 Flow top width inside pipe = 16.55(In.)
 Critical Depth = 15.23(In.)
 Pipe flow velocity = 8.36(Ft/s)
 Travel time through pipe = 0.38 min.
 Time of concentration (TC) = 17.34 min.

 Process from Point/Station 231.000 to Point/Station 231.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 7.200(Ac.)
 Runoff from this stream = 10.991(CFS)
 Time of concentration = 17.34 min.

Rainfall intensity = 1.742(In/Hr)

+++++
 Process from Point/Station 230.000 to Point/Station 231.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 340.000(Ft.)
 Top (of initial area) elevation = 374.000(Ft.)
 Bottom (of initial area) elevation = 370.000(Ft.)
 Difference in elevation = 4.000(Ft.)
 Slope = 0.01176 s(percent)= 1.18
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.762 min.
 Rainfall intensity = 2.389(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.829
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.387(CFS)
 Total initial stream area = 0.700(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 231.000 to Point/Station 231.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 0.700(Ac.)
 Runoff from this stream = 1.387(CFS)
 Time of concentration = 9.76 min.
 Rainfall intensity = 2.389(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	10.991	17.34	1.742
2	1.387	9.76	2.389

Largest stream flow has longer time of concentration

Qp = 10.991 + sum of
 Qb Ia/Ib
 1.387 * 0.729 = 1.011
 Qp = 12.002

Total of 2 streams to confluence:
 Flow rates before confluence point:
 10.991 1.387

Area of streams before confluence:

7.200 0.700

Results of confluence:

Total flow rate = 12.002(CFS)

Time of concentration = 17.342 min.

Effective stream area after confluence = 7.900(Ac.)

+++++
 Process from Point/Station 231.000 to Point/Station 232.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 370.000(Ft.)
 Downstream point/station elevation = 369.000(Ft.)
 Pipe length = 80.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 12.002(CFS)
 Nearest computed pipe diameter = 21.00(In.)
 Calculated individual pipe flow = 12.002(CFS)
 Normal flow depth in pipe = 12.67(In.)
 Flow top width inside pipe = 20.55(In.)
 Critical Depth = 15.50(In.)
 Pipe flow velocity = 7.91(Ft/s)
 Travel time through pipe = 0.17 min.
 Time of concentration (TC) = 17.51 min.

+++++
 Process from Point/Station 232.000 to Point/Station 232.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2

Stream flow area = 7.900(Ac.)
 Runoff from this stream = 12.002(CFS)
 Time of concentration = 17.51 min.
 Rainfall intensity = 1.732(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	53.812	12.89	2.051
2	12.002	17.51	1.732

Largest stream flow has longer or shorter time of concentration

Qp = 53.812 + sum of
 Qa Tb/Ta
 12.002 * 0.736 = 8.832
 Qp = 62.644

Total of 2 main streams to confluence:

Flow rates before confluence point:

53.812 12.002

Area of streams before confluence:

33.300 7.900

Results of confluence:

Total flow rate = 62.644(CFS)
 Time of concentration = 12.886 min.
 Effective stream area after confluence = 41.200(Ac.)

+++++
 Process from Point/Station 232.000 to Point/Station 235.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 369.000(Ft.)
 Downstream point/station elevation = 268.500(Ft.)
 Pipe length = 160.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 62.644(CFS)
 Nearest computed pipe diameter = 18.00(In.)
 Calculated individual pipe flow = 62.644(CFS)
 Normal flow depth in pipe = 11.66(In.)
 Flow top width inside pipe = 17.20(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 51.74(Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 12.94 min.

+++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 41.200(Ac.)
 Runoff from this stream = 62.644(CFS)
 Time of concentration = 12.94 min.
 Rainfall intensity = 2.046(In/Hr)

+++++
 Process from Point/Station 233.000 to Point/Station 235.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 920.000(Ft.)
 Top (of initial area) elevation = 404.500(Ft.)
 Bottom (of initial area) elevation = 368.500(Ft.)
 Difference in elevation = 36.000(Ft.)
 Slope = 0.03913 s(percent)= 3.91
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.431 min.
 Rainfall intensity = 2.190(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.824
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.874(CFS)
 Total initial stream area = 2.700(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** SUBAREA FLOW ADDITION ****

UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.781
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 80.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Time of concentration = 11.43 min.
 Rainfall intensity = 2.190(In/Hr) for a 10.0 year storm
 Subarea runoff = 3.593(CFS) for 2.100(Ac.)
 Total runoff = 8.467(CFS) Total area = 4.800(Ac.)

++++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 4.800(Ac.)
 Runoff from this stream = 8.467(CFS)
 Time of concentration = 11.43 min.
 Rainfall intensity = 2.190(In/Hr)

++++++
 Process from Point/Station 234.000 to Point/Station 235.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 525.000(Ft.)
 Top (of initial area) elevation = 374.000(Ft.)
 Bottom (of initial area) elevation = 368.500(Ft.)
 Difference in elevation = 5.500(Ft.)
 Slope = 0.01048 s(percent) = 1.05
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.887 min.
 Rainfall intensity = 2.144(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.823
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.998(CFS)
 Total initial stream area = 1.700(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
 Stream flow area = 1.700(Ac.)
 Runoff from this stream = 2.998(CFS)
 Time of concentration = 11.89 min.
 Rainfall intensity = 2.144(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	62.644	12.94	2.046
2	8.467	11.43	2.190
3	2.998	11.89	2.144

Largest stream flow has longer time of concentration

Qp = 62.644 + sum of
 Qb Ia/Ib
 8.467 * 0.934 = 7.909
 Qb Ia/Ib
 2.998 * 0.955 = 2.862
 Qp = 73.415

Total of 3 streams to confluence:

Flow rates before confluence point:

62.644 8.467 2.998

Area of streams before confluence:

41.200 4.800 1.700

Results of confluence:

Total flow rate = 73.415(CFS)

Time of concentration = 12.937 min.

Effective stream area after confluence = 47.700(Ac.)

++++++
 Process from Point/Station 235.000 to Point/Station 239.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 368.500(Ft.)
 Downstream point/station elevation = 368.300(Ft.)
 Pipe length = 30.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 73.415(CFS)

Nearest computed pipe diameter = 42.00(In.)
 Calculated individual pipe flow = 73.415(CFS)
 Normal flow depth in pipe = 30.98(In.)
 Flow top width inside pipe = 36.95(In.)
 Critical Depth = 32.19(In.)
 Pipe flow velocity = 9.65(Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 12.99 min.

++++++
 Process from Point/Station 239.000 to Point/Station 239.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 47.700(Ac.)
 Runoff from this stream = 73.415(CFS)
 Time of concentration = 12.99 min.
 Rainfall intensity = 2.042(In/Hr)
 Program is now starting with Main Stream No. 2

++++++
 Process from Point/Station 236.000 to Point/Station 238.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 765.000(Ft.)
 Top (of initial area) elevation = 408.500(Ft.)
 Bottom (of initial area) elevation = 376.000(Ft.)
 Difference in elevation = 32.500(Ft.)
 Slope = 0.04248 s(percent) = 4.25
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.444 min.
 Rainfall intensity = 2.302(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.827
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.666(CFS)
 Total initial stream area = 1.400(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 238.000 to Point/Station 238.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 1.400(Ac.)

Runoff from this stream = 2.666(CFS)
 Time of concentration = 10.44 min.
 Rainfall intensity = 2.302(In/Hr)

+++++
 Process from Point/Station 237.000 to Point/Station 238.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 510.000(Ft.)
 Top (of initial area) elevation = 383.000(Ft.)
 Bottom (of initial area) elevation = 376.000(Ft.)
 Difference in elevation = 7.000(Ft.)
 Slope = 0.01373 s(percent)= 1.37
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.132 min.
 Rainfall intensity = 2.223(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.825
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.750(CFS)
 Total initial stream area = 1.500(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 238.000 to Point/Station 238.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 1.500(Ac.)
 Runoff from this stream = 2.750(CFS)
 Time of concentration = 11.13 min.
 Rainfall intensity = 2.223(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	2.666	10.44	2.302
2	2.750	11.13	2.223

Largest stream flow has longer time of concentration

Qp = 2.750 + sum of
 $Qb \quad Ia/Ib$
 $2.666 * 0.966 = 2.574$
 Qp = 5.324

Total of 2 streams to confluence:

Flow rates before confluence point:

2.666 2.750

Area of streams before confluence:

1.400 1.500

Results of confluence:

Total flow rate = 5.324 (CFS)

Time of concentration = 11.132 min.

Effective stream area after confluence = 2.900 (Ac.)

+++++
Process from Point/Station 238.000 to Point/Station 239.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 376.000 (Ft.)
Downstream point/station elevation = 368.300 (Ft.)
Pipe length = 230.00 (Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 5.324 (CFS)
Nearest computed pipe diameter = 12.00 (In.)
Calculated individual pipe flow = 5.324 (CFS)
Normal flow depth in pipe = 8.25 (In.)
Flow top width inside pipe = 11.12 (In.)
Critical Depth = 11.18 (In.)
Pipe flow velocity = 9.26 (Ft/s)
Travel time through pipe = 0.41 min.
Time of concentration (TC) = 11.55 min.

+++++
Process from Point/Station 239.000 to Point/Station 239.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
Stream flow area = 2.900 (Ac.)
Runoff from this stream = 5.324 (CFS)
Time of concentration = 11.55 min.
Rainfall intensity = 2.178 (In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	73.415	12.99	2.042
2	5.324	11.55	2.178

Largest stream flow has longer time of concentration

Qp = 73.415 + sum of
Qb Ia/Ib
5.324 * 0.937 = 4.990
Qp = 78.406

Total of 2 main streams to confluence:

Flow rates before confluence point:

73.415 5.324
 Area of streams before confluence:
 47.700 2.900

Results of confluence:

Total flow rate = 78.406(CFS)
 Time of concentration = 12.989 min.
 Effective stream area after confluence = 50.600(Ac.)

+++++
 Process from Point/Station 239.000 to Point/Station 243.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 368.300(Ft.)
 Downstream point/station elevation = 350.000(Ft.)
 Pipe length = 270.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 78.406(CFS)
 Nearest computed pipe diameter = 27.00(In.)
 Calculated individual pipe flow = 78.406(CFS)
 Normal flow depth in pipe = 21.47(In.)
 Flow top width inside pipe = 21.79(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 23.11(Ft/s)
 Travel time through pipe = 0.19 min.
 Time of concentration (TC) = 13.18 min.

+++++
 Process from Point/Station 243.000 to Point/Station 243.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 50.600(Ac.)
 Runoff from this stream = 78.406(CFS)
 Time of concentration = 13.18 min.
 Rainfall intensity = 2.025(In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 240.000 to Point/Station 242.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 750.000(Ft.)
 Top (of initial area) elevation = 383.000(Ft.)
 Bottom (of initial area) elevation = 372.000(Ft.)
 Difference in elevation = 11.000(Ft.)
 Slope = 0.01467 s(percent)= 1.47
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.818 min.
 Rainfall intensity = 2.057(In/Hr) for a 10.0 year storm

SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.820
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.048(CFS)
 Total initial stream area = 2.400(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 242.000 to Point/Station 242.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 2.400(Ac.)
 Runoff from this stream = 4.048(CFS)
 Time of concentration = 12.82 min.
 Rainfall intensity = 2.057(In/Hr)

+++++
 Process from Point/Station 241.000 to Point/Station 242.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 460.000(Ft.)
 Top (of initial area) elevation = 379.000(Ft.)
 Bottom (of initial area) elevation = 372.000(Ft.)
 Difference in elevation = 7.000(Ft.)
 Slope = 0.01522 s(percent)= 1.52
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.464 min.
 Rainfall intensity = 2.299(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.827
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.184(CFS)
 Total initial stream area = 2.200(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 242.000 to Point/Station 242.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 2.200 (Ac.)
 Runoff from this stream = 4.184 (CFS)
 Time of concentration = 10.46 min.
 Rainfall intensity = 2.299 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	4.048	12.82	2.057
2	4.184	10.46	2.299

Largest stream flow has longer or shorter time of concentration

Qp = 4.184 + sum of

$$Qa \quad Tb/Ta$$

$$4.048 * 0.816 = 3.304$$
 Qp = 7.489

Total of 2 streams to confluence:

Flow rates before confluence point:

4.048 4.184

Area of streams before confluence:

2.400 2.200

Results of confluence:

Total flow rate = 7.489 (CFS)

Time of concentration = 10.464 min.

Effective stream area after confluence = 4.600 (Ac.)

 Process from Point/Station 242.000 to Point/Station 243.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 372.000 (Ft.)
 Downstream point/station elevation = 350.000 (Ft.)
 Pipe length = 275.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 7.489 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 7.489 (CFS)
 Normal flow depth in pipe = 7.70 (In.)
 Flow top width inside pipe = 11.51 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 14.05 (Ft/s)
 Travel time through pipe = 0.33 min.
 Time of concentration (TC) = 10.79 min.

 Process from Point/Station 243.000 to Point/Station 243.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2

Stream flow area = 4.600 (Ac.)

Runoff from this stream = 7.489(CFS)
 Time of concentration = 10.79 min.
 Rainfall intensity = 2.261(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	78.406	13.18	2.025
2	7.489	10.79	2.261

Largest stream flow has longer time of concentration

Qp = 78.406 + sum of
 Qb Ia/Ib
 7.489 * 0.896 = 6.707
 Qp = 85.113

Total of 2 main streams to confluence:

Flow rates before confluence point:

78.406 7.489

Area of streams before confluence:

50.600 4.600

Results of confluence:

Total flow rate = 85.113(CFS)

Time of concentration = 13.184 min.

Effective stream area after confluence = 55.200(Ac.)

 Process from Point/Station 243.000 to Point/Station 245.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 350.000(Ft.)
 Downstream point/station elevation = 349.000(Ft.)
 Pipe length = 275.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 85.113(CFS)
 Nearest computed pipe diameter = 48.00(In.)
 Calculated individual pipe flow = 85.113(CFS)
 Normal flow depth in pipe = 38.63(In.)
 Flow top width inside pipe = 38.06(In.)
 Critical Depth = 33.56(In.)
 Pipe flow velocity = 7.86(Ft/s)
 Travel time through pipe = 0.58 min.
 Time of concentration (TC) = 13.77 min.

 Process from Point/Station 245.000 to Point/Station 245.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 55.200(Ac.)

Runoff from this stream = 85.113 (CFS)
 Time of concentration = 13.77 min.
 Rainfall intensity = 1.977 (In/Hr)

+++++
 Process from Point/Station 244.000 to Point/Station 245.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 375.000 (Ft.)
 Top (of initial area) elevation = 251.000 (Ft.)
 Bottom (of initial area) elevation = 249.000 (Ft.)
 Difference in elevation = 2.000 (Ft.)
 Slope = 0.00533 s(percent) = 0.53
 $TC = k(0.710) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 21.651 min.
 Rainfall intensity = 1.542 (In/Hr) for a 10.0 year storm
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.773
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 2) = 84.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 4.407 (CFS)
 Total initial stream area = 3.700 (Ac.)
 Pervious area fraction = 1.000

+++++
 Process from Point/Station 245.000 to Point/Station 245.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 3.700 (Ac.)
 Runoff from this stream = 4.407 (CFS)
 Time of concentration = 21.65 min.
 Rainfall intensity = 1.542 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	85.113	13.77	1.977
2	4.407	21.65	1.542

Largest stream flow has longer or shorter time of concentration

Qp = 85.113 + sum of
 $Qa \quad Tb/Ta$
 $4.407 * 0.636 = 2.802$
 Qp = 87.915

Total of 2 streams to confluence:

Flow rates before confluence point:

85.113 4.407

Area of streams before confluence:

55.200 3.700

Results of confluence:

Total flow rate = 87.915(CFS)

Time of concentration = 13.767 min.

Effective stream area after confluence = 58.900(Ac.)

+++++
Process from Point/Station 245.000 to Point/Station 247.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 349.000(Ft.)
Downstream point/station elevation = 332.000(Ft.)
Pipe length = 310.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 87.915(CFS)
Nearest computed pipe diameter = 30.00(In.)
Calculated individual pipe flow = 87.915(CFS)
Normal flow depth in pipe = 22.57(In.)
Flow top width inside pipe = 25.90(In.)
Critical depth could not be calculated.
Pipe flow velocity = 22.19(Ft/s)
Travel time through pipe = 0.23 min.
Time of concentration (TC) = 14.00 min.

+++++
Process from Point/Station 247.000 to Point/Station 247.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 58.900(Ac.)
Runoff from this stream = 87.915(CFS)
Time of concentration = 14.00 min.
Rainfall intensity = 1.959(In/Hr)

+++++
Process from Point/Station 246.000 to Point/Station 247.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 460.000(Ft.)
Top (of initial area) elevation = 352.000(Ft.)
Bottom (of initial area) elevation = 332.000(Ft.)
Difference in elevation = 20.000(Ft.)
Slope = 0.04348 s(percent)= 4.35
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 8.482 min.
Rainfall intensity = 2.581(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.834
Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.722(CFS)
 Total initial stream area = 0.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 247.000 to Point/Station 247.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.800(Ac.)
 Runoff from this stream = 1.722(CFS)
 Time of concentration = 8.48 min.
 Rainfall intensity = 2.581(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	87.915	14.00	1.959
2	1.722	8.48	2.581

Largest stream flow has longer time of concentration

Qp = 87.915 + sum of
 Qb Ia/Ib
 1.722 * 0.759 = 1.307
 Qp = 89.222

Total of 2 streams to confluence:
 Flow rates before confluence point:
 87.915 1.722

Area of streams before confluence:
 58.900 0.800

Results of confluence:

Total flow rate = 89.222(CFS)
 Time of concentration = 14.000 min.
 Effective stream area after confluence = 59.700(Ac.)

++++++
 Process from Point/Station 247.000 to Point/Station 250.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 332.000(Ft.)
 Downstream point/station elevation = 322.000(Ft.)
 Pipe length = 890.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 89.222(CFS)
 Nearest computed pipe diameter = 39.00(In.)
 Calculated individual pipe flow = 89.222(CFS)

Normal flow depth in pipe = 32.72(In.)
 Flow top width inside pipe = 28.67(In.)
 Critical Depth = 35.07(In.)
 Pipe flow velocity = 12.01(Ft/s)
 Travel time through pipe = 1.23 min.
 Time of concentration (TC) = 15.23 min.

++++++
 Process from Point/Station 250.000 to Point/Station 250.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 59.700(Ac.)
 Runoff from this stream = 89.222(CFS)
 Time of concentration = 15.23 min.
 Rainfall intensity = 1.870(In/Hr)

++++++
 Process from Point/Station 248.000 to Point/Station 250.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 910.000(Ft.)
 Top (of initial area) elevation = 334.000(Ft.)
 Bottom (of initial area) elevation = 322.000(Ft.)
 Difference in elevation = 12.000(Ft.)
 Slope = 0.01319 s(percent)= 1.32
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 14.147 min.
 Rainfall intensity = 1.948(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.816
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.044(CFS)
 Total initial stream area = 3.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 250.000 to Point/Station 250.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 3.800(Ac.)
 Runoff from this stream = 6.044(CFS)
 Time of concentration = 14.15 min.
 Rainfall intensity = 1.948(In/Hr)

+++++
 Process from Point/Station 249.000 to Point/Station 250.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 935.000(Ft.)
 Top (of initial area) elevation = 334.000(Ft.)
 Bottom (of initial area) elevation = 322.000(Ft.)
 Difference in elevation = 12.000(Ft.)
 Slope = 0.01283 s(percent)= 1.28
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 14.379 min.
 Rainfall intensity = 1.931(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.816
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.198(CFS)
 Total initial stream area = 3.300(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 250.000 to Point/Station 250.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
 Stream flow area = 3.300(Ac.)
 Runoff from this stream = 5.198(CFS)
 Time of concentration = 14.38 min.
 Rainfall intensity = 1.931(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	89.222	15.23	1.870
2	6.044	14.15	1.948
3	5.198	14.38	1.931

Largest stream flow has longer time of concentration

Qp = 89.222 + sum of
 Qb Ia/Ib
 6.044 * 0.960 = 5.802
 Qb Ia/Ib
 5.198 * 0.969 = 5.035
 Qp = 100.060

Total of 3 streams to confluence:
 Flow rates before confluence point:

89.222 6.044 5.198
 Area of streams before confluence:
 59.700 3.800 3.300
 Results of confluence:
 Total flow rate = 100.060 (CFS)
 Time of concentration = 15.235 min.
 Effective stream area after confluence = 66.800 (Ac.)

+++++
 Process from Point/Station 250.000 to Point/Station 259.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 322.000 (Ft.)
 Downstream point/station elevation = 321.000 (Ft.)
 Pipe length = 140.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 100.060 (CFS)
 Nearest computed pipe diameter = 45.00 (In.)
 Calculated individual pipe flow = 100.060 (CFS)
 Normal flow depth in pipe = 36.09 (In.)
 Flow top width inside pipe = 35.86 (In.)
 Critical Depth = 36.77 (In.)
 Pipe flow velocity = 10.55 (Ft/s)
 Travel time through pipe = 0.22 min.
 Time of concentration (TC) = 15.46 min.

+++++
 Process from Point/Station 259.000 to Point/Station 259.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
 In Main Stream number: 1
 Stream flow area = 66.800 (Ac.)
 Runoff from this stream = 100.060 (CFS)
 Time of concentration = 15.46 min.
 Rainfall intensity = 1.856 (In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 251.000 to Point/Station 252.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 910.000 (Ft.)
 Top (of initial area) elevation = 383.000 (Ft.)
 Bottom (of initial area) elevation = 368.000 (Ft.)
 Difference in elevation = 15.000 (Ft.)
 Slope = 0.01648 s(percent)= 1.65
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 13.529 min.
 Rainfall intensity = 1.996 (In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.818

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.063(CFS)
 Total initial stream area = 3.100(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 252.000 to Point/Station 254.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 368.000(Ft.)
 Downstream point/station elevation = 364.000(Ft.)
 Pipe length = 100.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 5.063(CFS)
 Nearest computed pipe diameter = 12.00(In.)
 Calculated individual pipe flow = 5.063(CFS)
 Normal flow depth in pipe = 7.48(In.)
 Flow top width inside pipe = 11.63(In.)
 Critical Depth = 11.03(In.)
 Pipe flow velocity = 9.85(Ft/s)
 Travel time through pipe = 0.17 min.
 Time of concentration (TC) = 13.70 min.

++++++
 Process from Point/Station 254.000 to Point/Station 254.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 3.100(Ac.)
 Runoff from this stream = 5.063(CFS)
 Time of concentration = 13.70 min.
 Rainfall intensity = 1.983(In/Hr)

++++++
 Process from Point/Station 253.000 to Point/Station 254.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 770.000(Ft.)
 Top (of initial area) elevation = 383.000(Ft.)
 Bottom (of initial area) elevation = 364.000(Ft.)
 Difference in elevation = 19.000(Ft.)
 Slope = 0.02468 s(percent)= 2.47
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.674 min.
 Rainfall intensity = 2.165(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.823

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.061(CFS)
 Total initial stream area = 3.400(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 254.000 to Point/Station 254.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 3.400(Ac.)
 Runoff from this stream = 6.061(CFS)
 Time of concentration = 11.67 min.
 Rainfall intensity = 2.165(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	5.063	13.70	1.983
2	6.061	11.67	2.165

Largest stream flow has longer or shorter time of concentration

Qp = 6.061 + sum of
 Qa Tb/Ta
 5.063 * 0.852 = 4.315
 Qp = 10.376

Total of 2 streams to confluence:

Flow rates before confluence point:

5.063 6.061

Area of streams before confluence:

3.100 3.400

Results of confluence:

Total flow rate = 10.376(CFS)

Time of concentration = 11.674 min.

Effective stream area after confluence = 6.500(Ac.)

++++++
 Process from Point/Station 254.000 to Point/Station 256.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 364.000(Ft.)

Downstream point/station elevation = 340.000(Ft.)

Pipe length = 400.00(Ft.) Manning's N = 0.013

No. of pipes = 1 Required pipe flow = 10.376(CFS)

Nearest computed pipe diameter = 15.00(In.)

Calculated individual pipe flow = 10.376(CFS)
 Normal flow depth in pipe = 8.86(In.)
 Flow top width inside pipe = 14.75(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 13.75(Ft/s)
 Travel time through pipe = 0.48 min.
 Time of concentration (TC) = 12.16 min.

+++++
 Process from Point/Station 256.000 to Point/Station 256.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 6.500(Ac.)
 Runoff from this stream = 10.376(CFS)
 Time of concentration = 12.16 min.
 Rainfall intensity = 2.117(In/Hr)

+++++
 Process from Point/Station 355.000 to Point/Station 356.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 830.000(Ft.)
 Top (of initial area) elevation = 352.500(Ft.)
 Bottom (of initial area) elevation = 340.000(Ft.)
 Difference in elevation = 12.500(Ft.)
 Slope = 0.01506 s(percent)= 1.51
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 13.278 min.
 Rainfall intensity = 2.017(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.819
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 7.432(CFS)
 Total initial stream area = 4.500(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 356.000 to Point/Station 356.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 4.500(Ac.)
 Runoff from this stream = 7.432(CFS)
 Time of concentration = 13.28 min.
 Rainfall intensity = 2.017(In/Hr)

Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	10.376	12.16	2.117
2	7.432	13.28	2.017

Largest stream flow has longer or shorter time of concentration

Qp = 10.376 + sum of

Qa Tb/Ta

7.432 * 0.916 = 6.805

Qp = 17.182

Total of 2 streams to confluence:

Flow rates before confluence point:

10.376 7.432

Area of streams before confluence:

6.500 4.500

Results of confluence:

Total flow rate = 17.182 (CFS)

Time of concentration = 12.158 min.

Effective stream area after confluence = 11.000 (Ac.)

Process from Point/Station 256.000 to Point/Station 258.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 340.000 (Ft.)

Downstream point/station elevation = 321.000 (Ft.)

Pipe length = 220.00 (Ft.) Manning's N = 0.013

No. of pipes = 1 Required pipe flow = 17.182 (CFS)

Nearest computed pipe diameter = 15.00 (In.)

Calculated individual pipe flow = 17.182 (CFS)

Normal flow depth in pipe = 11.18 (In.)

Flow top width inside pipe = 13.07 (In.)

Critical depth could not be calculated.

Pipe flow velocity = 17.52 (Ft/s)

Travel time through pipe = 0.21 min.

Time of concentration (TC) = 12.37 min.

Process from Point/Station 258.000 to Point/Station 258.000

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1

Stream flow area = 11.000 (Ac.)

Runoff from this stream = 17.182 (CFS)

Time of concentration = 12.37 min.

Rainfall intensity = 2.098 (In/Hr)


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Process from Point/Station      259.000 to Point/Station      258.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 620.000(Ft.)
Top (of initial area) elevation = 360.000(Ft.)
Bottom (of initial area) elevation = 323.000(Ft.)
Difference in elevation = 37.000(Ft.)
Slope = 0.05968 s(percent)= 5.97
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.971 min.
Rainfall intensity = 2.503(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.832
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 2.499(CFS)
Total initial stream area = 1.200(Ac.)
Pervious area fraction = 0.500

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Process from Point/Station      258.000 to Point/Station      258.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 2 in normal stream number 2
Stream flow area = 1.200(Ac.)
Runoff from this stream = 2.499(CFS)
Time of concentration = 8.97 min.
Rainfall intensity = 2.503(In/Hr)

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Process from Point/Station      257.000 to Point/Station      258.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 352.000(Ft.)
Bottom (of initial area) elevation = 323.000(Ft.)
Difference in elevation = 29.000(Ft.)
Slope = 0.02900 s(percent)= 2.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.548 min.
Rainfall intensity = 2.081(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.821
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000

```

RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.270(CFS)
 Total initial stream area = 2.500(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 258.000 to Point/Station 258.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3

Stream flow area = 2.500(Ac.)
 Runoff from this stream = 4.270(CFS)
 Time of concentration = 12.55 min.
 Rainfall intensity = 2.081(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	17.182	12.37	2.098
2	2.499	8.97	2.503
3	4.270	12.55	2.081

Largest stream flow has longer or shorter time of concentration

Qp = 17.182 + sum of
 Qb Ia/Ib
 2.499 * 0.838 = 2.095
 Qa Tb/Ta
 4.270 * 0.986 = 4.208
 Qp = 23.485

Total of 3 streams to confluence:

Flow rates before confluence point:
 17.182 2.499 4.270

Area of streams before confluence:
 11.000 1.200 2.500

Results of confluence:

Total flow rate = 23.485(CFS)
 Time of concentration = 12.368 min.
 Effective stream area after confluence = 14.700(Ac.)

++++++
 Process from Point/Station 258.000 to Point/Station 259.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 323.000(Ft.)
 Downstream point/station elevation = 321.000(Ft.)
 Pipe length = 40.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 23.485(CFS)
 Nearest computed pipe diameter = 18.00(In.)
 Calculated individual pipe flow = 23.485(CFS)

Normal flow depth in pipe = 14.77(In.)
 Flow top width inside pipe = 13.82(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 15.15(Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 12.41 min.

++++++
 Process from Point/Station 259.000 to Point/Station 259.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 14.700(Ac.)
 Runoff from this stream = 23.485(CFS)
 Time of concentration = 12.41 min.
 Rainfall intensity = 2.093(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	100.060	15.46	1.856
2	23.485	12.41	2.093

Largest stream flow has longer time of concentration

$Q_p = 100.060 + \text{sum of}$
 $Q_b \quad I_a/I_b$
 $23.485 * 0.886 = 20.816$
 $Q_p = 120.875$

Total of 2 main streams to confluence:

Flow rates before confluence point:

100.060 23.485

Area of streams before confluence:

66.800 14.700

Results of confluence:

Total flow rate = 120.875(CFS)

Time of concentration = 15.456 min.

Effective stream area after confluence = 81.500(Ac.)

++++++
 Process from Point/Station 259.000 to Point/Station 261.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 321.000(Ft.)
 Downstream point/station elevation = 320.500(Ft.)
 Pipe length = 40.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 120.875(CFS)
 Nearest computed pipe diameter = 45.00(In.)

Calculated individual pipe flow = 120.875(CFS)
 Normal flow depth in pipe = 33.19(In.)
 Flow top width inside pipe = 39.60(In.)
 Critical Depth = 39.69(In.)
 Pipe flow velocity = 13.84(Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 15.50 min.

++++++
 Process from Point/Station 261.000 to Point/Station 261.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 81.500(Ac.)
 Runoff from this stream = 120.875(CFS)
 Time of concentration = 15.50 min.
 Rainfall intensity = 1.852(In/Hr)

++++++
 Process from Point/Station 260.000 to Point/Station 261.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 420.000(Ft.)
 Top (of initial area) elevation = 328.000(Ft.)
 Bottom (of initial area) elevation = 320.500(Ft.)
 Difference in elevation = 7.500(Ft.)
 Slope = 0.01786 s(percent) = 1.79
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.772 min.
 Rainfall intensity = 2.388(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.829
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.366(CFS)
 Total initial stream area = 1.700(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 261.000 to Point/Station 261.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 1.700(Ac.)
 Runoff from this stream = 3.366(CFS)
 Time of concentration = 9.77 min.
 Rainfall intensity = 2.388(In/Hr)

Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	120.875	15.50	1.852

2	3.366	9.77	2.388

Largest stream flow has longer time of concentration

Qp = 120.875 + sum of

Qb Ia/Ib

3.366 * 0.776 = 2.612

Qp = 123.487

Total of 2 streams to confluence:

Flow rates before confluence point:

120.875 3.366

Area of streams before confluence:

81.500 1.700

Results of confluence:

Total flow rate = 123.487(CFS)

Time of concentration = 15.504 min.

Effective stream area after confluence = 83.200(Ac.)

 Process from Point/Station 261.000 to Point/Station 264.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 320.500(Ft.)
 Downstream point/station elevation = 318.000(Ft.)
 Pipe length = 330.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 123.487(CFS)
 Nearest computed pipe diameter = 48.00(In.)
 Calculated individual pipe flow = 123.487(CFS)
 Normal flow depth in pipe = 38.81(In.)
 Flow top width inside pipe = 37.77(In.)
 Critical Depth = 40.09(In.)
 Pipe flow velocity = 11.34(Ft/s)
 Travel time through pipe = 0.48 min.
 Time of concentration (TC) = 15.99 min.

 Process from Point/Station 264.000 to Point/Station 264.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 83.200(Ac.)
 Runoff from this stream = 123.487(CFS)
 Time of concentration = 15.99 min.
 Rainfall intensity = 1.821(In/Hr)

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+++++
Process from Point/Station      262.000 to Point/Station      263.000
**** INITIAL AREA EVALUATION ****

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```

Initial area flow distance = 605.000(Ft.)
Top (of initial area) elevation = 370.000(Ft.)
Bottom (of initial area) elevation = 364.000(Ft.)
Difference in elevation = 6.000(Ft.)
Slope = 0.00992 s(percent)= 0.99
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.720 min.
Rainfall intensity = 2.065(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.820
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 5.930(CFS)
Total initial stream area = 3.500(Ac.)
Pervious area fraction = 0.500

```

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+++++
Process from Point/Station      263.000 to Point/Station      264.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```

```

Upstream point/station elevation = 364.000(Ft.)
Downstream point/station elevation = 318.000(Ft.)
Pipe length = 255.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 5.930(CFS)
Nearest computed pipe diameter = 9.00(In.)
Calculated individual pipe flow = 5.930(CFS)
Normal flow depth in pipe = 6.34(In.)
Flow top width inside pipe = 8.21(In.)
Critical depth could not be calculated.
Pipe flow velocity = 17.83(Ft/s)
Travel time through pipe = 0.24 min.
Time of concentration (TC) = 12.96 min.

```

```

+++++
Process from Point/Station      264.000 to Point/Station      264.000
**** CONFLUENCE OF MINOR STREAMS ****

```

```

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 3.500(Ac.)
Runoff from this stream = 5.930(CFS)
Time of concentration = 12.96 min.
Rainfall intensity = 2.044(In/Hr)
Summary of stream data:

```

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	123.487	15.99	1.821
2	5.930	12.96	2.044

Largest stream flow has longer time of concentration

Qp = 123.487 + sum of
 Qb Ia/Ib
 5.930 * 0.891 = 5.283
 Qp = 128.769

Total of 2 streams to confluence:

Flow rates before confluence point:

123.487 5.930

Area of streams before confluence:

83.200 3.500

Results of confluence:

Total flow rate = 128.769(CFS)

Time of concentration = 15.989 min.

Effective stream area after confluence = 86.700(Ac.)

+++++
 Process from Point/Station 264.000 to Point/Station 265.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 318.000(Ft.)
 Downstream point/station elevation = 290.000(Ft.)
 Pipe length = 225.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 128.769(CFS)
 Nearest computed pipe diameter = 30.00(In.)
 Calculated individual pipe flow = 128.769(CFS)
 Normal flow depth in pipe = 22.03(In.)
 Flow top width inside pipe = 26.50(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 33.31(Ft/s)
 Travel time through pipe = 0.11 min.
 Time of concentration (TC) = 16.10 min.

+++++
 Process from Point/Station 265.000 to Point/Station 269.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 290.000(Ft.)
 Downstream point elevation = 287.000(Ft.)
 Channel length thru subarea = 300.000(Ft.)
 Channel base width = 100.000(Ft.)
 Slope or 'Z' of left channel bank = 4.000
 Slope or 'Z' of right channel bank = 4.000
 Estimated mean flow rate at midpoint of channel = 131.704(CFS)
 Manning's 'N' = 0.030
 Maximum depth of channel = 5.000(Ft.)

Flow(q) thru subarea = 131.704(CFS)
 Depth of flow = 0.450(Ft.), Average velocity = 2.874(Ft/s)
 Channel flow top width = 103.602(Ft.)
 Flow Velocity = 2.87(Ft/s)
 Travel time = 1.74 min.
 Time of concentration = 17.84 min.

Sub-Channel No. 1 Critical depth = 0.375(Ft.)
 ' ' ' Critical flow top width = 103.000(Ft.)
 ' ' ' Critical flow velocity= 3.460(Ft/s)
 ' ' ' Critical flow area = 38.063(Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.754
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 80.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.715(In/Hr) for a 10.0 year storm
 Subarea runoff = 5.814(CFS) for 4.500(Ac.)
 Total runoff = 134.584(CFS) Total area = 91.200(Ac.)
 Depth of flow = 0.456(Ft.), Average velocity = 2.898(Ft/s)

Sub-Channel No. 1 Critical depth = 0.383(Ft.)
 ' ' ' Critical flow top width = 103.063(Ft.)
 ' ' ' Critical flow velocity= 3.463(Ft/s)
 ' ' ' Critical flow area = 38.867(Sq.Ft)

++++
 Process from Point/Station 269.000 to Point/Station 269.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 91.200(Ac.)
 Runoff from this stream = 134.584(CFS)
 Time of concentration = 17.84 min.
 Rainfall intensity = 1.715(In/Hr)

++++
 Process from Point/Station 266.000 to Point/Station 267.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 334.000(Ft.)
 Bottom (of initial area) elevation = 303.000(Ft.)
 Difference in elevation = 31.000(Ft.)
 Slope = 0.03100 s(percent)= 3.10
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 12.382 min.
 Rainfall intensity = 2.096(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.821
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.099(CFS)
 Total initial stream area = 1.800(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 267.000 to Point/Station 268.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 303.000(Ft.)
 Downstream point/station elevation = 287.000(Ft.)
 Pipe length = 330.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 3.099(CFS)
 Nearest computed pipe diameter = 9.00(In.)
 Calculated individual pipe flow = 3.099(CFS)
 Normal flow depth in pipe = 6.38(In.)
 Flow top width inside pipe = 8.18(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 9.26(Ft/s)
 Travel time through pipe = 0.59 min.
 Time of concentration (TC) = 12.98 min.

++++++
 Process from Point/Station 268.000 to Point/Station 269.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 287.500(Ft.)
 Downstream point elevation = 287.000(Ft.)
 Channel length thru subarea = 50.000(Ft.)
 Channel base width = 40.000(Ft.)
 Slope or 'Z' of left channel bank = 4.000
 Slope or 'Z' of right channel bank = 4.000
 Manning's 'N' = 0.030
 Maximum depth of channel = 5.000(Ft.)
 Flow(q) thru subarea = 3.099(CFS)
 Depth of flow = 0.082(Ft.), Average velocity = 0.933(Ft/s)
 Channel flow top width = 40.659(Ft.)
 Flow Velocity = 0.93(Ft/s)
 Travel time = 0.89 min.
 Time of concentration = 13.87 min.

Sub-Channel No. 1 Critical depth = 0.057(Ft.)
 ' ' ' Critical flow top width = 40.453(Ft.)

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'      '      '      Critical flow velocity=    1.360(Ft/s)
'      '      '      Critical flow area =        2.278(Sq.Ft)

```

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+++++
Process from Point/Station      269.000 to Point/Station      269.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 1.800(Ac.)
 Runoff from this stream = 3.099(CFS)
 Time of concentration = 13.87 min.
 Rainfall intensity = 1.969(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	134.584	17.84	1.715
2	3.099	13.87	1.969

Largest stream flow has longer time of concentration

Qp = 134.584 + sum of
 Qb Ia/Ib
 3.099 * 0.871 = 2.698
 Qp = 137.282

Total of 2 streams to confluence:

Flow rates before confluence point:

134.584 3.099

Area of streams before confluence:

91.200 1.800

Results of confluence:

Total flow rate = 137.282(CFS)

Time of concentration = 17.842 min.

Effective stream area after confluence = 93.000(Ac.)

```

+++++
Process from Point/Station      269.000 to Point/Station      277.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```

Upstream point/station elevation = 287.000(Ft.)
 Downstream point/station elevation = 283.000(Ft.)
 Pipe length = 150.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 137.282(CFS)
 Nearest computed pipe diameter = 39.00(In.)
 Calculated individual pipe flow = 137.282(CFS)
 Normal flow depth in pipe = 32.63(In.)
 Flow top width inside pipe = 28.84(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 18.51(Ft/s)
 Travel time through pipe = 0.14 min.

Time of concentration (TC) = 17.98 min.

+++++
 Process from Point/Station 277.000 to Point/Station 277.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 93.000(Ac.)
 Runoff from this stream = 137.282(CFS)
 Time of concentration = 17.98 min.
 Rainfall intensity = 1.708(In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 270.000 to Point/Station 271.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 660.000(Ft.)
 Top (of initial area) elevation = 473.000(Ft.)
 Bottom (of initial area) elevation = 388.000(Ft.)
 Difference in elevation = 85.000(Ft.)
 Slope = 0.12879 s(percent)= 12.88
 $TC = k(0.940) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 19.009 min.
 Rainfall intensity = 1.656(In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.673
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.500
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.500
 RI index for soil(AMC 2) = 70.50
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 10.032(CFS)
 Total initial stream area = 9.000(Ac.)
 Pervious area fraction = 1.000

+++++
 Process from Point/Station 271.000 to Point/Station 272.000
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 388.000(Ft.)
 End of natural channel elevation = 352.000(Ft.)
 Length of natural channel = 465.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 13.934(CFS)

Natural mountain channel type used
 L.A. County flood control district formula for channel velocity:
 $Velocity = 5.48(q^{.33})(slope^{.492})$
 Velocity using mean channel flow = 3.71(Ft/s)

Correction to map slope used on extremely rugged channels with drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.0774

Corrected/adjusted channel slope = 0.0774

Travel time = 2.09 min. TC = 21.10 min.

Adding area flow to channel

UNDEVELOPED (fair cover) subarea

Runoff Coefficient = 0.774

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil(AMC 2) = 84.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 1.564(In/Hr) for a 10.0 year storm

Subarea runoff = 8.475(CFS) for 7.000(Ac.)

Total runoff = 18.507(CFS) Total area = 16.000(Ac.)

+++++
Process from Point/Station 272.000 to Point/Station 273.000
**** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 352.000(Ft.)

Downstream point elevation = 347.000(Ft.)

Channel length thru subarea = 250.000(Ft.)

Channel base width = 10.000(Ft.)

Slope or 'Z' of left channel bank = 2.000

Slope or 'Z' of right channel bank = 2.000

Estimated mean flow rate at midpoint of channel = 23.346(CFS)

Manning's 'N' = 0.015

Maximum depth of channel = 5.000(Ft.)

Flow(q) thru subarea = 23.346(CFS)

Depth of flow = 0.338(Ft.), Average velocity = 6.467(Ft/s)

Channel flow top width = 11.353(Ft.)

Flow Velocity = 6.47(Ft/s)

Travel time = 0.64 min.

Time of concentration = 21.74 min.

Sub-Channel No. 1 Critical depth = 0.531(Ft.)

' ' ' Critical flow top width = 12.125(Ft.)

' ' ' Critical flow velocity = 3.972(Ft/s)

' ' ' Critical flow area = 5.877(Sq.Ft)

Adding area flow to channel

UNDEVELOPED (fair cover) subarea

Runoff Coefficient = 0.772

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil(AMC 2) = 84.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.538(In/Hr) for a 10.0 year storm
Subarea runoff = 9.742(CFS) for 8.200(Ac.)
Total runoff = 28.249(CFS) Total area = 24.200(Ac.)
Depth of flow = 0.379(Ft.), Average velocity = 6.936(Ft/s)

Sub-Channel No. 1	Critical depth =	0.602(Ft.)
'	Critical flow top width =	12.406(Ft.)
'	Critical flow velocity=	4.192(Ft/s)
'	Critical flow area =	6.739(Sq.Ft)

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+++++
Process from Point/Station      273.000 to Point/Station      276.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

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```

Upstream point/station elevation = 347.000(Ft.)
Downstream point/station elevation = 340.000(Ft.)
Pipe length = 530.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 28.249(CFS)
Nearest computed pipe diameter = 27.00(In.)
Calculated individual pipe flow = 28.249(CFS)
Normal flow depth in pipe = 18.16(In.)
Flow top width inside pipe = 25.34(In.)
Critical Depth = 22.17(In.)
Pipe flow velocity = 9.93(Ft/s)
Travel time through pipe = 0.89 min.
Time of concentration (TC) = 22.63 min.

```

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+++++
Process from Point/Station      276.000 to Point/Station      276.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 2 in normal stream number 1
Stream flow area = 24.200 (Ac.)
Runoff from this stream = 28.249 (CFS)
Time of concentration = 22.63 min.
Rainfall intensity = 1.504 (In/Hr)

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+++++
Process from Point/Station      274.000 to Point/Station      275.000
**** INITIAL AREA EVALUATION ****

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```
Initial area flow distance = 975.000(Ft.)
Top (of initial area) elevation = 522.000(Ft.)
Bottom (of initial area) elevation = 344.000(Ft.)
Difference in elevation = 178.000(Ft.)
Slope = 0.18256 s(percent)= 18.26
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.652 min.
```

Rainfall intensity = 1.843(In/Hr) for a 10.0 year storm
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.791
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 84.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 12.826(CFS)
 Total initial stream area = 8.800(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 275.000 to Point/Station 276.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 344.000(Ft.)
 Downstream point/station elevation = 340.000(Ft.)
 Pipe length = 190.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 12.826(CFS)
 Nearest computed pipe diameter = 18.00(In.)
 Calculated individual pipe flow = 12.826(CFS)
 Normal flow depth in pipe = 12.66(In.)
 Flow top width inside pipe = 16.45(In.)
 Critical Depth = 16.14(In.)
 Pipe flow velocity = 9.67(Ft/s)
 Travel time through pipe = 0.33 min.
 Time of concentration (TC) = 15.98 min.

++++++
 Process from Point/Station 276.000 to Point/Station 276.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 8.800(Ac.)
 Runoff from this stream = 12.826(CFS)
 Time of concentration = 15.98 min.
 Rainfall intensity = 1.822(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	28.249	22.63	1.504
2	12.826	15.98	1.822

Largest stream flow has longer time of concentration

Qp = 28.249 + sum of
 Qb Ia/Ib
 12.826 * 0.826 = 10.592
 Qp = 38.841

Total of 2 streams to confluence:
 Flow rates before confluence point:
 28.249 12.826
 Area of streams before confluence:
 24.200 8.800
 Results of confluence:
 Total flow rate = 38.841(CFS)
 Time of concentration = 22.631 min.
 Effective stream area after confluence = 33.000(Ac.)

 Process from Point/Station 276.000 to Point/Station 277.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 340.000(Ft.)
 Downstream point/station elevation = 283.000(Ft.)
 Pipe length = 1225.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 38.841(CFS)
 Nearest computed pipe diameter = 24.00(In.)
 Calculated individual pipe flow = 38.841(CFS)
 Normal flow depth in pipe = 16.17(In.)
 Flow top width inside pipe = 22.50(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 17.24(Ft/s)
 Travel time through pipe = 1.18 min.
 Time of concentration (TC) = 23.82 min.

 Process from Point/Station 277.000 to Point/Station 277.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 33.000(Ac.)
 Runoff from this stream = 38.841(CFS)
 Time of concentration = 23.82 min.
 Rainfall intensity = 1.463(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	137.282	17.98	1.708
2	38.841	23.82	1.463

Largest stream flow has longer or shorter time of concentration

Qp = 137.282 + sum of
 Qa Tb/Ta
 38.841 * 0.755 = 29.319
 Qp = 166.600

Total of 2 main streams to confluence:

Flow rates before confluence point:

137.282 38.841

Area of streams before confluence:

93.000 33.000

Results of confluence:

Total flow rate = 166.600 (CFS)

Time of concentration = 17.977 min.

Effective stream area after confluence = 126.000 (Ac.)

+++++
 Process from Point/Station 277.000 to Point/Station 278.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 283.000 (Ft.)
 Downstream point elevation = 282.000 (Ft.)
 Channel length thru subarea = 140.000 (Ft.)
 Channel base width = 20.000 (Ft.)
 Slope or 'Z' of left channel bank = 2.000
 Slope or 'Z' of right channel bank = 2.000
 Estimated mean flow rate at midpoint of channel = 170.368 (CFS)
 Manning's 'N' = 0.030
 Maximum depth of channel = 5.000 (Ft.)
 Flow (q) thru subarea = 170.368 (CFS)
 Depth of flow = 1.495 (Ft.), Average velocity = 4.956 (Ft/s)
 Channel flow top width = 25.981 (Ft.)
 Flow Velocity = 4.96 (Ft/s)
 Travel time = 0.47 min.
 Time of concentration = 18.45 min.

Sub-Channel No. 1 Critical depth = 1.250 (Ft.)
 ' ' ' Critical flow top width = 25.000 (Ft.)
 ' ' ' Critical flow velocity = 6.058 (Ft/s)
 ' ' ' Critical flow area = 28.125 (Sq. Ft)

Adding area flow to channel

UNDEVELOPED (fair cover) subarea

Runoff Coefficient = 0.782

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil (AMC 2) = 84.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 1.683 (In/Hr) for a 10.0 year storm

Subarea runoff = 7.504 (CFS) for 5.700 (Ac.)

Total runoff = 174.104 (CFS) Total area = 131.700 (Ac.)

Depth of flow = 1.514 (Ft.), Average velocity = 4.993 (Ft/s)

Sub-Channel No. 1 Critical depth = 1.266 (Ft.)

' ' ' Critical flow top width = 25.063 (Ft.)

' ' ' Critical flow velocity= 6.105 (Ft/s)
' ' ' Critical flow area = 28.516 (Sq.Ft)

End of computations, total study area = 131.70 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.687

Area averaged RI index number = 76.9

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 04/29/14 File:32786B100.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557

100-Year Rational Hydrology Area "B"

Proposed Condition

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.300(In/Hr)

Slope of intensity duration curve = 0.5500

 Process from Point/Station 204.000 to Point/Station 206.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 700.000(Ft.)

Top (of initial area) elevation = 511.000(Ft.)

Bottom (of initial area) elevation = 408.000(Ft.)

Difference in elevation = 103.000(Ft.)

Slope = 0.14714 s(percent)= 14.71

TC = $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$

Initial area time of concentration = 7.862 min.

Rainfall intensity = 3.975(In/Hr) for a 100.0 year storm

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.880

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 15.748(CFS)
 Total initial stream area = 4.500(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 206.000 to Point/Station 206.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 4.500(Ac.)
 Runoff from this stream = 15.748(CFS)
 Time of concentration = 7.86 min.
 Rainfall intensity = 3.975(In/Hr)

++++++
 Process from Point/Station 205.000 to Point/Station 206.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 800.000(Ft.)
 Top (of initial area) elevation = 482.000(Ft.)
 Bottom (of initial area) elevation = 408.000(Ft.)
 Difference in elevation = 74.000(Ft.)
 Slope = 0.09250 s(percent)= 9.25
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.101 min.
 Rainfall intensity = 3.668(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.879
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 26.753(CFS)
 Total initial stream area = 8.300(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 206.000 to Point/Station 206.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 8.300(Ac.)
 Runoff from this stream = 26.753(CFS)

Time of concentration = 9.10 min.
 Rainfall intensity = 3.668 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	15.748	7.86	3.975
2	26.753	9.10	3.668

Largest stream flow has longer time of concentration

Qp = 26.753 + sum of
 Qb Ia/Ib
 15.748 * 0.923 = 14.531
 Qp = 41.284

Total of 2 streams to confluence:
 Flow rates before confluence point:

15.748 26.753

Area of streams before confluence:

4.500 8.300

Results of confluence:

Total flow rate = 41.284 (CFS)

Time of concentration = 9.101 min.

Effective stream area after confluence = 12.800 (Ac.)

 Process from Point/Station 206.000 to Point/Station 203.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 408.000 (Ft.)
 End of street segment elevation = 398.000 (Ft.)
 Length of street segment = 150.000 (Ft.)
 Height of curb above gutter flowline = 6.0 (In.)
 Width of half street (curb to crown) = 18.000 (Ft.)
 Distance from crown to crossfall grade break = 10.000 (Ft.)
 Slope from gutter to grade break (v/hz) = 0.025
 Slope from grade break to crown (v/hz) = 0.025
 Street flow is on [1] side(s) of the street
 Distance from curb to property line = 20.000 (Ft.)
 Slope from curb to property line (v/hz) = 0.020
 Gutter width = 2.000 (Ft.)
 Gutter hike from flowline = 2.000 (In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 41.445 (CFS)
 Depth of flow = 0.584 (Ft.), Average velocity = 8.895 (Ft/s)
 Warning: depth of flow exceeds top of curb
 Note: depth of flow exceeds top of street crown.
 Distance that curb overflow reaches into property = 4.21 (Ft.)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 18.000 (Ft.)

Flow velocity = 8.89(Ft/s)
 Travel time = 0.28 min. TC = 9.38 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.878
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 3.607(In/Hr) for a 100.0 year storm
 Subarea runoff = 0.317(CFS) for 0.100(Ac.)
 Total runoff = 41.601(CFS) Total area = 12.900(Ac.)
 Street flow at end of street = 41.601(CFS)
 Half street flow at end of street = 41.601(CFS)
 Depth of flow = 0.585(Ft.), Average velocity = 8.904(Ft/s)
 Warning: depth of flow exceeds top of curb
 Note: depth of flow exceeds top of street crown.
 Distance that curb overflow reaches into property = 4.24(Ft.)
 Flow width (from curb towards crown)= 18.000(Ft.)

++++++
 Process from Point/Station 203.000 to Point/Station 203.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 12.900(Ac.)
 Runoff from this stream = 41.601(CFS)
 Time of concentration = 9.38 min.
 Rainfall intensity = 3.607(In/Hr)

++++++
 Process from Point/Station 201.000 to Point/Station 202.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 940.000(Ft.)
 Top (of initial area) elevation = 1450.000(Ft.)
 Bottom (of initial area) elevation = 1400.000(Ft.)
 Difference in elevation = 50.000(Ft.)
 Slope = 0.05319 s(percent)= 5.32
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.843 min.
 Rainfall intensity = 3.331(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.870
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.250
 Decimal fraction soil group C = 0.080
 Decimal fraction soil group D = 0.670
 RI index for soil(AMC 3) = 84.86
 Pervious area fraction = 0.500; Impervious fraction = 0.500

Initial subarea runoff = 24.634(CFS)
 Total initial stream area = 8.500(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 202.000 to Point/Station 203.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 400.000(Ft.)
 End of street segment elevation = 398.000(Ft.)
 Length of street segment = 280.000(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 20.000(Ft.)
 Distance from crown to crossfall grade break = 10.000(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [2] side(s) of the street
 Distance from curb to property line = 10.000(Ft.)
 Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 27.155(CFS)
 Depth of flow = 0.550(Ft.), Average velocity = 2.923(Ft/s)
 Warning: depth of flow exceeds top of curb
 Note: depth of flow exceeds top of street crown.
 Distance that curb overflow reaches into property = 2.00(Ft.)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 20.000(Ft.)
 Flow velocity = 2.92(Ft/s)
 Travel time = 1.60 min. TC = 12.44 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.875
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 3.089(In/Hr) for a 100.0 year storm
 Subarea runoff = 4.865(CFS) for 1.800(Ac.)
 Total runoff = 29.499(CFS) Total area = 10.300(Ac.)
 Street flow at end of street = 29.499(CFS)
 Half street flow at end of street = 14.749(CFS)
 Depth of flow = 0.563(Ft.), Average velocity = 2.995(Ft/s)
 Warning: depth of flow exceeds top of curb
 Note: depth of flow exceeds top of street crown.
 Distance that curb overflow reaches into property = 2.51(Ft.)
 Flow width (from curb towards crown)= 20.000(Ft.)

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Process from Point/Station      203.000 to Point/Station      203.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 1 in normal stream number 2

Stream flow area = 10.300 (Ac.)
 Runoff from this stream = 29.499 (CFS)
 Time of concentration = 12.44 min.
 Rainfall intensity = 3.089 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	41.601	9.38	3.607
2	29.499	12.44	3.089

Largest stream flow has longer or shorter time of concentration

Qp = 41.601 + sum of
 Qa Tb/Ta
 29.499 * 0.754 = 22.248
 Qp = 63.849

Total of 2 streams to confluence:

Flow rates before confluence point:

41.601 29.499

Area of streams before confluence:

12.900 10.300

Results of confluence:

Total flow rate = 63.849 (CFS)

Time of concentration = 9.382 min.

Effective stream area after confluence = 23.200 (Ac.)

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+++++
Process from Point/Station      203.000 to Point/Station      207.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```

Upstream point/station elevation = 398.000 (Ft.)
 Downstream point/station elevation = 396.000 (Ft.)
 Pipe length = 40.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 63.849 (CFS)
 Nearest computed pipe diameter = 30.00 (In.)
 Calculated individual pipe flow = 63.849 (CFS)
 Normal flow depth in pipe = 20.34 (In.)
 Flow top width inside pipe = 28.03 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 18.00 (Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 9.42 min.

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Process from Point/Station 207.000 to Point/Station 207.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 23.200 (Ac.)
 Runoff from this stream = 63.849 (CFS)
 Time of concentration = 9.42 min.
 Rainfall intensity = 3.599 (In/Hr)

 Process from Point/Station 208.000 to Point/Station 207.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 950.000 (Ft.)
 Top (of initial area) elevation = 408.000 (Ft.)
 Bottom (of initial area) elevation = 396.000 (Ft.)
 Difference in elevation = 12.000 (Ft.)
 Slope = 0.01263 s(percent) = 1.26
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 14.517 min.
 Rainfall intensity = 2.837 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.873
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 8.421 (CFS)
 Total initial stream area = 3.400 (Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 207.000 to Point/Station 207.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 3.400 (Ac.)
 Runoff from this stream = 8.421 (CFS)
 Time of concentration = 14.52 min.
 Rainfall intensity = 2.837 (In/Hr)

 Process from Point/Station 209.000 to Point/Station 207.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 350.000 (Ft.)
 Top (of initial area) elevation = 410.000 (Ft.)
 Bottom (of initial area) elevation = 396.000 (Ft.)
 Difference in elevation = 14.000 (Ft.)

Slope = 0.04000 s(percent)= 4.00
 TC = $k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.732 min.
 Rainfall intensity = 4.012(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.880
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.533(CFS)
 Total initial stream area = 1.000(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 207.000 to Point/Station 207.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
 Stream flow area = 1.000(Ac.)
 Runoff from this stream = 3.533(CFS)
 Time of concentration = 7.73 min.
 Rainfall intensity = 4.012(In/Hr)

++++++
 Process from Point/Station 214.000 to Point/Station 207.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 450.000(Ft.)
 Top (of initial area) elevation = 410.000(Ft.)
 Bottom (of initial area) elevation = 396.000(Ft.)
 Difference in elevation = 14.000(Ft.)
 Slope = 0.03111 s(percent)= 3.11
 TC = $k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.990 min.
 Rainfall intensity = 3.693(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.879
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.596(CFS)
 Total initial stream area = 0.800(Ac.)
 Pervious area fraction = 0.500

+++++

Process from Point/Station 207.000 to Point/Station 207.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 4

Stream flow area = 0.800 (Ac.)
 Runoff from this stream = 2.596 (CFS)
 Time of concentration = 8.99 min.
 Rainfall intensity = 3.693 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	63.849	9.42	3.599
2	8.421	14.52	2.837
3	3.533	7.73	4.012
4	2.596	8.99	3.693

Largest stream flow has longer or shorter time of concentration

Qp = 63.849 + sum of

Qa	Tb/Ta	
8.421 *	0.649 =	5.464
Qb	Ia/Ib	
3.533 *	0.897 =	3.169
Qb	Ia/Ib	
2.596 *	0.975 =	2.531

Qp = 75.013

Total of 4 streams to confluence:

Flow rates before confluence point:

63.849	8.421	3.533	2.596

Area of streams before confluence:

23.200	3.400	1.000	0.800

Results of confluence:

Total flow rate = 75.013 (CFS)

Time of concentration = 9.419 min.

Effective stream area after confluence = 28.400 (Ac.)

 Process from Point/Station 207.000 to Point/Station 215.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 396.000 (Ft.)
 Downstream point/station elevation = 395.000 (Ft.)
 Pipe length = 550.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 75.013 (CFS)
 Nearest computed pipe diameter = 54.00 (In.)
 Calculated individual pipe flow = 75.013 (CFS)
 Normal flow depth in pipe = 46.03 (In.)
 Flow top width inside pipe = 38.30 (In.)
 Critical Depth = 30.33 (In.)
 Pipe flow velocity = 5.20 (Ft/s)
 Travel time through pipe = 1.76 min.

Time of concentration (TC) = 11.18 min.

+++++
 Process from Point/Station 215.000 to Point/Station 215.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1

Stream flow area = 28.400(Ac.)
 Runoff from this stream = 75.013(CFS)
 Time of concentration = 11.18 min.
 Rainfall intensity = 3.275(In/Hr)

+++++
 Process from Point/Station 211.000 to Point/Station 215.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 400.000(Ft.)
 Top (of initial area) elevation = 435.000(Ft.)
 Bottom (of initial area) elevation = 395.000(Ft.)
 Difference in elevation = 40.000(Ft.)
 Slope = 0.10000 s(percent)= 10.00
 $TC = k(0.940) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 16.366 min.
 Rainfall intensity = 2.656(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.857
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 91.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 0.455(CFS)
 Total initial stream area = 0.200(Ac.)
 Pervious area fraction = 1.000

+++++
 Process from Point/Station 215.000 to Point/Station 215.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 0.200(Ac.)
 Runoff from this stream = 0.455(CFS)
 Time of concentration = 16.37 min.
 Rainfall intensity = 2.656(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1 75.013 11.18 3.275
 2 0.455 16.37 2.656
 Largest stream flow has longer or shorter time of concentration
 $Q_p = 75.013 + \text{sum of}$
 $Q_a \quad T_b/T_a$
 $0.455 * \quad 0.683 = \quad 0.311$
 $Q_p = 75.324$

Total of 2 streams to confluence:
 Flow rates before confluence point:
 75.013 0.455
 Area of streams before confluence:
 28.400 0.200
 Results of confluence:
 Total flow rate = 75.324 (CFS)
 Time of concentration = 11.183 min.
 Effective stream area after confluence = 28.600 (Ac.)

++++++
 Process from Point/Station 215.000 to Point/Station 224.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 395.000 (Ft.)
 Downstream point/station elevation = 370.000 (Ft.)
 Pipe length = 1050.00 (Ft.) Manning's N = 0.015
 No. of pipes = 1 Required pipe flow = 75.324 (CFS)
 Nearest computed pipe diameter = 33.00 (In.)
 Calculated individual pipe flow = 75.324 (CFS)
 Normal flow depth in pipe = 29.70 (In.)
 Flow top width inside pipe = 19.80 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 13.39 (Ft/s)
 Travel time through pipe = 1.31 min.
 Time of concentration (TC) = 12.49 min.

++++++
 Process from Point/Station 224.000 to Point/Station 224.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 28.600 (Ac.)
 Runoff from this stream = 75.324 (CFS)
 Time of concentration = 12.49 min.
 Rainfall intensity = 3.082 (In/Hr)

++++++
 Process from Point/Station 222.000 to Point/Station 224.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 950.000 (Ft.)
 Top (of initial area) elevation = 379.000 (Ft.)

Bottom (of initial area) elevation = 370.000(Ft.)
 Difference in elevation = 9.000(Ft.)
 Slope = 0.00947 s(percent)= 0.95
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 15.376 min.
 Rainfall intensity = 2.749(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.872
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.274(CFS)
 Total initial stream area = 2.200(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 224.000 to Point/Station 224.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.200(Ac.)
 Runoff from this stream = 5.274(CFS)
 Time of concentration = 15.38 min.
 Rainfall intensity = 2.749(In/Hr)

++++++
 Process from Point/Station 223.000 to Point/Station 224.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 900.000(Ft.)
 Top (of initial area) elevation = 378.000(Ft.)
 Bottom (of initial area) elevation = 370.000(Ft.)
 Difference in elevation = 8.000(Ft.)
 Slope = 0.00889 s(percent)= 0.89
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 15.240 min.
 Rainfall intensity = 2.762(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.872
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.023(CFS)
 Total initial stream area = 2.500(Ac.)
 Pervious area fraction = 0.500

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+++++
Process from Point/Station      224.000 to Point/Station      224.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 3

Stream flow area = 2.500 (Ac.)
 Runoff from this stream = 6.023 (CFS)
 Time of concentration = 15.24 min.
 Rainfall intensity = 2.762 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	75.324	12.49	3.082
2	5.274	15.38	2.749
3	6.023	15.24	2.762

Largest stream flow has longer or shorter time of concentration

Qp = 75.324 + sum of
 Qa Tb/Ta
 5.274 * 0.812 = 4.284
 Qa Tb/Ta
 6.023 * 0.820 = 4.937
 Qp = 84.545

Total of 3 streams to confluence:

Flow rates before confluence point:
 75.324 5.274 6.023

Area of streams before confluence:
 28.600 2.200 2.500

Results of confluence:

Total flow rate = 84.545 (CFS)
 Time of concentration = 12.490 min.
 Effective stream area after confluence = 33.300 (Ac.)

```

+++++
Process from Point/Station      224.000 to Point/Station      232.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```

Upstream point/station elevation = 370.000 (Ft.)
 Downstream point/station elevation = 369.000 (Ft.)
 Pipe length = 40.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 84.545 (CFS)
 Nearest computed pipe diameter = 33.00 (In.)
 Calculated individual pipe flow = 84.545 (CFS)
 Normal flow depth in pipe = 27.38 (In.)
 Flow top width inside pipe = 24.82 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 16.04 (Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 12.53 min.

```

+++++
Process from Point/Station      232.000 to Point/Station      232.000
**** CONFLUENCE OF MAIN STREAMS ****

```

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 33.300 (Ac.)
 Runoff from this stream = 84.545 (CFS)
 Time of concentration = 12.53 min.
 Rainfall intensity = 3.076 (In/Hr)
 Program is now starting with Main Stream No. 2

```

+++++
Process from Point/Station      225.000 to Point/Station      227.000
**** INITIAL AREA EVALUATION ****

```

Initial area flow distance = 850.000 (Ft.)
 Top (of initial area) elevation = 382.000 (Ft.)
 Bottom (of initial area) elevation = 375.000 (Ft.)
 Difference in elevation = 7.000 (Ft.)
 Slope = 0.00824 s(percent) = 0.82
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 15.125 min.
 Rainfall intensity = 2.774 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.872
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 9.195 (CFS)
 Total initial stream area = 3.800 (Ac.)
 Pervious area fraction = 0.500

```

+++++
Process from Point/Station      227.000 to Point/Station      229.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

```

Top of street segment elevation = 375.000 (Ft.)
 End of street segment elevation = 374.000 (Ft.)
 Length of street segment = 200.000 (Ft.)
 Height of curb above gutter flowline = 6.0 (In.)
 Width of half street (curb to crown) = 20.000 (Ft.)
 Distance from crown to crossfall grade break = 10.000 (Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [2] side(s) of the street
 Distance from curb to property line = 10.000 (Ft.)

Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 9.800(CFS)
 Depth of flow = 0.430(Ft.), Average velocity = 2.024(Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 15.146(Ft.)
 Flow velocity = 2.02(Ft/s)
 Travel time = 1.65 min. TC = 16.77 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.871
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 2.621(In/Hr) for a 100.0 year storm
 Subarea runoff = 1.141(CFS) for 0.500(Ac.)
 Total runoff = 10.336(CFS) Total area = 4.300(Ac.)
 Street flow at end of street = 10.336(CFS)
 Half street flow at end of street = 5.168(CFS)
 Depth of flow = 0.436(Ft.), Average velocity = 2.050(Ft/s)
 Flow width (from curb towards crown) = 15.472(Ft.)

++++++
 Process from Point/Station 229.000 to Point/Station 229.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 4.300(Ac.)
 Runoff from this stream = 10.336(CFS)
 Time of concentration = 16.77 min.
 Rainfall intensity = 2.621(In/Hr)

++++++
 Process from Point/Station 226.000 to Point/Station 228.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 830.000(Ft.)
 Top (of initial area) elevation = 386.000(Ft.)
 Bottom (of initial area) elevation = 375.000(Ft.)
 Difference in elevation = 11.000(Ft.)
 Slope = 0.01325 s(percent) = 1.33
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 13.622 min.
 Rainfall intensity = 2.938(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.874
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.392(CFS)
 Total initial stream area = 2.100(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 228.000 to Point/Station 229.000
 **** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 375.000(Ft.)
 End of street segment elevation = 374.000(Ft.)
 Length of street segment = 235.000(Ft.)
 Height of curb above gutter flowline = 6.0(In.)
 Width of half street (curb to crown) = 20.000(Ft.)
 Distance from crown to crossfall grade break = 10.000(Ft.)
 Slope from gutter to grade break (v/hz) = 0.020
 Slope from grade break to crown (v/hz) = 0.020
 Street flow is on [2] side(s) of the street
 Distance from curb to property line = 10.000(Ft.)
 Slope from curb to property line (v/hz) = 0.025
 Gutter width = 2.000(Ft.)
 Gutter hike from flowline = 2.000(In.)
 Manning's N in gutter = 0.0150
 Manning's N from gutter to grade break = 0.0150
 Manning's N from grade break to crown = 0.0150
 Estimated mean flow rate at midpoint of street = 6.419(CFS)
 Depth of flow = 0.390(Ft.), Average velocity = 1.720(Ft/s)
 Streetflow hydraulics at midpoint of street travel:
 Halfstreet flow width = 13.188(Ft.)
 Flow velocity = 1.72(Ft/s)
 Travel time = 2.28 min. TC = 15.90 min.
 Adding area flow to street
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.872
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Rainfall intensity = 2.699(In/Hr) for a 100.0 year storm
 Subarea runoff = 1.882(CFS) for 0.800(Ac.)
 Total runoff = 7.273(CFS) Total area = 2.900(Ac.)
 Street flow at end of street = 7.273(CFS)
 Half street flow at end of street = 3.637(CFS)
 Depth of flow = 0.404(Ft.), Average velocity = 1.772(Ft/s)
 Flow width (from curb towards crown)= 13.876(Ft.)

+++++
 Process from Point/Station 229.000 to Point/Station 229.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 2.900 (Ac.)
 Runoff from this stream = 7.273 (CFS)
 Time of concentration = 15.90 min.
 Rainfall intensity = 2.699 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	10.336	16.77	2.621

2	7.273	15.90	2.699

Largest stream flow has longer time of concentration

Qp = 10.336 + sum of
 Qb Ia/Ib
 7.273 * 0.971 = 7.063
 Qp = 17.399

Total of 2 streams to confluence:

Flow rates before confluence point:

10.336 7.273

Area of streams before confluence:

4.300 2.900

Results of confluence:

Total flow rate = 17.399 (CFS)

Time of concentration = 16.772 min.

Effective stream area after confluence = 7.200 (Ac.)

+++++
 Process from Point/Station 229.000 to Point/Station 231.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 374.000 (Ft.)

Downstream point/station elevation = 371.000 (Ft.)

Pipe length = 190.00 (Ft.) Manning's N = 0.013

No. of pipes = 1 Required pipe flow = 17.399 (CFS)

Nearest computed pipe diameter = 21.00 (In.)

Calculated individual pipe flow = 17.399 (CFS)

Normal flow depth in pipe = 15.21 (In.)

Flow top width inside pipe = 18.77 (In.)

Critical Depth = 18.29 (In.)

Pipe flow velocity = 9.33 (Ft/s)

Travel time through pipe = 0.34 min.

Time of concentration (TC) = 17.11 min.

```

+++++
Process from Point/Station      231.000 to Point/Station      231.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 7.200(Ac.)
 Runoff from this stream = 17.399(CFS)
 Time of concentration = 17.11 min.
 Rainfall intensity = 2.592(In/Hr)

```

+++++
Process from Point/Station      230.000 to Point/Station      231.000
**** INITIAL AREA EVALUATION ****

```

Initial area flow distance = 340.000(Ft.)
 Top (of initial area) elevation = 374.000(Ft.)
 Bottom (of initial area) elevation = 370.000(Ft.)
 Difference in elevation = 4.000(Ft.)
 Slope = 0.01176 s(percent)= 1.18
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.762 min.
 Rainfall intensity = 3.529(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.878
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.169(CFS)
 Total initial stream area = 0.700(Ac.)
 Pervious area fraction = 0.500

```

+++++
Process from Point/Station      231.000 to Point/Station      231.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 0.700(Ac.)
 Runoff from this stream = 2.169(CFS)
 Time of concentration = 9.76 min.
 Rainfall intensity = 3.529(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	17.399	17.11	2.592
2	2.169	9.76	3.529

Largest stream flow has longer time of concentration

$Q_p = 17.399 + \text{sum of}$
 $\quad Q_b \quad I_a/I_b$
 $\quad 2.169 * \quad 0.734 = \quad 1.593$
 $Q_p = \quad 18.992$

Total of 2 streams to confluence:

Flow rates before confluence point:

17.399 2.169

Area of streams before confluence:

7.200 0.700

Results of confluence:

Total flow rate = 18.992(CFS)

Time of concentration = 17.111 min.

Effective stream area after confluence = 7.900(Ac.)

++++++
 Process from Point/Station 231.000 to Point/Station 232.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 370.000(Ft.)
 Downstream point/station elevation = 369.000(Ft.)
 Pipe length = 80.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 18.992(CFS)
 Nearest computed pipe diameter = 24.00(In.)
 Calculated individual pipe flow = 18.992(CFS)
 Normal flow depth in pipe = 15.52(In.)
 Flow top width inside pipe = 22.95(In.)
 Critical Depth = 18.81(In.)
 Pipe flow velocity = 8.84(Ft/s)
 Travel time through pipe = 0.15 min.
 Time of concentration (TC) = 17.26 min.

++++++
 Process from Point/Station 232.000 to Point/Station 232.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 7.900(Ac.)
 Runoff from this stream = 18.992(CFS)
 Time of concentration = 17.26 min.
 Rainfall intensity = 2.579(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	84.545	12.53	3.076
2	18.992	17.26	2.579

Largest stream flow has longer or shorter time of concentration

$Q_p = 84.545 + \text{sum of}$

Q_a T_b/T_a
 18.992 * 0.726 = 13.787
 $Q_p =$ 98.332

Total of 2 main streams to confluence:

Flow rates before confluence point:

84.545 18.992

Area of streams before confluence:

33.300 7.900

Results of confluence:

Total flow rate = 98.332 (CFS)

Time of concentration = 12.532 min.

Effective stream area after confluence = 41.200 (Ac.)

++++++
 Process from Point/Station 232.000 to Point/Station 235.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 369.000 (Ft.)
 Downstream point/station elevation = 268.500 (Ft.)
 Pipe length = 160.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 98.332 (CFS)
 Nearest computed pipe diameter = 21.00 (In.)
 Calculated individual pipe flow = 98.332 (CFS)
 Normal flow depth in pipe = 13.99 (In.)
 Flow top width inside pipe = 19.80 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 57.78 (Ft/s)
 Travel time through pipe = 0.05 min.
 Time of concentration (TC) = 12.58 min.

++++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 41.200 (Ac.)
 Runoff from this stream = 98.332 (CFS)
 Time of concentration = 12.58 min.
 Rainfall intensity = 3.070 (In/Hr)

++++++
 Process from Point/Station 233.000 to Point/Station 235.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 920.000 (Ft.)
 Top (of initial area) elevation = 404.500 (Ft.)
 Bottom (of initial area) elevation = 368.500 (Ft.)
 Difference in elevation = 36.000 (Ft.)

Slope = 0.03913 s(percent)= 3.91
 TC = $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
 Initial area time of concentration = 11.431 min.
 Rainfall intensity = 3.236(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.876
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 7.654(CFS)
 Total initial stream area = 2.700(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** SUBAREA FLOW ADDITION ****

UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.865
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 91.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Time of concentration = 11.43 min.
 Rainfall intensity = 3.236(In/Hr) for a 100.0 year storm
 Subarea runoff = 5.876(CFS) for 2.100(Ac.)
 Total runoff = 13.530(CFS) Total area = 4.800(Ac.)

++++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 4.800(Ac.)
 Runoff from this stream = 13.530(CFS)
 Time of concentration = 11.43 min.
 Rainfall intensity = 3.236(In/Hr)

++++++
 Process from Point/Station 234.000 to Point/Station 235.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 525.000(Ft.)
 Top (of initial area) elevation = 374.000(Ft.)
 Bottom (of initial area) elevation = 368.500(Ft.)
 Difference in elevation = 5.500(Ft.)

Slope = 0.01048 s(percent)= 1.05
 TC = $k(0.390)*[(\text{length}^3)/(\text{elevation change})]^{0.2}$
 Initial area time of concentration = 11.887 min.
 Rainfall intensity = 3.167(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.876
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.714(CFS)
 Total initial stream area = 1.700(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 235.000 to Point/Station 235.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3

Stream flow area = 1.700(Ac.)
 Runoff from this stream = 4.714(CFS)
 Time of concentration = 11.89 min.
 Rainfall intensity = 3.167(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	98.332	12.58	3.070
2	13.530	11.43	3.236
3	4.714	11.89	3.167

Largest stream flow has longer time of concentration

Qp = 98.332 + sum of
 Qb Ia/Ib
 13.530 * 0.949 = 12.837
 Qb Ia/Ib
 4.714 * 0.969 = 4.570
 Qp = 115.738

Total of 3 streams to confluence:

Flow rates before confluence point:
 98.332 13.530 4.714

Area of streams before confluence:
 41.200 4.800 1.700

Results of confluence:

Total flow rate = 115.738(CFS)
 Time of concentration = 12.578 min.
 Effective stream area after confluence = 47.700(Ac.)

```

+++++
Process from Point/Station      235.000 to Point/Station      239.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```

```

Upstream point/station elevation = 368.500(Ft.)
Downstream point/station elevation = 368.300(Ft.)
Pipe length = 30.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 115.738(CFS)
Nearest computed pipe diameter = 48.00(In.)
Calculated individual pipe flow = 115.738(CFS)
Normal flow depth in pipe = 38.81(In.)
Flow top width inside pipe = 37.77(In.)
Critical Depth = 38.96(In.)
Pipe flow velocity = 10.64(Ft/s)
Travel time through pipe = 0.05 min.
Time of concentration (TC) = 12.62 min.

```

```

+++++
Process from Point/Station      239.000 to Point/Station      239.000
**** CONFLUENCE OF MAIN STREAMS ****

```

The following data inside Main Stream is listed:

```

In Main Stream number: 1
Stream flow area = 47.700(Ac.)
Runoff from this stream = 115.738(CFS)
Time of concentration = 12.62 min.
Rainfall intensity = 3.064(In/Hr)
Program is now starting with Main Stream No. 2

```

```

+++++
Process from Point/Station      236.000 to Point/Station      238.000
**** INITIAL AREA EVALUATION ****

```

```

Initial area flow distance = 765.000(Ft.)
Top (of initial area) elevation = 408.500(Ft.)
Bottom (of initial area) elevation = 376.000(Ft.)
Difference in elevation = 32.500(Ft.)
Slope = 0.04248 s(percent)= 4.25
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.444 min.
Rainfall intensity = 3.400(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3) = 88.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 4.176(CFS)
Total initial stream area = 1.400(Ac.)
Pervious area fraction = 0.500

```



```

+++++
Process from Point/Station      238.000 to Point/Station      238.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 1.400 (Ac.)
 Runoff from this stream = 4.176 (CFS)
 Time of concentration = 10.44 min.
 Rainfall intensity = 3.400 (In/Hr)

```

+++++
Process from Point/Station      237.000 to Point/Station      238.000
**** INITIAL AREA EVALUATION ****

```

Initial area flow distance = 510.000 (Ft.)
 Top (of initial area) elevation = 383.000 (Ft.)
 Bottom (of initial area) elevation = 376.000 (Ft.)
 Difference in elevation = 7.000 (Ft.)
 Slope = 0.01373 s(percent) = 1.37
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.132 min.
 Rainfall intensity = 3.283 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.876
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.316 (CFS)
 Total initial stream area = 1.500 (Ac.)
 Pervious area fraction = 0.500

```

+++++
Process from Point/Station      238.000 to Point/Station      238.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 1.500 (Ac.)
 Runoff from this stream = 4.316 (CFS)
 Time of concentration = 11.13 min.
 Rainfall intensity = 3.283 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	4.176	10.44	3.400

2 4.316 11.13 3.283
 Largest stream flow has longer time of concentration

Qp = 4.316 + sum of
 Qb Ia/Ib
 4.176 * 0.966 = 4.032
 Qp = 8.348

Total of 2 streams to confluence:

Flow rates before confluence point:

4.176 4.316

Area of streams before confluence:

1.400 1.500

Results of confluence:

Total flow rate = 8.348(CFS)

Time of concentration = 11.132 min.

Effective stream area after confluence = 2.900(Ac.)

+++++
 Process from Point/Station 238.000 to Point/Station 239.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 376.000(Ft.)
 Downstream point/station elevation = 368.300(Ft.)
 Pipe length = 230.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 8.348(CFS)
 Nearest computed pipe diameter = 15.00(In.)
 Calculated individual pipe flow = 8.348(CFS)
 Normal flow depth in pipe = 9.30(In.)
 Flow top width inside pipe = 14.56(In.)
 Critical Depth = 13.56(In.)
 Pipe flow velocity = 10.44(Ft/s)
 Travel time through pipe = 0.37 min.
 Time of concentration (TC) = 11.50 min.

+++++
 Process from Point/Station 239.000 to Point/Station 239.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 2.900(Ac.)
 Runoff from this stream = 8.348(CFS)
 Time of concentration = 11.50 min.
 Rainfall intensity = 3.225(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	115.738	12.62	3.064
2	8.348	11.50	3.225

Largest stream flow has longer time of concentration

Qp = 115.738 + sum of
 Qb Ia/Ib
 8.348 * 0.950 = 7.930
 Qp = 123.669

Total of 2 main streams to confluence:

Flow rates before confluence point:

115.738 8.348

Area of streams before confluence:

47.700 2.900

Results of confluence:

Total flow rate = 123.669(CFS)

Time of concentration = 12.625 min.

Effective stream area after confluence = 50.600(Ac.)

+++++
 Process from Point/Station 239.000 to Point/Station 243.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 368.300(Ft.)
 Downstream point/station elevation = 350.000(Ft.)
 Pipe length = 270.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 123.669(CFS)
 Nearest computed pipe diameter = 33.00(In.)
 Calculated individual pipe flow = 123.669(CFS)
 Normal flow depth in pipe = 24.42(In.)
 Flow top width inside pipe = 28.95(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 26.23(Ft/s)
 Travel time through pipe = 0.17 min.
 Time of concentration (TC) = 12.80 min.

+++++
 Process from Point/Station 243.000 to Point/Station 243.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 50.600(Ac.)
 Runoff from this stream = 123.669(CFS)
 Time of concentration = 12.80 min.
 Rainfall intensity = 3.041(In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 240.000 to Point/Station 242.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 750.000(Ft.)
 Top (of initial area) elevation = 383.000(Ft.)
 Bottom (of initial area) elevation = 372.000(Ft.)
 Difference in elevation = 11.000(Ft.)
 Slope = 0.01467 s(percent)= 1.47
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.818 min.
 Rainfall intensity = 3.038(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.875
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.377(CFS)
 Total initial stream area = 2.400(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 242.000 to Point/Station 242.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 2.400(Ac.)
 Runoff from this stream = 6.377(CFS)
 Time of concentration = 12.82 min.
 Rainfall intensity = 3.038(In/Hr)

++++++
 Process from Point/Station 241.000 to Point/Station 242.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 460.000(Ft.)
 Top (of initial area) elevation = 379.000(Ft.)
 Bottom (of initial area) elevation = 372.000(Ft.)
 Difference in elevation = 7.000(Ft.)
 Slope = 0.01522 s(percent)= 1.52
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.464 min.
 Rainfall intensity = 3.397(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.877
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.555(CFS)
 Total initial stream area = 2.200(Ac.)

Pervious area fraction = 0.500

+++++
 Process from Point/Station 242.000 to Point/Station 242.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 2.200 (Ac.)
 Runoff from this stream = 6.555 (CFS)
 Time of concentration = 10.46 min.
 Rainfall intensity = 3.397 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	6.377	12.82	3.038
2	6.555	10.46	3.397

Largest stream flow has longer or shorter time of concentration

Qp = 6.555 + sum of

$$Q_a \quad T_b/T_a$$

$$6.377 * 0.816 = 5.206$$
 Qp = 11.761

Total of 2 streams to confluence:

Flow rates before confluence point:

6.377 6.555

Area of streams before confluence:

2.400 2.200

Results of confluence:

Total flow rate = 11.761 (CFS)

Time of concentration = 10.464 min.

Effective stream area after confluence = 4.600 (Ac.)

+++++
 Process from Point/Station 242.000 to Point/Station 243.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 372.000 (Ft.)
 Downstream point/station elevation = 350.000 (Ft.)
 Pipe length = 275.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 11.761 (CFS)
 Nearest computed pipe diameter = 15.00 (In.)
 Calculated individual pipe flow = 11.761 (CFS)
 Normal flow depth in pipe = 8.75 (In.)
 Flow top width inside pipe = 14.79 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 15.82 (Ft/s)
 Travel time through pipe = 0.29 min.
 Time of concentration (TC) = 10.75 min.

```

+++++
Process from Point/Station      243.000 to Point/Station      243.000
**** CONFLUENCE OF MAIN STREAMS ****

```

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 4.600 (Ac.)
 Runoff from this stream = 11.761 (CFS)
 Time of concentration = 10.75 min.
 Rainfall intensity = 3.346 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	123.669	12.80	3.041
2	11.761	10.75	3.346

Largest stream flow has longer time of concentration

Qp = 123.669 + sum of
 Qb Ia/Ib
 11.761 * 0.909 = 10.688
 Qp = 134.357

Total of 2 main streams to confluence:

Flow rates before confluence point:

123.669 11.761

Area of streams before confluence:

50.600 4.600

Results of confluence:

Total flow rate = 134.357 (CFS)

Time of concentration = 12.797 min.

Effective stream area after confluence = 55.200 (Ac.)

```

+++++
Process from Point/Station      243.000 to Point/Station      245.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

```

Upstream point/station elevation = 350.000 (Ft.)
 Downstream point/station elevation = 349.000 (Ft.)
 Pipe length = 275.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 134.357 (CFS)
 Nearest computed pipe diameter = 57.00 (In.)
 Calculated individual pipe flow = 134.357 (CFS)
 Normal flow depth in pipe = 45.75 (In.)
 Flow top width inside pipe = 45.37 (In.)
 Critical Depth = 40.39 (In.)
 Pipe flow velocity = 8.81 (Ft/s)
 Travel time through pipe = 0.52 min.
 Time of concentration (TC) = 13.32 min.

```

+++++
Process from Point/Station      245.000 to Point/Station      245.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 55.200 (Ac.)
 Runoff from this stream = 134.357 (CFS)
 Time of concentration = 13.32 min.
 Rainfall intensity = 2.975 (In/Hr)

```

+++++
Process from Point/Station      244.000 to Point/Station      245.000
**** INITIAL AREA EVALUATION ****

```

Initial area flow distance = 375.000 (Ft.)
 Top (of initial area) elevation = 251.000 (Ft.)
 Bottom (of initial area) elevation = 249.000 (Ft.)
 Difference in elevation = 2.000 (Ft.)
 Slope = 0.00533 s(percent) = 0.53
 $TC = k(0.710) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 21.651 min.
 Rainfall intensity = 2.277 (In/Hr) for a 100.0 year storm
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.864
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 7.282 (CFS)
 Total initial stream area = 3.700 (Ac.)
 Pervious area fraction = 1.000

```

+++++
Process from Point/Station      245.000 to Point/Station      245.000
**** CONFLUENCE OF MINOR STREAMS ****

```

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 3.700 (Ac.)
 Runoff from this stream = 7.282 (CFS)
 Time of concentration = 21.65 min.
 Rainfall intensity = 2.277 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	134.357	13.32	2.975

2 7.282 21.65 2.277
 Largest stream flow has longer or shorter time of concentration
 $Q_p = 134.357 + \text{sum of}$
 Q_a T_b/T_a
 $7.282 * 0.615 = 4.479$
 $Q_p = 138.836$

Total of 2 streams to confluence:
 Flow rates before confluence point:
 134.357 7.282
 Area of streams before confluence:
 55.200 3.700
 Results of confluence:
 Total flow rate = 138.836 (CFS)
 Time of concentration = 13.317 min.
 Effective stream area after confluence = 58.900 (Ac.)

+++++
 Process from Point/Station 245.000 to Point/Station 247.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 349.000 (Ft.)
 Downstream point/station elevation = 332.000 (Ft.)
 Pipe length = 310.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 138.836 (CFS)
 Nearest computed pipe diameter = 36.00 (In.)
 Calculated individual pipe flow = 138.836 (CFS)
 Normal flow depth in pipe = 26.44 (In.)
 Flow top width inside pipe = 31.80 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 24.97 (Ft/s)
 Travel time through pipe = 0.21 min.
 Time of concentration (TC) = 13.52 min.

+++++
 Process from Point/Station 247.000 to Point/Station 247.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 58.900 (Ac.)
 Runoff from this stream = 138.836 (CFS)
 Time of concentration = 13.52 min.
 Rainfall intensity = 2.950 (In/Hr)

+++++
 Process from Point/Station 246.000 to Point/Station 247.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 460.000 (Ft.)
 Top (of initial area) elevation = 352.000 (Ft.)
 Bottom (of initial area) elevation = 332.000 (Ft.)

Difference in elevation = 20.000 (Ft.)
 Slope = 0.04348 s(percent) = 4.35
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.482 min.
 Rainfall intensity = 3.813 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.880
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.683 (CFS)
 Total initial stream area = 0.800 (Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 247.000 to Point/Station 247.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.800 (Ac.)
 Runoff from this stream = 2.683 (CFS)
 Time of concentration = 8.48 min.
 Rainfall intensity = 3.813 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	138.836	13.52	2.950
2	2.683	8.48	3.813

Largest stream flow has longer time of concentration

$Q_p = 138.836 + \text{sum of}$
 $Q_b \quad I_a/I_b$
 $2.683 * 0.774 = 2.076$
 $Q_p = 140.912$

Total of 2 streams to confluence:

Flow rates before confluence point:

138.836 2.683

Area of streams before confluence:

58.900 0.800

Results of confluence:

Total flow rate = 140.912 (CFS)

Time of concentration = 13.524 min.

Effective stream area after confluence = 59.700 (Ac.)

++++++
 Process from Point/Station 247.000 to Point/Station 250.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 332.000(Ft.)
 Downstream point/station elevation = 322.000(Ft.)
 Pipe length = 890.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 140.912(CFS)
 Nearest computed pipe diameter = 48.00(In.)
 Calculated individual pipe flow = 140.912(CFS)
 Normal flow depth in pipe = 36.47(In.)
 Flow top width inside pipe = 41.01(In.)
 Critical Depth = 42.23(In.)
 Pipe flow velocity = 13.76(Ft/s)
 Travel time through pipe = 1.08 min.
 Time of concentration (TC) = 14.60 min.

+++++
 Process from Point/Station 250.000 to Point/Station 250.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 59.700(Ac.)
 Runoff from this stream = 140.912(CFS)
 Time of concentration = 14.60 min.
 Rainfall intensity = 2.828(In/Hr)

+++++
 Process from Point/Station 248.000 to Point/Station 250.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 910.000(Ft.)
 Top (of initial area) elevation = 334.000(Ft.)
 Bottom (of initial area) elevation = 322.000(Ft.)
 Difference in elevation = 12.000(Ft.)
 Slope = 0.01319 s(percent)= 1.32
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 14.147 min.
 Rainfall intensity = 2.878(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.873
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 9.550(CFS)
 Total initial stream area = 3.800(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 250.000 to Point/Station 250.000

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 3.800(Ac.)
 Runoff from this stream = 9.550(CFS)
 Time of concentration = 14.15 min.
 Rainfall intensity = 2.878(In/Hr)

+++++
 Process from Point/Station 249.000 to Point/Station 250.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 935.000(Ft.)
 Top (of initial area) elevation = 334.000(Ft.)
 Bottom (of initial area) elevation = 322.000(Ft.)
 Difference in elevation = 12.000(Ft.)
 Slope = 0.01283 s(percent)= 1.28
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 14.379 min.
 Rainfall intensity = 2.852(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.873
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 8.217(CFS)
 Total initial stream area = 3.300(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 250.000 to Point/Station 250.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3
 Stream flow area = 3.300(Ac.)
 Runoff from this stream = 8.217(CFS)
 Time of concentration = 14.38 min.
 Rainfall intensity = 2.852(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	140.912	14.60	2.828
2	9.550	14.15	2.878
3	8.217	14.38	2.852

Largest stream flow has longer time of concentration
 Qp = 140.912 + sum of

Qb	Ia/Ib	
9.550 *	0.983 =	9.385
Qb	Ia/Ib	
8.217 *	0.992 =	8.148
Qp =	158.444	

Total of 3 streams to confluence:

Flow rates before confluence point:

140.912 9.550 8.217

Area of streams before confluence:

59.700 3.800 3.300

Results of confluence:

Total flow rate = 158.444 (CFS)

Time of concentration = 14.602 min.

Effective stream area after confluence = 66.800 (Ac.)

+++++
 Process from Point/Station 250.000 to Point/Station 259.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 322.000 (Ft.)
 Downstream point/station elevation = 321.000 (Ft.)
 Pipe length = 140.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 158.444 (CFS)
 Nearest computed pipe diameter = 54.00 (In.)
 Calculated individual pipe flow = 158.444 (CFS)
 Normal flow depth in pipe = 42.19 (In.)
 Flow top width inside pipe = 44.65 (In.)
 Critical Depth = 44.17 (In.)
 Pipe flow velocity = 11.90 (Ft/s)
 Travel time through pipe = 0.20 min.
 Time of concentration (TC) = 14.80 min.

+++++
 Process from Point/Station 259.000 to Point/Station 259.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 66.800 (Ac.)
 Runoff from this stream = 158.444 (CFS)
 Time of concentration = 14.80 min.
 Rainfall intensity = 2.807 (In/Hr)
 Program is now starting with Main Stream No. 2

+++++
 Process from Point/Station 251.000 to Point/Station 252.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 910.000 (Ft.)
 Top (of initial area) elevation = 383.000 (Ft.)

Bottom (of initial area) elevation = 368.000 (Ft.)
 Difference in elevation = 15.000 (Ft.)
 Slope = 0.01648 s(percent)= 1.65
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 13.529 min.
 Rainfall intensity = 2.949 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.874
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 7.990 (CFS)
 Total initial stream area = 3.100 (Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 252.000 to Point/Station 254.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 368.000 (Ft.)
 Downstream point/station elevation = 364.000 (Ft.)
 Pipe length = 100.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 7.990 (CFS)
 Nearest computed pipe diameter = 15.00 (In.)
 Calculated individual pipe flow = 7.990 (CFS)
 Normal flow depth in pipe = 8.53 (In.)
 Flow top width inside pipe = 14.86 (In.)
 Critical Depth = 13.37 (In.)
 Pipe flow velocity = 11.08 (Ft/s)
 Travel time through pipe = 0.15 min.
 Time of concentration (TC) = 13.68 min.

++++++
 Process from Point/Station 254.000 to Point/Station 254.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 3.100 (Ac.)
 Runoff from this stream = 7.990 (CFS)
 Time of concentration = 13.68 min.
 Rainfall intensity = 2.931 (In/Hr)

++++++
 Process from Point/Station 253.000 to Point/Station 254.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 770.000 (Ft.)
 Top (of initial area) elevation = 383.000 (Ft.)

Bottom (of initial area) elevation = 364.000 (Ft.)
 Difference in elevation = 19.000 (Ft.)
 Slope = 0.02468 s(percent) = 2.47
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 11.674 min.
 Rainfall intensity = 3.199 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.876
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 9.525 (CFS)
 Total initial stream area = 3.400 (Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 254.000 to Point/Station 254.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 3.400 (Ac.)
 Runoff from this stream = 9.525 (CFS)
 Time of concentration = 11.67 min.
 Rainfall intensity = 3.199 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	7.990	13.68	2.931
2	9.525	11.67	3.199

Largest stream flow has longer or shorter time of concentration

$Q_p = 9.525 + \text{sum of}$
 $\quad Q_a \quad T_b/T_a$
 $\quad 7.990 * 0.853 = 6.818$
 $Q_p = 16.343$

Total of 2 streams to confluence:

Flow rates before confluence point:
 7.990 9.525

Area of streams before confluence:
 3.100 3.400

Results of confluence:

Total flow rate = 16.343 (CFS)
 Time of concentration = 11.674 min.
 Effective stream area after confluence = 6.500 (Ac.)

+++++

Process from Point/Station 254.000 to Point/Station 256.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 364.000 (Ft.)
 Downstream point/station elevation = 340.000 (Ft.)
 Pipe length = 400.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 16.343 (CFS)
 Nearest computed pipe diameter = 18.00 (In.)
 Calculated individual pipe flow = 16.343 (CFS)
 Normal flow depth in pipe = 10.42 (In.)
 Flow top width inside pipe = 17.78 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 15.42 (Ft/s)
 Travel time through pipe = 0.43 min.
 Time of concentration (TC) = 12.11 min.

+++++
 Process from Point/Station 256.000 to Point/Station 256.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 6.500 (Ac.)
 Runoff from this stream = 16.343 (CFS)
 Time of concentration = 12.11 min.
 Rainfall intensity = 3.135 (In/Hr)

+++++
 Process from Point/Station 355.000 to Point/Station 356.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 830.000 (Ft.)
 Top (of initial area) elevation = 352.500 (Ft.)
 Bottom (of initial area) elevation = 340.000 (Ft.)
 Difference in elevation = 12.500 (Ft.)
 Slope = 0.01506 s(percent) = 1.51
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 13.278 min.
 Rainfall intensity = 2.980 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.874
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 11.722 (CFS)
 Total initial stream area = 4.500 (Ac.)
 Pervious area fraction = 0.500

+++++

Process from Point/Station 356.000 to Point/Station 356.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 4.500 (Ac.)
 Runoff from this stream = 11.722 (CFS)
 Time of concentration = 13.28 min.
 Rainfall intensity = 2.980 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	16.343	12.11	3.135
2	11.722	13.28	2.980

Largest stream flow has longer or shorter time of concentration

Qp = 16.343 + sum of

$$Qa \quad Tb/Ta$$

$$11.722 * 0.912 = 10.687$$
 Qp = 27.030

Total of 2 streams to confluence:

Flow rates before confluence point:

16.343 11.722

Area of streams before confluence:

6.500 4.500

Results of confluence:

Total flow rate = 27.030 (CFS)

Time of concentration = 12.106 min.

Effective stream area after confluence = 11.000 (Ac.)

 Process from Point/Station 256.000 to Point/Station 258.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 340.000 (Ft.)
 Downstream point/station elevation = 321.000 (Ft.)
 Pipe length = 220.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 27.030 (CFS)
 Nearest computed pipe diameter = 18.00 (In.)
 Calculated individual pipe flow = 27.030 (CFS)
 Normal flow depth in pipe = 13.05 (In.)
 Flow top width inside pipe = 16.07 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 19.70 (Ft/s)
 Travel time through pipe = 0.19 min.
 Time of concentration (TC) = 12.29 min.

 Process from Point/Station 258.000 to Point/Station 258.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 11.000(Ac.)
 Runoff from this stream = 27.030(CFS)
 Time of concentration = 12.29 min.
 Rainfall intensity = 3.109(In/Hr)

+++++
 Process from Point/Station 259.000 to Point/Station 258.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 620.000(Ft.)
 Top (of initial area) elevation = 360.000(Ft.)
 Bottom (of initial area) elevation = 323.000(Ft.)
 Difference in elevation = 37.000(Ft.)
 Slope = 0.05968 s(percent)= 5.97
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 8.971 min.
 Rainfall intensity = 3.697(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.879
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 3.899(CFS)
 Total initial stream area = 1.200(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 258.000 to Point/Station 258.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 1.200(Ac.)
 Runoff from this stream = 3.899(CFS)
 Time of concentration = 8.97 min.
 Rainfall intensity = 3.697(In/Hr)

+++++
 Process from Point/Station 257.000 to Point/Station 258.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 352.000(Ft.)
 Bottom (of initial area) elevation = 323.000(Ft.)
 Difference in elevation = 29.000(Ft.)
 Slope = 0.02900 s(percent)= 2.90
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 12.548 min.
 Rainfall intensity = 3.074 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.875
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.723 (CFS)
 Total initial stream area = 2.500 (Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 258.000 to Point/Station 258.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3

Stream flow area = 2.500 (Ac.)
 Runoff from this stream = 6.723 (CFS)
 Time of concentration = 12.55 min.
 Rainfall intensity = 3.074 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	27.030	12.29	3.109
2	3.899	8.97	3.697
3	6.723	12.55	3.074

Largest stream flow has longer or shorter time of concentration

Qp = 27.030 + sum of
 Qb Ia/Ib
 3.899 * 0.841 = 3.279
 Qa Tb/Ta
 6.723 * 0.980 = 6.586
 Qp = 36.895

Total of 3 streams to confluence:

Flow rates before confluence point:
 27.030 3.899 6.723

Area of streams before confluence:
 11.000 1.200 2.500

Results of confluence:

Total flow rate = 36.895 (CFS)
 Time of concentration = 12.292 min.
 Effective stream area after confluence = 14.700 (Ac.)

++++++
 Process from Point/Station 258.000 to Point/Station 259.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 323.000(Ft.)
 Downstream point/station elevation = 321.000(Ft.)
 Pipe length = 40.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 36.895(CFS)
 Nearest computed pipe diameter = 24.00(In.)
 Calculated individual pipe flow = 36.895(CFS)
 Normal flow depth in pipe = 15.21(In.)
 Flow top width inside pipe = 23.12(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 17.57(Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 12.33 min.

+++++
 Process from Point/Station 259.000 to Point/Station 259.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 14.700(Ac.)
 Runoff from this stream = 36.895(CFS)
 Time of concentration = 12.33 min.
 Rainfall intensity = 3.104(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	158.444	14.80	2.807
2	36.895	12.33	3.104

Largest stream flow has longer time of concentration

Qp = 158.444 + sum of
 Qb Ia/Ib
 36.895 * 0.905 = 33.372
 Qp = 191.817

Total of 2 main streams to confluence:

Flow rates before confluence point:

158.444 36.895

Area of streams before confluence:

66.800 14.700

Results of confluence:

Total flow rate = 191.817(CFS)

Time of concentration = 14.798 min.

Effective stream area after confluence = 81.500(Ac.)

+++++

Process from Point/Station 259.000 to Point/Station 261.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 321.000(Ft.)
 Downstream point/station elevation = 320.500(Ft.)
 Pipe length = 40.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 191.817(CFS)
 Nearest computed pipe diameter = 51.00(In.)
 Calculated individual pipe flow = 191.817(CFS)
 Normal flow depth in pipe = 42.56(In.)
 Flow top width inside pipe = 37.90(In.)
 Critical Depth = 47.14(In.)
 Pipe flow velocity = 15.16(Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 14.84 min.

+++++
 Process from Point/Station 261.000 to Point/Station 261.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 81.500(Ac.)
 Runoff from this stream = 191.817(CFS)
 Time of concentration = 14.84 min.
 Rainfall intensity = 2.803(In/Hr)

+++++
 Process from Point/Station 260.000 to Point/Station 261.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 420.000(Ft.)
 Top (of initial area) elevation = 328.000(Ft.)
 Bottom (of initial area) elevation = 320.500(Ft.)
 Difference in elevation = 7.500(Ft.)
 Slope = 0.01786 s(percent) = 1.79
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.772 min.
 Rainfall intensity = 3.527(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.878
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.264(CFS)
 Total initial stream area = 1.700(Ac.)
 Pervious area fraction = 0.500

+++++

Process from Point/Station 261.000 to Point/Station 261.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 1.700 (Ac.)
 Runoff from this stream = 5.264 (CFS)
 Time of concentration = 9.77 min.
 Rainfall intensity = 3.527 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	191.817	14.84	2.803
2	5.264	9.77	3.527

Largest stream flow has longer time of concentration

Qp = 191.817 + sum of
 Qb Ia/Ib
 5.264 * 0.795 = 4.183
 Qp = 196.000

Total of 2 streams to confluence:

Flow rates before confluence point:

191.817 5.264

Area of streams before confluence:

81.500 1.700

Results of confluence:

Total flow rate = 196.000 (CFS)

Time of concentration = 14.842 min.

Effective stream area after confluence = 83.200 (Ac.)

 Process from Point/Station 261.000 to Point/Station 264.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 320.500 (Ft.)
 Downstream point/station elevation = 318.000 (Ft.)
 Pipe length = 330.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 196.000 (CFS)
 Nearest computed pipe diameter = 57.00 (In.)
 Calculated individual pipe flow = 196.000 (CFS)
 Normal flow depth in pipe = 46.31 (In.)
 Flow top width inside pipe = 44.50 (In.)
 Critical Depth = 48.23 (In.)
 Pipe flow velocity = 12.72 (Ft/s)
 Travel time through pipe = 0.43 min.
 Time of concentration (TC) = 15.27 min.

 Process from Point/Station 264.000 to Point/Station 264.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 83.200 (Ac.)
 Runoff from this stream = 196.000 (CFS)
 Time of concentration = 15.27 min.
 Rainfall intensity = 2.759 (In/Hr)

+++++
 Process from Point/Station 262.000 to Point/Station 263.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 605.000 (Ft.)
 Top (of initial area) elevation = 370.000 (Ft.)
 Bottom (of initial area) elevation = 364.000 (Ft.)
 Difference in elevation = 6.000 (Ft.)
 Slope = 0.00992 s(percent) = 0.99
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.720 min.
 Rainfall intensity = 3.051 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.875
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil (AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 9.341 (CFS)
 Total initial stream area = 3.500 (Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 263.000 to Point/Station 264.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 364.000 (Ft.)
 Downstream point/station elevation = 318.000 (Ft.)
 Pipe length = 255.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 9.341 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 9.341 (CFS)
 Normal flow depth in pipe = 6.82 (In.)
 Flow top width inside pipe = 11.89 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 20.27 (Ft/s)
 Travel time through pipe = 0.21 min.
 Time of concentration (TC) = 12.93 min.

+++++
 Process from Point/Station 264.000 to Point/Station 264.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 3.500 (Ac.)
 Runoff from this stream = 9.341 (CFS)
 Time of concentration = 12.93 min.
 Rainfall intensity = 3.024 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	196.000	15.27	2.759
2	9.341	12.93	3.024

Largest stream flow has longer time of concentration

Qp = 196.000 + sum of
 Qb Ia/Ib
 9.341 * 0.912 = 8.523
 Qp = 204.523

Total of 2 streams to confluence:

Flow rates before confluence point:

196.000 9.341

Area of streams before confluence:

83.200 3.500

Results of confluence:

Total flow rate = 204.523 (CFS)

Time of concentration = 15.275 min.

Effective stream area after confluence = 86.700 (Ac.)

+++++
 Process from Point/Station 264.000 to Point/Station 265.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 318.000 (Ft.)
 Downstream point/station elevation = 290.000 (Ft.)
 Pipe length = 225.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 204.523 (CFS)
 Nearest computed pipe diameter = 36.00 (In.)
 Calculated individual pipe flow = 204.523 (CFS)
 Normal flow depth in pipe = 25.97 (In.)
 Flow top width inside pipe = 32.28 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 37.50 (Ft/s)
 Travel time through pipe = 0.10 min.
 Time of concentration (TC) = 15.37 min.

+++++
 Process from Point/Station 265.000 to Point/Station 269.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 290.000 (Ft.)

Downstream point elevation = 287.000(Ft.)
 Channel length thru subarea = 300.000(Ft.)
 Channel base width = 100.000(Ft.)
 Slope or 'Z' of left channel bank = 4.000
 Slope or 'Z' of right channel bank = 4.000
 Estimated mean flow rate at midpoint of channel = 209.599(CFS)
 Manning's 'N' = 0.030
 Maximum depth of channel = 5.000(Ft.)
 Flow(q) thru subarea = 209.599(CFS)
 Depth of flow = 0.594(Ft.), Average velocity = 3.445(Ft/s)
 Channel flow top width = 104.754(Ft.)
 Flow Velocity = 3.44(Ft/s)
 Travel time = 1.45 min.
 Time of concentration = 16.83 min.

Sub-Channel No. 1 Critical depth = 0.512(Ft.)
 ' ' ' Critical flow top width = 104.094(Ft.)
 ' ' ' Critical flow velocity= 4.014(Ft/s)
 ' ' ' Critical flow area = 52.219(Sq.Ft)

Adding area flow to channel

UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.857
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 91.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.616(In/Hr) for a 100.0 year storm
 Subarea runoff = 10.086(CFS) for 4.500(Ac.)
 Total runoff = 214.609(CFS) Total area = 91.200(Ac.)
 Depth of flow = 0.603(Ft.), Average velocity = 3.477(Ft/s)

Sub-Channel No. 1 Critical depth = 0.520(Ft.)
 ' ' ' Critical flow top width = 104.156(Ft.)
 ' ' ' Critical flow velocity= 4.047(Ft/s)
 ' ' ' Critical flow area = 53.033(Sq.Ft)

++++++
 Process from Point/Station 269.000 to Point/Station 269.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 91.200(Ac.)
 Runoff from this stream = 214.609(CFS)
 Time of concentration = 16.83 min.
 Rainfall intensity = 2.616(In/Hr)

++++++
 Process from Point/Station 266.000 to Point/Station 267.000

**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 334.000(Ft.)
 Bottom (of initial area) elevation = 303.000(Ft.)
 Difference in elevation = 31.000(Ft.)
 Slope = 0.03100 s(percent)= 3.10
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.382 min.
 Rainfall intensity = 3.097(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.875
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.877(CFS)
 Total initial stream area = 1.800(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 267.000 to Point/Station 268.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 303.000(Ft.)
 Downstream point/station elevation = 287.000(Ft.)
 Pipe length = 330.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 4.877(CFS)
 Nearest computed pipe diameter = 12.00(In.)
 Calculated individual pipe flow = 4.877(CFS)
 Normal flow depth in pipe = 6.85(In.)
 Flow top width inside pipe = 11.88(In.)
 Critical Depth = 10.92(In.)
 Pipe flow velocity = 10.53(Ft/s)
 Travel time through pipe = 0.52 min.
 Time of concentration (TC) = 12.90 min.

+++++
 Process from Point/Station 268.000 to Point/Station 269.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 287.500(Ft.)
 Downstream point elevation = 287.000(Ft.)
 Channel length thru subarea = 50.000(Ft.)
 Channel base width = 40.000(Ft.)
 Slope or 'Z' of left channel bank = 4.000
 Slope or 'Z' of right channel bank = 4.000
 Manning's 'N' = 0.030
 Maximum depth of channel = 5.000(Ft.)
 Flow(q) thru subarea = 4.877(CFS)

Depth of flow = 0.108(Ft.), Average velocity = 1.116(Ft/s)
 Channel flow top width = 40.865(Ft.)
 Flow Velocity = 1.12(Ft/s)
 Travel time = 0.75 min.
 Time of concentration = 13.65 min.

Sub-Channel No. 1 Critical depth = 0.077(Ft.)
 ' ' ' Critical flow top width = 40.617(Ft.)
 ' ' ' Critical flow velocity = 1.568(Ft/s)
 ' ' ' Critical flow area = 3.110(Sq.Ft)

+++++
 Process from Point/Station 269.000 to Point/Station 269.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 1.800(Ac.)
 Runoff from this stream = 4.877(CFS)
 Time of concentration = 13.65 min.
 Rainfall intensity = 2.935(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	214.609	16.83	2.616
2	4.877	13.65	2.935

Largest stream flow has longer time of concentration

Qp = 214.609 + sum of
 Qb Ia/Ib
 4.877 * 0.891 = 4.348
 Qp = 218.957

Total of 2 streams to confluence:

Flow rates before confluence point:

214.609 4.877

Area of streams before confluence:

91.200 1.800

Results of confluence:

Total flow rate = 218.957(CFS)

Time of concentration = 16.826 min.

Effective stream area after confluence = 93.000(Ac.)

+++++
 Process from Point/Station 269.000 to Point/Station 277.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 287.000(Ft.)
 Downstream point/station elevation = 283.000(Ft.)
 Pipe length = 150.00(Ft.) Manning's N = 0.013

No. of pipes = 1 Required pipe flow = 218.957(CFS)
 Nearest computed pipe diameter = 48.00(In.)
 Calculated individual pipe flow = 218.957(CFS)
 Normal flow depth in pipe = 36.75(In.)
 Flow top width inside pipe = 40.67(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 21.21(Ft/s)
 Travel time through pipe = 0.12 min.
 Time of concentration (TC) = 16.94 min.

++++++
 Process from Point/Station 277.000 to Point/Station 277.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 93.000(Ac.)
 Runoff from this stream = 218.957(CFS)
 Time of concentration = 16.94 min.
 Rainfall intensity = 2.606(In/Hr)
 Program is now starting with Main Stream No. 2

++++++
 Process from Point/Station 270.000 to Point/Station 271.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 660.000(Ft.)
 Top (of initial area) elevation = 473.000(Ft.)
 Bottom (of initial area) elevation = 388.000(Ft.)
 Difference in elevation = 85.000(Ft.)
 Slope = $0.12879 \text{ s(percent)} = 12.88$
 $TC = k(0.940) * [(length^3) / (elevation \text{ change})]^{0.2}$
 Initial area time of concentration = 19.009 min.
 Rainfall intensity = 2.446(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.823
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.500
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.500
 RI index for soil(AMC 3) = 85.30
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 18.113(CFS)
 Total initial stream area = 9.000(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 271.000 to Point/Station 272.000
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 388.000(Ft.)

End of natural channel elevation = 352.000(Ft.)
 Length of natural channel = 465.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 25.157(CFS)

Natural mountain channel type used
 L.A. County flood control district formula for channel velocity:
 $Velocity = 5.48(q^{.33})(slope^{.492})$
 Velocity using mean channel flow = 4.51(Ft/s)

Correction to map slope used on extremely rugged channels with
 drops and waterfalls (Plate D-6.2)
 Normal channel slope = 0.0774
 Corrected/adjusted channel slope = 0.0774
 Travel time = 1.72 min. TC = 20.73 min.

Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.865
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.333(In/Hr) for a 100.0 year storm
 Subarea runoff = 14.124(CFS) for 7.000(Ac.)
 Total runoff = 32.237(CFS) Total area = 16.000(Ac.)

+++++
 Process from Point/Station 272.000 to Point/Station 273.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 352.000(Ft.)
 Downstream point elevation = 347.000(Ft.)
 Channel length thru subarea = 250.000(Ft.)
 Channel base width = 10.000(Ft.)
 Slope or 'Z' of left channel bank = 2.000
 Slope or 'Z' of right channel bank = 2.000
 Estimated mean flow rate at midpoint of channel = 40.419(CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 5.000(Ft.)
 Flow(q) thru subarea = 40.419(CFS)
 Depth of flow = 0.468(Ft.), Average velocity = 7.897(Ft/s)
 Channel flow top width = 11.872(Ft.)
 Flow Velocity = 7.90(Ft/s)
 Travel time = 0.53 min.
 Time of concentration = 21.25 min.

Sub-Channel No. 1 Critical depth = 0.758(Ft.)
 ' ' ' Critical flow top width = 13.031(Ft.)
 ' ' ' Critical flow velocity = 4.632(Ft/s)
 ' ' ' Critical flow area = 8.727(Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.865
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.301(In/Hr) for a 100.0 year storm
 Subarea runoff = 16.310(CFS) for 8.200(Ac.)
 Total runoff = 48.547(CFS) Total area = 24.200(Ac.)
 Depth of flow = 0.521(Ft.), Average velocity = 8.432(Ft/s)

Sub-Channel No. 1 Critical depth = 0.852(Ft.)
 ' ' ' Critical flow top width = 13.406(Ft.)
 ' ' ' Critical flow velocity = 4.871(Ft/s)
 ' ' ' Critical flow area = 9.966(Sq.Ft)

+++++
 Process from Point/Station 273.000 to Point/Station 276.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 347.000(Ft.)
 Downstream point/station elevation = 340.000(Ft.)
 Pipe length = 530.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 48.547(CFS)
 Nearest computed pipe diameter = 30.00(In.)
 Calculated individual pipe flow = 48.547(CFS)
 Normal flow depth in pipe = 25.50(In.)
 Flow top width inside pipe = 21.42(In.)
 Critical Depth = 27.35(In.)
 Pipe flow velocity = 10.92(Ft/s)
 Travel time through pipe = 0.81 min.
 Time of concentration (TC) = 22.06 min.

+++++
 Process from Point/Station 276.000 to Point/Station 276.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 24.200(Ac.)
 Runoff from this stream = 48.547(CFS)
 Time of concentration = 22.06 min.
 Rainfall intensity = 2.254(In/Hr)

+++++
 Process from Point/Station 274.000 to Point/Station 275.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 975.000(Ft.)
 Top (of initial area) elevation = 522.000(Ft.)
 Bottom (of initial area) elevation = 344.000(Ft.)
 Difference in elevation = 178.000(Ft.)
 Slope = 0.18256 s(percent)= 18.26
 $TC = k(0.710)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 15.652 min.
 Rainfall intensity = 2.722(In/Hr) for a 100.0 year storm
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.870
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 20.838(CFS)
 Total initial stream area = 8.800(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 275.000 to Point/Station 276.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 344.000(Ft.)
 Downstream point/station elevation = 340.000(Ft.)
 Pipe length = 190.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 20.838(CFS)
 Nearest computed pipe diameter = 21.00(In.)
 Calculated individual pipe flow = 20.838(CFS)
 Normal flow depth in pipe = 15.66(In.)
 Flow top width inside pipe = 18.29(In.)
 Critical Depth = 19.41(In.)
 Pipe flow velocity = 10.83(Ft/s)
 Travel time through pipe = 0.29 min.
 Time of concentration (TC) = 15.94 min.

++++++
 Process from Point/Station 276.000 to Point/Station 276.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 8.800(Ac.)
 Runoff from this stream = 20.838(CFS)
 Time of concentration = 15.94 min.
 Rainfall intensity = 2.695(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1 48.547 22.06 2.254
 2 20.838 15.94 2.695

Largest stream flow has longer time of concentration

Qp = 48.547 + sum of
 Qb Ia/Ib
 20.838 * 0.836 = 17.429

Qp = 65.976

Total of 2 streams to confluence:

Flow rates before confluence point:

48.547 20.838

Area of streams before confluence:

24.200 8.800

Results of confluence:

Total flow rate = 65.976(CFS)

Time of concentration = 22.064 min.

Effective stream area after confluence = 33.000(Ac.)

+++++
 Process from Point/Station 276.000 to Point/Station 277.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 340.000(Ft.)
 Downstream point/station elevation = 283.000(Ft.)
 Pipe length = 1225.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 65.976(CFS)
 Nearest computed pipe diameter = 27.00(In.)
 Calculated individual pipe flow = 65.976(CFS)
 Normal flow depth in pipe = 21.84(In.)
 Flow top width inside pipe = 21.23(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 19.15(Ft/s)
 Travel time through pipe = 1.07 min.
 Time of concentration (TC) = 23.13 min.

+++++
 Process from Point/Station 277.000 to Point/Station 277.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 33.000(Ac.)
 Runoff from this stream = 65.976(CFS)
 Time of concentration = 23.13 min.
 Rainfall intensity = 2.196(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1 218.957 16.94 2.606
 2 65.976 23.13 2.196
 Largest stream flow has longer or shorter time of concentration
 $Q_p = 218.957 + \text{sum of}$
 Q_a T_b/T_a
 $65.976 * 0.733 = 48.331$
 $Q_p = 267.288$

Total of 2 main streams to confluence:
 Flow rates before confluence point:
 218.957 65.976
 Area of streams before confluence:
 93.000 33.000

Results of confluence:
 Total flow rate = 267.288(CFS)
 Time of concentration = 16.944 min.
 Effective stream area after confluence = 126.000(Ac.)

++++++
 Process from Point/Station 277.000 to Point/Station 278.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 283.000(Ft.)
 Downstream point elevation = 282.000(Ft.)
 Channel length thru subarea = 140.000(Ft.)
 Channel base width = 20.000(Ft.)
 Slope or 'Z' of left channel bank = 2.000
 Slope or 'Z' of right channel bank = 2.000
 Estimated mean flow rate at midpoint of channel = 273.614(CFS)
 Manning's 'N' = 0.030
 Maximum depth of channel = 5.000(Ft.)
 Flow(q) thru subarea = 273.614(CFS)
 Depth of flow = 1.967(Ft.), Average velocity = 5.810(Ft/s)
 Channel flow top width = 27.870(Ft.)
 Flow Velocity = 5.81(Ft/s)
 Travel time = 0.40 min.
 Time of concentration = 17.35 min.

Sub-Channel No. 1 Critical depth = 1.688(Ft.)
 ' ' Critical flow top width = 26.750(Ft.)
 ' ' Critical flow velocity = 6.937(Ft/s)
 ' ' Critical flow area = 39.445(Sq.Ft)

Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.868
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 93.40

Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.573(In/Hr) for a 100.0 year storm
 Subarea runoff = 12.731(CFS) for 5.700(Ac.)
 Total runoff = 280.019(CFS) Total area = 131.700(Ac.)
 Depth of flow = 1.994(Ft.), Average velocity = 5.855(Ft/s)

Sub-Channel No. 1 Critical depth = 1.719(Ft.)
 ' ' ' Critical flow top width = 26.875(Ft.)
 ' ' ' Critical flow velocity= 6.951(Ft/s)
 ' ' ' Critical flow area = 40.283(Sq.Ft)

End of computations, total study area = 131.70 (Ac.)
 The following figures may
 be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.687
 Area averaged RI index number = 76.9



MAYERS & ASSOCIATES
Civil Engineering, Inc.
PLANNING • ENGINEERING • SURVEYING

Preliminary Hydrology Analysis
VTTM 36557, 'Terracina'
City of Lake Elsinore / Riverside County

DRAINAGE AREA "C" CALCULATION

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 10/31/13 File:32786C.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557

10-Year Rational Hydrology Area "C" **Proposed Condition**

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 10.0

Calculated rainfall intensity data:

1 hour intensity = 0.880(In/Hr)

Slope of intensity duration curve = 0.5500

 Process from Point/Station 102.000 to Point/Station 103.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 830.000(Ft.)

Top (of initial area) elevation = 497.300(Ft.)

Bottom (of initial area) elevation = 468.000(Ft.)

Difference in elevation = 29.300(Ft.)

Slope = 0.03530 s(percent)= 3.53

$TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 11.198 min.

Rainfall intensity = 2.215(In/Hr) for a 10.0 year storm

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.804

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000

Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.098(CFS)
 Total initial stream area = 2.300(Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 103.000 to Point/Station 103.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 2.300(Ac.)
 Runoff from this stream = 4.098(CFS)
 Time of concentration = 11.20 min.
 Rainfall intensity = 2.215(In/Hr)

 Process from Point/Station 104.000 to Point/Station 103.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 900.000(Ft.)
 Top (of initial area) elevation = 498.000(Ft.)
 Bottom (of initial area) elevation = 479.000(Ft.)
 Difference in elevation = 19.000(Ft.)
 Slope = 0.02111 s(percent)= 2.11
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.819 min.
 Rainfall intensity = 2.057(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.798
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 69.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 5.255(CFS)
 Total initial stream area = 3.200(Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 103.000 to Point/Station 103.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 3.200(Ac.)
 Runoff from this stream = 5.255(CFS)
 Time of concentration = 12.82 min.
 Rainfall intensity = 2.057(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	4.098	11.20	2.215
2	5.255	12.82	2.057

Largest stream flow has longer time of concentration

Qp = 5.255 + sum of

Qb	Ia/Ib	
4.098 *	0.928 =	3.804

Qp = 9.059

Total of 2 streams to confluence:
Flow rates before confluence point:
4.098 5.255
Area of streams before confluence:
2.300 3.200
Results of confluence:
Total flow rate = 9.059(CFS)
Time of concentration = 12.819 min.
Effective stream area after confluence = 5.500(Ac.)

+++++

Process from Point/Station 103.000 to Point/Station 107.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 479.000(Ft.)
Downstream point/station elevation = 389.000(Ft.)
Pipe length = 1000.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 9.059(CFS)
Nearest computed pipe diameter = 12.00(In.)
Calculated individual pipe flow = 9.059(CFS)
Normal flow depth in pipe = 8.48(In.)
Flow top width inside pipe = 10.92(In.)
Critical depth could not be calculated.
Pipe flow velocity = 15.27(Ft/s)
Travel time through pipe = 1.09 min.
Time of concentration (TC) = 13.91 min.

+++++

Process from Point/Station 107.000 to Point/Station 107.000

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 5.500(Ac.)
Runoff from this stream = 9.059(CFS)
Time of concentration = 13.91 min.
Rainfall intensity = 1.966(In/Hr)

+++++

Process from Point/Station 105.000 to Point/Station 107.000

**** INITIAL AREA EVALUATION ****

Initial area flow distance = 970.000(Ft.)
Top (of initial area) elevation = 500.000(Ft.)
Bottom (of initial area) elevation = 389.000(Ft.)

Difference in elevation = 111.000(Ft.)
 Slope = 0.11443 s(percent)= 11.44
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 22.705 min.
 Rainfall intensity = 1.502(In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.686
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 74.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 2.679(CFS)
 Total initial stream area = 2.600(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 107.000 to Point/Station 107.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.600(Ac.)
 Runoff from this stream = 2.679(CFS)
 Time of concentration = 22.71 min.
 Rainfall intensity = 1.502(In/Hr)

++++++
 Process from Point/Station 106.000 to Point/Station 107.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 475.000(Ft.)
 Bottom (of initial area) elevation = 389.000(Ft.)
 Difference in elevation = 86.000(Ft.)
 Slope = 0.08600 s(percent)= 8.60
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.096 min.
 Rainfall intensity = 2.345(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.806
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.050
 Decimal fraction soil group C = 0.950
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 68.35
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 7.563(CFS)
 Total initial stream area = 4.000(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 107.000 to Point/Station 107.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3

Stream flow area = 4.000 (Ac.)
 Runoff from this stream = 7.563 (CFS)
 Time of concentration = 10.10 min.
 Rainfall intensity = 2.345 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	9.059	13.91	1.966
2	2.679	22.71	1.502
3	7.563	10.10	2.345

Largest stream flow has longer or shorter time of concentration

Qp = 9.059 + sum of

$$Qa \quad Tb/Ta$$

$$2.679 * 0.613 = 1.641$$

$$Qb \quad Ia/Ib$$

$$7.563 * 0.838 = 6.341$$
 Qp = 17.041

Total of 3 streams to confluence:

Flow rates before confluence point:

9.059 2.679 7.563

Area of streams before confluence:

5.500 2.600 4.000

Results of confluence:

Total flow rate = 17.041 (CFS)

Time of concentration = 13.911 min.

Effective stream area after confluence = 12.100 (Ac.)

 Process from Point/Station 107.000 to Point/Station 108.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 389.000 (Ft.)
 Downstream point/station elevation = 371.000 (Ft.)
 Pipe length = 160.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 17.041 (CFS)
 Nearest computed pipe diameter = 15.00 (In.)
 Calculated individual pipe flow = 17.041 (CFS)
 Normal flow depth in pipe = 10.02 (In.)
 Flow top width inside pipe = 14.13 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 19.55 (Ft/s)
 Travel time through pipe = 0.14 min.
 Time of concentration (TC) = 14.05 min.

 Process from Point/Station 108.000 to Point/Station 108.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 12.100(Ac.)
 Runoff from this stream = 17.041(CFS)
 Time of concentration = 14.05 min.
 Rainfall intensity = 1.956(In/Hr)
 Program is now starting with Main Stream No. 2

 Process from Point/Station 109.000 to Point/Station 111.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 470.000(Ft.)
 Top (of initial area) elevation = 386.000(Ft.)
 Bottom (of initial area) elevation = 374.000(Ft.)
 Difference in elevation = 12.000(Ft.)
 Slope = 0.02553 s(percent)= 2.55
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.517 min.
 Rainfall intensity = 2.423(In/Hr) for a 10.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.764
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.777(CFS)
 Total initial stream area = 1.500(Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 111.000 to Point/Station 111.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 1.500(Ac.)
 Runoff from this stream = 2.777(CFS)
 Time of concentration = 9.52 min.
 Rainfall intensity = 2.423(In/Hr)

 Process from Point/Station 110.000 to Point/Station 111.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 270.000(Ft.)
 Top (of initial area) elevation = 378.000(Ft.)
 Bottom (of initial area) elevation = 374.000(Ft.)
 Difference in elevation = 4.000(Ft.)
 Slope = 0.01481 s(percent)= 1.48
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 6.539 min.
 Rainfall intensity = 2.978(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type

Runoff Coefficient = 0.877
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.522(CFS)
 Total initial stream area = 0.200(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 111.000 to Point/Station 111.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 0.200(Ac.)
 Runoff from this stream = 0.522(CFS)
 Time of concentration = 6.54 min.
 Rainfall intensity = 2.978(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	2.777	9.52	2.423
2	0.522	6.54	2.978

Largest stream flow has longer time of concentration

Qp = 2.777 + sum of
 Qb Ia/Ib
 0.522 * 0.814 = 0.425
 Qp = 3.202

Total of 2 streams to confluence:

Flow rates before confluence point:

2.777 0.522

Area of streams before confluence:

1.500 0.200

Results of confluence:

Total flow rate = 3.202(CFS)

Time of concentration = 9.517 min.

Effective stream area after confluence = 1.700(Ac.)

++++++
 Process from Point/Station 111.000 to Point/Station 108.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 374.000(Ft.)
 Downstream point/station elevation = 372.000(Ft.)
 Pipe length = 190.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 3.202(CFS)
 Nearest computed pipe diameter = 12.00(In.)
 Calculated individual pipe flow = 3.202(CFS)
 Normal flow depth in pipe = 8.71(In.)

Flow top width inside pipe = 10.71(In.)
 Critical Depth = 9.20(In.)
 Pipe flow velocity = 5.25(Ft/s)
 Travel time through pipe = 0.60 min.
 Time of concentration (TC) = 10.12 min.

+++++
 Process from Point/Station 108.000 to Point/Station 108.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 1.700(Ac.)
 Runoff from this stream = 3.202(CFS)
 Time of concentration = 10.12 min.
 Rainfall intensity = 2.342(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	17.041	14.05	1.956
2	3.202	10.12	2.342

Largest stream flow has longer time of concentration

Qp = 17.041 + sum of
 Qb Ia/Ib
 3.202 * 0.835 = 2.673
 Qp = 19.714

Total of 2 main streams to confluence:

Flow rates before confluence point:

17.041 3.202

Area of streams before confluence:

12.100 1.700

Results of confluence:

Total flow rate = 19.714(CFS)

Time of concentration = 14.047 min.

Effective stream area after confluence = 13.800(Ac.)

+++++
 Process from Point/Station 108.000 to Point/Station 112.000
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 371.000(Ft.)
 End of natural channel elevation = 370.000(Ft.)
 Length of natural channel = 150.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 20.500(CFS)

Natural valley channel type used

L.A. County flood control district formula for channel velocity:

Velocity(ft/s) = $(7 + 8(q(\text{English Units})^{.352})(\text{slope}^{.5}))$

Velocity using mean channel flow = 2.46(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.0067

Corrected/adjusted channel slope = 0.0067

Travel time = 1.02 min. TC = 15.06 min.

Adding area flow to channel

UNDEVELOPED (good cover) subarea

Runoff Coefficient = 0.640

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.800

Decimal fraction soil group C = 0.200

Decimal fraction soil group D = 0.000

RI index for soil(AMC 2) = 63.60

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 1.882(In/Hr) for a 10.0 year storm

Subarea runoff = 1.326(CFS) for 1.100(Ac.)

Total runoff = 21.040(CFS) Total area = 14.900(Ac.)

+++++
Process from Point/Station 112.000 to Point/Station 114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 370.000(Ft.)
Downstream point/station elevation = 369.000(Ft.)
Pipe length = 120.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 21.040(CFS)
Nearest computed pipe diameter = 24.00(In.)
Calculated individual pipe flow = 21.040(CFS)
Normal flow depth in pipe = 20.11(In.)
Flow top width inside pipe = 17.69(In.)
Critical Depth = 19.71(In.)
Pipe flow velocity = 7.49(Ft/s)
Travel time through pipe = 0.27 min.
Time of concentration (TC) = 15.33 min.

+++++
Process from Point/Station 114.000 to Point/Station 114.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 14.900(Ac.)
Runoff from this stream = 21.040(CFS)
Time of concentration = 15.33 min.
Rainfall intensity = 1.864(In/Hr)

+++++
Process from Point/Station 113.000 to Point/Station 114.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 650.000(Ft.)
Top (of initial area) elevation = 500.000(Ft.)

Bottom (of initial area) elevation = 390.000 (Ft.)
 Difference in elevation = 110.000 (Ft.)
 Slope = 0.16923 s(percent) = 16.92
 $TC = k(0.940) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 17.889 min.
 Rainfall intensity = 1.712 (In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.707
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 2) = 74.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 2.541 (CFS)
 Total initial stream area = 2.100 (Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 114.000 to Point/Station 114.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 2.100 (Ac.)
 Runoff from this stream = 2.541 (CFS)
 Time of concentration = 17.89 min.
 Rainfall intensity = 1.712 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	21.040	15.33	1.864
2	2.541	17.89	1.712

Largest stream flow has longer or shorter time of concentration

Qp = 21.040 + sum of
 Qa Tb/Ta
 2.541 * 0.857 = 2.177
 Qp = 23.217

Total of 2 streams to confluence:

Flow rates before confluence point:

21.040 2.541

Area of streams before confluence:

14.900 2.100

Results of confluence:

Total flow rate = 23.217 (CFS)

Time of concentration = 15.329 min.

Effective stream area after confluence = 17.000 (Ac.)

++++++
 Process from Point/Station 114.000 to Point/Station 115.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 369.000(Ft.)
 Downstream point/station elevation = 365.000(Ft.)
 Pipe length = 50.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 23.217(CFS)
 Nearest computed pipe diameter = 18.00(In.)
 Calculated individual pipe flow = 23.217(CFS)
 Normal flow depth in pipe = 11.98(In.)
 Flow top width inside pipe = 16.99(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 18.60(Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 15.37 min.

++++++
 Process from Point/Station 115.000 to Point/Station 115.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 17.000(Ac.)
 Runoff from this stream = 23.217(CFS)
 Time of concentration = 15.37 min.
 Rainfall intensity = 1.861(In/Hr)

++++++
 Process from Point/Station 116.000 to Point/Station 115.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 90.000(Ft.)
 Top (of initial area) elevation = 412.000(Ft.)
 Bottom (of initial area) elevation = 390.000(Ft.)
 Difference in elevation = 22.000(Ft.)
 Slope = 0.24444 s(percent)= 24.44
 $TC = k(0.940) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.537 min.
 Rainfall intensity = 2.754(In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.687
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 61.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 0.189(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 115.000 to Point/Station 115.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.100(Ac.)
 Runoff from this stream = 0.189(CFS)

Time of concentration = 7.54 min.
 Rainfall intensity = 2.754 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	23.217	15.37	1.861
2	0.189	7.54	2.754

Largest stream flow has longer time of concentration

Qp = 23.217 + sum of
 Qb Ia/Ib
 0.189 * 0.676 = 0.128
 Qp = 23.345

Total of 2 streams to confluence:

Flow rates before confluence point:

23.217 0.189

Area of streams before confluence:

17.000 0.100

Results of confluence:

Total flow rate = 23.345 (CFS)

Time of concentration = 15.374 min.

Effective stream area after confluence = 17.100 (Ac.)

 Process from Point/Station 115.000 to Point/Station 122.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 365.000 (Ft.)
 Downstream point/station elevation = 363.000 (Ft.)
 Pipe length = 150.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 23.345 (CFS)
 Nearest computed pipe diameter = 24.00 (In.)
 Calculated individual pipe flow = 23.345 (CFS)
 Normal flow depth in pipe = 17.70 (In.)
 Flow top width inside pipe = 21.12 (In.)
 Critical Depth = 20.61 (In.)
 Pipe flow velocity = 9.40 (Ft/s)
 Travel time through pipe = 0.27 min.
 Time of concentration (TC) = 15.64 min.

 Process from Point/Station 122.000 to Point/Station 122.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 17.100 (Ac.)
 Runoff from this stream = 23.345 (CFS)
 Time of concentration = 15.64 min.
 Rainfall intensity = 1.843 (In/Hr)
 Program is now starting with Main Stream No. 2

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Process from Point/Station      117.000 to Point/Station      119.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance =   680.000(Ft.)
Top (of initial area) elevation =   445.000(Ft.)
Bottom (of initial area) elevation =   380.000(Ft.)
Difference in elevation =    65.000(Ft.)
Slope =    0.09559  s(percent)=    9.56
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   20.420 min.
Rainfall intensity =    1.592(In/Hr) for a   10.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.695
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =   74.00
Pervious area fraction =   1.000; Impervious fraction =   0.000
Initial subarea runoff =    3.653(CFS)
Total initial stream area =    3.300(Ac.)
Pervious area fraction = 1.000

```

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+++++
Process from Point/Station      119.000 to Point/Station      121.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

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Upstream point/station elevation =   380.000(Ft.)
Downstream point/station elevation =   365.000(Ft.)
Pipe length =   150.00(Ft.)  Manning's N = 0.013
No. of pipes = 1  Required pipe flow =    3.653(CFS)
Nearest computed pipe diameter =    9.00(In.)
Calculated individual pipe flow =    3.653(CFS)
Normal flow depth in pipe =    5.54(In.)
Flow top width inside pipe =    8.75(In.)
Critical depth could not be calculated.
Pipe flow velocity =   12.81(Ft/s)
Travel time through pipe =    0.20 min.
Time of concentration (TC) =   20.61 min.

```

```

+++++
Process from Point/Station      121.000 to Point/Station      121.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 2 in normal stream number 1
Stream flow area =    3.300(Ac.)
Runoff from this stream =    3.653(CFS)
Time of concentration =   20.61 min.
Rainfall intensity =    1.584(In/Hr)

```

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+++++
Process from Point/Station      120.000 to Point/Station      121.000

```

**** INITIAL AREA EVALUATION ****

Initial area flow distance = 750.000(Ft.)
 Top (of initial area) elevation = 399.000(Ft.)
 Bottom (of initial area) elevation = 365.000(Ft.)
 Difference in elevation = 34.000(Ft.)
 Slope = 0.04533 s(percent)= 4.53
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.868 min.
 Rainfall intensity = 2.690(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.880
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.400
 Decimal fraction soil group C = 0.600
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 63.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.894(CFS)
 Total initial stream area = 0.800(Ac.)
 Pervious area fraction = 0.100

+++++
 Process from Point/Station 121.000 to Point/Station 121.000
 **** SUBAREA FLOW ADDITION ****

SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.774
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Time of concentration = 7.87 min.
 Rainfall intensity = 2.690(In/Hr) for a 10.0 year storm
 Subarea runoff = 1.873(CFS) for 0.900(Ac.)
 Total runoff = 3.768(CFS) Total area = 1.700(Ac.)

+++++
 Process from Point/Station 121.000 to Point/Station 121.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 1.700(Ac.)
 Runoff from this stream = 3.768(CFS)
 Time of concentration = 7.87 min.
 Rainfall intensity = 2.690(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	3.653	20.61	1.584

2 3.768 7.87 2.690
 Largest stream flow has longer or shorter time of concentration

Qp = 3.768 + sum of
 Qa Tb/Ta
 3.653 * 0.382 = 1.394
 Qp = 5.162

Total of 2 streams to confluence:
 Flow rates before confluence point:
 3.653 3.768
 Area of streams before confluence:
 3.300 1.700

Results of confluence:
 Total flow rate = 5.162 (CFS)
 Time of concentration = 7.868 min.
 Effective stream area after confluence = 5.000 (Ac.)

+++++
 Process from Point/Station 121.000 to Point/Station 122.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 365.000 (Ft.)
 Downstream point/station elevation = 363.000 (Ft.)
 Pipe length = 60.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 5.162 (CFS)
 Nearest computed pipe diameter = 12.00 (In.)
 Calculated individual pipe flow = 5.162 (CFS)
 Normal flow depth in pipe = 8.07 (In.)
 Flow top width inside pipe = 11.26 (In.)
 Critical Depth = 11.09 (In.)
 Pipe flow velocity = 9.19 (Ft/s)
 Travel time through pipe = 0.11 min.
 Time of concentration (TC) = 7.98 min.

+++++
 Process from Point/Station 122.000 to Point/Station 122.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 5.000 (Ac.)
 Runoff from this stream = 5.162 (CFS)
 Time of concentration = 7.98 min.
 Rainfall intensity = 2.670 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	23.345	15.64	1.843
2	5.162	7.98	2.670

Largest stream flow has longer time of concentration
 Qp = 23.345 + sum of
 Qb Ia/Ib

$5.162 * 0.691 = 3.564$
 $Qp = 26.909$

Total of 2 main streams to confluence:

Flow rates before confluence point:

23.345 5.162

Area of streams before confluence:

17.100 5.000

Results of confluence:

Total flow rate = 26.909(CFS)

Time of concentration = 15.640 min.

Effective stream area after confluence = 22.100(Ac.)

++++++
 Process from Point/Station 122.000 to Point/Station 124.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 363.000(Ft.)
 Downstream point/station elevation = 360.000(Ft.)
 Pipe length = 470.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 26.909(CFS)
 Nearest computed pipe diameter = 30.00(In.)
 Calculated individual pipe flow = 26.909(CFS)
 Normal flow depth in pipe = 20.70(In.)
 Flow top width inside pipe = 27.75(In.)
 Critical Depth = 21.21(In.)
 Pipe flow velocity = 7.45(Ft/s)
 Travel time through pipe = 1.05 min.
 Time of concentration (TC) = 16.69 min.

++++++
 Process from Point/Station 124.000 to Point/Station 124.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 22.100(Ac.)
 Runoff from this stream = 26.909(CFS)
 Time of concentration = 16.69 min.
 Rainfall intensity = 1.779(In/Hr)

++++++
 Process from Point/Station 123.000 to Point/Station 124.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 720.000(Ft.)
 Top (of initial area) elevation = 373.000(Ft.)
 Bottom (of initial area) elevation = 360.000(Ft.)
 Difference in elevation = 13.000(Ft.)
 Slope = 0.01806 s(percent)= 1.81
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.097 min.
 Rainfall intensity = 2.123(In/Hr) for a 10.0 year storm

SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.751
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 56.00
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 1.755(CFS)
 Total initial stream area = 1.100(Ac.)
 Pervious area fraction = 0.500

+++++
 Process from Point/Station 124.000 to Point/Station 124.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 1.100(Ac.)
 Runoff from this stream = 1.755(CFS)
 Time of concentration = 12.10 min.
 Rainfall intensity = 2.123(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	26.909	16.69	1.779
2	1.755	12.10	2.123

Largest stream flow has longer time of concentration

Qp = 26.909 + sum of
 Qb Ia/Ib
 1.755 * 0.838 = 1.470
 Qp = 28.379

Total of 2 streams to confluence:

Flow rates before confluence point:

26.909 1.755

Area of streams before confluence:

22.100 1.100

Results of confluence:

Total flow rate = 28.379(CFS)

Time of concentration = 16.691 min.

Effective stream area after confluence = 23.200(Ac.)

+++++
 Process from Point/Station 130.000 to Point/Station 131.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 880.000(Ft.)
 Top (of initial area) elevation = 460.000(Ft.)
 Bottom (of initial area) elevation = 382.000(Ft.)
 Difference in elevation = 78.000(Ft.)
 Slope = 0.08864 s(percent)= 8.86
 $TC = k(0.940) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 22.983 min.
 Rainfall intensity = 1.492(In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.685
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 74.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 1.533(CFS)
 Total initial stream area = 1.500(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 132.000 to Point/Station 133.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 435.000(Ft.)
 Bottom (of initial area) elevation = 360.000(Ft.)
 Difference in elevation = 75.000(Ft.)
 Slope = 0.07500 s(percent)= 7.50
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 25.010 min.
 Rainfall intensity = 1.424(In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.626
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.450
 Decimal fraction soil group C = 0.550
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 2) = 68.15
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 1.694(CFS)
 Total initial stream area = 1.900(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 134.000 to Point/Station 135.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 450.000(Ft.)
 Top (of initial area) elevation = 426.000(Ft.)
 Bottom (of initial area) elevation = 380.000(Ft.)
 Difference in elevation = 46.000(Ft.)
 Slope = 0.10222 s(percent)= 10.22
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 17.081 min.
 Rainfall intensity = 1.756(In/Hr) for a 10.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.622
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.850
 Decimal fraction soil group C = 0.150

Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 62.95
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.437(CFS)
Total initial stream area = 0.400(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 27.00 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.726
Area averaged RI index number = 68.3

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 10/31/13 File:32786C100.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557 100-Year Rational Hydrology Area "C" Proposed Condition

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.300(In/Hr)

Slope of intensity duration curve = 0.5500

 Process from Point/Station 102.000 to Point/Station 103.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 830.000(Ft.)

Top (of initial area) elevation = 497.300(Ft.)

Bottom (of initial area) elevation = 468.000(Ft.)

Difference in elevation = 29.300(Ft.)

Slope = 0.03530 s(percent)= 3.53

$TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$

Initial area time of concentration = 11.198 min.

Rainfall intensity = 3.273(In/Hr) for a 100.0 year storm

SINGLE FAMILY (1/4 Acre Lot)

Runoff Coefficient = 0.868

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000

Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 6.537(CFS)
 Total initial stream area = 2.300(Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 103.000 to Point/Station 103.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 2.300(Ac.)
 Runoff from this stream = 6.537(CFS)
 Time of concentration = 11.20 min.
 Rainfall intensity = 3.273(In/Hr)

 Process from Point/Station 104.000 to Point/Station 103.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 900.000(Ft.)
 Top (of initial area) elevation = 498.000(Ft.)
 Bottom (of initial area) elevation = 479.000(Ft.)
 Difference in elevation = 19.000(Ft.)
 Slope = 0.02111 s(percent)= 2.11
 $TC = k(0.390) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.819 min.
 Rainfall intensity = 3.038(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.866
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.40
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 8.422(CFS)
 Total initial stream area = 3.200(Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 103.000 to Point/Station 103.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 3.200(Ac.)
 Runoff from this stream = 8.422(CFS)
 Time of concentration = 12.82 min.
 Rainfall intensity = 3.038(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	6.537	11.20	3.273
2	8.422	12.82	3.038

Largest stream flow has longer time of concentration

Qp = 8.422 + sum of

Qb	Ia/Ib	
6.537 *	0.928 =	6.069

Qp = 14.490

Total of 2 streams to confluence:

Flow rates before confluence point:

6.537	8.422

Area of streams before confluence:

2.300	3.200

Results of confluence:

Total flow rate = 14.490 (CFS)

Time of concentration = 12.819 min.

Effective stream area after confluence = 5.500 (Ac.)

Process from Point/Station 103.000 to Point/Station 107.000

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 479.000 (Ft.)

Downstream point/station elevation = 389.000 (Ft.)

Pipe length = 1000.00 (Ft.) Manning's N = 0.013

No. of pipes = 1 Required pipe flow = 14.490 (CFS)

Nearest computed pipe diameter = 15.00 (In.)

Calculated individual pipe flow = 14.490 (CFS)

Normal flow depth in pipe = 9.67 (In.)

Flow top width inside pipe = 14.36 (In.)

Critical depth could not be calculated.

Pipe flow velocity = 17.32 (Ft/s)

Travel time through pipe = 0.96 min.

Time of concentration (TC) = 13.78 min.

Process from Point/Station 107.000 to Point/Station 107.000

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1

Stream flow area = 5.500 (Ac.)

Runoff from this stream = 14.490 (CFS)

Time of concentration = 13.78 min.

Rainfall intensity = 2.920 (In/Hr)

Process from Point/Station 105.000 to Point/Station 107.000

**** INITIAL AREA EVALUATION ****

Initial area flow distance = 970.000 (Ft.)

Top (of initial area) elevation = 500.000 (Ft.)

Bottom (of initial area) elevation = 389.000 (Ft.)

Difference in elevation = 111.000(Ft.)
 Slope = 0.11443 s(percent)= 11.44
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 22.705 min.
 Rainfall intensity = 2.218(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.828
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 87.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 4.777(CFS)
 Total initial stream area = 2.600(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 107.000 to Point/Station 107.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 2.600(Ac.)
 Runoff from this stream = 4.777(CFS)
 Time of concentration = 22.71 min.
 Rainfall intensity = 2.218(In/Hr)

++++++
 Process from Point/Station 106.000 to Point/Station 107.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 475.000(Ft.)
 Bottom (of initial area) elevation = 389.000(Ft.)
 Difference in elevation = 86.000(Ft.)
 Slope = 0.08600 s(percent)= 8.60
 $TC = k(0.390)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 10.096 min.
 Rainfall intensity = 3.464(In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.869
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.050
 Decimal fraction soil group C = 0.950
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 84.01
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 12.046(CFS)
 Total initial stream area = 4.000(Ac.)
 Pervious area fraction = 0.500

++++++
 Process from Point/Station 107.000 to Point/Station 107.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 3

Stream flow area = 4.000 (Ac.)
 Runoff from this stream = 12.046 (CFS)
 Time of concentration = 10.10 min.
 Rainfall intensity = 3.464 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	14.490	13.78	2.920
2	4.777	22.71	2.218
3	12.046	10.10	3.464

Largest stream flow has longer or shorter time of concentration

Qp = 14.490 + sum of
 Qa Tb/Ta
 4.777 * 0.607 = 2.900
 Qb Ia/Ib
 12.046 * 0.843 = 10.152
 Qp = 27.542

Total of 3 streams to confluence:

Flow rates before confluence point:
 14.490 4.777 12.046

Area of streams before confluence:
 5.500 2.600 4.000

Results of confluence:

Total flow rate = 27.542 (CFS)
 Time of concentration = 13.782 min.
 Effective stream area after confluence = 12.100 (Ac.)

 Process from Point/Station 107.000 to Point/Station 108.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 389.000 (Ft.)
 Downstream point/station elevation = 371.000 (Ft.)
 Pipe length = 160.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 27.542 (CFS)
 Nearest computed pipe diameter = 18.00 (In.)
 Calculated individual pipe flow = 27.542 (CFS)
 Normal flow depth in pipe = 11.98 (In.)
 Flow top width inside pipe = 16.99 (In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 22.06 (Ft/s)
 Travel time through pipe = 0.12 min.
 Time of concentration (TC) = 13.90 min.

 Process from Point/Station 108.000 to Point/Station 108.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
 Stream flow area = 12.100 (Ac.)
 Runoff from this stream = 27.542 (CFS)
 Time of concentration = 13.90 min.
 Rainfall intensity = 2.906 (In/Hr)
 Program is now starting with Main Stream No. 2

 Process from Point/Station 109.000 to Point/Station 111.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 470.000 (Ft.)
 Top (of initial area) elevation = 386.000 (Ft.)
 Bottom (of initial area) elevation = 374.000 (Ft.)
 Difference in elevation = 12.000 (Ft.)
 Slope = 0.02553 s(percent) = 2.55
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 9.517 min.
 Rainfall intensity = 3.579 (In/Hr) for a 100.0 year storm
 SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.850
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 3) = 74.80
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 4.562 (CFS)
 Total initial stream area = 1.500 (Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 111.000 to Point/Station 111.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 1
 Stream flow area = 1.500 (Ac.)
 Runoff from this stream = 4.562 (CFS)
 Time of concentration = 9.52 min.
 Rainfall intensity = 3.579 (In/Hr)

 Process from Point/Station 110.000 to Point/Station 111.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 270.000 (Ft.)
 Top (of initial area) elevation = 378.000 (Ft.)
 Bottom (of initial area) elevation = 374.000 (Ft.)
 Difference in elevation = 4.000 (Ft.)
 Slope = 0.01481 s(percent) = 1.48
 $TC = k(0.300) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 6.539 min.
 Rainfall intensity = 4.399 (In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type

Runoff Coefficient = 0.892
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.785(CFS)
 Total initial stream area = 0.200(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 111.000 to Point/Station 111.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2

Stream flow area = 0.200(Ac.)
 Runoff from this stream = 0.785(CFS)
 Time of concentration = 6.54 min.
 Rainfall intensity = 4.399(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	4.562	9.52	3.579
2	0.785	6.54	4.399

Largest stream flow has longer time of concentration

Qp = 4.562 + sum of
 Qb Ia/Ib
 0.785 * 0.814 = 0.638
 Qp = 5.200

Total of 2 streams to confluence:

Flow rates before confluence point:

4.562 0.785

Area of streams before confluence:

1.500 0.200

Results of confluence:

Total flow rate = 5.200(CFS)

Time of concentration = 9.517 min.

Effective stream area after confluence = 1.700(Ac.)

++++++
 Process from Point/Station 111.000 to Point/Station 108.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 374.000(Ft.)
 Downstream point/station elevation = 372.000(Ft.)
 Pipe length = 190.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 5.200(CFS)
 Nearest computed pipe diameter = 15.00(In.)
 Calculated individual pipe flow = 5.200(CFS)
 Normal flow depth in pipe = 10.01(In.)

Flow top width inside pipe = 14.14(In.)
 Critical Depth = 11.10(In.)
 Pipe flow velocity = 5.98(Ft/s)
 Travel time through pipe = 0.53 min.
 Time of concentration (TC) = 10.05 min.

+++++
 Process from Point/Station 108.000 to Point/Station 108.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 1.700(Ac.)
 Runoff from this stream = 5.200(CFS)
 Time of concentration = 10.05 min.
 Rainfall intensity = 3.474(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	27.542	13.90	2.906
2	5.200	10.05	3.474

Largest stream flow has longer time of concentration

Qp = 27.542 + sum of
 Qb Ia/Ib
 5.200 * 0.836 = 4.350
 Qp = 31.891

Total of 2 main streams to confluence:

Flow rates before confluence point:

27.542 5.200

Area of streams before confluence:

12.100 1.700

Results of confluence:

Total flow rate = 31.891(CFS)

Time of concentration = 13.902 min.

Effective stream area after confluence = 13.800(Ac.)

+++++
 Process from Point/Station 108.000 to Point/Station 112.000
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 371.000(Ft.)
 End of natural channel elevation = 370.000(Ft.)
 Length of natural channel = 150.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 33.162(CFS)

Natural valley channel type used

L.A. County flood control district formula for channel velocity:

Velocity(ft/s) = $(7 + 8(q(\text{English Units})^{.352})(\text{slope}^{.5}))$

Velocity using mean channel flow = 2.81(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.0067

Corrected/adjusted channel slope = 0.0067

Travel time = 0.89 min. TC = 14.79 min.

Adding area flow to channel

UNDEVELOPED (good cover) subarea

Runoff Coefficient = 0.809

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.800

Decimal fraction soil group C = 0.200

Decimal fraction soil group D = 0.000

RI index for soil(AMC 3) = 80.88

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 2.808(In/Hr) for a 100.0 year storm

Subarea runoff = 2.500(CFS) for 1.100(Ac.)

Total runoff = 34.391(CFS) Total area = 14.900(Ac.)

Process from Point/Station 112.000 to Point/Station 114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 370.000(Ft.)
Downstream point/station elevation = 369.000(Ft.)
Pipe length = 120.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 34.391(CFS)
Nearest computed pipe diameter = 30.00(In.)
Calculated individual pipe flow = 34.391(CFS)
Normal flow depth in pipe = 22.64(In.)
Flow top width inside pipe = 25.82(In.)
Critical Depth = 23.93(In.)
Pipe flow velocity = 8.65(Ft/s)
Travel time through pipe = 0.23 min.
Time of concentration (TC) = 15.02 min.

Process from Point/Station 114.000 to Point/Station 114.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 14.900(Ac.)
Runoff from this stream = 34.391(CFS)
Time of concentration = 15.02 min.
Rainfall intensity = 2.784(In/Hr)

Process from Point/Station 113.000 to Point/Station 114.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 650.000(Ft.)
Top (of initial area) elevation = 500.000(Ft.)

Bottom (of initial area) elevation = 390.000 (Ft.)
 Difference in elevation = 110.000 (Ft.)
 Slope = 0.16923 s(percent) = 16.92
 $TC = k(0.940) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 17.889 min.
 Rainfall intensity = 2.529 (In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.836
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil (AMC 3) = 87.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 4.443 (CFS)
 Total initial stream area = 2.100 (Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 114.000 to Point/Station 114.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 2.100 (Ac.)
 Runoff from this stream = 4.443 (CFS)
 Time of concentration = 17.89 min.
 Rainfall intensity = 2.529 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	34.391	15.02	2.784
2	4.443	17.89	2.529

Largest stream flow has longer or shorter time of concentration

Qp = 34.391 + sum of
 Qa Tb/Ta
 4.443 * 0.840 = 3.731
 Qp = 38.121

Total of 2 streams to confluence:

Flow rates before confluence point:

34.391 4.443

Area of streams before confluence:

14.900 2.100

Results of confluence:

Total flow rate = 38.121 (CFS)

Time of concentration = 15.023 min.

Effective stream area after confluence = 17.000 (Ac.)

++++++
 Process from Point/Station 114.000 to Point/Station 115.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 369.000(Ft.)
 Downstream point/station elevation = 365.000(Ft.)
 Pipe length = 50.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 38.121(CFS)
 Nearest computed pipe diameter = 21.00(In.)
 Calculated individual pipe flow = 38.121(CFS)
 Normal flow depth in pipe = 14.88(In.)
 Flow top width inside pipe = 19.08(In.)
 Critical depth could not be calculated.
 Pipe flow velocity = 20.92(Ft/s)
 Travel time through pipe = 0.04 min.
 Time of concentration (TC) = 15.06 min.

++++++
 Process from Point/Station 115.000 to Point/Station 115.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 17.000(Ac.)
 Runoff from this stream = 38.121(CFS)
 Time of concentration = 15.06 min.
 Rainfall intensity = 2.780(In/Hr)

++++++
 Process from Point/Station 116.000 to Point/Station 115.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 90.000(Ft.)
 Top (of initial area) elevation = 412.000(Ft.)
 Bottom (of initial area) elevation = 390.000(Ft.)
 Difference in elevation = 22.000(Ft.)
 Slope = 0.24444 s(percent)= 24.44
 $TC = k(0.940) * [(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.537 min.
 Rainfall intensity = 4.069(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.827
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 78.80
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 0.337(CFS)
 Total initial stream area = 0.100(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 115.000 to Point/Station 115.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.100(Ac.)
 Runoff from this stream = 0.337(CFS)

Time of concentration = 7.54 min.
 Rainfall intensity = 4.069 (In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	38.121	15.06	2.780
2	0.337	7.54	4.069

Largest stream flow has longer time of concentration

Qp = 38.121 + sum of
 Qb Ia/Ib
 0.337 * 0.683 = 0.230
 Qp = 38.351

Total of 2 streams to confluence:

Flow rates before confluence point:

38.121 0.337

Area of streams before confluence:

17.000 0.100

Results of confluence:

Total flow rate = 38.351 (CFS)

Time of concentration = 15.062 min.

Effective stream area after confluence = 17.100 (Ac.)

+++++
 Process from Point/Station 115.000 to Point/Station 122.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 365.000 (Ft.)
 Downstream point/station elevation = 363.000 (Ft.)
 Pipe length = 150.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 38.351 (CFS)
 Nearest computed pipe diameter = 30.00 (In.)
 Calculated individual pipe flow = 38.351 (CFS)
 Normal flow depth in pipe = 20.48 (In.)
 Flow top width inside pipe = 27.92 (In.)
 Critical Depth = 25.10 (In.)
 Pipe flow velocity = 10.74 (Ft/s)
 Travel time through pipe = 0.23 min.
 Time of concentration (TC) = 15.30 min.

+++++
 Process from Point/Station 122.000 to Point/Station 122.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1

Stream flow area = 17.100 (Ac.)

Runoff from this stream = 38.351 (CFS)

Time of concentration = 15.30 min.

Rainfall intensity = 2.757 (In/Hr)

Program is now starting with Main Stream No. 2

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Process from Point/Station      117.000 to Point/Station      119.000
**** INITIAL AREA EVALUATION ****

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Initial area flow distance =   680.000(Ft.)
Top (of initial area) elevation =   445.000(Ft.)
Bottom (of initial area) elevation =   380.000(Ft.)
Difference in elevation =    65.000(Ft.)
Slope =    0.09559  s(percent)=    9.56
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   20.420 min.
Rainfall intensity =    2.352(In/Hr) for a   100.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.832
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) =   87.40
Pervious area fraction =   1.000; Impervious fraction =   0.000
Initial subarea runoff =    6.457(CFS)
Total initial stream area =    3.300(Ac.)
Pervious area fraction = 1.000

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Process from Point/Station      119.000 to Point/Station      121.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

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Upstream point/station elevation =   380.000(Ft.)
Downstream point/station elevation =   365.000(Ft.)
Pipe length =   150.00(Ft.)  Manning's N = 0.013
No. of pipes = 1  Required pipe flow =    6.457(CFS)
Nearest computed pipe diameter =    12.00(In.)
Calculated individual pipe flow =    6.457(CFS)
Normal flow depth in pipe =    6.52(In.)
Flow top width inside pipe =   11.96(In.)
Critical depth could not be calculated.
Pipe flow velocity =    14.84(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =    20.59 min.

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Process from Point/Station      121.000 to Point/Station      121.000
**** CONFLUENCE OF MINOR STREAMS ****

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Along Main Stream number: 2 in normal stream number 1
Stream flow area =    3.300(Ac.)
Runoff from this stream =    6.457(CFS)
Time of concentration =    20.59 min.
Rainfall intensity =    2.341(In/Hr)

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Process from Point/Station      120.000 to Point/Station      121.000

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**** INITIAL AREA EVALUATION ****

Initial area flow distance = 750.000(Ft.)
 Top (of initial area) elevation = 399.000(Ft.)
 Bottom (of initial area) elevation = 365.000(Ft.)
 Difference in elevation = 34.000(Ft.)
 Slope = 0.04533 s(percent)= 4.53
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 7.868 min.
 Rainfall intensity = 3.974(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.893
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.400
 Decimal fraction soil group C = 0.600
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 81.04
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 2.840(CFS)
 Total initial stream area = 0.800(Ac.)
 Pervious area fraction = 0.100

+++++
 Process from Point/Station 121.000 to Point/Station 121.000
 **** SUBAREA FLOW ADDITION ****

SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.854
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Time of concentration = 7.87 min.
 Rainfall intensity = 3.974(In/Hr) for a 100.0 year storm
 Subarea runoff = 3.055(CFS) for 0.900(Ac.)
 Total runoff = 5.896(CFS) Total area = 1.700(Ac.)

+++++
 Process from Point/Station 121.000 to Point/Station 121.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 2
 Stream flow area = 1.700(Ac.)
 Runoff from this stream = 5.896(CFS)
 Time of concentration = 7.87 min.
 Rainfall intensity = 3.974(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	6.457	20.59	2.341

2 5.896 7.87 3.974
 Largest stream flow has longer time of concentration
 $Q_p = 6.457 + \text{sum of}$
 $Q_b \quad I_a/I_b$
 $5.896 * 0.589 = 3.473$
 $Q_p = 9.931$

Total of 2 streams to confluence:
 Flow rates before confluence point:
 6.457 5.896
 Area of streams before confluence:
 3.300 1.700
 Results of confluence:
 Total flow rate = 9.931(CFS)
 Time of concentration = 20.588 min.
 Effective stream area after confluence = 5.000(Ac.)

+++++
 Process from Point/Station 121.000 to Point/Station 122.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 365.000(Ft.)
 Downstream point/station elevation = 363.000(Ft.)
 Pipe length = 60.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 9.931(CFS)
 Nearest computed pipe diameter = 15.00(In.)
 Calculated individual pipe flow = 9.931(CFS)
 Normal flow depth in pipe = 10.55(In.)
 Flow top width inside pipe = 13.71(In.)
 Critical Depth = 14.19(In.)
 Pipe flow velocity = 10.77(Ft/s)
 Travel time through pipe = 0.09 min.
 Time of concentration (TC) = 20.68 min.

+++++
 Process from Point/Station 122.000 to Point/Station 122.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 5.000(Ac.)
 Runoff from this stream = 9.931(CFS)
 Time of concentration = 20.68 min.
 Rainfall intensity = 2.335(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)

1	38.351	15.30	2.757
2	9.931	20.68	2.335

Largest stream flow has longer or shorter time of concentration
 $Q_p = 38.351 + \text{sum of}$
 $Q_a \quad T_b/T_a$

$9.931 * 0.740 = 7.344$
 $Q_p = 45.696$

Total of 2 main streams to confluence:

Flow rates before confluence point:

38.351 9.931

Area of streams before confluence:

17.100 5.000

Results of confluence:

Total flow rate = 45.696 (CFS)

Time of concentration = 15.295 min.

Effective stream area after confluence = 22.100 (Ac.)

++++++
 Process from Point/Station 122.000 to Point/Station 124.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 363.000 (Ft.)
 Downstream point/station elevation = 360.000 (Ft.)
 Pipe length = 470.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 45.696 (CFS)
 Nearest computed pipe diameter = 36.00 (In.)
 Calculated individual pipe flow = 45.696 (CFS)
 Normal flow depth in pipe = 25.69 (In.)
 Flow top width inside pipe = 32.55 (In.)
 Critical Depth = 26.41 (In.)
 Pipe flow velocity = 8.47 (Ft/s)
 Travel time through pipe = 0.92 min.
 Time of concentration (TC) = 16.22 min.

++++++
 Process from Point/Station 124.000 to Point/Station 124.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1

Stream flow area = 22.100 (Ac.)
 Runoff from this stream = 45.696 (CFS)
 Time of concentration = 16.22 min.
 Rainfall intensity = 2.669 (In/Hr)

++++++
 Process from Point/Station 123.000 to Point/Station 124.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 720.000 (Ft.)
 Top (of initial area) elevation = 373.000 (Ft.)
 Bottom (of initial area) elevation = 360.000 (Ft.)
 Difference in elevation = 13.000 (Ft.)
 Slope = 0.01806 s(percent) = 1.81
 $TC = k(0.390) * [(length^3) / (elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.097 min.
 Rainfall intensity = 3.137 (In/Hr) for a 100.0 year storm

SINGLE FAMILY (1/4 Acre Lot)
 Runoff Coefficient = 0.844
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 1.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 74.80
 Pervious area fraction = 0.500; Impervious fraction = 0.500
 Initial subarea runoff = 2.911(CFS)
 Total initial stream area = 1.100(Ac.)
 Pervious area fraction = 0.500

 Process from Point/Station 124.000 to Point/Station 124.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 1.100(Ac.)
 Runoff from this stream = 2.911(CFS)
 Time of concentration = 12.10 min.
 Rainfall intensity = 3.137(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	45.696	16.22	2.669
2	2.911	12.10	3.137

Largest stream flow has longer time of concentration
 $Q_p = 45.696 + \text{sum of } Q_b \text{ Ia/Ib}$
 $2.911 * 0.851 = 2.477$
 $Q_p = 48.173$

Total of 2 streams to confluence:
 Flow rates before confluence point:
 45.696 2.911
 Area of streams before confluence:
 22.100 1.100
 Results of confluence:
 Total flow rate = 48.173(CFS)
 Time of concentration = 16.219 min.
 Effective stream area after confluence = 23.200(Ac.)

 Process from Point/Station 130.000 to Point/Station 131.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 880.000(Ft.)
 Top (of initial area) elevation = 460.000(Ft.)
 Bottom (of initial area) elevation = 382.000(Ft.)
 Difference in elevation = 78.000(Ft.)
 Slope = 0.08864 s(percent)= 8.86
 $TC = k(0.940) * [(length^3)/(elevation \text{ change})]^{0.2}$

Initial area time of concentration = 22.983 min.
 Rainfall intensity = 2.204(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.828
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 1.000
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 87.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 2.736(CFS)
 Total initial stream area = 1.500(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 132.000 to Point/Station 133.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
 Top (of initial area) elevation = 435.000(Ft.)
 Bottom (of initial area) elevation = 360.000(Ft.)
 Difference in elevation = 75.000(Ft.)
 Slope = 0.07500 s(percent)= 7.50
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 25.010 min.
 Rainfall intensity = 2.104(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.802
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.450
 Decimal fraction soil group C = 0.550
 Decimal fraction soil group D = 0.000
 RI index for soil(AMC 3) = 83.89
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 3.207(CFS)
 Total initial stream area = 1.900(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 134.000 to Point/Station 135.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 450.000(Ft.)
 Top (of initial area) elevation = 426.000(Ft.)
 Bottom (of initial area) elevation = 380.000(Ft.)
 Difference in elevation = 46.000(Ft.)
 Slope = 0.10222 s(percent)= 10.22
 $TC = k(0.940)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 17.081 min.
 Rainfall intensity = 2.594(In/Hr) for a 100.0 year storm
 UNDEVELOPED (good cover) subarea
 Runoff Coefficient = 0.800
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.850
 Decimal fraction soil group C = 0.150

Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 80.36
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.830(CFS)
Total initial stream area = 0.400(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 27.00 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.726
Area averaged RI index number = 68.3

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 04/29/14 File:32786D.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557

10-Year Rational Hydrology Area "D" **Proposed Condition**

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 10.0

Calculated rainfall intensity data:

1 hour intensity = 0.880(In/Hr)

Slope of intensity duration curve = 0.5500

+++++
 Process from Point/Station 501.000 to Point/Station 502.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)

Top (of initial area) elevation = 1602.500(Ft.)

Bottom (of initial area) elevation = 1388.000(Ft.)

Difference in elevation = 214.500(Ft.)

Slope = 0.21450 s(percent)= 21.45

$TC = k(0.710) * [(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 15.310 min.

Rainfall intensity = 1.865(In/Hr) for a 10.0 year storm

UNDEVELOPED (fair cover) subarea

Runoff Coefficient = 0.792

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 84.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 6.797(CFS)
 Total initial stream area = 4.600(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 502.000 to Point/Station 503.000
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1388.000(Ft.)
 End of natural channel elevation = 1340.000(Ft.)
 Length of natural channel = 455.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 9.678(CFS)

Natural mountain channel type used
 L.A. County flood control district formula for channel velocity:
 Velocity = $5.48(q^{.33})(\text{slope}^{.492})$
 Velocity using mean channel flow = 3.83(Ft/s)

Correction to map slope used on extremely rugged channels with
 drops and waterfalls (Plate D-6.2)
 Normal channel slope = 0.1055
 Corrected/adjusted channel slope = 0.1055
 Travel time = 1.98 min. TC = 17.29 min.

Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.786
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 84.00
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 1.745(In/Hr) for a 10.0 year storm
 Subarea runoff = 5.345(CFS) for 3.900(Ac.)
 Total runoff = 12.142(CFS) Total area = 8.500(Ac.)

++++++
 Process from Point/Station 503.000 to Point/Station 504.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1340.000(Ft.)
 Downstream point elevation = 1331.000(Ft.)
 Channel length thru subarea = 1170.000(Ft.)
 Channel base width = 1.000(Ft.)

Slope or 'Z' of left channel bank = 1.000
 Slope or 'Z' of right channel bank = 1.000
 Estimated mean flow rate at midpoint of channel = 14.592 (CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 2.000 (Ft.)
 Flow(q) thru subarea = 14.592 (CFS)
 Depth of flow = 1.136 (Ft.), Average velocity = 6.014 (Ft/s)
 Channel flow top width = 3.272 (Ft.)
 Flow Velocity = 6.01 (Ft/s)
 Travel time = 3.24 min.
 Time of concentration = 20.53 min.

Sub-Channel No. 1 Critical depth = 1.266 (Ft.)
 ' ' ' Critical flow top width = 3.531 (Ft.)
 ' ' ' Critical flow velocity = 5.089 (Ft/s)
 ' ' ' Critical flow area = 2.867 (Sq.Ft)

Adding area flow to channel

UNDEVELOPED (fair cover) subarea

Runoff Coefficient = 0.776

Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 0.000

Decimal fraction soil group D = 1.000

RI index for soil (AMC 2) = 84.00

Pervious area fraction = 1.000; Impervious fraction = 0.000

Rainfall intensity = 1.587 (In/Hr) for a 10.0 year storm

Subarea runoff = 4.803 (CFS) for 3.900 (Ac.)

Total runoff = 16.945 (CFS) Total area = 12.400 (Ac.)

Depth of flow = 1.222 (Ft.), Average velocity = 6.244 (Ft/s)

Sub-Channel No. 1 Critical depth = 1.359 (Ft.)
 ' ' ' Critical flow top width = 3.719 (Ft.)
 ' ' ' Critical flow velocity = 5.283 (Ft/s)
 ' ' ' Critical flow area = 3.207 (Sq.Ft)

++++++
 Process from Point/Station 504.000 to Point/Station 504.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1

Stream flow area = 12.400 (Ac.)

Runoff from this stream = 16.945 (CFS)

Time of concentration = 20.53 min.

Rainfall intensity = 1.587 (In/Hr)

++++++
 Process from Point/Station 504.100 to Point/Station 504.200
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000 (Ft.)

Top (of initial area) elevation = 1342.000(Ft.)
 Bottom (of initial area) elevation = 1335.000(Ft.)
 Difference in elevation = 7.000(Ft.)
 Slope = 0.00700 s(percent)= 0.70
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.826 min.
 Rainfall intensity = 2.056(In/Hr) for a 10.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.884
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 0.727(CFS)
 Total initial stream area = 0.400(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 504.200 to Point/Station 504.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1335.000(Ft.)
 Downstream point elevation = 1332.000(Ft.)
 Channel length thru subarea = 335.000(Ft.)
 Channel base width = 0.000(Ft.)
 Slope or 'Z' of left channel bank = 1.000
 Slope or 'Z' of right channel bank = 20.000
 Estimated mean flow rate at midpoint of channel = 0.818(CFS)
 Manning's 'N' = 0.020
 Maximum depth of channel = 0.500(Ft.)
 Flow(q) thru subarea = 0.818(CFS)
 Depth of flow = 0.221(Ft.), Average velocity = 1.596(Ft/s)
 Channel flow top width = 4.639(Ft.)
 Flow Velocity = 1.60(Ft/s)
 Travel time = 3.50 min.
 Time of concentration = 16.32 min.

Sub-Channel No. 1 Critical depth = 0.207(Ft.)
 ' ' ' Critical flow top width = 4.348(Ft.)
 ' ' ' Critical flow velocity = 1.817(Ft/s)
 ' ' ' Critical flow area = 0.450(Sq.Ft)

Adding area flow to channel
 COMMERCIAL subarea type
 Runoff Coefficient = 0.882
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 2) = 75.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900

Rainfall intensity = 1.801(In/Hr) for a 10.0 year storm
 Subarea runoff = 0.159(CFS) for 0.100(Ac.)
 Total runoff = 0.886(CFS) Total area = 0.500(Ac.)
 Depth of flow = 0.228(Ft.), Average velocity = 1.629(Ft/s)

Sub-Channel No. 1 Critical depth = 0.213(Ft.)
 ' ' ' Critical flow top width = 4.471(Ft.)
 ' ' ' Critical flow velocity = 1.861(Ft/s)
 ' ' ' Critical flow area = 0.476(Sq.Ft)

++++++
 Process from Point/Station 504.000 to Point/Station 504.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2

Stream flow area = 0.500(Ac.)
 Runoff from this stream = 0.886(CFS)
 Time of concentration = 16.32 min.
 Rainfall intensity = 1.801(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	16.945	20.53	1.587
2	0.886	16.32	1.801

Largest stream flow has longer time of concentration
 $Q_p = 16.945 + \text{sum of } \frac{Q_b I_a}{I_b}$
 $0.886 * 0.882 = 0.781$
 $Q_p = 17.726$

Total of 2 streams to confluence:

Flow rates before confluence point:

16.945 0.886

Area of streams before confluence:

12.400 0.500

Results of confluence:

Total flow rate = 17.726(CFS)

Time of concentration = 20.531 min.

Effective stream area after confluence = 12.900(Ac.)

End of computations, total study area = 12.90 (Ac.)

The following figures may

be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.965

Area averaged RI index number = 83.7

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
 Rational Hydrology Study Date: 04/29/14 File:32786D.out

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

TTM 36557

100-Year Rational Hydrology Area "A"
Proposed Condition

Program License Serial Number 6194

Rational Method Hydrology Program based on
 Riverside County Flood Control & Water Conservation District
 1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)

For the [Murrieta,Tmc,Rnch CaNorco] area used.

10 year storm 10 minute intensity = 2.360(In/Hr)

10 year storm 60 minute intensity = 0.880(In/Hr)

100 year storm 10 minute intensity = 3.480(In/Hr)

100 year storm 60 minute intensity = 1.300(In/Hr)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.300(In/Hr)

Slope of intensity duration curve = 0.5500

 Process from Point/Station 501.000 to Point/Station 502.000
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)

Top (of initial area) elevation = 1602.500(Ft.)

Bottom (of initial area) elevation = 1388.000(Ft.)

Difference in elevation = 214.500(Ft.)

Slope = 0.21450 s(percent)= 21.45

$TC = k(0.710)*[(length^3)/(elevation\ change)]^{0.2}$

Initial area time of concentration = 15.310 min.

Rainfall intensity = 2.755(In/Hr) for a 100.0 year storm

UNDEVELOPED (fair cover) subarea

Runoff Coefficient = 0.870

Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Initial subarea runoff = 11.030(CFS)
 Total initial stream area = 4.600(Ac.)
 Pervious area fraction = 1.000

++++++
 Process from Point/Station 502.000 to Point/Station 503.000
 **** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1388.000(Ft.)
 End of natural channel elevation = 1340.000(Ft.)
 Length of natural channel = 455.000(Ft.)
 Estimated mean flow rate at midpoint of channel = 15.706(CFS)

Natural mountain channel type used
 L.A. County flood control district formula for channel velocity:
 Velocity = $5.48(q^{.33})(\text{slope}^{.492})$
 Velocity using mean channel flow = 4.50(Ft/s)

Correction to map slope used on extremely rugged channels with
 drops and waterfalls (Plate D-6.2)

Normal channel slope = 0.1055
 Corrected/adjusted channel slope = 0.1055
 Travel time = 1.69 min. TC = 17.00 min.

Adding area flow to channel
 UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.869
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.602(In/Hr) for a 100.0 year storm
 Subarea runoff = 8.812(CFS) for 3.900(Ac.)
 Total runoff = 19.843(CFS) Total area = 8.500(Ac.)

++++++
 Process from Point/Station 503.000 to Point/Station 504.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1340.000(Ft.)
 Downstream point elevation = 1331.000(Ft.)
 Channel length thru subarea = 1170.000(Ft.)
 Channel base width = 1.000(Ft.)

Slope or 'Z' of left channel bank = 1.000
 Slope or 'Z' of right channel bank = 1.000
 Estimated mean flow rate at midpoint of channel = 23.907 (CFS)
 Manning's 'N' = 0.015
 Maximum depth of channel = 2.000 (Ft.)
 Flow(q) thru subarea = 23.907 (CFS)
 Depth of flow = 1.440 (Ft.), Average velocity = 6.802 (Ft/s)
 Channel flow top width = 3.880 (Ft.)
 Flow Velocity = 6.80 (Ft/s)
 Travel time = 2.87 min.
 Time of concentration = 19.86 min.

Sub-Channel No. 1 Critical depth = 1.609 (Ft.)
 ' ' Critical flow top width = 4.219 (Ft.)
 ' ' Critical flow velocity = 5.693 (Ft/s)
 ' ' Critical flow area = 4.199 (Sq.Ft)

Adding area flow to channel

UNDEVELOPED (fair cover) subarea
 Runoff Coefficient = 0.866
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 93.40
 Pervious area fraction = 1.000; Impervious fraction = 0.000
 Rainfall intensity = 2.388 (In/Hr) for a 100.0 year storm
 Subarea runoff = 8.063 (CFS) for 3.900 (Ac.)
 Total runoff = 27.906 (CFS) Total area = 12.400 (Ac.)
 Depth of flow = 1.549 (Ft.), Average velocity = 7.068 (Ft/s)

Sub-Channel No. 1 Critical depth = 1.734 (Ft.)
 ' ' Critical flow top width = 4.469 (Ft.)
 ' ' Critical flow velocity = 5.884 (Ft/s)
 ' ' Critical flow area = 4.742 (Sq.Ft)

++++++
 Process from Point/Station 504.000 to Point/Station 504.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 12.400 (Ac.)
 Runoff from this stream = 27.906 (CFS)
 Time of concentration = 19.86 min.
 Rainfall intensity = 2.388 (In/Hr)

++++++
 Process from Point/Station 504.100 to Point/Station 504.200
 **** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000 (Ft.)

Top (of initial area) elevation = 1342.000(Ft.)
 Bottom (of initial area) elevation = 1335.000(Ft.)
 Difference in elevation = 7.000(Ft.)
 Slope = 0.00700 s(percent)= 0.70
 $TC = k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
 Initial area time of concentration = 12.826 min.
 Rainfall intensity = 3.037(In/Hr) for a 100.0 year storm
 COMMERCIAL subarea type
 Runoff Coefficient = 0.895
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900
 Initial subarea runoff = 1.087(CFS)
 Total initial stream area = 0.400(Ac.)
 Pervious area fraction = 0.100

++++++
 Process from Point/Station 504.200 to Point/Station 504.000
 **** IMPROVED CHANNEL TRAVEL TIME ****

Upstream point elevation = 1335.000(Ft.)
 Downstream point elevation = 1332.000(Ft.)
 Channel length thru subarea = 335.000(Ft.)
 Channel base width = 0.000(Ft.)
 Slope or 'Z' of left channel bank = 1.000
 Slope or 'Z' of right channel bank = 20.000
 Estimated mean flow rate at midpoint of channel = 1.223(CFS)
 Manning's 'N' = 0.020
 Maximum depth of channel = 0.500(Ft.)
 Flow(q) thru subarea = 1.223(CFS)
 Depth of flow = 0.257(Ft.), Average velocity = 1.765(Ft/s)
 Channel flow top width = 5.394(Ft.)
 Flow Velocity = 1.77(Ft/s)
 Travel time = 3.16 min.
 Time of concentration = 15.99 min.

Sub-Channel No. 1 Critical depth = 0.242(Ft.)
 ' ' ' Critical flow top width = 5.086(Ft.)
 ' ' ' Critical flow velocity= 1.986(Ft/s)
 ' ' ' Critical flow area = 0.616(Sq.Ft)

Adding area flow to channel
 COMMERCIAL subarea type
 Runoff Coefficient = 0.894
 Decimal fraction soil group A = 0.000
 Decimal fraction soil group B = 0.000
 Decimal fraction soil group C = 0.000
 Decimal fraction soil group D = 1.000
 RI index for soil(AMC 3) = 88.00
 Pervious area fraction = 0.100; Impervious fraction = 0.900

Rainfall intensity = 2.690(In/Hr) for a 100.0 year storm
 Subarea runoff = 0.241(CFS) for 0.100(Ac.)
 Total runoff = 1.328(CFS) Total area = 0.500(Ac.)
 Depth of flow = 0.265(Ft.), Average velocity = 1.802(Ft/s)

Sub-Channel No. 1 Critical depth = 0.250(Ft.)
 ' ' ' Critical flow top width = 5.250(Ft.)
 ' ' ' Critical flow velocity = 2.023(Ft/s)
 ' ' ' Critical flow area = 0.656(Sq.Ft)

++++++
 Process from Point/Station 504.000 to Point/Station 504.000
 **** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
 Stream flow area = 0.500(Ac.)
 Runoff from this stream = 1.328(CFS)
 Time of concentration = 15.99 min.
 Rainfall intensity = 2.690(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	27.906	19.86	2.388
2	1.328	15.99	2.690

Largest stream flow has longer time of concentration
 $Q_p = 27.906 + \text{sum of}$
 $\quad Q_b \quad I_a/I_b$
 $\quad 1.328 * 0.888 = 1.178$
 $Q_p = 29.084$

Total of 2 streams to confluence:
 Flow rates before confluence point:
 27.906 1.328
 Area of streams before confluence:
 12.400 0.500
 Results of confluence:
 Total flow rate = 29.084(CFS)
 Time of concentration = 19.863 min.
 Effective stream area after confluence = 12.900(Ac.)
 End of computations, total study area = 12.90 (Ac.)
 The following figures may
 be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.965
 Area averaged RI index number = 83.7

APPENDIX "B"

UNIT HYDROGRAPH ANALYSIS

AREA "A" CALCULATION

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 04/24/14 File: 32786A1N12.out

+++++

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
45.60	0.58	26.45

100 YEAR Area rainfall data:

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

45.60

1.45

66.12

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.580 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.580 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.830

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	5.532
2	0.167	150.772	19.600
3	0.250	226.159	9.809
4	0.333	301.545	3.938
5	0.417	376.931	2.380
6	0.500	452.317	1.539
7	0.583	527.704	1.073
8	0.667	603.090	0.783
9	0.750	678.476	0.545
10	0.833	753.862	0.373

11	0.917	829.248	0.838	0.385
		Sum = 100.000	Sum=	45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.507)	0.254	0.052
2	0.17	4.50	0.313	(0.507)	0.260	0.053
3	0.25	5.40	0.376	(0.507)	0.312	0.064
4	0.33	5.40	0.376	(0.507)	0.312	0.064
5	0.42	5.70	0.397	(0.507)	0.329	0.067
6	0.50	6.40	0.445	(0.507)	0.369	0.076
7	0.58	7.90	0.550	(0.507)	0.456	0.094
8	0.67	9.10	0.633	0.507	(0.525)	0.126
9	0.75	12.80	0.891	0.507	(0.739)	0.384
10	0.83	25.60	1.781	0.507	(1.478)	1.274
11	0.92	7.90	0.550	(0.507)	0.456	0.094
12	1.00	4.90	0.341	(0.507)	0.283	0.058

(Loss Rate Not Used)

Sum = 100.0 Sum = 2.4

Flood volume = Effective rainfall 0.20 (In)
times area 45.6 (Ac.) / [(In) / (Ft.)] = 0.8 (Ac.Ft)
Total soil loss = 0.38 (In)
Total soil loss = 1.441 (Ac.Ft)
Total rainfall = 0.58 (In)
Flood volume = 33179.9 Cubic Feet
Total soil loss = 62786.6 Cubic Feet

Peak flow rate of this hydrograph = 30.300 (CFS)

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1 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q (CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0020	0.29	Q					
0+10	0.0111	1.32	VQ					
0+15	0.0242	1.91	Q					
0+20	0.0403	2.34	Q					
0+25	0.0581	2.59	QV					
0+30	0.0776	2.83	Q V					
0+35	0.0997	3.21	Q V					
0+40	0.1265	3.89	Q V					
0+45	0.1693	6.21	Q V					

0+50	0.2838	16.63			V Q				
0+55	0.4925	30.30				V	Q		
1+ 0	0.6084	16.83			Q		V		
1+ 5	0.6664	8.43		Q				V	
1+10	0.6999	4.86		Q				V	
1+15	0.7208	3.03		Q				V	
1+20	0.7351	2.08		Q				V	
1+25	0.7453	1.48		Q				V	
1+30	0.7524	1.02		Q				V	
1+35	0.7573	0.72	Q					V	
1+40	0.7612	0.56	Q					V	
1+45	0.7616	0.06	Q					V	
1+50	0.7617	0.02	Q					V	

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 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]
45.60	0.98	44.69

100 YEAR Area rainfall data:

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

45.60

2.48

113.09

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 0.980(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 0.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	5.532
2	0.167	150.772	19.600
3	0.250	226.159	9.809
4	0.333	301.545	3.938
5	0.417	376.931	2.380
6	0.500	452.317	1.539
7	0.583	527.704	1.073
8	0.667	603.090	0.783
9	0.750	678.476	0.545
10	0.833	753.862	0.373
11	0.917	829.248	0.385
Sum =		100.000	Sum= 45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.507)	0.127	0.026
2	0.17	1.30	0.153	(0.507)	0.127	0.026
3	0.25	1.10	0.129	(0.507)	0.107	0.022
4	0.33	1.50	0.176	(0.507)	0.146	0.030
5	0.42	1.50	0.176	(0.507)	0.146	0.030
6	0.50	1.80	0.212	(0.507)	0.176	0.036
7	0.58	1.50	0.176	(0.507)	0.146	0.030
8	0.67	1.80	0.212	(0.507)	0.176	0.036
9	0.75	1.80	0.212	(0.507)	0.176	0.036
10	0.83	1.50	0.176	(0.507)	0.146	0.030
11	0.92	1.60	0.188	(0.507)	0.156	0.032
12	1.00	1.80	0.212	(0.507)	0.176	0.036
13	1.08	2.20	0.259	(0.507)	0.215	0.044
14	1.17	2.20	0.259	(0.507)	0.215	0.044
15	1.25	2.20	0.259	(0.507)	0.215	0.044
16	1.33	2.00	0.235	(0.507)	0.195	0.040
17	1.42	2.60	0.306	(0.507)	0.254	0.052
18	1.50	2.70	0.317	(0.507)	0.263	0.054
19	1.58	2.40	0.282	(0.507)	0.234	0.048
20	1.67	2.70	0.317	(0.507)	0.263	0.054
21	1.75	3.30	0.388	(0.507)	0.322	0.066
22	1.83	3.10	0.364	(0.507)	0.302	0.062
23	1.92	2.90	0.341	(0.507)	0.283	0.058
24	2.00	3.00	0.353	(0.507)	0.293	0.060
25	2.08	3.10	0.364	(0.507)	0.302	0.062
26	2.17	4.20	0.494	(0.507)	0.410	0.084
27	2.25	5.00	0.588	(0.507)	0.488	0.100
28	2.33	3.50	0.412	(0.507)	0.341	0.070
29	2.42	6.80	0.800	0.507	(0.663)	0.293
30	2.50	7.30	0.858	0.507	(0.712)	0.351
31	2.58	8.20	0.964	0.507	(0.800)	0.457
32	2.67	5.90	0.694	0.507	(0.576)	0.187
33	2.75	2.00	0.235	(0.507)	0.195	0.040
34	2.83	1.80	0.212	(0.507)	0.176	0.036
35	2.92	1.80	0.212	(0.507)	0.176	0.036
36	3.00	0.60	0.071	(0.507)	0.059	0.012

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.7

Flood volume = Effective rainfall 0.23(In)

times area 45.6(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)

Total soil loss = 0.75(In)

Total soil loss = 2.860(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 37583.4 Cubic Feet

Total soil loss = 124601.7 Cubic Feet

Peak flow rate of this hydrograph = 15.137(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0010	0.14	Q					
0+10	0.0055	0.65	VQ					
0+15	0.0116	0.89	VQ					
0+20	0.0182	0.96	VQ					
0+25	0.0260	1.14	VQ					
0+30	0.0348	1.27	VQ					
0+35	0.0444	1.41	Q					
0+40	0.0542	1.41	Q					
0+45	0.0646	1.52	VQ					
0+50	0.0753	1.55	Q					
0+55	0.0855	1.48	QV					
1+ 0	0.0957	1.49	Q V					
1+ 5	0.1069	1.62	QV					
1+10	0.1194	1.82	Q V					
1+15	0.1326	1.91	Q V					
1+20	0.1459	1.93	Q V					
1+25	0.1593	1.94	Q V					
1+30	0.1742	2.17	Q V					
1+35	0.1899	2.28	Q V					
1+40	0.2055	2.26	Q V					
1+45	0.2222	2.43	Q V					
1+50	0.2408	2.70	Q V					
1+55	0.2597	2.74	Q V					
2+ 0	0.2782	2.70	Q V					
2+ 5	0.2970	2.73	Q V					
2+10	0.3171	2.91	Q V					
2+15	0.3409	3.46	Q V					
2+20	0.3673	3.84	Q V					
2+25	0.3999	4.73	Q V					
2+30	0.4636	9.25	Q V					
2+35	0.5540	13.13	Q V					
2+40	0.6583	15.14	Q V					
2+45	0.7327	10.81	Q V					
2+50	0.7751	6.15	Q V					
2+55	0.8036	4.14	Q V					
3+ 0	0.8253	3.15	Q V					
3+ 5	0.8398	2.10	Q V					
3+10	0.8487	1.29	Q V					
3+15	0.8547	0.87	Q V					
3+20	0.8586	0.56	Q V					
3+25	0.8610	0.35	Q V					

3+30	0.8620	0.15	Q				V
3+35	0.8624	0.06	Q				V
3+40	0.8626	0.03	Q				V
3+45	0.8628	0.02	Q				V
3+50	0.8628	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
45.60	1.38	62.93

100 YEAR Area rainfall data:

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

45.60

3.48

158.69

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	12.037
2	0.167	150.772	42.649
3	0.250	226.159	21.345
4	0.333	301.545	8.568
5	0.417	376.931	5.179
6	0.500	452.317	3.348
7	0.583	527.704	2.334
8	0.667	603.090	1.704
9	0.750	678.476	1.186
10	0.833	753.862	0.812
11	0.917	829.248	0.838
Sum = 100.000		Sum=	45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.083	(0.507)	0.069	0.014
2	0.17	0.60	0.099	(0.507)	0.082	0.017
3	0.25	0.60	0.099	(0.507)	0.082	0.017
4	0.33	0.60	0.099	(0.507)	0.082	0.017
5	0.42	0.60	0.099	(0.507)	0.082	0.017
6	0.50	0.70	0.116	(0.507)	0.096	0.020
7	0.58	0.70	0.116	(0.507)	0.096	0.020
8	0.67	0.70	0.116	(0.507)	0.096	0.020
9	0.75	0.70	0.116	(0.507)	0.096	0.020
10	0.83	0.70	0.116	(0.507)	0.096	0.020
11	0.92	0.70	0.116	(0.507)	0.096	0.020
12	1.00	0.80	0.132	(0.507)	0.110	0.023
13	1.08	0.80	0.132	(0.507)	0.110	0.023
14	1.17	0.80	0.132	(0.507)	0.110	0.023
15	1.25	0.80	0.132	(0.507)	0.110	0.023
16	1.33	0.80	0.132	(0.507)	0.110	0.023
17	1.42	0.80	0.132	(0.507)	0.110	0.023
18	1.50	0.80	0.132	(0.507)	0.110	0.023
19	1.58	0.80	0.132	(0.507)	0.110	0.023
20	1.67	0.80	0.132	(0.507)	0.110	0.023
21	1.75	0.80	0.132	(0.507)	0.110	0.023
22	1.83	0.80	0.132	(0.507)	0.110	0.023
23	1.92	0.80	0.132	(0.507)	0.110	0.023
24	2.00	0.90	0.149	(0.507)	0.124	0.025
25	2.08	0.80	0.132	(0.507)	0.110	0.023
26	2.17	0.90	0.149	(0.507)	0.124	0.025
27	2.25	0.90	0.149	(0.507)	0.124	0.025
28	2.33	0.90	0.149	(0.507)	0.124	0.025
29	2.42	0.90	0.149	(0.507)	0.124	0.025
30	2.50	0.90	0.149	(0.507)	0.124	0.025
31	2.58	0.90	0.149	(0.507)	0.124	0.025
32	2.67	0.90	0.149	(0.507)	0.124	0.025
33	2.75	1.00	0.166	(0.507)	0.137	0.028
34	2.83	1.00	0.166	(0.507)	0.137	0.028
35	2.92	1.00	0.166	(0.507)	0.137	0.028
36	3.00	1.00	0.166	(0.507)	0.137	0.028
37	3.08	1.00	0.166	(0.507)	0.137	0.028
38	3.17	1.10	0.182	(0.507)	0.151	0.031
39	3.25	1.10	0.182	(0.507)	0.151	0.031
40	3.33	1.10	0.182	(0.507)	0.151	0.031
41	3.42	1.20	0.199	(0.507)	0.165	0.034
42	3.50	1.30	0.215	(0.507)	0.179	0.037
43	3.58	1.40	0.232	(0.507)	0.192	0.039
44	3.67	1.40	0.232	(0.507)	0.192	0.039

45	3.75	1.50	0.248	(0.507)	0.206	0.042
46	3.83	1.50	0.248	(0.507)	0.206	0.042
47	3.92	1.60	0.265	(0.507)	0.220	0.045
48	4.00	1.60	0.265	(0.507)	0.220	0.045
49	4.08	1.70	0.281	(0.507)	0.234	0.048
50	4.17	1.80	0.298	(0.507)	0.247	0.051
51	4.25	1.90	0.315	(0.507)	0.261	0.054
52	4.33	2.00	0.331	(0.507)	0.275	0.056
53	4.42	2.10	0.348	(0.507)	0.289	0.059
54	4.50	2.10	0.348	(0.507)	0.289	0.059
55	4.58	2.20	0.364	(0.507)	0.302	0.062
56	4.67	2.30	0.381	(0.507)	0.316	0.065
57	4.75	2.40	0.397	(0.507)	0.330	0.068
58	4.83	2.40	0.397	(0.507)	0.330	0.068
59	4.92	2.50	0.414	(0.507)	0.343	0.070
60	5.00	2.60	0.430	(0.507)	0.357	0.073
61	5.08	3.10	0.513	(0.507)	0.426	0.087
62	5.17	3.60	0.596	(0.507)	0.495	0.101
63	5.25	3.90	0.646	0.507	(0.536)	0.139
64	5.33	4.20	0.695	0.507	(0.577)	0.188
65	5.42	4.70	0.778	0.507	(0.646)	0.271
66	5.50	5.60	0.927	0.507	(0.769)	0.420
67	5.58	1.90	0.315	(0.507)	0.261	0.054
68	5.67	0.90	0.149	(0.507)	0.124	0.025
69	5.75	0.60	0.099	(0.507)	0.082	0.017
70	5.83	0.50	0.083	(0.507)	0.069	0.014
71	5.92	0.30	0.050	(0.507)	0.041	0.008
72	6.00	0.20	0.033	(0.507)	0.027	0.006

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.3

Flood volume = Effective rainfall 0.28(In)
 times area 45.6(Ac.)/[(In)/(Ft.)] = 1.1(Ac.Ft)
 Total soil loss = 1.10(In)
 Total soil loss = 4.192(Ac.Ft)
 Total rainfall = 1.38(In)
 Flood volume = 45771.8 Cubic Feet
 Total soil loss = 182621.0 Cubic Feet

 Peak flow rate of this hydrograph = 12.669(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0005	0.08	Q				
0+10	0.0031	0.37	Q				
0+15	0.0070	0.56	VQ				
0+20	0.0114	0.65	VQ				
0+25	0.0162	0.69	VQ				

0+30	0.0212	0.74	VQ						
0+35	0.0268	0.81	Q						
0+40	0.0327	0.85	Q						
0+45	0.0387	0.87	Q						
0+50	0.0448	0.89	Q						
0+55	0.0510	0.90	Q						
1+ 0	0.0573	0.92	QV						
1+ 5	0.0640	0.97	QV						
1+10	0.0709	1.00	Q						
1+15	0.0779	1.02	Q						
1+20	0.0850	1.02	QV						
1+25	0.0920	1.03	QV						
1+30	0.0991	1.03	QV						
1+35	0.1062	1.03	Q V						
1+40	0.1134	1.03	Q V						
1+45	0.1205	1.04	Q V						
1+50	0.1276	1.04	Q V						
1+55	0.1348	1.04	Q V						
2+ 0	0.1420	1.05	Q V						
2+ 5	0.1495	1.09	Q V						
2+10	0.1570	1.08	Q V						
2+15	0.1647	1.12	Q V						
2+20	0.1725	1.14	Q V						
2+25	0.1805	1.15	Q V						
2+30	0.1884	1.16	Q V						
2+35	0.1964	1.16	Q V						
2+40	0.2044	1.16	Q V						
2+45	0.2125	1.18	Q V						
2+50	0.2211	1.24	Q V						
2+55	0.2298	1.26	Q V						
3+ 0	0.2385	1.28	Q V						
3+ 5	0.2474	1.28	Q V						
3+10	0.2563	1.30	Q V						
3+15	0.2657	1.36	Q V						
3+20	0.2753	1.39	Q V						
3+25	0.2851	1.42	Q V						
3+30	0.2954	1.50	Q V						
3+35	0.3064	1.60	Q V						
3+40	0.3181	1.70	Q V						
3+45	0.3302	1.76	Q V						
3+50	0.3429	1.84	Q V						
3+55	0.3560	1.90	Q V						
4+ 0	0.3696	1.98	Q V						
4+ 5	0.3836	2.03	Q V						
4+10	0.3982	2.12	Q V						
4+15	0.4136	2.24	Q V						
4+20	0.4298	2.35	Q V						
4+25	0.4469	2.48	Q V						
4+30	0.4647	2.58	Q V						
4+35	0.4830	2.66	Q V						
4+40	0.5020	2.75	Q V						
4+45	0.5217	2.87	Q V						
4+50	0.5422	2.98	Q V						
4+55	0.5632	3.05	Q V						

5+ 0	0.5849	3.15		Q		V	
5+ 5	0.6078	3.33		Q		V	
5+10	0.6335	3.73		Q		V	
5+15	0.6637	4.38		Q		V	
5+20	0.7022	5.59			Q	V	
5+25	0.7538	7.49			Q	V	
5+30	0.8271	10.64				Q	V
5+35	0.9143	12.67				Q	V
5+40	0.9647	7.32			Q		V
5+45	0.9925	4.04		Q			V
5+50	1.0112	2.71		Q			V
5+55	1.0246	1.95		Q			V
6+ 0	1.0343	1.40	Q				V
6+ 5	1.0411	0.99	Q				V
6+10	1.0454	0.62	Q				V
6+15	1.0481	0.39	Q				V
6+20	1.0498	0.25	Q				V
6+25	1.0503	0.07	Q				V
6+30	1.0505	0.04	Q				V
6+35	1.0506	0.02	Q				V
6+40	1.0507	0.01	Q				V
6+45	1.0508	0.01	Q				V
6+50	1.0508	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 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]
45.60	2.48	113.09

100 YEAR Area rainfall data:

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

45.60

6.90

314.64

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 2.480 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 2.480 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	5.532
2	0.167	150.772	19.600
3	0.250	226.159	9.809
4	0.333	301.545	3.938
5	0.417	376.931	2.380
6	0.500	452.317	1.539
7	0.583	527.704	1.073
8	0.667	603.090	0.783
9	0.750	678.476	0.545
10	0.833	753.862	0.373
11	0.917	829.248	0.385
Sum = 100.000		Sum=	45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.020	(0.899)	0.016	0.003
2	0.17	0.07	0.020	(0.895)	0.016	0.003
3	0.25	0.07	0.020	(0.892)	0.016	0.003
4	0.33	0.10	0.030	(0.888)	0.025	0.005
5	0.42	0.10	0.030	(0.885)	0.025	0.005
6	0.50	0.10	0.030	(0.881)	0.025	0.005
7	0.58	0.10	0.030	(0.878)	0.025	0.005
8	0.67	0.10	0.030	(0.875)	0.025	0.005
9	0.75	0.10	0.030	(0.871)	0.025	0.005
10	0.83	0.13	0.040	(0.868)	0.033	0.007
11	0.92	0.13	0.040	(0.864)	0.033	0.007
12	1.00	0.13	0.040	(0.861)	0.033	0.007
13	1.08	0.10	0.030	(0.857)	0.025	0.005
14	1.17	0.10	0.030	(0.854)	0.025	0.005
15	1.25	0.10	0.030	(0.851)	0.025	0.005
16	1.33	0.10	0.030	(0.847)	0.025	0.005
17	1.42	0.10	0.030	(0.844)	0.025	0.005
18	1.50	0.10	0.030	(0.841)	0.025	0.005
19	1.58	0.10	0.030	(0.837)	0.025	0.005
20	1.67	0.10	0.030	(0.834)	0.025	0.005
21	1.75	0.10	0.030	(0.830)	0.025	0.005
22	1.83	0.13	0.040	(0.827)	0.033	0.007
23	1.92	0.13	0.040	(0.824)	0.033	0.007
24	2.00	0.13	0.040	(0.820)	0.033	0.007
25	2.08	0.13	0.040	(0.817)	0.033	0.007
26	2.17	0.13	0.040	(0.814)	0.033	0.007
27	2.25	0.13	0.040	(0.811)	0.033	0.007
28	2.33	0.13	0.040	(0.807)	0.033	0.007
29	2.42	0.13	0.040	(0.804)	0.033	0.007
30	2.50	0.13	0.040	(0.801)	0.033	0.007
31	2.58	0.17	0.050	(0.797)	0.041	0.008
32	2.67	0.17	0.050	(0.794)	0.041	0.008
33	2.75	0.17	0.050	(0.791)	0.041	0.008
34	2.83	0.17	0.050	(0.788)	0.041	0.008
35	2.92	0.17	0.050	(0.784)	0.041	0.008
36	3.00	0.17	0.050	(0.781)	0.041	0.008
37	3.08	0.17	0.050	(0.778)	0.041	0.008
38	3.17	0.17	0.050	(0.775)	0.041	0.008
39	3.25	0.17	0.050	(0.771)	0.041	0.008
40	3.33	0.17	0.050	(0.768)	0.041	0.008
41	3.42	0.17	0.050	(0.765)	0.041	0.008
42	3.50	0.17	0.050	(0.762)	0.041	0.008
43	3.58	0.17	0.050	(0.759)	0.041	0.008
44	3.67	0.17	0.050	(0.755)	0.041	0.008

45	3.75	0.17	0.050	(0.752)	0.041	0.008
46	3.83	0.20	0.060	(0.749)	0.049	0.010
47	3.92	0.20	0.060	(0.746)	0.049	0.010
48	4.00	0.20	0.060	(0.743)	0.049	0.010
49	4.08	0.20	0.060	(0.740)	0.049	0.010
50	4.17	0.20	0.060	(0.736)	0.049	0.010
51	4.25	0.20	0.060	(0.733)	0.049	0.010
52	4.33	0.23	0.069	(0.730)	0.058	0.012
53	4.42	0.23	0.069	(0.727)	0.058	0.012
54	4.50	0.23	0.069	(0.724)	0.058	0.012
55	4.58	0.23	0.069	(0.721)	0.058	0.012
56	4.67	0.23	0.069	(0.718)	0.058	0.012
57	4.75	0.23	0.069	(0.715)	0.058	0.012
58	4.83	0.27	0.079	(0.712)	0.066	0.014
59	4.92	0.27	0.079	(0.709)	0.066	0.014
60	5.00	0.27	0.079	(0.705)	0.066	0.014
61	5.08	0.20	0.060	(0.702)	0.049	0.010
62	5.17	0.20	0.060	(0.699)	0.049	0.010
63	5.25	0.20	0.060	(0.696)	0.049	0.010
64	5.33	0.23	0.069	(0.693)	0.058	0.012
65	5.42	0.23	0.069	(0.690)	0.058	0.012
66	5.50	0.23	0.069	(0.687)	0.058	0.012
67	5.58	0.27	0.079	(0.684)	0.066	0.014
68	5.67	0.27	0.079	(0.681)	0.066	0.014
69	5.75	0.27	0.079	(0.678)	0.066	0.014
70	5.83	0.27	0.079	(0.675)	0.066	0.014
71	5.92	0.27	0.079	(0.672)	0.066	0.014
72	6.00	0.27	0.079	(0.669)	0.066	0.014
73	6.08	0.30	0.089	(0.666)	0.074	0.015
74	6.17	0.30	0.089	(0.663)	0.074	0.015
75	6.25	0.30	0.089	(0.660)	0.074	0.015
76	6.33	0.30	0.089	(0.657)	0.074	0.015
77	6.42	0.30	0.089	(0.654)	0.074	0.015
78	6.50	0.30	0.089	(0.651)	0.074	0.015
79	6.58	0.33	0.099	(0.649)	0.082	0.017
80	6.67	0.33	0.099	(0.646)	0.082	0.017
81	6.75	0.33	0.099	(0.643)	0.082	0.017
82	6.83	0.33	0.099	(0.640)	0.082	0.017
83	6.92	0.33	0.099	(0.637)	0.082	0.017
84	7.00	0.33	0.099	(0.634)	0.082	0.017
85	7.08	0.33	0.099	(0.631)	0.082	0.017
86	7.17	0.33	0.099	(0.628)	0.082	0.017
87	7.25	0.33	0.099	(0.625)	0.082	0.017
88	7.33	0.37	0.109	(0.623)	0.091	0.019
89	7.42	0.37	0.109	(0.620)	0.091	0.019
90	7.50	0.37	0.109	(0.617)	0.091	0.019
91	7.58	0.40	0.119	(0.614)	0.099	0.020
92	7.67	0.40	0.119	(0.611)	0.099	0.020
93	7.75	0.40	0.119	(0.608)	0.099	0.020
94	7.83	0.43	0.129	(0.606)	0.107	0.022
95	7.92	0.43	0.129	(0.603)	0.107	0.022
96	8.00	0.43	0.129	(0.600)	0.107	0.022
97	8.08	0.50	0.149	(0.597)	0.123	0.025
98	8.17	0.50	0.149	(0.594)	0.123	0.025

99	8.25	0.50	0.149	(0.592)	0.123	0.025
100	8.33	0.50	0.149	(0.589)	0.123	0.025
101	8.42	0.50	0.149	(0.586)	0.123	0.025
102	8.50	0.50	0.149	(0.583)	0.123	0.025
103	8.58	0.53	0.159	(0.581)	0.132	0.027
104	8.67	0.53	0.159	(0.578)	0.132	0.027
105	8.75	0.53	0.159	(0.575)	0.132	0.027
106	8.83	0.57	0.169	(0.572)	0.140	0.029
107	8.92	0.57	0.169	(0.570)	0.140	0.029
108	9.00	0.57	0.169	(0.567)	0.140	0.029
109	9.08	0.63	0.188	(0.564)	0.156	0.032
110	9.17	0.63	0.188	(0.562)	0.156	0.032
111	9.25	0.63	0.188	(0.559)	0.156	0.032
112	9.33	0.67	0.198	(0.556)	0.165	0.034
113	9.42	0.67	0.198	(0.554)	0.165	0.034
114	9.50	0.67	0.198	(0.551)	0.165	0.034
115	9.58	0.70	0.208	(0.548)	0.173	0.035
116	9.67	0.70	0.208	(0.546)	0.173	0.035
117	9.75	0.70	0.208	(0.543)	0.173	0.035
118	9.83	0.73	0.218	(0.541)	0.181	0.037
119	9.92	0.73	0.218	(0.538)	0.181	0.037
120	10.00	0.73	0.218	(0.535)	0.181	0.037
121	10.08	0.50	0.149	(0.533)	0.123	0.025
122	10.17	0.50	0.149	(0.530)	0.123	0.025
123	10.25	0.50	0.149	(0.528)	0.123	0.025
124	10.33	0.50	0.149	(0.525)	0.123	0.025
125	10.42	0.50	0.149	(0.522)	0.123	0.025
126	10.50	0.50	0.149	(0.520)	0.123	0.025
127	10.58	0.67	0.198	(0.517)	0.165	0.034
128	10.67	0.67	0.198	(0.515)	0.165	0.034
129	10.75	0.67	0.198	(0.512)	0.165	0.034
130	10.83	0.67	0.198	(0.510)	0.165	0.034
131	10.92	0.67	0.198	(0.507)	0.165	0.034
132	11.00	0.67	0.198	(0.505)	0.165	0.034
133	11.08	0.63	0.188	(0.502)	0.156	0.032
134	11.17	0.63	0.188	(0.500)	0.156	0.032
135	11.25	0.63	0.188	(0.497)	0.156	0.032
136	11.33	0.63	0.188	(0.495)	0.156	0.032
137	11.42	0.63	0.188	(0.493)	0.156	0.032
138	11.50	0.63	0.188	(0.490)	0.156	0.032
139	11.58	0.57	0.169	(0.488)	0.140	0.029
140	11.67	0.57	0.169	(0.485)	0.140	0.029
141	11.75	0.57	0.169	(0.483)	0.140	0.029
142	11.83	0.60	0.179	(0.480)	0.148	0.030
143	11.92	0.60	0.179	(0.478)	0.148	0.030
144	12.00	0.60	0.179	(0.476)	0.148	0.030
145	12.08	0.83	0.248	(0.473)	0.206	0.042
146	12.17	0.83	0.248	(0.471)	0.206	0.042
147	12.25	0.83	0.248	(0.469)	0.206	0.042
148	12.33	0.87	0.258	(0.466)	0.214	0.044
149	12.42	0.87	0.258	(0.464)	0.214	0.044
150	12.50	0.87	0.258	(0.461)	0.214	0.044
151	12.58	0.93	0.278	(0.459)	0.230	0.047
152	12.67	0.93	0.278	(0.457)	0.230	0.047

153	12.75	0.93	0.278	(0.455)	0.230	0.047
154	12.83	0.97	0.288	(0.452)	0.239	0.049
155	12.92	0.97	0.288	(0.450)	0.239	0.049
156	13.00	0.97	0.288	(0.448)	0.239	0.049
157	13.08	1.13	0.337	(0.445)	0.280	0.057
158	13.17	1.13	0.337	(0.443)	0.280	0.057
159	13.25	1.13	0.337	(0.441)	0.280	0.057
160	13.33	1.13	0.337	(0.439)	0.280	0.057
161	13.42	1.13	0.337	(0.436)	0.280	0.057
162	13.50	1.13	0.337	(0.434)	0.280	0.057
163	13.58	0.77	0.228	(0.432)	0.189	0.039
164	13.67	0.77	0.228	(0.430)	0.189	0.039
165	13.75	0.77	0.228	(0.428)	0.189	0.039
166	13.83	0.77	0.228	(0.425)	0.189	0.039
167	13.92	0.77	0.228	(0.423)	0.189	0.039
168	14.00	0.77	0.228	(0.421)	0.189	0.039
169	14.08	0.90	0.268	(0.419)	0.222	0.046
170	14.17	0.90	0.268	(0.417)	0.222	0.046
171	14.25	0.90	0.268	(0.415)	0.222	0.046
172	14.33	0.87	0.258	(0.413)	0.214	0.044
173	14.42	0.87	0.258	(0.410)	0.214	0.044
174	14.50	0.87	0.258	(0.408)	0.214	0.044
175	14.58	0.87	0.258	(0.406)	0.214	0.044
176	14.67	0.87	0.258	(0.404)	0.214	0.044
177	14.75	0.87	0.258	(0.402)	0.214	0.044
178	14.83	0.83	0.248	(0.400)	0.206	0.042
179	14.92	0.83	0.248	(0.398)	0.206	0.042
180	15.00	0.83	0.248	(0.396)	0.206	0.042
181	15.08	0.80	0.238	(0.394)	0.198	0.041
182	15.17	0.80	0.238	(0.392)	0.198	0.041
183	15.25	0.80	0.238	(0.390)	0.198	0.041
184	15.33	0.77	0.228	(0.388)	0.189	0.039
185	15.42	0.77	0.228	(0.386)	0.189	0.039
186	15.50	0.77	0.228	(0.384)	0.189	0.039
187	15.58	0.63	0.188	(0.382)	0.156	0.032
188	15.67	0.63	0.188	(0.380)	0.156	0.032
189	15.75	0.63	0.188	(0.378)	0.156	0.032
190	15.83	0.63	0.188	(0.376)	0.156	0.032
191	15.92	0.63	0.188	(0.374)	0.156	0.032
192	16.00	0.63	0.188	(0.372)	0.156	0.032
193	16.08	0.13	0.040	(0.370)	0.033	0.007
194	16.17	0.13	0.040	(0.368)	0.033	0.007
195	16.25	0.13	0.040	(0.367)	0.033	0.007
196	16.33	0.13	0.040	(0.365)	0.033	0.007
197	16.42	0.13	0.040	(0.363)	0.033	0.007
198	16.50	0.13	0.040	(0.361)	0.033	0.007
199	16.58	0.10	0.030	(0.359)	0.025	0.005
200	16.67	0.10	0.030	(0.357)	0.025	0.005
201	16.75	0.10	0.030	(0.356)	0.025	0.005
202	16.83	0.10	0.030	(0.354)	0.025	0.005
203	16.92	0.10	0.030	(0.352)	0.025	0.005
204	17.00	0.10	0.030	(0.350)	0.025	0.005
205	17.08	0.17	0.050	(0.348)	0.041	0.008
206	17.17	0.17	0.050	(0.347)	0.041	0.008

207	17.25	0.17	0.050	(0.345)	0.041	0.008
208	17.33	0.17	0.050	(0.343)	0.041	0.008
209	17.42	0.17	0.050	(0.341)	0.041	0.008
210	17.50	0.17	0.050	(0.340)	0.041	0.008
211	17.58	0.17	0.050	(0.338)	0.041	0.008
212	17.67	0.17	0.050	(0.336)	0.041	0.008
213	17.75	0.17	0.050	(0.335)	0.041	0.008
214	17.83	0.13	0.040	(0.333)	0.033	0.007
215	17.92	0.13	0.040	(0.331)	0.033	0.007
216	18.00	0.13	0.040	(0.330)	0.033	0.007
217	18.08	0.13	0.040	(0.328)	0.033	0.007
218	18.17	0.13	0.040	(0.327)	0.033	0.007
219	18.25	0.13	0.040	(0.325)	0.033	0.007
220	18.33	0.13	0.040	(0.323)	0.033	0.007
221	18.42	0.13	0.040	(0.322)	0.033	0.007
222	18.50	0.13	0.040	(0.320)	0.033	0.007
223	18.58	0.10	0.030	(0.319)	0.025	0.005
224	18.67	0.10	0.030	(0.317)	0.025	0.005
225	18.75	0.10	0.030	(0.316)	0.025	0.005
226	18.83	0.07	0.020	(0.314)	0.016	0.003
227	18.92	0.07	0.020	(0.313)	0.016	0.003
228	19.00	0.07	0.020	(0.311)	0.016	0.003
229	19.08	0.10	0.030	(0.310)	0.025	0.005
230	19.17	0.10	0.030	(0.308)	0.025	0.005
231	19.25	0.10	0.030	(0.307)	0.025	0.005
232	19.33	0.13	0.040	(0.305)	0.033	0.007
233	19.42	0.13	0.040	(0.304)	0.033	0.007
234	19.50	0.13	0.040	(0.302)	0.033	0.007
235	19.58	0.10	0.030	(0.301)	0.025	0.005
236	19.67	0.10	0.030	(0.300)	0.025	0.005
237	19.75	0.10	0.030	(0.298)	0.025	0.005
238	19.83	0.07	0.020	(0.297)	0.016	0.003
239	19.92	0.07	0.020	(0.296)	0.016	0.003
240	20.00	0.07	0.020	(0.294)	0.016	0.003
241	20.08	0.10	0.030	(0.293)	0.025	0.005
242	20.17	0.10	0.030	(0.292)	0.025	0.005
243	20.25	0.10	0.030	(0.291)	0.025	0.005
244	20.33	0.10	0.030	(0.289)	0.025	0.005
245	20.42	0.10	0.030	(0.288)	0.025	0.005
246	20.50	0.10	0.030	(0.287)	0.025	0.005
247	20.58	0.10	0.030	(0.286)	0.025	0.005
248	20.67	0.10	0.030	(0.284)	0.025	0.005
249	20.75	0.10	0.030	(0.283)	0.025	0.005
250	20.83	0.07	0.020	(0.282)	0.016	0.003
251	20.92	0.07	0.020	(0.281)	0.016	0.003
252	21.00	0.07	0.020	(0.280)	0.016	0.003
253	21.08	0.10	0.030	(0.279)	0.025	0.005
254	21.17	0.10	0.030	(0.278)	0.025	0.005
255	21.25	0.10	0.030	(0.277)	0.025	0.005
256	21.33	0.07	0.020	(0.275)	0.016	0.003
257	21.42	0.07	0.020	(0.274)	0.016	0.003
258	21.50	0.07	0.020	(0.273)	0.016	0.003
259	21.58	0.10	0.030	(0.272)	0.025	0.005
260	21.67	0.10	0.030	(0.271)	0.025	0.005

261	21.75	0.10	0.030	(0.270)	0.025	0.005
262	21.83	0.07	0.020	(0.270)	0.016	0.003
263	21.92	0.07	0.020	(0.269)	0.016	0.003
264	22.00	0.07	0.020	(0.268)	0.016	0.003
265	22.08	0.10	0.030	(0.267)	0.025	0.005
266	22.17	0.10	0.030	(0.266)	0.025	0.005
267	22.25	0.10	0.030	(0.265)	0.025	0.005
268	22.33	0.07	0.020	(0.264)	0.016	0.003
269	22.42	0.07	0.020	(0.263)	0.016	0.003
270	22.50	0.07	0.020	(0.263)	0.016	0.003
271	22.58	0.07	0.020	(0.262)	0.016	0.003
272	22.67	0.07	0.020	(0.261)	0.016	0.003
273	22.75	0.07	0.020	(0.260)	0.016	0.003
274	22.83	0.07	0.020	(0.260)	0.016	0.003
275	22.92	0.07	0.020	(0.259)	0.016	0.003
276	23.00	0.07	0.020	(0.258)	0.016	0.003
277	23.08	0.07	0.020	(0.258)	0.016	0.003
278	23.17	0.07	0.020	(0.257)	0.016	0.003
279	23.25	0.07	0.020	(0.257)	0.016	0.003
280	23.33	0.07	0.020	(0.256)	0.016	0.003
281	23.42	0.07	0.020	(0.256)	0.016	0.003
282	23.50	0.07	0.020	(0.255)	0.016	0.003
283	23.58	0.07	0.020	(0.255)	0.016	0.003
284	23.67	0.07	0.020	(0.255)	0.016	0.003
285	23.75	0.07	0.020	(0.254)	0.016	0.003
286	23.83	0.07	0.020	(0.254)	0.016	0.003
287	23.92	0.07	0.020	(0.254)	0.016	0.003
288	24.00	0.07	0.020	(0.254)	0.016	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.1

Flood volume = Effective rainfall 0.42(In)

times area 45.6(Ac.)/[(In)/(Ft.)] = 1.6(Ac.Ft)

Total soil loss = 2.06(In)

Total soil loss = 7.819(Ac.Ft)

Total rainfall = 2.48(In)

Flood volume = 69862.5 Cubic Feet

Total soil loss = 340610.4 Cubic Feet

Peak flow rate of this hydrograph = 2.611(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.02	Q				
0+10	0.0007	0.08	Q				
0+15	0.0015	0.12	Q				
0+20	0.0025	0.14	Q				
0+25	0.0037	0.18	Q				

0+30	0.0051	0.20	Q
0+35	0.0066	0.21	Q
0+40	0.0081	0.22	Q
0+45	0.0097	0.22	Q
0+50	0.0113	0.24	Q
0+55	0.0132	0.27	VQ
1+ 0	0.0152	0.29	VQ
1+ 5	0.0172	0.29	VQ
1+10	0.0190	0.26	VQ
1+15	0.0207	0.25	Q
1+20	0.0223	0.24	Q
1+25	0.0240	0.24	Q
1+30	0.0256	0.24	Q
1+35	0.0272	0.24	Q
1+40	0.0289	0.24	Q
1+45	0.0305	0.23	Q
1+50	0.0321	0.24	Q
1+55	0.0340	0.28	VQ
2+ 0	0.0361	0.29	VQ
2+ 5	0.0381	0.30	VQ
2+10	0.0402	0.30	Q
2+15	0.0423	0.31	Q
2+20	0.0444	0.31	Q
2+25	0.0465	0.31	Q
2+30	0.0487	0.31	Q
2+35	0.0509	0.32	Q
2+40	0.0533	0.35	Q
2+45	0.0558	0.37	Q
2+50	0.0584	0.38	Q
2+55	0.0610	0.38	Q
3+ 0	0.0637	0.38	Q
3+ 5	0.0663	0.38	Q
3+10	0.0690	0.39	Q
3+15	0.0717	0.39	Q
3+20	0.0743	0.39	Q
3+25	0.0770	0.39	Q
3+30	0.0797	0.39	Q
3+35	0.0823	0.39	QV
3+40	0.0850	0.39	QV
3+45	0.0877	0.39	QV
3+50	0.0904	0.40	QV
3+55	0.0934	0.43	QV
4+ 0	0.0965	0.45	QV
4+ 5	0.0996	0.45	QV
4+10	0.1027	0.46	QV
4+15	0.1059	0.46	QV
4+20	0.1092	0.47	QV
4+25	0.1127	0.51	Q
4+30	0.1163	0.52	Q
4+35	0.1199	0.53	Q
4+40	0.1236	0.54	QV
4+45	0.1273	0.54	QV
4+50	0.1311	0.55	QV
4+55	0.1351	0.58	QV

5+ 0	0.1392	0.60	QV				
5+ 5	0.1433	0.59	QV				
5+10	0.1469	0.53	QV				
5+15	0.1504	0.50	Q V				
5+20	0.1538	0.50	Q V				
5+25	0.1574	0.52	QV				
5+30	0.1611	0.53	Q V				
5+35	0.1648	0.55	Q V				
5+40	0.1688	0.58	Q V				
5+45	0.1730	0.60	Q V				
5+50	0.1771	0.61	Q V				
5+55	0.1814	0.61	Q V				
6+ 0	0.1856	0.61	Q V				
6+ 5	0.1899	0.63	Q V				
6+10	0.1944	0.66	Q V				
6+15	0.1991	0.68	Q V				
6+20	0.2038	0.69	Q V				
6+25	0.2086	0.69	Q V				
6+30	0.2134	0.69	Q V				
6+35	0.2182	0.70	Q V				
6+40	0.2233	0.74	Q V				
6+45	0.2285	0.76	Q V				
6+50	0.2338	0.76	Q V				
6+55	0.2391	0.77	Q V				
7+ 0	0.2444	0.77	Q V				
7+ 5	0.2497	0.77	Q V				
7+10	0.2550	0.77	Q V				
7+15	0.2604	0.77	Q V				
7+20	0.2658	0.78	Q V				
7+25	0.2714	0.82	Q V				
7+30	0.2772	0.84	Q V				
7+35	0.2830	0.85	Q V				
7+40	0.2892	0.89	Q V				
7+45	0.2954	0.91	Q V				
7+50	0.3018	0.93	Q V				
7+55	0.3084	0.96	Q V				
8+ 0	0.3152	0.98	Q V				
8+ 5	0.3222	1.01	Q V				
8+10	0.3296	1.08	Q V				
8+15	0.3373	1.12	Q V				
8+20	0.3452	1.14	Q V				
8+25	0.3531	1.15	Q V				
8+30	0.3610	1.15	Q V				
8+35	0.3690	1.17	Q V				
8+40	0.3773	1.20	Q V				
8+45	0.3857	1.22	Q V				
8+50	0.3942	1.24	Q V				
8+55	0.4030	1.28	Q V				
9+ 0	0.4120	1.30	Q V				
9+ 5	0.4211	1.32	Q V				
9+10	0.4307	1.39	Q V				
9+15	0.4405	1.43	Q V				
9+20	0.4506	1.46	Q V				
9+25	0.4609	1.50	Q V				

9+30	0.4714	1.52	Q	V			
9+35	0.4820	1.54	Q	V			
9+40	0.4929	1.58	Q	V			
9+45	0.5039	1.60	Q	V			
9+50	0.5151	1.62	Q	V			
9+55	0.5266	1.66	Q	V			
10+ 0	0.5381	1.68	Q	V			
10+ 5	0.5493	1.63	Q	V			
10+10	0.5590	1.40	Q	V			
10+15	0.5679	1.29	Q	V			
10+20	0.5764	1.24	Q	V			
10+25	0.5848	1.22	Q	V			
10+30	0.5931	1.20	Q	V			
10+35	0.6016	1.24	Q	V			
10+40	0.6112	1.39	Q	V			
10+45	0.6213	1.47	Q	V			
10+50	0.6316	1.50	Q	V			
10+55	0.6420	1.51	Q	V			
11+ 0	0.6525	1.53	Q	V			
11+ 5	0.6630	1.53	Q	V			
11+10	0.6734	1.50	Q	V			
11+15	0.6836	1.49	Q	V			
11+20	0.6938	1.48	Q	V			
11+25	0.7040	1.48	Q	V			
11+30	0.7142	1.48	Q	V			
11+35	0.7243	1.46	Q	V			
11+40	0.7339	1.39	Q	V			
11+45	0.7432	1.36	Q	V			
11+50	0.7525	1.35	Q	V			
11+55	0.7620	1.38	Q	V			
12+ 0	0.7716	1.39	Q	V			
12+ 5	0.7816	1.46	Q	V			
12+10	0.7933	1.69	Q	V			
12+15	0.8057	1.81	Q	V			
12+20	0.8186	1.86	Q	V			
12+25	0.8318	1.93	Q	V			
12+30	0.8453	1.96	Q	V			
12+35	0.8591	2.00	Q	V			
12+40	0.8734	2.08	Q	V			
12+45	0.8880	2.12	Q	V			
12+50	0.9029	2.15	Q	V			
12+55	0.9180	2.20	Q	V			
13+ 0	0.9333	2.22	Q	V			
13+ 5	0.9490	2.28	Q	V			
13+10	0.9659	2.45	Q	V			
13+15	0.9833	2.54	Q	V			
13+20	1.0011	2.57	Q	V			
13+25	1.0190	2.60	Q	V			
13+30	1.0369	2.61	Q	V			
13+35	1.0543	2.52	Q	V			
13+40	1.0692	2.16	Q	V			
13+45	1.0828	1.98	Q	V			
13+50	1.0960	1.91	Q	V			
13+55	1.1089	1.87	Q	V			

14+ 0	1.1216	1.84		Q		V	
14+ 5	1.1344	1.86		Q		V	
14+10	1.1481	1.98		Q		V	
14+15	1.1621	2.04		Q		V	
14+20	1.1762	2.05		Q		V	
14+25	1.1901	2.02		Q		V	
14+30	1.2040	2.02		Q		V	
14+35	1.2179	2.02		Q		V	
14+40	1.2318	2.02		Q		V	
14+45	1.2457	2.02		Q		V	
14+50	1.2595	2.01		Q		V	
14+55	1.2731	1.98		Q		V	
15+ 0	1.2866	1.96		Q		V	
15+ 5	1.3000	1.94		Q		V	
15+10	1.3131	1.91		Q		V	
15+15	1.3261	1.89		Q		V	
15+20	1.3390	1.87		Q		V	
15+25	1.3516	1.83		Q		V	
15+30	1.3641	1.81		Q		V	
15+35	1.3762	1.76		Q		V	
15+40	1.3874	1.63		Q		V	
15+45	1.3981	1.56		Q		V	
15+50	1.4087	1.53		Q		V	
15+55	1.4191	1.51		Q		V	
16+ 0	1.4294	1.50		Q		V	
16+ 5	1.4387	1.35		Q		V	
16+10	1.4445	0.85		Q		V	
16+15	1.4486	0.59		Q		V	
16+20	1.4520	0.49		Q		V	
16+25	1.4549	0.43		Q		V	
16+30	1.4576	0.39		Q		V	
16+35	1.4601	0.35		Q		V	
16+40	1.4621	0.30		Q		V	
16+45	1.4640	0.27		Q		V	
16+50	1.4658	0.25		Q		V	
16+55	1.4674	0.24		Q		V	
17+ 0	1.4691	0.24		Q		V	
17+ 5	1.4708	0.26		Q		V	
17+10	1.4730	0.32		Q		V	
17+15	1.4754	0.35		Q		V	
17+20	1.4780	0.36		Q		V	
17+25	1.4805	0.37		Q		V	
17+30	1.4831	0.38		Q		V	
17+35	1.4857	0.38		Q		V	
17+40	1.4884	0.38		Q		V	
17+45	1.4910	0.39		Q		V	
17+50	1.4936	0.38		Q		V	
17+55	1.4960	0.35		Q		V	
18+ 0	1.4983	0.33		Q		V	
18+ 5	1.5005	0.32		Q		V	
18+10	1.5027	0.32		Q		V	
18+15	1.5049	0.32		Q		V	
18+20	1.5070	0.31		Q		V	
18+25	1.5092	0.31		Q		V	

18+30	1.5113	0.31	Q				V
18+35	1.5134	0.30	Q				V
18+40	1.5153	0.27	Q				V
18+45	1.5170	0.25	Q				V
18+50	1.5186	0.24	Q				V
18+55	1.5200	0.20	Q				V
19+ 0	1.5212	0.18	Q				V
19+ 5	1.5225	0.18	Q				V
19+10	1.5239	0.21	Q				V
19+15	1.5254	0.22	Q				V
19+20	1.5270	0.23	Q				V
19+25	1.5289	0.27	Q				V
19+30	1.5309	0.29	Q				V
19+35	1.5328	0.29	Q				V
19+40	1.5346	0.26	Q				V
19+45	1.5363	0.24	Q				V
19+50	1.5379	0.23	Q				V
19+55	1.5392	0.20	Q				V
20+ 0	1.5405	0.18	Q				V
20+ 5	1.5417	0.18	Q				V
20+10	1.5431	0.21	Q				V
20+15	1.5447	0.22	Q				V
20+20	1.5462	0.23	Q				V
20+25	1.5478	0.23	Q				V
20+30	1.5493	0.23	Q				V
20+35	1.5509	0.23	Q				V
20+40	1.5525	0.23	Q				V
20+45	1.5541	0.23	Q				V
20+50	1.5556	0.22	Q				V
20+55	1.5570	0.19	Q				V
21+ 0	1.5582	0.17	Q				V
21+ 5	1.5594	0.18	Q				V
21+10	1.5608	0.21	Q				V
21+15	1.5623	0.22	Q				V
21+20	1.5638	0.22	Q				V
21+25	1.5651	0.18	Q				V
21+30	1.5662	0.17	Q				V
21+35	1.5674	0.17	Q				V
21+40	1.5688	0.20	Q				V
21+45	1.5703	0.22	Q				V
21+50	1.5718	0.21	Q				V
21+55	1.5731	0.18	Q				V
22+ 0	1.5742	0.17	Q				V
22+ 5	1.5754	0.17	Q				V
22+10	1.5768	0.20	Q				V
22+15	1.5783	0.22	Q				V
22+20	1.5798	0.21	Q				V
22+25	1.5811	0.18	Q				V
22+30	1.5823	0.17	Q				V
22+35	1.5834	0.16	Q				V
22+40	1.5845	0.16	Q				V
22+45	1.5856	0.16	Q				V
22+50	1.5867	0.16	Q				V
22+55	1.5878	0.16	Q				V

23+ 0	1.5889	0.16	Q				V
23+ 5	1.5899	0.16	Q				V
23+10	1.5910	0.16	Q				V
23+15	1.5921	0.16	Q				V
23+20	1.5931	0.16	Q				V
23+25	1.5942	0.16	Q				V
23+30	1.5953	0.16	Q				V
23+35	1.5963	0.16	Q				V
23+40	1.5974	0.16	Q				V
23+45	1.5985	0.16	Q				V
23+50	1.5995	0.16	Q				V
23+55	1.6006	0.16	Q				V
24+ 0	1.6017	0.16	Q				V
24+ 5	1.6026	0.14	Q				V
24+10	1.6031	0.07	Q				V
24+15	1.6034	0.04	Q				V
24+20	1.6035	0.02	Q				V
24+25	1.6036	0.02	Q				V
24+30	1.6037	0.01	Q				V
24+35	1.6038	0.01	Q				V
24+40	1.6038	0.00	Q				V
24+45	1.6038	0.00	Q				V
24+50	1.6038	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
45.60	0.58	26.45

100 YEAR Area rainfall data:

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

45.60

1.45

66.12

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 0.580 (In)
 Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.784 (In)
 Areal adjustment factor = 99.96 %
 Adjusted average point rain = 0.783 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.830

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	12.037
2	0.167	150.772	42.649
3	0.250	226.159	21.345
4	0.333	301.545	8.568
5	0.417	376.931	5.179
6	0.500	452.317	3.348
7	0.583	527.704	2.334
8	0.667	603.090	1.704
9	0.750	678.476	1.186
10	0.833	753.862	0.812

11 0.917 829.248 0.838 0.385
 Sum = 100.000 Sum= 45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.414	(0.507)	0.343	0.070
2	0.17	4.50	0.423	(0.507)	0.351	0.072
3	0.25	5.40	0.508	(0.507)	0.421	0.086
4	0.33	5.40	0.508	(0.507)	0.421	0.086
5	0.42	5.70	0.536	(0.507)	0.445	0.091
6	0.50	6.40	0.602	(0.507)	0.499	0.102
7	0.58	7.90	0.743	0.507	(0.616)	0.236
8	0.67	9.10	0.856	0.507	(0.710)	0.349
9	0.75	12.80	1.203	0.507	(0.999)	0.696
10	0.83	25.60	2.407	0.507	(1.997)	1.900
11	0.92	7.90	0.743	0.507	(0.616)	0.236
12	1.00	4.90	0.461	(0.507)	0.382	0.078

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.0

Flood volume = Effective rainfall 0.33 (In)
 times area 45.6 (Ac.) / [(In) / (Ft.)] = 1.3 (Ac.Ft)
 Total soil loss = 0.45 (In)
 Total soil loss = 1.709 (Ac.Ft)
 Total rainfall = 0.78 (In)
 Flood volume = 55224.4 Cubic Feet
 Total soil loss = 74458.7 Cubic Feet

Peak flow rate of this hydrograph = 47.754 (CFS)

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1 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q (CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0027	0.39	Q				
0+10	0.0149	1.78	VQ				
0+15	0.0327	2.58	VQ				
0+20	0.0545	3.16	VQ				
0+25	0.0785	3.50	Q				
0+30	0.1049	3.82	Q				
0+35	0.1389	4.94	QV				
0+40	0.1967	8.39	Q				
0+45	0.2927	13.94	V Q				

0+50	0.4933	29.13			V	Q		
0+55	0.8222	47.75				V		Q
1+ 0	1.0146	27.93				Q	V	
1+ 5	1.1108	13.98		Q				V
1+10	1.1658	7.98						V
1+15	1.2003	5.02		Q				V
1+20	1.2241	3.45	Q					V
1+25	1.2411	2.46	Q					V
1+30	1.2528	1.70	Q					V
1+35	1.2608	1.17	Q					V
1+40	1.2667	0.86	Q					V
1+45	1.2676	0.12	Q					V
1+50	1.2678	0.03	Q					V

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 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]
45.60	0.98	44.69

100 YEAR Area rainfall data:

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

45.60

2.48

113.09

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.331 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.331 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	5.532
2	0.167	150.772	19.600
3	0.250	226.159	9.809
4	0.333	301.545	3.938
5	0.417	376.931	2.380
6	0.500	452.317	1.539
7	0.583	527.704	1.073
8	0.667	603.090	0.783
9	0.750	678.476	0.545
10	0.833	753.862	0.373
11	0.917	829.248	0.385
Sum = 100.000		Sum =	45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.208	(0.507)	0.172	0.035
2	0.17	1.30	0.208	(0.507)	0.172	0.035
3	0.25	1.10	0.176	(0.507)	0.146	0.030
4	0.33	1.50	0.240	(0.507)	0.199	0.041
5	0.42	1.50	0.240	(0.507)	0.199	0.041
6	0.50	1.80	0.288	(0.507)	0.239	0.049
7	0.58	1.50	0.240	(0.507)	0.199	0.041
8	0.67	1.80	0.288	(0.507)	0.239	0.049
9	0.75	1.80	0.288	(0.507)	0.239	0.049
10	0.83	1.50	0.240	(0.507)	0.199	0.041
11	0.92	1.60	0.256	(0.507)	0.212	0.043
12	1.00	1.80	0.288	(0.507)	0.239	0.049
13	1.08	2.20	0.351	(0.507)	0.292	0.060
14	1.17	2.20	0.351	(0.507)	0.292	0.060
15	1.25	2.20	0.351	(0.507)	0.292	0.060
16	1.33	2.00	0.319	(0.507)	0.265	0.054
17	1.42	2.60	0.415	(0.507)	0.345	0.071
18	1.50	2.70	0.431	(0.507)	0.358	0.073
19	1.58	2.40	0.383	(0.507)	0.318	0.065
20	1.67	2.70	0.431	(0.507)	0.358	0.073
21	1.75	3.30	0.527	(0.507)	0.437	0.090
22	1.83	3.10	0.495	(0.507)	0.411	0.084
23	1.92	2.90	0.463	(0.507)	0.384	0.079
24	2.00	3.00	0.479	(0.507)	0.398	0.082
25	2.08	3.10	0.495	(0.507)	0.411	0.084
26	2.17	4.20	0.671	0.507	(0.557)	0.164
27	2.25	5.00	0.799	0.507	(0.663)	0.292
28	2.33	3.50	0.559	(0.507)	0.464	0.095
29	2.42	6.80	1.086	0.507	(0.901)	0.579
30	2.50	7.30	1.166	0.507	(0.968)	0.659
31	2.58	8.20	1.310	0.507	(1.087)	0.803
32	2.67	5.90	0.942	0.507	(0.782)	0.435
33	2.75	2.00	0.319	(0.507)	0.265	0.054
34	2.83	1.80	0.288	(0.507)	0.239	0.049
35	2.92	1.80	0.288	(0.507)	0.239	0.049
36	3.00	0.60	0.096	(0.507)	0.080	0.016

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.39(In)

times area 45.6(Ac.)/[(In)/(Ft.)] = 1.5(Ac.Ft)

Total soil loss = 0.94(In)

Total soil loss = 3.591(Ac.Ft)

Total rainfall = 1.33(In)

Flood volume = 63919.7 Cubic Feet

Total soil loss = 156409.8 Cubic Feet

Peak flow rate of this hydrograph = 27.927(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0013	0.20	Q				
0+10	0.0075	0.89	VQ				
0+15	0.0158	1.21	VQ				
0+20	0.0247	1.30	VQ				
0+25	0.0353	1.54	V Q				
0+30	0.0472	1.73	VQ				
0+35	0.0604	1.91	VQ				
0+40	0.0736	1.92	Q				
0+45	0.0878	2.06	Q				
0+50	0.1023	2.11	Q				
0+55	0.1161	2.00	QV				
1+ 0	0.1301	2.03	QV				
1+ 5	0.1452	2.20	QV				
1+10	0.1622	2.47	QV				
1+15	0.1801	2.60	QV				
1+20	0.1982	2.62	Q V				
1+25	0.2164	2.64	Q V				
1+30	0.2366	2.94	Q V				
1+35	0.2580	3.10	Q V				
1+40	0.2792	3.08	Q V				
1+45	0.3019	3.30	Q V				
1+50	0.3271	3.67	Q V				
1+55	0.3528	3.72	Q V				
2+ 0	0.3780	3.66	Q V				
2+ 5	0.4035	3.71	Q V				
2+10	0.4326	4.23	Q V				
2+15	0.4777	6.54	Q V				
2+20	0.5380	8.76	Q V				
2+25	0.6010	9.16	Q V				
2+30	0.7241	17.87	Q V				
2+35	0.8937	24.64	Q V				
2+40	1.0861	27.93	Q V				
2+45	1.2334	21.39	Q V				
2+50	1.3141	11.72	Q V				
2+55	1.3647	7.35	Q V				
3+ 0	1.4019	5.40	Q V				
3+ 5	1.4270	3.63	Q V				
3+10	1.4425	2.26	Q V				
3+15	1.4533	1.56	Q V				
3+20	1.4602	1.00	Q V				
3+25	1.4645	0.62	Q V				

3+30	1.4663	0.27	Q				V
3+35	1.4669	0.08	Q				V
3+40	1.4672	0.05	Q				V
3+45	1.4674	0.02	Q				V
3+50	1.4674	0.01	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 1

Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
45.60	1.38	62.93

100 YEAR Area rainfall data:

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

45.60

3.48

158.69

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.872 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.872 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	5.532
2	0.167	150.772	19.600
3	0.250	226.159	9.809
4	0.333	301.545	3.938
5	0.417	376.931	2.380
6	0.500	452.317	1.539
7	0.583	527.704	1.073
8	0.667	603.090	0.783
9	0.750	678.476	0.545
10	0.833	753.862	0.373
11	0.917	829.248	0.385
Sum =		100.000	Sum= 45.956

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	0.08	0.50	0.112	(0.507)	0.093 0.019
2	0.17	0.60	0.135	(0.507)	0.112 0.023
3	0.25	0.60	0.135	(0.507)	0.112 0.023
4	0.33	0.60	0.135	(0.507)	0.112 0.023
5	0.42	0.60	0.135	(0.507)	0.112 0.023
6	0.50	0.70	0.157	(0.507)	0.130 0.027
7	0.58	0.70	0.157	(0.507)	0.130 0.027
8	0.67	0.70	0.157	(0.507)	0.130 0.027
9	0.75	0.70	0.157	(0.507)	0.130 0.027
10	0.83	0.70	0.157	(0.507)	0.130 0.027
11	0.92	0.70	0.157	(0.507)	0.130 0.027
12	1.00	0.80	0.180	(0.507)	0.149 0.031
13	1.08	0.80	0.180	(0.507)	0.149 0.031
14	1.17	0.80	0.180	(0.507)	0.149 0.031
15	1.25	0.80	0.180	(0.507)	0.149 0.031
16	1.33	0.80	0.180	(0.507)	0.149 0.031
17	1.42	0.80	0.180	(0.507)	0.149 0.031
18	1.50	0.80	0.180	(0.507)	0.149 0.031
19	1.58	0.80	0.180	(0.507)	0.149 0.031
20	1.67	0.80	0.180	(0.507)	0.149 0.031
21	1.75	0.80	0.180	(0.507)	0.149 0.031
22	1.83	0.80	0.180	(0.507)	0.149 0.031
23	1.92	0.80	0.180	(0.507)	0.149 0.031
24	2.00	0.90	0.202	(0.507)	0.168 0.034
25	2.08	0.80	0.180	(0.507)	0.149 0.031
26	2.17	0.90	0.202	(0.507)	0.168 0.034
27	2.25	0.90	0.202	(0.507)	0.168 0.034
28	2.33	0.90	0.202	(0.507)	0.168 0.034
29	2.42	0.90	0.202	(0.507)	0.168 0.034
30	2.50	0.90	0.202	(0.507)	0.168 0.034
31	2.58	0.90	0.202	(0.507)	0.168 0.034
32	2.67	0.90	0.202	(0.507)	0.168 0.034
33	2.75	1.00	0.225	(0.507)	0.186 0.038
34	2.83	1.00	0.225	(0.507)	0.186 0.038
35	2.92	1.00	0.225	(0.507)	0.186 0.038
36	3.00	1.00	0.225	(0.507)	0.186 0.038
37	3.08	1.00	0.225	(0.507)	0.186 0.038
38	3.17	1.10	0.247	(0.507)	0.205 0.042
39	3.25	1.10	0.247	(0.507)	0.205 0.042
40	3.33	1.10	0.247	(0.507)	0.205 0.042
41	3.42	1.20	0.270	(0.507)	0.224 0.046
42	3.50	1.30	0.292	(0.507)	0.242 0.050
43	3.58	1.40	0.314	(0.507)	0.261 0.054
44	3.67	1.40	0.314	(0.507)	0.261 0.054

45	3.75	1.50	0.337	(0.507)	0.280	0.057
46	3.83	1.50	0.337	(0.507)	0.280	0.057
47	3.92	1.60	0.359	(0.507)	0.298	0.061
48	4.00	1.60	0.359	(0.507)	0.298	0.061
49	4.08	1.70	0.382	(0.507)	0.317	0.065
50	4.17	1.80	0.404	(0.507)	0.335	0.069
51	4.25	1.90	0.427	(0.507)	0.354	0.073
52	4.33	2.00	0.449	(0.507)	0.373	0.076
53	4.42	2.10	0.472	(0.507)	0.391	0.080
54	4.50	2.10	0.472	(0.507)	0.391	0.080
55	4.58	2.20	0.494	(0.507)	0.410	0.084
56	4.67	2.30	0.517	(0.507)	0.429	0.088
57	4.75	2.40	0.539	(0.507)	0.447	0.092
58	4.83	2.40	0.539	(0.507)	0.447	0.092
59	4.92	2.50	0.561	(0.507)	0.466	0.096
60	5.00	2.60	0.584	(0.507)	0.485	0.099
61	5.08	3.10	0.696	0.507 (0.578)		0.189
62	5.17	3.60	0.809	0.507 (0.671)		0.302
63	5.25	3.90	0.876	0.507 (0.727)		0.369
64	5.33	4.20	0.943	0.507 (0.783)		0.436
65	5.42	4.70	1.056	0.507 (0.876)		0.549
66	5.50	5.60	1.258	0.507 (1.044)		0.751
67	5.58	1.90	0.427	(0.507)	0.354	0.073
68	5.67	0.90	0.202	(0.507)	0.168	0.034
69	5.75	0.60	0.135	(0.507)	0.112	0.023
70	5.83	0.50	0.112	(0.507)	0.093	0.019
71	5.92	0.30	0.067	(0.507)	0.056	0.011
72	6.00	0.20	0.045	(0.507)	0.037	0.008

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.5

Flood volume = Effective rainfall 0.45(In)

times area 45.6(Ac.) / [(In)/(Ft.)] = 1.7(Ac.Ft)

Total soil loss = 1.42(In)

Total soil loss = 5.383(Ac.Ft)

Total rainfall = 1.87(In)

Flood volume = 75293.9 Cubic Feet

Total soil loss = 234504.6 Cubic Feet

Peak flow rate of this hydrograph = 23.972(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0007	0.11	Q				
0+10	0.0042	0.50	Q				
0+15	0.0094	0.76	VQ				
0+20	0.0155	0.88	VQ				
0+25	0.0219	0.94	VQ				

0+30	0.0288	1.00	VQ						
0+35	0.0364	1.10	VQ						
0+40	0.0443	1.16	Q						
0+45	0.0525	1.18	Q						
0+50	0.0608	1.20	Q						
0+55	0.0691	1.22	Q						
1+ 0	0.0777	1.24	Q						
1+ 5	0.0868	1.32	QV						
1+10	0.0962	1.36	QV						
1+15	0.1057	1.38	QV						
1+20	0.1152	1.39	QV						
1+25	0.1248	1.39	QV						
1+30	0.1345	1.40	Q V						
1+35	0.1441	1.40	Q V						
1+40	0.1538	1.40	Q V						
1+45	0.1635	1.40	Q V						
1+50	0.1731	1.41	Q V						
1+55	0.1828	1.41	Q V						
2+ 0	0.1926	1.43	Q V						
2+ 5	0.2028	1.48	Q V						
2+10	0.2129	1.46	Q V						
2+15	0.2234	1.52	Q V						
2+20	0.2341	1.55	Q V						
2+25	0.2448	1.56	Q V						
2+30	0.2556	1.57	Q V						
2+35	0.2664	1.57	Q V						
2+40	0.2773	1.58	Q V						
2+45	0.2883	1.60	Q V						
2+50	0.2998	1.68	Q V						
2+55	0.3116	1.71	Q V						
3+ 0	0.3236	1.73	Q V						
3+ 5	0.3355	1.74	Q V						
3+10	0.3477	1.77	Q V						
3+15	0.3604	1.85	Q V						
3+20	0.3734	1.89	Q V						
3+25	0.3867	1.92	Q V						
3+30	0.4007	2.03	Q V						
3+35	0.4156	2.17	Q V						
3+40	0.4315	2.30	Q V						
3+45	0.4479	2.39	Q V						
3+50	0.4651	2.50	Q V						
3+55	0.4829	2.58	Q V						
4+ 0	0.5013	2.68	Q V						
4+ 5	0.5203	2.76	Q V						
4+10	0.5402	2.88	Q V						
4+15	0.5611	3.03	Q V						
4+20	0.5830	3.19	Q V						
4+25	0.6062	3.36	Q V						
4+30	0.6303	3.51	Q V						
4+35	0.6551	3.60	Q V						
4+40	0.6809	3.74	Q V						
4+45	0.7077	3.90	Q V						
4+50	0.7355	4.04	Q V						
4+55	0.7640	4.13	Q V						

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 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]
45.60	2.48	113.09

100 YEAR Area rainfall data:

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

45.60

6.90

314.64

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.072	0.035
56.0	36.0	0.706	0.500	0.388	0.079	0.031
69.0	49.8	0.574	0.500	0.316	0.024	0.008
40.0	22.0	0.824	0.000	0.824	0.066	0.054
75.0	57.0	0.501	0.000	0.501	0.759	0.380
Sum (F) =						0.507

Area averaged mean soil loss (F) (In/Hr) = 0.507

Minimum soil loss rate ((In/Hr)) = 0.253

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

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	0.083	75.386	12.037
2	0.167	150.772	42.649
3	0.250	226.159	21.345
4	0.333	301.545	8.568
5	0.417	376.931	5.179
6	0.500	452.317	3.348
7	0.583	527.704	2.334
8	0.667	603.090	1.704
9	0.750	678.476	1.186
10	0.833	753.862	0.812
11	0.917	829.248	0.838
Sum = 100.000			Sum= 45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.028	(0.899)	0.023	0.005
2	0.17	0.07	0.028	(0.895)	0.023	0.005
3	0.25	0.07	0.028	(0.892)	0.023	0.005
4	0.33	0.10	0.042	(0.888)	0.035	0.007
5	0.42	0.10	0.042	(0.885)	0.035	0.007
6	0.50	0.10	0.042	(0.881)	0.035	0.007
7	0.58	0.10	0.042	(0.878)	0.035	0.007
8	0.67	0.10	0.042	(0.875)	0.035	0.007
9	0.75	0.10	0.042	(0.871)	0.035	0.007
10	0.83	0.13	0.056	(0.868)	0.047	0.010
11	0.92	0.13	0.056	(0.864)	0.047	0.010
12	1.00	0.13	0.056	(0.861)	0.047	0.010
13	1.08	0.10	0.042	(0.857)	0.035	0.007
14	1.17	0.10	0.042	(0.854)	0.035	0.007
15	1.25	0.10	0.042	(0.851)	0.035	0.007
16	1.33	0.10	0.042	(0.847)	0.035	0.007
17	1.42	0.10	0.042	(0.844)	0.035	0.007
18	1.50	0.10	0.042	(0.841)	0.035	0.007
19	1.58	0.10	0.042	(0.837)	0.035	0.007
20	1.67	0.10	0.042	(0.834)	0.035	0.007
21	1.75	0.10	0.042	(0.830)	0.035	0.007
22	1.83	0.13	0.056	(0.827)	0.047	0.010
23	1.92	0.13	0.056	(0.824)	0.047	0.010
24	2.00	0.13	0.056	(0.820)	0.047	0.010
25	2.08	0.13	0.056	(0.817)	0.047	0.010
26	2.17	0.13	0.056	(0.814)	0.047	0.010
27	2.25	0.13	0.056	(0.811)	0.047	0.010
28	2.33	0.13	0.056	(0.807)	0.047	0.010
29	2.42	0.13	0.056	(0.804)	0.047	0.010
30	2.50	0.13	0.056	(0.801)	0.047	0.010
31	2.58	0.17	0.070	(0.797)	0.058	0.012
32	2.67	0.17	0.070	(0.794)	0.058	0.012
33	2.75	0.17	0.070	(0.791)	0.058	0.012
34	2.83	0.17	0.070	(0.788)	0.058	0.012
35	2.92	0.17	0.070	(0.784)	0.058	0.012
36	3.00	0.17	0.070	(0.781)	0.058	0.012
37	3.08	0.17	0.070	(0.778)	0.058	0.012
38	3.17	0.17	0.070	(0.775)	0.058	0.012
39	3.25	0.17	0.070	(0.771)	0.058	0.012
40	3.33	0.17	0.070	(0.768)	0.058	0.012
41	3.42	0.17	0.070	(0.765)	0.058	0.012
42	3.50	0.17	0.070	(0.762)	0.058	0.012
43	3.58	0.17	0.070	(0.759)	0.058	0.012
44	3.67	0.17	0.070	(0.755)	0.058	0.012

45	3.75	0.17	0.070	(0.752)	0.058	0.012
46	3.83	0.20	0.084	(0.749)	0.070	0.014
47	3.92	0.20	0.084	(0.746)	0.070	0.014
48	4.00	0.20	0.084	(0.743)	0.070	0.014
49	4.08	0.20	0.084	(0.740)	0.070	0.014
50	4.17	0.20	0.084	(0.736)	0.070	0.014
51	4.25	0.20	0.084	(0.733)	0.070	0.014
52	4.33	0.23	0.098	(0.730)	0.082	0.017
53	4.42	0.23	0.098	(0.727)	0.082	0.017
54	4.50	0.23	0.098	(0.724)	0.082	0.017
55	4.58	0.23	0.098	(0.721)	0.082	0.017
56	4.67	0.23	0.098	(0.718)	0.082	0.017
57	4.75	0.23	0.098	(0.715)	0.082	0.017
58	4.83	0.27	0.112	(0.712)	0.093	0.019
59	4.92	0.27	0.112	(0.709)	0.093	0.019
60	5.00	0.27	0.112	(0.705)	0.093	0.019
61	5.08	0.20	0.084	(0.702)	0.070	0.014
62	5.17	0.20	0.084	(0.699)	0.070	0.014
63	5.25	0.20	0.084	(0.696)	0.070	0.014
64	5.33	0.23	0.098	(0.693)	0.082	0.017
65	5.42	0.23	0.098	(0.690)	0.082	0.017
66	5.50	0.23	0.098	(0.687)	0.082	0.017
67	5.58	0.27	0.112	(0.684)	0.093	0.019
68	5.67	0.27	0.112	(0.681)	0.093	0.019
69	5.75	0.27	0.112	(0.678)	0.093	0.019
70	5.83	0.27	0.112	(0.675)	0.093	0.019
71	5.92	0.27	0.112	(0.672)	0.093	0.019
72	6.00	0.27	0.112	(0.669)	0.093	0.019
73	6.08	0.30	0.127	(0.666)	0.105	0.022
74	6.17	0.30	0.127	(0.663)	0.105	0.022
75	6.25	0.30	0.127	(0.660)	0.105	0.022
76	6.33	0.30	0.127	(0.657)	0.105	0.022
77	6.42	0.30	0.127	(0.654)	0.105	0.022
78	6.50	0.30	0.127	(0.651)	0.105	0.022
79	6.58	0.33	0.141	(0.649)	0.117	0.024
80	6.67	0.33	0.141	(0.646)	0.117	0.024
81	6.75	0.33	0.141	(0.643)	0.117	0.024
82	6.83	0.33	0.141	(0.640)	0.117	0.024
83	6.92	0.33	0.141	(0.637)	0.117	0.024
84	7.00	0.33	0.141	(0.634)	0.117	0.024
85	7.08	0.33	0.141	(0.631)	0.117	0.024
86	7.17	0.33	0.141	(0.628)	0.117	0.024
87	7.25	0.33	0.141	(0.625)	0.117	0.024
88	7.33	0.37	0.155	(0.623)	0.128	0.026
89	7.42	0.37	0.155	(0.620)	0.128	0.026
90	7.50	0.37	0.155	(0.617)	0.128	0.026
91	7.58	0.40	0.169	(0.614)	0.140	0.029
92	7.67	0.40	0.169	(0.611)	0.140	0.029
93	7.75	0.40	0.169	(0.608)	0.140	0.029
94	7.83	0.43	0.183	(0.606)	0.152	0.031
95	7.92	0.43	0.183	(0.603)	0.152	0.031
96	8.00	0.43	0.183	(0.600)	0.152	0.031
97	8.08	0.50	0.211	(0.597)	0.175	0.036
98	8.17	0.50	0.211	(0.594)	0.175	0.036

99	8.25	0.50	0.211	(0.592)	0.175	0.036
100	8.33	0.50	0.211	(0.589)	0.175	0.036
101	8.42	0.50	0.211	(0.586)	0.175	0.036
102	8.50	0.50	0.211	(0.583)	0.175	0.036
103	8.58	0.53	0.225	(0.581)	0.187	0.038
104	8.67	0.53	0.225	(0.578)	0.187	0.038
105	8.75	0.53	0.225	(0.575)	0.187	0.038
106	8.83	0.57	0.239	(0.572)	0.198	0.041
107	8.92	0.57	0.239	(0.570)	0.198	0.041
108	9.00	0.57	0.239	(0.567)	0.198	0.041
109	9.08	0.63	0.267	(0.564)	0.222	0.045
110	9.17	0.63	0.267	(0.562)	0.222	0.045
111	9.25	0.63	0.267	(0.559)	0.222	0.045
112	9.33	0.67	0.281	(0.556)	0.233	0.048
113	9.42	0.67	0.281	(0.554)	0.233	0.048
114	9.50	0.67	0.281	(0.551)	0.233	0.048
115	9.58	0.70	0.295	(0.548)	0.245	0.050
116	9.67	0.70	0.295	(0.546)	0.245	0.050
117	9.75	0.70	0.295	(0.543)	0.245	0.050
118	9.83	0.73	0.309	(0.541)	0.257	0.053
119	9.92	0.73	0.309	(0.538)	0.257	0.053
120	10.00	0.73	0.309	(0.535)	0.257	0.053
121	10.08	0.50	0.211	(0.533)	0.175	0.036
122	10.17	0.50	0.211	(0.530)	0.175	0.036
123	10.25	0.50	0.211	(0.528)	0.175	0.036
124	10.33	0.50	0.211	(0.525)	0.175	0.036
125	10.42	0.50	0.211	(0.522)	0.175	0.036
126	10.50	0.50	0.211	(0.520)	0.175	0.036
127	10.58	0.67	0.281	(0.517)	0.233	0.048
128	10.67	0.67	0.281	(0.515)	0.233	0.048
129	10.75	0.67	0.281	(0.512)	0.233	0.048
130	10.83	0.67	0.281	(0.510)	0.233	0.048
131	10.92	0.67	0.281	(0.507)	0.233	0.048
132	11.00	0.67	0.281	(0.505)	0.233	0.048
133	11.08	0.63	0.267	(0.502)	0.222	0.045
134	11.17	0.63	0.267	(0.500)	0.222	0.045
135	11.25	0.63	0.267	(0.497)	0.222	0.045
136	11.33	0.63	0.267	(0.495)	0.222	0.045
137	11.42	0.63	0.267	(0.493)	0.222	0.045
138	11.50	0.63	0.267	(0.490)	0.222	0.045
139	11.58	0.57	0.239	(0.488)	0.198	0.041
140	11.67	0.57	0.239	(0.485)	0.198	0.041
141	11.75	0.57	0.239	(0.483)	0.198	0.041
142	11.83	0.60	0.253	(0.480)	0.210	0.043
143	11.92	0.60	0.253	(0.478)	0.210	0.043
144	12.00	0.60	0.253	(0.476)	0.210	0.043
145	12.08	0.83	0.351	(0.473)	0.292	0.060
146	12.17	0.83	0.351	(0.471)	0.292	0.060
147	12.25	0.83	0.351	(0.469)	0.292	0.060
148	12.33	0.87	0.366	(0.466)	0.303	0.062
149	12.42	0.87	0.366	(0.464)	0.303	0.062
150	12.50	0.87	0.366	(0.461)	0.303	0.062
151	12.58	0.93	0.394	(0.459)	0.327	0.067
152	12.67	0.93	0.394	(0.457)	0.327	0.067

153	12.75	0.93	0.394	(0.455)	0.327	0.067
154	12.83	0.97	0.408	(0.452)	0.338	0.069
155	12.92	0.97	0.408	(0.450)	0.338	0.069
156	13.00	0.97	0.408	(0.448)	0.338	0.069
157	13.08	1.13	0.478	(0.445)	0.397	0.081
158	13.17	1.13	0.478	(0.443)	0.397	0.081
159	13.25	1.13	0.478	(0.441)	0.397	0.081
160	13.33	1.13	0.478	(0.439)	0.397	0.081
161	13.42	1.13	0.478	(0.436)	0.397	0.081
162	13.50	1.13	0.478	(0.434)	0.397	0.081
163	13.58	0.77	0.323	(0.432)	0.268	0.055
164	13.67	0.77	0.323	(0.430)	0.268	0.055
165	13.75	0.77	0.323	(0.428)	0.268	0.055
166	13.83	0.77	0.323	(0.425)	0.268	0.055
167	13.92	0.77	0.323	(0.423)	0.268	0.055
168	14.00	0.77	0.323	(0.421)	0.268	0.055
169	14.08	0.90	0.380	(0.419)	0.315	0.065
170	14.17	0.90	0.380	(0.417)	0.315	0.065
171	14.25	0.90	0.380	(0.415)	0.315	0.065
172	14.33	0.87	0.366	(0.413)	0.303	0.062
173	14.42	0.87	0.366	(0.410)	0.303	0.062
174	14.50	0.87	0.366	(0.408)	0.303	0.062
175	14.58	0.87	0.366	(0.406)	0.303	0.062
176	14.67	0.87	0.366	(0.404)	0.303	0.062
177	14.75	0.87	0.366	(0.402)	0.303	0.062
178	14.83	0.83	0.351	(0.400)	0.292	0.060
179	14.92	0.83	0.351	(0.398)	0.292	0.060
180	15.00	0.83	0.351	(0.396)	0.292	0.060
181	15.08	0.80	0.337	(0.394)	0.280	0.057
182	15.17	0.80	0.337	(0.392)	0.280	0.057
183	15.25	0.80	0.337	(0.390)	0.280	0.057
184	15.33	0.77	0.323	(0.388)	0.268	0.055
185	15.42	0.77	0.323	(0.386)	0.268	0.055
186	15.50	0.77	0.323	(0.384)	0.268	0.055
187	15.58	0.63	0.267	(0.382)	0.222	0.045
188	15.67	0.63	0.267	(0.380)	0.222	0.045
189	15.75	0.63	0.267	(0.378)	0.222	0.045
190	15.83	0.63	0.267	(0.376)	0.222	0.045
191	15.92	0.63	0.267	(0.374)	0.222	0.045
192	16.00	0.63	0.267	(0.372)	0.222	0.045
193	16.08	0.13	0.056	(0.370)	0.047	0.010
194	16.17	0.13	0.056	(0.368)	0.047	0.010
195	16.25	0.13	0.056	(0.367)	0.047	0.010
196	16.33	0.13	0.056	(0.365)	0.047	0.010
197	16.42	0.13	0.056	(0.363)	0.047	0.010
198	16.50	0.13	0.056	(0.361)	0.047	0.010
199	16.58	0.10	0.042	(0.359)	0.035	0.007
200	16.67	0.10	0.042	(0.357)	0.035	0.007
201	16.75	0.10	0.042	(0.356)	0.035	0.007
202	16.83	0.10	0.042	(0.354)	0.035	0.007
203	16.92	0.10	0.042	(0.352)	0.035	0.007
204	17.00	0.10	0.042	(0.350)	0.035	0.007
205	17.08	0.17	0.070	(0.348)	0.058	0.012
206	17.17	0.17	0.070	(0.347)	0.058	0.012

207	17.25	0.17	0.070	(0.345)	0.058	0.012
208	17.33	0.17	0.070	(0.343)	0.058	0.012
209	17.42	0.17	0.070	(0.341)	0.058	0.012
210	17.50	0.17	0.070	(0.340)	0.058	0.012
211	17.58	0.17	0.070	(0.338)	0.058	0.012
212	17.67	0.17	0.070	(0.336)	0.058	0.012
213	17.75	0.17	0.070	(0.335)	0.058	0.012
214	17.83	0.13	0.056	(0.333)	0.047	0.010
215	17.92	0.13	0.056	(0.331)	0.047	0.010
216	18.00	0.13	0.056	(0.330)	0.047	0.010
217	18.08	0.13	0.056	(0.328)	0.047	0.010
218	18.17	0.13	0.056	(0.327)	0.047	0.010
219	18.25	0.13	0.056	(0.325)	0.047	0.010
220	18.33	0.13	0.056	(0.323)	0.047	0.010
221	18.42	0.13	0.056	(0.322)	0.047	0.010
222	18.50	0.13	0.056	(0.320)	0.047	0.010
223	18.58	0.10	0.042	(0.319)	0.035	0.007
224	18.67	0.10	0.042	(0.317)	0.035	0.007
225	18.75	0.10	0.042	(0.316)	0.035	0.007
226	18.83	0.07	0.028	(0.314)	0.023	0.005
227	18.92	0.07	0.028	(0.313)	0.023	0.005
228	19.00	0.07	0.028	(0.311)	0.023	0.005
229	19.08	0.10	0.042	(0.310)	0.035	0.007
230	19.17	0.10	0.042	(0.308)	0.035	0.007
231	19.25	0.10	0.042	(0.307)	0.035	0.007
232	19.33	0.13	0.056	(0.305)	0.047	0.010
233	19.42	0.13	0.056	(0.304)	0.047	0.010
234	19.50	0.13	0.056	(0.302)	0.047	0.010
235	19.58	0.10	0.042	(0.301)	0.035	0.007
236	19.67	0.10	0.042	(0.300)	0.035	0.007
237	19.75	0.10	0.042	(0.298)	0.035	0.007
238	19.83	0.07	0.028	(0.297)	0.023	0.005
239	19.92	0.07	0.028	(0.296)	0.023	0.005
240	20.00	0.07	0.028	(0.294)	0.023	0.005
241	20.08	0.10	0.042	(0.293)	0.035	0.007
242	20.17	0.10	0.042	(0.292)	0.035	0.007
243	20.25	0.10	0.042	(0.291)	0.035	0.007
244	20.33	0.10	0.042	(0.289)	0.035	0.007
245	20.42	0.10	0.042	(0.288)	0.035	0.007
246	20.50	0.10	0.042	(0.287)	0.035	0.007
247	20.58	0.10	0.042	(0.286)	0.035	0.007
248	20.67	0.10	0.042	(0.284)	0.035	0.007
249	20.75	0.10	0.042	(0.283)	0.035	0.007
250	20.83	0.07	0.028	(0.282)	0.023	0.005
251	20.92	0.07	0.028	(0.281)	0.023	0.005
252	21.00	0.07	0.028	(0.280)	0.023	0.005
253	21.08	0.10	0.042	(0.279)	0.035	0.007
254	21.17	0.10	0.042	(0.278)	0.035	0.007
255	21.25	0.10	0.042	(0.277)	0.035	0.007
256	21.33	0.07	0.028	(0.275)	0.023	0.005
257	21.42	0.07	0.028	(0.274)	0.023	0.005
258	21.50	0.07	0.028	(0.273)	0.023	0.005
259	21.58	0.10	0.042	(0.272)	0.035	0.007
260	21.67	0.10	0.042	(0.271)	0.035	0.007

261	21.75	0.10	0.042	(0.270)	0.035	0.007
262	21.83	0.07	0.028	(0.270)	0.023	0.005
263	21.92	0.07	0.028	(0.269)	0.023	0.005
264	22.00	0.07	0.028	(0.268)	0.023	0.005
265	22.08	0.10	0.042	(0.267)	0.035	0.007
266	22.17	0.10	0.042	(0.266)	0.035	0.007
267	22.25	0.10	0.042	(0.265)	0.035	0.007
268	22.33	0.07	0.028	(0.264)	0.023	0.005
269	22.42	0.07	0.028	(0.263)	0.023	0.005
270	22.50	0.07	0.028	(0.263)	0.023	0.005
271	22.58	0.07	0.028	(0.262)	0.023	0.005
272	22.67	0.07	0.028	(0.261)	0.023	0.005
273	22.75	0.07	0.028	(0.260)	0.023	0.005
274	22.83	0.07	0.028	(0.260)	0.023	0.005
275	22.92	0.07	0.028	(0.259)	0.023	0.005
276	23.00	0.07	0.028	(0.258)	0.023	0.005
277	23.08	0.07	0.028	(0.258)	0.023	0.005
278	23.17	0.07	0.028	(0.257)	0.023	0.005
279	23.25	0.07	0.028	(0.257)	0.023	0.005
280	23.33	0.07	0.028	(0.256)	0.023	0.005
281	23.42	0.07	0.028	(0.256)	0.023	0.005
282	23.50	0.07	0.028	(0.255)	0.023	0.005
283	23.58	0.07	0.028	(0.255)	0.023	0.005
284	23.67	0.07	0.028	(0.255)	0.023	0.005
285	23.75	0.07	0.028	(0.254)	0.023	0.005
286	23.83	0.07	0.028	(0.254)	0.023	0.005
287	23.92	0.07	0.028	(0.254)	0.023	0.005
288	24.00	0.07	0.028	(0.254)	0.023	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 7.2

Flood volume = Effective rainfall 0.60(In)

times area 45.6(Ac.)/[(In)/(Ft.)] = 2.3(Ac.Ft)

Total soil loss = 2.92(In)

Total soil loss = 11.084(Ac.Ft)

Total rainfall = 3.51(In)

Flood volume = 99026.4 Cubic Feet

Total soil loss = 482797.6 Cubic Feet

Peak flow rate of this hydrograph = 3.701(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.03	Q				
0+10	0.0010	0.12	Q				
0+15	0.0022	0.17	Q				
0+20	0.0035	0.20	Q				
0+25	0.0053	0.26	VQ				

0+30	0.0073	0.29	VQ
0+35	0.0094	0.30	VQ
0+40	0.0115	0.31	VQ
0+45	0.0137	0.32	VQ
0+50	0.0161	0.34	VQ
0+55	0.0187	0.39	VQ
1+ 0	0.0216	0.41	VQ
1+ 5	0.0244	0.41	VQ
1+10	0.0269	0.37	VQ
1+15	0.0293	0.35	VQ
1+20	0.0317	0.34	VQ
1+25	0.0340	0.34	VQ
1+30	0.0363	0.34	VQ
1+35	0.0386	0.33	VQ
1+40	0.0409	0.33	VQ
1+45	0.0432	0.33	VQ
1+50	0.0456	0.34	VQ
1+55	0.0483	0.39	VQ
2+ 0	0.0511	0.41	VQ
2+ 5	0.0540	0.42	VQ
2+10	0.0570	0.43	Q
2+15	0.0600	0.43	Q
2+20	0.0629	0.44	Q
2+25	0.0660	0.44	Q
2+30	0.0690	0.44	Q
2+35	0.0721	0.45	Q
2+40	0.0755	0.50	VQ
2+45	0.0791	0.52	VQ
2+50	0.0828	0.53	VQ
2+55	0.0865	0.54	VQ
3+ 0	0.0903	0.54	VQ
3+ 5	0.0940	0.55	VQ
3+10	0.0978	0.55	VQ
3+15	0.1016	0.55	VQ
3+20	0.1053	0.55	VQ
3+25	0.1091	0.55	VQ
3+30	0.1129	0.55	VQ
3+35	0.1167	0.55	Q
3+40	0.1205	0.55	Q
3+45	0.1243	0.55	Q
3+50	0.1282	0.56	Q
3+55	0.1324	0.61	Q
4+ 0	0.1367	0.63	Q
4+ 5	0.1412	0.64	Q
4+10	0.1456	0.65	Q
4+15	0.1501	0.65	Q
4+20	0.1547	0.67	Q
4+25	0.1597	0.72	Q
4+30	0.1648	0.74	Q
4+35	0.1700	0.75	VQ
4+40	0.1752	0.76	Q
4+45	0.1804	0.76	Q
4+50	0.1858	0.78	Q
4+55	0.1915	0.83	Q

5+ 0	0.1974	0.85	Q				
5+ 5	0.2031	0.84	Q				
5+10	0.2083	0.75	QV				
5+15	0.2131	0.71	QV				
5+20	0.2180	0.70	QV				
5+25	0.2231	0.74	QV				
5+30	0.2283	0.76	QV				
5+35	0.2336	0.78	QV				
5+40	0.2393	0.83	QV				
5+45	0.2452	0.85	QV				
5+50	0.2511	0.86	QV				
5+55	0.2571	0.87	QV				
6+ 0	0.2631	0.87	QV				
6+ 5	0.2692	0.89	QV				
6+10	0.2756	0.94	QV				
6+15	0.2822	0.96	QV				
6+20	0.2889	0.97	Q V				
6+25	0.2957	0.98	Q V				
6+30	0.3025	0.98	Q V				
6+35	0.3093	1.00	Q V				
6+40	0.3165	1.05	QV				
6+45	0.3239	1.07	QV				
6+50	0.3314	1.08	QV				
6+55	0.3389	1.09	QV				
7+ 0	0.3464	1.09	Q V				
7+ 5	0.3540	1.10	Q V				
7+10	0.3615	1.10	Q V				
7+15	0.3691	1.10	Q V				
7+20	0.3767	1.11	Q V				
7+25	0.3847	1.16	Q V				
7+30	0.3929	1.18	Q V				
7+35	0.4012	1.21	Q V				
7+40	0.4099	1.26	Q V				
7+45	0.4187	1.29	Q V				
7+50	0.4278	1.31	Q V				
7+55	0.4372	1.37	Q V				
8+ 0	0.4468	1.39	Q V				
8+ 5	0.4566	1.43	Q V				
8+10	0.4672	1.54	Q V				
8+15	0.4782	1.59	Q V				
8+20	0.4893	1.61	Q V				
8+25	0.5005	1.62	Q V				
8+30	0.5117	1.63	Q V				
8+35	0.5231	1.65	Q V				
8+40	0.5348	1.70	Q V				
8+45	0.5467	1.73	Q V				
8+50	0.5588	1.75	Q V				
8+55	0.5713	1.81	Q V				
9+ 0	0.5839	1.84	Q V				
9+ 5	0.5968	1.88	Q V				
9+10	0.6105	1.98	Q V				
9+15	0.6244	2.03	Q V				
9+20	0.6386	2.06	Q V				
9+25	0.6533	2.13	Q V				

9+30	0.6681	2.16	Q	V			
9+35	0.6832	2.19	Q	V			
9+40	0.6986	2.24	Q	V			
9+45	0.7143	2.27	Q	V			
9+50	0.7301	2.30	Q	V			
9+55	0.7464	2.36	Q	V			
10+ 0	0.7628	2.38	Q	V			
10+ 5	0.7787	2.31	Q	V			
10+10	0.7923	1.99	Q	V			
10+15	0.8049	1.83	Q	V			
10+20	0.8171	1.76	Q	V			
10+25	0.8289	1.73	Q	V			
10+30	0.8407	1.70	Q	V			
10+35	0.8527	1.75	Q	V			
10+40	0.8663	1.97	Q	V			
10+45	0.8806	2.08	Q	V			
10+50	0.8953	2.12	Q	V			
10+55	0.9100	2.14	Q	V			
11+ 0	0.9249	2.16	Q	V			
11+ 5	0.9398	2.16	Q	V			
11+10	0.9544	2.12	Q	V			
11+15	0.9690	2.11	Q	V			
11+20	0.9834	2.10	Q	V			
11+25	0.9979	2.10	Q	V			
11+30	1.0124	2.10	Q	V			
11+35	1.0266	2.07	Q	V			
11+40	1.0402	1.97	Q	V			
11+45	1.0535	1.93	Q	V			
11+50	1.0667	1.92	Q	V			
11+55	1.0801	1.95	Q	V			
12+ 0	1.0937	1.97	Q	V			
12+ 5	1.1079	2.07	Q	V			
12+10	1.1244	2.40	Q	V			
12+15	1.1421	2.56	Q	V			
12+20	1.1603	2.64	Q	V			
12+25	1.1791	2.73	Q	V			
12+30	1.1982	2.78	Q	V			
12+35	1.2177	2.83	Q	V			
12+40	1.2380	2.95	Q	V			
12+45	1.2588	3.01	Q	V			
12+50	1.2798	3.05	Q	V			
12+55	1.3012	3.12	Q	V			
13+ 0	1.3229	3.15	Q	V			
13+ 5	1.3451	3.23	Q	V			
13+10	1.3691	3.47	Q	V			
13+15	1.3938	3.60	Q	V			
13+20	1.4190	3.65	Q	V			
13+25	1.4443	3.68	Q	V			
13+30	1.4698	3.70	Q	V			
13+35	1.4944	3.57	Q	V			
13+40	1.5155	3.06	Q	V			
13+45	1.5349	2.81	Q	V			
13+50	1.5535	2.71	Q	V			
13+55	1.5718	2.65	Q	V			

14+ 0	1.5898	2.61			Q		V
14+ 5	1.6080	2.64			Q		V
14+10	1.6273	2.81				Q	V
14+15	1.6472	2.89				Q	V
14+20	1.6672	2.90				Q	V
14+25	1.6869	2.87				Q	V
14+30	1.7066	2.86				Q	V
14+35	1.7263	2.86				Q	V
14+40	1.7459	2.86				Q	V
14+45	1.7657	2.86				Q	V
14+50	1.7853	2.85				Q	V
14+55	1.8046	2.80				Q	V
15+ 0	1.8237	2.78				Q	V
15+ 5	1.8427	2.76				Q	V
15+10	1.8613	2.70			Q		V
15+15	1.8797	2.67			Q		V
15+20	1.8980	2.65			Q		V
15+25	1.9158	2.59			Q		V
15+30	1.9335	2.57			Q		V
15+35	1.9507	2.50			Q		V
15+40	1.9666	2.30			Q		V
15+45	1.9818	2.21			Q		V
15+50	1.9967	2.16			Q		V
15+55	2.0114	2.14			Q		V
16+ 0	2.0260	2.12			Q		V
16+ 5	2.0392	1.91			Q		V
16+10	2.0475	1.20		Q			V
16+15	2.0533	0.84		Q			V
16+20	2.0581	0.70	Q				V
16+25	2.0623	0.61	Q				V
16+30	2.0661	0.55	Q				V
16+35	2.0696	0.50	Q				V
16+40	2.0725	0.43	Q				V
16+45	2.0751	0.38	Q				V
16+50	2.0776	0.36	Q				V
16+55	2.0800	0.34	Q				V
17+ 0	2.0823	0.34	Q				V
17+ 5	2.0848	0.36	Q				V
17+10	2.0879	0.45	Q				V
17+15	2.0914	0.50	Q				V
17+20	2.0949	0.52	Q				V
17+25	2.0986	0.53	Q				V
17+30	2.1022	0.54	Q				V
17+35	2.1060	0.54	Q				V
17+40	2.1097	0.54	Q				V
17+45	2.1135	0.55	Q				V
17+50	2.1172	0.54	Q				V
17+55	2.1205	0.49	Q				V
18+ 0	2.1237	0.47	Q				V
18+ 5	2.1269	0.46	Q				V
18+10	2.1300	0.45	Q				V
18+15	2.1331	0.45	Q				V
18+20	2.1361	0.45	Q				V
18+25	2.1392	0.44	Q				V

18+30	2.1422	0.44	Q				V
18+35	2.1452	0.43	Q				V
18+40	2.1478	0.38	Q				V
18+45	2.1503	0.36	Q				V
18+50	2.1526	0.33	Q				V
18+55	2.1545	0.28	Q				V
19+ 0	2.1562	0.25	Q				V
19+ 5	2.1580	0.26	Q				V
19+10	2.1600	0.29	Q				V
19+15	2.1622	0.31	Q				V
19+20	2.1645	0.33	Q				V
19+25	2.1671	0.38	Q				V
19+30	2.1699	0.41	Q				V
19+35	2.1727	0.41	Q				V
19+40	2.1752	0.37	Q				V
19+45	2.1776	0.35	Q				V
19+50	2.1799	0.33	Q				V
19+55	2.1818	0.28	Q				V
20+ 0	2.1835	0.25	Q				V
20+ 5	2.1853	0.25	Q				V
20+10	2.1873	0.29	Q				V
20+15	2.1895	0.31	Q				V
20+20	2.1917	0.32	Q				V
20+25	2.1939	0.32	Q				V
20+30	2.1961	0.32	Q				V
20+35	2.1984	0.33	Q				V
20+40	2.2006	0.33	Q				V
20+45	2.2029	0.33	Q				V
20+50	2.2051	0.32	Q				V
20+55	2.2069	0.27	Q				V
21+ 0	2.2086	0.25	Q				V
21+ 5	2.2103	0.25	Q				V
21+10	2.2123	0.29	Q				V
21+15	2.2145	0.31	Q				V
21+20	2.2166	0.30	Q				V
21+25	2.2184	0.26	Q				V
21+30	2.2200	0.24	Q				V
21+35	2.2217	0.25	Q				V
21+40	2.2237	0.29	Q				V
21+45	2.2259	0.31	Q				V
21+50	2.2279	0.30	Q				V
21+55	2.2298	0.26	Q				V
22+ 0	2.2314	0.24	Q				V
22+ 5	2.2331	0.25	Q				V
22+10	2.2351	0.29	Q				V
22+15	2.2372	0.31	Q				V
22+20	2.2393	0.30	Q				V
22+25	2.2411	0.26	Q				V
22+30	2.2428	0.24	Q				V
22+35	2.2444	0.23	Q				V
22+40	2.2460	0.23	Q				V
22+45	2.2475	0.23	Q				V
22+50	2.2491	0.22	Q				V
22+55	2.2506	0.22	Q				V

23+ 0	2.2521	0.22	Q				V
23+ 5	2.2536	0.22	Q				V
23+10	2.2552	0.22	Q				V
23+15	2.2567	0.22	Q				V
23+20	2.2582	0.22	Q				V
23+25	2.2597	0.22	Q				V
23+30	2.2612	0.22	Q				V
23+35	2.2627	0.22	Q				V
23+40	2.2642	0.22	Q				V
23+45	2.2658	0.22	Q				V
23+50	2.2673	0.22	Q				V
23+55	2.2688	0.22	Q				V
24+ 0	2.2703	0.22	Q				V
24+ 5	2.2716	0.19	Q				V
24+10	2.2723	0.10	Q				V
24+15	2.2727	0.05	Q				V
24+20	2.2729	0.03	Q				V
24+25	2.2731	0.02	Q				V
24+30	2.2732	0.02	Q				V
24+35	2.2733	0.01	Q				V
24+40	2.2733	0.01	Q				V
24+45	2.2733	0.00	Q				V
24+50	2.2733	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 1

Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
45.60	0.58	26.45

100 YEAR Area rainfall data:

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

45.60

1.45

66.12

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.938 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.938 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.072	0.030
56.0	56.0	0.511	0.500	0.281	0.079	0.022
69.0	69.0	0.373	0.500	0.205	0.024	0.005
40.0	40.0	0.670	0.000	0.670	0.066	0.044
75.0	75.0	0.303	0.000	0.303	0.759	0.230
Sum (F) =						0.331

Area averaged mean soil loss (F) (In/Hr) = 0.331

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	5.532
2	0.167	150.772	19.600
3	0.250	226.159	9.809
4	0.333	301.545	3.938
5	0.417	376.931	2.380
6	0.500	452.317	1.539
7	0.583	527.704	1.073
8	0.667	603.090	0.783
9	0.750	678.476	0.545
10	0.833	753.862	0.373

11 0.917 829.248 0.838 0.385
 Sum = 100.000 Sum= 45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.495	0.331	(0.411)	0.164
2	0.17	4.50	0.506	0.331	(0.420)	0.176
3	0.25	5.40	0.608	0.331	(0.504)	0.277
4	0.33	5.40	0.608	0.331	(0.504)	0.277
5	0.42	5.70	0.641	0.331	(0.532)	0.311
6	0.50	6.40	0.720	0.331	(0.597)	0.389
7	0.58	7.90	0.889	0.331	(0.738)	0.558
8	0.67	9.10	1.024	0.331	(0.850)	0.693
9	0.75	12.80	1.440	0.331	(1.195)	1.109
10	0.83	25.60	2.880	0.331	(2.390)	2.549
11	0.92	7.90	0.889	0.331	(0.738)	0.558
12	1.00	4.90	0.551	0.331	(0.457)	0.221

(Loss Rate Not Used)

Sum = 100.0

Sum = 7.3

Flood volume = Effective rainfall 0.61(In)
 times area 45.6 (Ac.) / [(In)/(Ft.)] = 2.3 (Ac.Ft)

Total soil loss = 0.33 (In)

Total soil loss = 1.256 (Ac.Ft)

Total rainfall = 0.94 (In)

Flood volume = 100457.5 Cubic Feet

Total soil loss = 54731.2 Cubic Feet

Peak flow rate of this hydrograph = 69.462 (CFS)

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1 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q (CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0063	0.91	Q				
0+10	0.0352	4.20	V Q				
0+15	0.0805	6.59	V Q				
0+20	0.1448	9.33	V Q				
0+25	0.2202	10.95	V Q				
0+30	0.3079	12.73	V Q				
0+35	0.4179	15.97	V Q				
0+40	0.5641	21.23	V Q				
0+45	0.7599	28.43	V Q				

0+50	1.0832	46.94			V	Q		
0+55	1.5616	69.46				V		Q
1+ 0	1.8719	45.05				Q	V	
1+ 5	2.0429	24.84			Q		V	
1+10	2.1377	13.76		Q			V	
1+15	2.1957	8.43		Q			V	
1+20	2.2352	5.73		Q			V	
1+25	2.2628	4.02		Q			V	
1+30	2.2817	2.75	Q				V	
1+35	2.2945	1.86	Q				V	
1+40	2.3036	1.31	Q				V	
1+45	2.3056	0.30	Q				V	
1+50	2.3062	0.09	Q				V	

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 1

Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 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]
45.60	0.98	44.69

100 YEAR Area rainfall data:

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

45.60

2.48

113.09

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.597 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.597 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.072	0.030
56.0	56.0	0.511	0.500	0.281	0.079	0.022
69.0	69.0	0.373	0.500	0.205	0.024	0.005
40.0	40.0	0.670	0.000	0.670	0.066	0.044
75.0	75.0	0.303	0.000	0.303	0.759	0.230
Sum (F) =						0.331

Area averaged mean soil loss (F) (In/Hr) = 0.331

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	12.037
2	0.167	150.772	42.649
3	0.250	226.159	21.345
4	0.333	301.545	8.568
5	0.417	376.931	5.179
6	0.500	452.317	3.348
7	0.583	527.704	2.334
8	0.667	603.090	1.704
9	0.750	678.476	1.186
10	0.833	753.862	0.812
11	0.917	829.248	0.838
Sum =		100.000	Sum= 45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.331)	0.207	0.042
2	0.17	1.30	0.249	(0.331)	0.207	0.042
3	0.25	1.10	0.211	(0.331)	0.175	0.036
4	0.33	1.50	0.287	(0.331)	0.239	0.049
5	0.42	1.50	0.287	(0.331)	0.239	0.049
6	0.50	1.80	0.345	(0.331)	0.286	0.059
7	0.58	1.50	0.287	(0.331)	0.239	0.049
8	0.67	1.80	0.345	(0.331)	0.286	0.059
9	0.75	1.80	0.345	(0.331)	0.286	0.059
10	0.83	1.50	0.287	(0.331)	0.239	0.049
11	0.92	1.60	0.307	(0.331)	0.254	0.052
12	1.00	1.80	0.345	(0.331)	0.286	0.059
13	1.08	2.20	0.422	0.331	(0.350)	0.091
14	1.17	2.20	0.422	0.331	(0.350)	0.091
15	1.25	2.20	0.422	0.331	(0.350)	0.091
16	1.33	2.00	0.383	(0.331)	0.318	0.065
17	1.42	2.60	0.498	0.331	(0.413)	0.168
18	1.50	2.70	0.517	0.331	(0.429)	0.187
19	1.58	2.40	0.460	0.331	(0.382)	0.129
20	1.67	2.70	0.517	0.331	(0.429)	0.187
21	1.75	3.30	0.632	0.331	(0.525)	0.302
22	1.83	3.10	0.594	0.331	(0.493)	0.263
23	1.92	2.90	0.556	0.331	(0.461)	0.225
24	2.00	3.00	0.575	0.331	(0.477)	0.244
25	2.08	3.10	0.594	0.331	(0.493)	0.263
26	2.17	4.20	0.805	0.331	(0.668)	0.474
27	2.25	5.00	0.958	0.331	(0.795)	0.627
28	2.33	3.50	0.671	0.331	(0.557)	0.340
29	2.42	6.80	1.303	0.331	(1.081)	0.972
30	2.50	7.30	1.399	0.331	(1.161)	1.068
31	2.58	8.20	1.571	0.331	(1.304)	1.241
32	2.67	5.90	1.131	0.331	(0.938)	0.800
33	2.75	2.00	0.383	(0.331)	0.318	0.065
34	2.83	1.80	0.345	(0.331)	0.286	0.059
35	2.92	1.80	0.345	(0.331)	0.286	0.059
36	3.00	0.60	0.115	(0.331)	0.095	0.020

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.6

Flood volume = Effective rainfall 0.72(In)

times area 45.6(Ac.) / [(In)/(Ft.)] = 2.7(Ac.Ft)

Total soil loss = 0.88(In)

Total soil loss = 3.334(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 119095.8 Cubic Feet

Total soil loss = 145218.2 Cubic Feet

Peak flow rate of this hydrograph = 45.878 (CFS)

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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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0016	0.23	Q					
0+10	0.0090	1.07	Q					
0+15	0.0189	1.45	VQ					
0+20	0.0296	1.56	VQ					
0+25	0.0424	1.85	VQ					
0+30	0.0567	2.07	VQ					
0+35	0.0724	2.29	Q					
0+40	0.0883	2.30	Q					
0+45	0.1053	2.47	Q					
0+50	0.1227	2.53	VQ					
0+55	0.1393	2.40	QV					
1+ 0	0.1560	2.43	QV					
1+ 5	0.1750	2.75	Q					
1+10	0.1987	3.44	Q					
1+15	0.2248	3.79	Q					
1+20	0.2508	3.79	Q					
1+25	0.2779	3.93	QV					
1+30	0.3182	5.85	Q					
1+35	0.3653	6.85	Q					
1+40	0.4108	6.59	QV					
1+45	0.4665	8.09	Q					
1+50	0.5400	10.67	VQ					
1+55	0.6161	11.05	QV					
2+ 0	0.6892	10.62	Q V					
2+ 5	0.7645	10.93	Q V					
2+10	0.8516	12.65	Q V					
2+15	0.9751	17.93	Q					
2+20	1.1235	21.55	VQ					
2+25	1.2737	21.81	QV					
2+30	1.5016	33.09	V					
2+35	1.7890	41.73	Q					
2+40	2.1050	45.88	V					
2+45	2.3573	36.64	Q					
2+50	2.4929	19.69	Q					
2+55	2.5741	11.80	Q					
3+ 0	2.6321	8.42	Q					
3+ 5	2.6710	5.65	Q					
3+10	2.6956	3.57	Q					
3+15	2.7125	2.45	Q					
3+20	2.7232	1.56	Q					
3+25	2.7298	0.95	Q					

3+30	2.7328	0.43	Q				V
3+35	2.7334	0.09	Q				V
3+40	2.7338	0.06	Q				V
3+45	2.7340	0.03	Q				V
3+50	2.7341	0.01	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 1 Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
45.60	1.38	62.93

100 YEAR Area rainfall data:

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

45.60

3.48

158.69

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 2.244 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 2.244 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.072	0.030
56.0	56.0	0.511	0.500	0.281	0.079	0.022
69.0	69.0	0.373	0.500	0.205	0.024	0.005
40.0	40.0	0.670	0.000	0.670	0.066	0.044
75.0	75.0	0.303	0.000	0.303	0.759	0.230
Sum (F) =						0.331

Area averaged mean soil loss (F) (In/Hr) = 0.331

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	75.386	5.532
2	0.167	150.772	19.600
3	0.250	226.159	9.809
4	0.333	301.545	3.938
5	0.417	376.931	2.380
6	0.500	452.317	1.539
7	0.583	527.704	1.073
8	0.667	603.090	0.783
9	0.750	678.476	0.545
10	0.833	753.862	0.373
11	0.917	829.248	0.385
Sum =		100.000	Sum= 45.956

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	0.08	0.50	0.135	(0.331) 0.112	0.023
2	0.17	0.60	0.162	(0.331) 0.134	0.027
3	0.25	0.60	0.162	(0.331) 0.134	0.027
4	0.33	0.60	0.162	(0.331) 0.134	0.027
5	0.42	0.60	0.162	(0.331) 0.134	0.027
6	0.50	0.70	0.188	(0.331) 0.156	0.032
7	0.58	0.70	0.188	(0.331) 0.156	0.032
8	0.67	0.70	0.188	(0.331) 0.156	0.032
9	0.75	0.70	0.188	(0.331) 0.156	0.032
10	0.83	0.70	0.188	(0.331) 0.156	0.032
11	0.92	0.70	0.188	(0.331) 0.156	0.032
12	1.00	0.80	0.215	(0.331) 0.179	0.037
13	1.08	0.80	0.215	(0.331) 0.179	0.037
14	1.17	0.80	0.215	(0.331) 0.179	0.037
15	1.25	0.80	0.215	(0.331) 0.179	0.037
16	1.33	0.80	0.215	(0.331) 0.179	0.037
17	1.42	0.80	0.215	(0.331) 0.179	0.037
18	1.50	0.80	0.215	(0.331) 0.179	0.037
19	1.58	0.80	0.215	(0.331) 0.179	0.037
20	1.67	0.80	0.215	(0.331) 0.179	0.037
21	1.75	0.80	0.215	(0.331) 0.179	0.037
22	1.83	0.80	0.215	(0.331) 0.179	0.037
23	1.92	0.80	0.215	(0.331) 0.179	0.037
24	2.00	0.90	0.242	(0.331) 0.201	0.041
25	2.08	0.80	0.215	(0.331) 0.179	0.037
26	2.17	0.90	0.242	(0.331) 0.201	0.041
27	2.25	0.90	0.242	(0.331) 0.201	0.041
28	2.33	0.90	0.242	(0.331) 0.201	0.041
29	2.42	0.90	0.242	(0.331) 0.201	0.041
30	2.50	0.90	0.242	(0.331) 0.201	0.041
31	2.58	0.90	0.242	(0.331) 0.201	0.041
32	2.67	0.90	0.242	(0.331) 0.201	0.041
33	2.75	1.00	0.269	(0.331) 0.223	0.046
34	2.83	1.00	0.269	(0.331) 0.223	0.046
35	2.92	1.00	0.269	(0.331) 0.223	0.046
36	3.00	1.00	0.269	(0.331) 0.223	0.046
37	3.08	1.00	0.269	(0.331) 0.223	0.046
38	3.17	1.10	0.296	(0.331) 0.246	0.050
39	3.25	1.10	0.296	(0.331) 0.246	0.050
40	3.33	1.10	0.296	(0.331) 0.246	0.050
41	3.42	1.20	0.323	(0.331) 0.268	0.055
42	3.50	1.30	0.350	(0.331) 0.290	0.060
43	3.58	1.40	0.377	(0.331) 0.313	0.064
44	3.67	1.40	0.377	(0.331) 0.313	0.064

45	3.75	1.50	0.404	0.331	(0.335)	0.073
46	3.83	1.50	0.404	0.331	(0.335)	0.073
47	3.92	1.60	0.431	0.331	(0.357)	0.100
48	4.00	1.60	0.431	0.331	(0.357)	0.100
49	4.08	1.70	0.458	0.331	(0.380)	0.127
50	4.17	1.80	0.485	0.331	(0.402)	0.154
51	4.25	1.90	0.512	0.331	(0.424)	0.181
52	4.33	2.00	0.538	0.331	(0.447)	0.208
53	4.42	2.10	0.565	0.331	(0.469)	0.235
54	4.50	2.10	0.565	0.331	(0.469)	0.235
55	4.58	2.20	0.592	0.331	(0.492)	0.262
56	4.67	2.30	0.619	0.331	(0.514)	0.289
57	4.75	2.40	0.646	0.331	(0.536)	0.316
58	4.83	2.40	0.646	0.331	(0.536)	0.316
59	4.92	2.50	0.673	0.331	(0.559)	0.342
60	5.00	2.60	0.700	0.331	(0.581)	0.369
61	5.08	3.10	0.835	0.331	(0.693)	0.504
62	5.17	3.60	0.969	0.331	(0.804)	0.639
63	5.25	3.90	1.050	0.331	(0.871)	0.719
64	5.33	4.20	1.131	0.331	(0.938)	0.800
65	5.42	4.70	1.265	0.331	(1.050)	0.935
66	5.50	5.60	1.508	0.331	(1.251)	1.177
67	5.58	1.90	0.512	0.331	(0.424)	0.181
68	5.67	0.90	0.242	(0.331)	0.201	0.041
69	5.75	0.60	0.162	(0.331)	0.134	0.027
70	5.83	0.50	0.135	(0.331)	0.112	0.023
71	5.92	0.30	0.081	(0.331)	0.067	0.014
72	6.00	0.20	0.054	(0.331)	0.045	0.009

(Loss Rate Not Used)

Sum = 100.0

Sum = 10.2

Flood volume = Effective rainfall 0.85(In)
 times area 45.6(Ac.) / [(In) / (Ft.)] = 3.2(Ac.Ft)
 Total soil loss = 1.39(In)
 Total soil loss = 5.295(Ac.Ft)
 Total rainfall = 2.24(In)
 Flood volume = 140744.4 Cubic Feet
 Total soil loss = 230635.1 Cubic Feet

 Peak flow rate of this hydrograph = 40.362(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0009	0.13	Q				
0+10	0.0050	0.60	Q				
0+15	0.0113	0.92	Q				
0+20	0.0186	1.05	Q				
0+25	0.0263	1.12	Q				

0+30	0.0345	1.20	Q				
0+35	0.0436	1.32	VQ				
0+40	0.0532	1.38	VQ				
0+45	0.0629	1.42	VQ				
0+50	0.0728	1.44	VQ				
0+55	0.0829	1.46	Q				
1+ 0	0.0932	1.49	Q				
1+ 5	0.1041	1.58	Q				
1+10	0.1153	1.63	Q				
1+15	0.1267	1.65	Q				
1+20	0.1381	1.66	Q				
1+25	0.1496	1.67	Q				
1+30	0.1612	1.68	Q				
1+35	0.1728	1.68	QV				
1+40	0.1843	1.68	QV				
1+45	0.1959	1.68	QV				
1+50	0.2075	1.69	QV				
1+55	0.2192	1.69	QV				
2+ 0	0.2309	1.71	QV				
2+ 5	0.2432	1.78	Q V				
2+10	0.2553	1.76	Q V				
2+15	0.2678	1.82	Q V				
2+20	0.2806	1.86	Q V				
2+25	0.2935	1.87	Q V				
2+30	0.3064	1.88	Q V				
2+35	0.3194	1.89	Q V				
2+40	0.3324	1.89	Q V				
2+45	0.3456	1.92	Q V				
2+50	0.3594	2.01	Q V				
2+55	0.3736	2.05	Q V				
3+ 0	0.3879	2.07	Q V				
3+ 5	0.4022	2.09	Q V				
3+10	0.4168	2.12	Q V				
3+15	0.4321	2.21	Q V				
3+20	0.4476	2.26	Q V				
3+25	0.4635	2.31	Q V				
3+30	0.4803	2.43	Q V				
3+35	0.4982	2.60	Q V				
3+40	0.5173	2.76	Q V				
3+45	0.5372	2.89	Q V				
3+50	0.5585	3.11	Q V				
3+55	0.5817	3.37	Q V				
4+ 0	0.6089	3.95	Q V				
4+ 5	0.6392	4.39	Q V				
4+10	0.6750	5.20	Q V				
4+15	0.7178	6.22	Q V				
4+20	0.7683	7.32	Q V				
4+25	0.8266	8.47	Q V				
4+30	0.8920	9.49	Q V				
4+35	0.9620	10.17	Q V				
4+40	1.0385	11.12	Q V				
4+45	1.1228	12.24	Q V				
4+50	1.2141	13.25	Q V				
4+55	1.3099	13.92	Q V				

5+ 0	1.4123	14.87		Q	V		
5+ 5	1.5264	16.57			V		
5+10	1.6672	20.44			Q	V	
5+15	1.8400	25.09				Q	V
5+20	2.0406	29.13					Q V
5+25	2.2693	33.20					Q V
5+30	2.5372	38.89					
5+35	2.8151	40.36					Q V
5+40	2.9773	23.55			Q		
5+45	3.0645	12.65		Q			
5+50	3.1204	8.13					
5+55	3.1594	5.66					
6+ 0	3.1868	3.98					
6+ 5	3.2056	2.74					
6+10	3.2175	1.73					
6+15	3.2248	1.06	Q				
6+20	3.2292	0.63	Q				
6+25	3.2302	0.15	Q				
6+30	3.2306	0.06	Q				
6+35	3.2308	0.03	Q				
6+40	3.2310	0.02	Q				
6+45	3.2310	0.01	Q				
6+50	3.2310	0.00	Q				

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A1N2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 1

Existing Condition

Drainage Area = 45.60 (Ac.) = 0.071 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 45.60 (Ac.) = 0.071 Sq. Mi.
Length along longest watercourse = 4197.90 (Ft.)
Length along longest watercourse measured to centroid = 3148.50 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.596 Mi.
Difference in elevation = 406.00 (Ft.)
Slope along watercourse = 510.6553 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.111 Hr.
Lag time = 6.63 Min.
25% of lag time = 1.66 Min.
40% of lag time = 2.65 Min.
Unit time = 5.00 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]
45.60	2.48	113.09

100 YEAR Area rainfall data:

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

45.60

6.90

314.64

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 4.298 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 4.298 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.300	32.00	0.500
3.600	56.00	0.500
1.100	69.00	0.500
3.000	40.00	0.000
34.600	75.00	0.000
Total Area Entered = 45.60 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.072	0.030
56.0	56.0	0.511	0.500	0.281	0.079	0.022
69.0	69.0	0.373	0.500	0.205	0.024	0.005
40.0	40.0	0.670	0.000	0.670	0.066	0.044
75.0	75.0	0.303	0.000	0.303	0.759	0.230
Sum (F) =						0.331

Area averaged mean soil loss (F) (In/Hr) = 0.331

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.830

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	75.386	12.037
2	0.167	150.772	42.649
3	0.250	226.159	21.345
4	0.333	301.545	8.568
5	0.417	376.931	5.179
6	0.500	452.317	3.348
7	0.583	527.704	2.334
8	0.667	603.090	1.704
9	0.750	678.476	1.186
10	0.833	753.862	0.812
11	0.917	829.248	0.838
Sum = 100.000		Sum=	45.956

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.034	(0.586)	0.029	0.006
2	0.17	0.07	0.034	(0.584)	0.029	0.006
3	0.25	0.07	0.034	(0.582)	0.029	0.006
4	0.33	0.10	0.052	(0.579)	0.043	0.009
5	0.42	0.10	0.052	(0.577)	0.043	0.009
6	0.50	0.10	0.052	(0.575)	0.043	0.009
7	0.58	0.10	0.052	(0.573)	0.043	0.009
8	0.67	0.10	0.052	(0.570)	0.043	0.009
9	0.75	0.10	0.052	(0.568)	0.043	0.009
10	0.83	0.13	0.069	(0.566)	0.057	0.012
11	0.92	0.13	0.069	(0.564)	0.057	0.012
12	1.00	0.13	0.069	(0.561)	0.057	0.012
13	1.08	0.10	0.052	(0.559)	0.043	0.009
14	1.17	0.10	0.052	(0.557)	0.043	0.009
15	1.25	0.10	0.052	(0.555)	0.043	0.009
16	1.33	0.10	0.052	(0.553)	0.043	0.009
17	1.42	0.10	0.052	(0.550)	0.043	0.009
18	1.50	0.10	0.052	(0.548)	0.043	0.009
19	1.58	0.10	0.052	(0.546)	0.043	0.009
20	1.67	0.10	0.052	(0.544)	0.043	0.009
21	1.75	0.10	0.052	(0.542)	0.043	0.009
22	1.83	0.13	0.069	(0.539)	0.057	0.012
23	1.92	0.13	0.069	(0.537)	0.057	0.012
24	2.00	0.13	0.069	(0.535)	0.057	0.012
25	2.08	0.13	0.069	(0.533)	0.057	0.012
26	2.17	0.13	0.069	(0.531)	0.057	0.012
27	2.25	0.13	0.069	(0.529)	0.057	0.012
28	2.33	0.13	0.069	(0.526)	0.057	0.012
29	2.42	0.13	0.069	(0.524)	0.057	0.012
30	2.50	0.13	0.069	(0.522)	0.057	0.012
31	2.58	0.17	0.086	(0.520)	0.071	0.015
32	2.67	0.17	0.086	(0.518)	0.071	0.015
33	2.75	0.17	0.086	(0.516)	0.071	0.015
34	2.83	0.17	0.086	(0.514)	0.071	0.015
35	2.92	0.17	0.086	(0.512)	0.071	0.015
36	3.00	0.17	0.086	(0.509)	0.071	0.015
37	3.08	0.17	0.086	(0.507)	0.071	0.015
38	3.17	0.17	0.086	(0.505)	0.071	0.015
39	3.25	0.17	0.086	(0.503)	0.071	0.015
40	3.33	0.17	0.086	(0.501)	0.071	0.015
41	3.42	0.17	0.086	(0.499)	0.071	0.015
42	3.50	0.17	0.086	(0.497)	0.071	0.015
43	3.58	0.17	0.086	(0.495)	0.071	0.015
44	3.67	0.17	0.086	(0.493)	0.071	0.015

45	3.75	0.17	0.086	(0.491)	0.071	0.015
46	3.83	0.20	0.103	(0.489)	0.086	0.018
47	3.92	0.20	0.103	(0.486)	0.086	0.018
48	4.00	0.20	0.103	(0.484)	0.086	0.018
49	4.08	0.20	0.103	(0.482)	0.086	0.018
50	4.17	0.20	0.103	(0.480)	0.086	0.018
51	4.25	0.20	0.103	(0.478)	0.086	0.018
52	4.33	0.23	0.120	(0.476)	0.100	0.020
53	4.42	0.23	0.120	(0.474)	0.100	0.020
54	4.50	0.23	0.120	(0.472)	0.100	0.020
55	4.58	0.23	0.120	(0.470)	0.100	0.020
56	4.67	0.23	0.120	(0.468)	0.100	0.020
57	4.75	0.23	0.120	(0.466)	0.100	0.020
58	4.83	0.27	0.138	(0.464)	0.114	0.023
59	4.92	0.27	0.138	(0.462)	0.114	0.023
60	5.00	0.27	0.138	(0.460)	0.114	0.023
61	5.08	0.20	0.103	(0.458)	0.086	0.018
62	5.17	0.20	0.103	(0.456)	0.086	0.018
63	5.25	0.20	0.103	(0.454)	0.086	0.018
64	5.33	0.23	0.120	(0.452)	0.100	0.020
65	5.42	0.23	0.120	(0.450)	0.100	0.020
66	5.50	0.23	0.120	(0.448)	0.100	0.020
67	5.58	0.27	0.138	(0.446)	0.114	0.023
68	5.67	0.27	0.138	(0.444)	0.114	0.023
69	5.75	0.27	0.138	(0.442)	0.114	0.023
70	5.83	0.27	0.138	(0.440)	0.114	0.023
71	5.92	0.27	0.138	(0.438)	0.114	0.023
72	6.00	0.27	0.138	(0.436)	0.114	0.023
73	6.08	0.30	0.155	(0.435)	0.128	0.026
74	6.17	0.30	0.155	(0.433)	0.128	0.026
75	6.25	0.30	0.155	(0.431)	0.128	0.026
76	6.33	0.30	0.155	(0.429)	0.128	0.026
77	6.42	0.30	0.155	(0.427)	0.128	0.026
78	6.50	0.30	0.155	(0.425)	0.128	0.026
79	6.58	0.33	0.172	(0.423)	0.143	0.029
80	6.67	0.33	0.172	(0.421)	0.143	0.029
81	6.75	0.33	0.172	(0.419)	0.143	0.029
82	6.83	0.33	0.172	(0.417)	0.143	0.029
83	6.92	0.33	0.172	(0.415)	0.143	0.029
84	7.00	0.33	0.172	(0.414)	0.143	0.029
85	7.08	0.33	0.172	(0.412)	0.143	0.029
86	7.17	0.33	0.172	(0.410)	0.143	0.029
87	7.25	0.33	0.172	(0.408)	0.143	0.029
88	7.33	0.37	0.189	(0.406)	0.157	0.032
89	7.42	0.37	0.189	(0.404)	0.157	0.032
90	7.50	0.37	0.189	(0.402)	0.157	0.032
91	7.58	0.40	0.206	(0.400)	0.171	0.035
92	7.67	0.40	0.206	(0.399)	0.171	0.035
93	7.75	0.40	0.206	(0.397)	0.171	0.035
94	7.83	0.43	0.223	(0.395)	0.185	0.038
95	7.92	0.43	0.223	(0.393)	0.185	0.038
96	8.00	0.43	0.223	(0.391)	0.185	0.038
97	8.08	0.50	0.258	(0.389)	0.214	0.044
98	8.17	0.50	0.258	(0.388)	0.214	0.044

99	8.25	0.50	0.258	(0.386)	0.214	0.044
100	8.33	0.50	0.258	(0.384)	0.214	0.044
101	8.42	0.50	0.258	(0.382)	0.214	0.044
102	8.50	0.50	0.258	(0.380)	0.214	0.044
103	8.58	0.53	0.275	(0.379)	0.228	0.047
104	8.67	0.53	0.275	(0.377)	0.228	0.047
105	8.75	0.53	0.275	(0.375)	0.228	0.047
106	8.83	0.57	0.292	(0.373)	0.243	0.050
107	8.92	0.57	0.292	(0.372)	0.243	0.050
108	9.00	0.57	0.292	(0.370)	0.243	0.050
109	9.08	0.63	0.327	(0.368)	0.271	0.056
110	9.17	0.63	0.327	(0.366)	0.271	0.056
111	9.25	0.63	0.327	(0.365)	0.271	0.056
112	9.33	0.67	0.344	(0.363)	0.285	0.059
113	9.42	0.67	0.344	(0.361)	0.285	0.059
114	9.50	0.67	0.344	(0.359)	0.285	0.059
115	9.58	0.70	0.361	(0.358)	0.300	0.061
116	9.67	0.70	0.361	(0.356)	0.300	0.061
117	9.75	0.70	0.361	(0.354)	0.300	0.061
118	9.83	0.73	0.378	(0.353)	0.314	0.064
119	9.92	0.73	0.378	(0.351)	0.314	0.064
120	10.00	0.73	0.378	(0.349)	0.314	0.064
121	10.08	0.50	0.258	(0.347)	0.214	0.044
122	10.17	0.50	0.258	(0.346)	0.214	0.044
123	10.25	0.50	0.258	(0.344)	0.214	0.044
124	10.33	0.50	0.258	(0.342)	0.214	0.044
125	10.42	0.50	0.258	(0.341)	0.214	0.044
126	10.50	0.50	0.258	(0.339)	0.214	0.044
127	10.58	0.67	0.344	(0.337)	0.285	0.059
128	10.67	0.67	0.344	(0.336)	0.285	0.059
129	10.75	0.67	0.344	(0.334)	0.285	0.059
130	10.83	0.67	0.344	(0.333)	0.285	0.059
131	10.92	0.67	0.344	(0.331)	0.285	0.059
132	11.00	0.67	0.344	(0.329)	0.285	0.059
133	11.08	0.63	0.327	(0.328)	0.271	0.056
134	11.17	0.63	0.327	(0.326)	0.271	0.056
135	11.25	0.63	0.327	(0.324)	0.271	0.056
136	11.33	0.63	0.327	(0.323)	0.271	0.056
137	11.42	0.63	0.327	(0.321)	0.271	0.056
138	11.50	0.63	0.327	(0.320)	0.271	0.056
139	11.58	0.57	0.292	(0.318)	0.243	0.050
140	11.67	0.57	0.292	(0.316)	0.243	0.050
141	11.75	0.57	0.292	(0.315)	0.243	0.050
142	11.83	0.60	0.309	(0.313)	0.257	0.053
143	11.92	0.60	0.309	(0.312)	0.257	0.053
144	12.00	0.60	0.309	(0.310)	0.257	0.053
145	12.08	0.83	0.430	0.309	(0.357)	0.121
146	12.17	0.83	0.430	0.307	(0.357)	0.123
147	12.25	0.83	0.430	0.306	(0.357)	0.124
148	12.33	0.87	0.447	0.304	(0.371)	0.143
149	12.42	0.87	0.447	0.303	(0.371)	0.144
150	12.50	0.87	0.447	0.301	(0.371)	0.146
151	12.58	0.93	0.481	0.299	(0.399)	0.182
152	12.67	0.93	0.481	0.298	(0.399)	0.183

153	12.75	0.93	0.481	0.296	(0.399)	0.185
154	12.83	0.97	0.499	0.295	(0.414)	0.204
155	12.92	0.97	0.499	0.293	(0.414)	0.205
156	13.00	0.97	0.499	0.292	(0.414)	0.207
157	13.08	1.13	0.585	0.291	(0.485)	0.294
158	13.17	1.13	0.585	0.289	(0.485)	0.296
159	13.25	1.13	0.585	0.288	(0.485)	0.297
160	13.33	1.13	0.585	0.286	(0.485)	0.298
161	13.42	1.13	0.585	0.285	(0.485)	0.300
162	13.50	1.13	0.585	0.283	(0.485)	0.301
163	13.58	0.77	0.395	0.282	(0.328)	0.114
164	13.67	0.77	0.395	0.280	(0.328)	0.115
165	13.75	0.77	0.395	0.279	(0.328)	0.117
166	13.83	0.77	0.395	0.277	(0.328)	0.118
167	13.92	0.77	0.395	0.276	(0.328)	0.119
168	14.00	0.77	0.395	0.275	(0.328)	0.121
169	14.08	0.90	0.464	0.273	(0.385)	0.191
170	14.17	0.90	0.464	0.272	(0.385)	0.192
171	14.25	0.90	0.464	0.270	(0.385)	0.194
172	14.33	0.87	0.447	0.269	(0.371)	0.178
173	14.42	0.87	0.447	0.268	(0.371)	0.179
174	14.50	0.87	0.447	0.266	(0.371)	0.181
175	14.58	0.87	0.447	0.265	(0.371)	0.182
176	14.67	0.87	0.447	0.264	(0.371)	0.183
177	14.75	0.87	0.447	0.262	(0.371)	0.185
178	14.83	0.83	0.430	0.261	(0.357)	0.169
179	14.92	0.83	0.430	0.260	(0.357)	0.170
180	15.00	0.83	0.430	0.258	(0.357)	0.172
181	15.08	0.80	0.413	0.257	(0.342)	0.156
182	15.17	0.80	0.413	0.256	(0.342)	0.157
183	15.25	0.80	0.413	0.254	(0.342)	0.158
184	15.33	0.77	0.395	0.253	(0.328)	0.142
185	15.42	0.77	0.395	0.252	(0.328)	0.144
186	15.50	0.77	0.395	0.250	(0.328)	0.145
187	15.58	0.63	0.327	0.249	(0.271)	0.078
188	15.67	0.63	0.327	0.248	(0.271)	0.079
189	15.75	0.63	0.327	0.247	(0.271)	0.080
190	15.83	0.63	0.327	0.245	(0.271)	0.081
191	15.92	0.63	0.327	0.244	(0.271)	0.083
192	16.00	0.63	0.327	0.243	(0.271)	0.084
193	16.08	0.13	0.069	(0.242)	0.057	0.012
194	16.17	0.13	0.069	(0.240)	0.057	0.012
195	16.25	0.13	0.069	(0.239)	0.057	0.012
196	16.33	0.13	0.069	(0.238)	0.057	0.012
197	16.42	0.13	0.069	(0.237)	0.057	0.012
198	16.50	0.13	0.069	(0.235)	0.057	0.012
199	16.58	0.10	0.052	(0.234)	0.043	0.009
200	16.67	0.10	0.052	(0.233)	0.043	0.009
201	16.75	0.10	0.052	(0.232)	0.043	0.009
202	16.83	0.10	0.052	(0.231)	0.043	0.009
203	16.92	0.10	0.052	(0.230)	0.043	0.009
204	17.00	0.10	0.052	(0.228)	0.043	0.009
205	17.08	0.17	0.086	(0.227)	0.071	0.015
206	17.17	0.17	0.086	(0.226)	0.071	0.015

207	17.25	0.17	0.086	(0.225)	0.071	0.015
208	17.33	0.17	0.086	(0.224)	0.071	0.015
209	17.42	0.17	0.086	(0.223)	0.071	0.015
210	17.50	0.17	0.086	(0.222)	0.071	0.015
211	17.58	0.17	0.086	(0.220)	0.071	0.015
212	17.67	0.17	0.086	(0.219)	0.071	0.015
213	17.75	0.17	0.086	(0.218)	0.071	0.015
214	17.83	0.13	0.069	(0.217)	0.057	0.012
215	17.92	0.13	0.069	(0.216)	0.057	0.012
216	18.00	0.13	0.069	(0.215)	0.057	0.012
217	18.08	0.13	0.069	(0.214)	0.057	0.012
218	18.17	0.13	0.069	(0.213)	0.057	0.012
219	18.25	0.13	0.069	(0.212)	0.057	0.012
220	18.33	0.13	0.069	(0.211)	0.057	0.012
221	18.42	0.13	0.069	(0.210)	0.057	0.012
222	18.50	0.13	0.069	(0.209)	0.057	0.012
223	18.58	0.10	0.052	(0.208)	0.043	0.009
224	18.67	0.10	0.052	(0.207)	0.043	0.009
225	18.75	0.10	0.052	(0.206)	0.043	0.009
226	18.83	0.07	0.034	(0.205)	0.029	0.006
227	18.92	0.07	0.034	(0.204)	0.029	0.006
228	19.00	0.07	0.034	(0.203)	0.029	0.006
229	19.08	0.10	0.052	(0.202)	0.043	0.009
230	19.17	0.10	0.052	(0.201)	0.043	0.009
231	19.25	0.10	0.052	(0.200)	0.043	0.009
232	19.33	0.13	0.069	(0.199)	0.057	0.012
233	19.42	0.13	0.069	(0.198)	0.057	0.012
234	19.50	0.13	0.069	(0.197)	0.057	0.012
235	19.58	0.10	0.052	(0.196)	0.043	0.009
236	19.67	0.10	0.052	(0.195)	0.043	0.009
237	19.75	0.10	0.052	(0.195)	0.043	0.009
238	19.83	0.07	0.034	(0.194)	0.029	0.006
239	19.92	0.07	0.034	(0.193)	0.029	0.006
240	20.00	0.07	0.034	(0.192)	0.029	0.006
241	20.08	0.10	0.052	(0.191)	0.043	0.009
242	20.17	0.10	0.052	(0.190)	0.043	0.009
243	20.25	0.10	0.052	(0.189)	0.043	0.009
244	20.33	0.10	0.052	(0.189)	0.043	0.009
245	20.42	0.10	0.052	(0.188)	0.043	0.009
246	20.50	0.10	0.052	(0.187)	0.043	0.009
247	20.58	0.10	0.052	(0.186)	0.043	0.009
248	20.67	0.10	0.052	(0.185)	0.043	0.009
249	20.75	0.10	0.052	(0.185)	0.043	0.009
250	20.83	0.07	0.034	(0.184)	0.029	0.006
251	20.92	0.07	0.034	(0.183)	0.029	0.006
252	21.00	0.07	0.034	(0.182)	0.029	0.006
253	21.08	0.10	0.052	(0.182)	0.043	0.009
254	21.17	0.10	0.052	(0.181)	0.043	0.009
255	21.25	0.10	0.052	(0.180)	0.043	0.009
256	21.33	0.07	0.034	(0.180)	0.029	0.006
257	21.42	0.07	0.034	(0.179)	0.029	0.006
258	21.50	0.07	0.034	(0.178)	0.029	0.006
259	21.58	0.10	0.052	(0.178)	0.043	0.009
260	21.67	0.10	0.052	(0.177)	0.043	0.009

261	21.75	0.10	0.052	(0.176)	0.043	0.009
262	21.83	0.07	0.034	(0.176)	0.029	0.006
263	21.92	0.07	0.034	(0.175)	0.029	0.006
264	22.00	0.07	0.034	(0.175)	0.029	0.006
265	22.08	0.10	0.052	(0.174)	0.043	0.009
266	22.17	0.10	0.052	(0.173)	0.043	0.009
267	22.25	0.10	0.052	(0.173)	0.043	0.009
268	22.33	0.07	0.034	(0.172)	0.029	0.006
269	22.42	0.07	0.034	(0.172)	0.029	0.006
270	22.50	0.07	0.034	(0.171)	0.029	0.006
271	22.58	0.07	0.034	(0.171)	0.029	0.006
272	22.67	0.07	0.034	(0.170)	0.029	0.006
273	22.75	0.07	0.034	(0.170)	0.029	0.006
274	22.83	0.07	0.034	(0.169)	0.029	0.006
275	22.92	0.07	0.034	(0.169)	0.029	0.006
276	23.00	0.07	0.034	(0.169)	0.029	0.006
277	23.08	0.07	0.034	(0.168)	0.029	0.006
278	23.17	0.07	0.034	(0.168)	0.029	0.006
279	23.25	0.07	0.034	(0.167)	0.029	0.006
280	23.33	0.07	0.034	(0.167)	0.029	0.006
281	23.42	0.07	0.034	(0.167)	0.029	0.006
282	23.50	0.07	0.034	(0.167)	0.029	0.006
283	23.58	0.07	0.034	(0.166)	0.029	0.006
284	23.67	0.07	0.034	(0.166)	0.029	0.006
285	23.75	0.07	0.034	(0.166)	0.029	0.006
286	23.83	0.07	0.034	(0.166)	0.029	0.006
287	23.92	0.07	0.034	(0.165)	0.029	0.006
288	24.00	0.07	0.034	(0.165)	0.029	0.006

(Loss Rate Not Used)

Sum = 100.0

Sum = 13.2

Flood volume = Effective rainfall 1.10(In)

times area 45.6(Ac.)/[(In)/(Ft.)] = 4.2(Ac.Ft)

Total soil loss = 3.20(In)

Total soil loss = 12.156(Ac.Ft)

Total rainfall = 4.30(In)

Flood volume = 181930.3 Cubic Feet

Total soil loss = 529515.9 Cubic Feet

Peak flow rate of this hydrograph = 13.437(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0002	0.03	Q				
0+10	0.0012	0.15	Q				
0+15	0.0026	0.20	Q				
0+20	0.0043	0.24	Q				
0+25	0.0065	0.32	Q				

0+30	0.0089	0.35	Q
0+35	0.0115	0.37	Q
0+40	0.0141	0.38	Q
0+45	0.0168	0.39	Q
0+50	0.0196	0.41	Q
0+55	0.0229	0.47	Q
1+ 0	0.0264	0.50	VQ
1+ 5	0.0298	0.50	VQ
1+10	0.0329	0.45	Q
1+15	0.0358	0.43	Q
1+20	0.0387	0.42	Q
1+25	0.0416	0.41	Q
1+30	0.0444	0.41	Q
1+35	0.0472	0.41	Q
1+40	0.0500	0.41	Q
1+45	0.0528	0.41	Q
1+50	0.0557	0.42	Q
1+55	0.0590	0.48	Q
2+ 0	0.0625	0.51	VQ
2+ 5	0.0661	0.52	VQ
2+10	0.0697	0.52	VQ
2+15	0.0733	0.53	VQ
2+20	0.0770	0.53	VQ
2+25	0.0807	0.53	VQ
2+30	0.0843	0.54	VQ
2+35	0.0882	0.55	VQ
2+40	0.0924	0.61	VQ
2+45	0.0968	0.64	VQ
2+50	0.1013	0.65	VQ
2+55	0.1058	0.66	Q
3+ 0	0.1104	0.66	Q
3+ 5	0.1150	0.67	Q
3+10	0.1196	0.67	Q
3+15	0.1242	0.67	Q
3+20	0.1288	0.67	Q
3+25	0.1334	0.67	Q
3+30	0.1381	0.67	Q
3+35	0.1427	0.67	Q
3+40	0.1473	0.67	Q
3+45	0.1520	0.67	Q
3+50	0.1567	0.69	Q
3+55	0.1619	0.75	Q
4+ 0	0.1672	0.78	Q
4+ 5	0.1726	0.79	Q
4+10	0.1781	0.79	Q
4+15	0.1836	0.80	Q
4+20	0.1892	0.82	Q
4+25	0.1952	0.88	Q
4+30	0.2015	0.91	Q
4+35	0.2078	0.92	Q
4+40	0.2142	0.93	QV
4+45	0.2206	0.93	QV
4+50	0.2272	0.95	QV
4+55	0.2342	1.01	Q

5+ 0	0.2413	1.04	Q				
5+ 5	0.2484	1.02	Q				
5+10	0.2547	0.92	QV				
5+15	0.2606	0.86	QV				
5+20	0.2665	0.86	QV				
5+25	0.2728	0.90	QV				
5+30	0.2791	0.93	QV				
5+35	0.2857	0.95	QV				
5+40	0.2926	1.01	Q				
5+45	0.2998	1.04	Q				
5+50	0.3070	1.05	Q				
5+55	0.3143	1.06	QV				
6+ 0	0.3217	1.06	QV				
6+ 5	0.3291	1.09	QV				
6+10	0.3370	1.15	QV				
6+15	0.3451	1.18	QV				
6+20	0.3533	1.19	QV				
6+25	0.3616	1.20	QV				
6+30	0.3698	1.20	QV				
6+35	0.3782	1.22	QV				
6+40	0.3871	1.28	QV				
6+45	0.3961	1.31	QV				
6+50	0.4052	1.32	QV				
6+55	0.4144	1.33	QV				
7+ 0	0.4236	1.34	Q V				
7+ 5	0.4328	1.34	Q V				
7+10	0.4420	1.34	Q V				
7+15	0.4513	1.34	Q V				
7+20	0.4607	1.36	Q V				
7+25	0.4704	1.42	Q V				
7+30	0.4804	1.45	Q V				
7+35	0.4906	1.48	Q V				
7+40	0.5012	1.54	QV				
7+45	0.5120	1.57	QV				
7+50	0.5231	1.60	Q V				
7+55	0.5346	1.67	Q V				
8+ 0	0.5463	1.71	Q V				
8+ 5	0.5584	1.75	Q V				
8+10	0.5713	1.88	Q V				
8+15	0.5847	1.94	Q V				
8+20	0.5983	1.97	Q V				
8+25	0.6119	1.99	Q V				
8+30	0.6257	2.00	Q V				
8+35	0.6396	2.02	Q V				
8+40	0.6540	2.08	Q V				
8+45	0.6685	2.12	Q V				
8+50	0.6833	2.15	Q V				
8+55	0.6986	2.21	Q V				
9+ 0	0.7140	2.25	Q V				
9+ 5	0.7298	2.29	Q V				
9+10	0.7465	2.42	Q V				
9+15	0.7635	2.48	Q V				
9+20	0.7809	2.52	Q V				
9+25	0.7988	2.60	Q V				

9+30	0.8170	2.64	Q	V				
9+35	0.8354	2.67	Q	V				
9+40	0.8543	2.74	Q	V				
9+45	0.8734	2.78	Q	V				
9+50	0.8928	2.81	Q	V				
9+55	0.9126	2.88	Q	V				
10+ 0	0.9327	2.92	Q	V				
10+ 5	0.9521	2.82	Q	V				
10+10	0.9689	2.43	Q	V				
10+15	0.9842	2.23	Q	V				
10+20	0.9991	2.16	Q	V				
10+25	1.0136	2.11	Q	V				
10+30	1.0279	2.08	Q	V				
10+35	1.0427	2.14	Q	V				
10+40	1.0593	2.41	Q	V				
10+45	1.0768	2.55	Q	V				
10+50	1.0947	2.60	Q	V				
10+55	1.1128	2.62	Q	V				
11+ 0	1.1310	2.64	Q	V				
11+ 5	1.1492	2.64	Q	V				
11+10	1.1671	2.60	Q	V				
11+15	1.1848	2.58	Q	V				
11+20	1.2025	2.57	Q	V				
11+25	1.2202	2.57	Q	V				
11+30	1.2379	2.57	Q	V				
11+35	1.2553	2.53	Q	V				
11+40	1.2720	2.41	Q	V				
11+45	1.2882	2.35	Q	V				
11+50	1.3043	2.35	Q	V				
11+55	1.3208	2.39	Q	V				
12+ 0	1.3374	2.41	Q	V				
12+ 5	1.3566	2.79	Q	V				
12+10	1.3851	4.15	Q	V				
12+15	1.4186	4.86	Q	V				
12+20	1.4550	5.28	Q	V				
12+25	1.4952	5.84	Q	V				
12+30	1.5377	6.18	Q	V				
12+35	1.5830	6.57	Q	V				
12+40	1.6340	7.41	Q	V				
12+45	1.6883	7.88	Q	V				
12+50	1.7449	8.22	Q	V				
12+55	1.8052	8.75	Q	V				
13+ 0	1.8675	9.05	Q	V				
13+ 5	1.9344	9.71	Q	V				
13+10	2.0138	11.53	Q	V				
13+15	2.0999	12.49	Q	V				
13+20	2.1889	12.93	Q	V				
13+25	2.2800	13.23	Q	V				
13+30	2.3725	13.44	Q	V				
13+35	2.4590	12.56	Q	V				
13+40	2.5209	8.99	Q	V				
13+45	2.5708	7.24	Q	V				
13+50	2.6162	6.60	Q	V				
13+55	2.6593	6.25	Q	V				

14+ 0	2.7007	6.02			Q		V
14+ 5	2.7439	6.26			Q		V
14+10	2.7957	7.53				Q	V
14+15	2.8519	8.16				Q	V
14+20	2.9093	8.33				Q	V
14+25	2.9655	8.15				Q	V
14+30	3.0216	8.15				Q	V
14+35	3.0782	8.22				Q	V
14+40	3.1354	8.30				Q	V
14+45	3.1930	8.37				Q	V
14+50	3.2505	8.35				Q	V
14+55	3.3062	8.08				Q	V
15+ 0	3.3611	7.97				Q	V
15+ 5	3.4152	7.86				Q	V
15+10	3.4671	7.54				Q	V
15+15	3.5181	7.40				Q	V
15+20	3.5682	7.28				Q	V
15+25	3.6161	6.95				Q	V
15+30	3.6630	6.81				Q	V
15+35	3.7070	6.39				Q	V
15+40	3.7417	5.04			Q		V
15+45	3.7719	4.39			Q		V
15+50	3.8005	4.15			Q		V
15+55	3.8283	4.03			Q		V
16+ 0	3.8556	3.97			Q		V
16+ 5	3.8800	3.54			Q		V
16+10	3.8944	2.09		Q			V
16+15	3.9038	1.36	Q				V
16+20	3.9111	1.06	Q				V
16+25	3.9171	0.87	Q				V
16+30	3.9223	0.76	Q				V
16+35	3.9269	0.67	Q				V
16+40	3.9308	0.56	Q				V
16+45	3.9341	0.49	Q				V
16+50	3.9372	0.45	Q				V
16+55	3.9401	0.42	Q				V
17+ 0	3.9430	0.41	Q				V
17+ 5	3.9460	0.44	Q				V
17+10	3.9498	0.55	Q				V
17+15	3.9540	0.61	Q				V
17+20	3.9584	0.63	Q				V
17+25	3.9628	0.65	Q				V
17+30	3.9673	0.65	Q				V
17+35	3.9719	0.66	Q				V
17+40	3.9765	0.67	Q				V
17+45	3.9811	0.67	Q				V
17+50	3.9856	0.65	Q				V
17+55	3.9897	0.60	Q				V
18+ 0	3.9936	0.57	Q				V
18+ 5	3.9975	0.56	Q				V
18+10	4.0013	0.55	Q				V
18+15	4.0050	0.55	Q				V
18+20	4.0088	0.54	Q				V
18+25	4.0125	0.54	Q				V

18+30	4.0162	0.54	Q				V
18+35	4.0199	0.52	Q				V
18+40	4.0231	0.46	Q				V
18+45	4.0261	0.44	Q				V
18+50	4.0289	0.41	Q				V
18+55	4.0312	0.34	Q				V
19+ 0	4.0334	0.31	Q				V
19+ 5	4.0355	0.31	Q				V
19+10	4.0380	0.36	Q				V
19+15	4.0406	0.38	Q				V
19+20	4.0434	0.41	Q				V
19+25	4.0467	0.47	Q				V
19+30	4.0501	0.50	Q				V
19+35	4.0535	0.50	Q				V
19+40	4.0566	0.45	Q				V
19+45	4.0595	0.42	Q				V
19+50	4.0623	0.40	Q				V
19+55	4.0646	0.34	Q				V
20+ 0	4.0667	0.31	Q				V
20+ 5	4.0689	0.31	Q				V
20+10	4.0714	0.36	Q				V
20+15	4.0740	0.38	Q				V
20+20	4.0767	0.39	Q				V
20+25	4.0794	0.39	Q				V
20+30	4.0821	0.40	Q				V
20+35	4.0849	0.40	Q				V
20+40	4.0876	0.40	Q				V
20+45	4.0904	0.40	Q				V
20+50	4.0930	0.39	Q				V
20+55	4.0953	0.33	Q				V
21+ 0	4.0974	0.30	Q				V
21+ 5	4.0995	0.31	Q				V
21+10	4.1020	0.36	Q				V
21+15	4.1046	0.38	Q				V
21+20	4.1071	0.37	Q				V
21+25	4.1094	0.32	Q				V
21+30	4.1114	0.29	Q				V
21+35	4.1135	0.30	Q				V
21+40	4.1159	0.35	Q				V
21+45	4.1185	0.38	Q				V
21+50	4.1210	0.37	Q				V
21+55	4.1233	0.32	Q				V
22+ 0	4.1253	0.29	Q				V
22+ 5	4.1274	0.30	Q				V
22+10	4.1298	0.35	Q				V
22+15	4.1324	0.38	Q				V
22+20	4.1349	0.37	Q				V
22+25	4.1372	0.32	Q				V
22+30	4.1392	0.29	Q				V
22+35	4.1411	0.28	Q				V
22+40	4.1431	0.28	Q				V
22+45	4.1450	0.28	Q				V
22+50	4.1469	0.27	Q				V
22+55	4.1487	0.27	Q				V

23+ 0	4.1506	0.27	Q				V
23+ 5	4.1525	0.27	Q				V
23+10	4.1543	0.27	Q				V
23+15	4.1562	0.27	Q				V
23+20	4.1580	0.27	Q				V
23+25	4.1599	0.27	Q				V
23+30	4.1617	0.27	Q				V
23+35	4.1636	0.27	Q				V
23+40	4.1654	0.27	Q				V
23+45	4.1673	0.27	Q				V
23+50	4.1691	0.27	Q				V
23+55	4.1710	0.27	Q				V
24+ 0	4.1728	0.27	Q				V
24+ 5	4.1745	0.24	Q				V
24+10	4.1753	0.12	Q				V
24+15	4.1758	0.06	Q				V
24+20	4.1760	0.04	Q				V
24+25	4.1762	0.03	Q				V
24+30	4.1764	0.02	Q				V
24+35	4.1764	0.01	Q				V
24+40	4.1765	0.01	Q				V
24+45	4.1765	0.00	Q				V
24+50	4.1765	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
67.20	0.58	38.98

100 YEAR Area rainfall data:

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

67.20

1.45

97.44

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 0.580 (In)
 Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.580 (In)
 Areal adjustment factor = 99.94 %
 Adjusted average point rain = 0.580 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417

Minimum soil loss rate ((In/Hr)) = 0.209

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum =		100.000	Sum= 67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.417)	0.275	0.031
2	0.17	4.50	0.313	(0.417)	0.282	0.031
3	0.25	5.40	0.376	(0.417)	0.338	0.038
4	0.33	5.40	0.376	(0.417)	0.338	0.038
5	0.42	5.70	0.396	(0.417)	0.357	0.040
6	0.50	6.40	0.445	(0.417)	0.401	0.045
7	0.58	7.90	0.550	0.417	(0.495)	0.132
8	0.67	9.10	0.633	0.417	(0.570)	0.216
9	0.75	12.80	0.890	0.417	(0.801)	0.473
10	0.83	25.60	1.781	0.417	(1.603)	1.364
11	0.92	7.90	0.550	0.417	(0.495)	0.132
12	1.00	4.90	0.341	(0.417)	0.307	0.034

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.6

Flood volume = Effective rainfall 0.21(In)

times area 67.2(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)

Total soil loss = 0.37(In)

Total soil loss = 2.045(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 52308.6 Cubic Feet

Total soil loss = 89088.2 Cubic Feet

Peak flow rate of this hydrograph = 42.760(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0012		0.17	Q				
0+10	0.0071		0.87	Q				
0+15	0.0173		1.47	VQ				
0+20	0.0300		1.84	VQ				
0+25	0.0444		2.10	Q				
0+30	0.0603		2.31	QV				
0+35	0.0812		3.03	Q				
0+40	0.1201		5.65	Q				
0+45	0.1935		10.65	V Q				
0+50	0.3559		23.59		V	Q		
0+55	0.6504		42.76			V	Q	
1+ 0	0.8762		32.79				Q V	

1+ 5	0.9852	15.82			Q			V	
1+10	1.0494	9.32			Q			V	
1+15	1.0917	6.15			Q			V	
1+20	1.1218	4.37			Q			V	
1+25	1.1436	3.16			Q			V	
1+30	1.1608	2.49	Q					V	
1+35	1.1737	1.87	Q					V	
1+40	1.1834	1.42	Q					V	
1+45	1.1906	1.04	Q					V	
1+50	1.1962	0.82	Q					V	
1+55	1.2003	0.59	Q					V	
2+ 0	1.2007	0.06	Q					V	
2+ 5	1.2008	0.01	Q					V	

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 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]
67.20	0.98	65.86

100 YEAR Area rainfall data:

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

67.20

2.48

166.66

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 0.980 (In)
 Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 0.980 (In)
 Areal adjustment factor = 99.97 %
 Adjusted average point rain = 0.980 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417

Minimum soil loss rate ((In/Hr)) = 0.209

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum = 100.000		Sum=	67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.417)	0.138	0.015
2	0.17	1.30	0.153	(0.417)	0.138	0.015
3	0.25	1.10	0.129	(0.417)	0.116	0.013
4	0.33	1.50	0.176	(0.417)	0.159	0.018
5	0.42	1.50	0.176	(0.417)	0.159	0.018
6	0.50	1.80	0.212	(0.417)	0.190	0.021
7	0.58	1.50	0.176	(0.417)	0.159	0.018
8	0.67	1.80	0.212	(0.417)	0.190	0.021
9	0.75	1.80	0.212	(0.417)	0.190	0.021
10	0.83	1.50	0.176	(0.417)	0.159	0.018
11	0.92	1.60	0.188	(0.417)	0.169	0.019
12	1.00	1.80	0.212	(0.417)	0.190	0.021
13	1.08	2.20	0.259	(0.417)	0.233	0.026
14	1.17	2.20	0.259	(0.417)	0.233	0.026
15	1.25	2.20	0.259	(0.417)	0.233	0.026
16	1.33	2.00	0.235	(0.417)	0.212	0.024
17	1.42	2.60	0.306	(0.417)	0.275	0.031
18	1.50	2.70	0.317	(0.417)	0.286	0.032
19	1.58	2.40	0.282	(0.417)	0.254	0.028
20	1.67	2.70	0.317	(0.417)	0.286	0.032
21	1.75	3.30	0.388	(0.417)	0.349	0.039
22	1.83	3.10	0.364	(0.417)	0.328	0.036
23	1.92	2.90	0.341	(0.417)	0.307	0.034
24	2.00	3.00	0.353	(0.417)	0.317	0.035
25	2.08	3.10	0.364	(0.417)	0.328	0.036
26	2.17	4.20	0.494	0.417	(0.444)	0.077
27	2.25	5.00	0.588	0.417	(0.529)	0.171
28	2.33	3.50	0.411	(0.417)	0.370	0.041
29	2.42	6.80	0.799	0.417	(0.720)	0.382
30	2.50	7.30	0.858	0.417	(0.772)	0.441
31	2.58	8.20	0.964	0.417	(0.868)	0.547
32	2.67	5.90	0.694	0.417	(0.624)	0.277
33	2.75	2.00	0.235	(0.417)	0.212	0.024
34	2.83	1.80	0.212	(0.417)	0.190	0.021
35	2.92	1.80	0.212	(0.417)	0.190	0.021
36	3.00	0.60	0.071	(0.417)	0.063	0.007

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.6

Flood volume = Effective rainfall 0.22(In)
times area 67.2(Ac.) / [(In) / (Ft.)] = 1.2(Ac.Ft)
Total soil loss = 0.76(In)
Total soil loss = 4.259(Ac.Ft)
Total rainfall = 0.98(In)
Flood volume = 53479.9 Cubic Feet
Total soil loss = 185507.1 Cubic Feet

Peak flow rate of this hydrograph = 25.653(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0006		0.08	Q				
0+10	0.0035		0.43	Q				
0+15	0.0083		0.70	Q				
0+20	0.0137		0.78	VQ				
0+25	0.0199		0.90	VQ				
0+30	0.0270		1.03	VQ				
0+35	0.0350		1.15	Q				
0+40	0.0431		1.19	Q				
0+45	0.0518		1.25	Q				
0+50	0.0608		1.31	Q				
0+55	0.0695		1.27	QV				
1+ 0	0.0782		1.27	QV				
1+ 5	0.0876		1.36	QV				
1+10	0.0980		1.52	QV				
1+15	0.1092		1.62	QV				
1+20	0.1206		1.65	QV				
1+25	0.1320		1.66	Q V				
1+30	0.1444		1.80	Q V				
1+35	0.1578		1.94	Q V				
1+40	0.1711		1.94	Q V				
1+45	0.1852		2.04	Q V				
1+50	0.2007		2.25	Q V				
1+55	0.2168		2.34	Q V				
2+ 0	0.2327		2.32	Q V				
2+ 5	0.2488		2.33	Q V				
2+10	0.2667		2.61	Q V				
2+15	0.2948		4.07	Q V				
2+20	0.3378		6.25	Q V				
2+25	0.3872		7.17	Q V				
2+30	0.4819	13.75			V Q			
2+35	0.6296	21.45			V Q			
2+40	0.8063	25.65				V Q		
2+45	0.9560	21.75				V Q		
2+50	1.0452	12.94			Q		V	Q
2+55	1.0978	7.65			Q		V	Q
3+ 0	1.1356	5.47					V	Q
3+ 5	1.1627	3.95					V	Q
3+10	1.1817	2.76					V	Q
3+15	1.1957	2.03					V	Q
3+20	1.2061	1.52					V	Q
3+25	1.2137	1.10					V	Q
3+30	1.2196	0.86					V	Q
3+35	1.2237	0.59					V	Q
3+40	1.2263	0.37					V	Q

3+45	1.2273	0.15	Q				V
3+50	1.2275	0.03	Q				V
3+55	1.2276	0.02	Q				V
4+ 0	1.2277	0.01	Q				V
4+ 5	1.2277	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
67.20	1.38	92.74

100 YEAR Area rainfall data:

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

67.20

3.48

233.86

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.380 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.380 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417

Minimum soil loss rate ((In/Hr)) = 0.209

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum =		100.000	Sum= 67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.083	(0.417)	0.075	0.008
2	0.17	0.60	0.099	(0.417)	0.089	0.010
3	0.25	0.60	0.099	(0.417)	0.089	0.010
4	0.33	0.60	0.099	(0.417)	0.089	0.010
5	0.42	0.60	0.099	(0.417)	0.089	0.010
6	0.50	0.70	0.116	(0.417)	0.104	0.012
7	0.58	0.70	0.116	(0.417)	0.104	0.012
8	0.67	0.70	0.116	(0.417)	0.104	0.012
9	0.75	0.70	0.116	(0.417)	0.104	0.012
10	0.83	0.70	0.116	(0.417)	0.104	0.012
11	0.92	0.70	0.116	(0.417)	0.104	0.012
12	1.00	0.80	0.132	(0.417)	0.119	0.013
13	1.08	0.80	0.132	(0.417)	0.119	0.013
14	1.17	0.80	0.132	(0.417)	0.119	0.013
15	1.25	0.80	0.132	(0.417)	0.119	0.013
16	1.33	0.80	0.132	(0.417)	0.119	0.013
17	1.42	0.80	0.132	(0.417)	0.119	0.013
18	1.50	0.80	0.132	(0.417)	0.119	0.013
19	1.58	0.80	0.132	(0.417)	0.119	0.013
20	1.67	0.80	0.132	(0.417)	0.119	0.013
21	1.75	0.80	0.132	(0.417)	0.119	0.013
22	1.83	0.80	0.132	(0.417)	0.119	0.013
23	1.92	0.80	0.132	(0.417)	0.119	0.013
24	2.00	0.90	0.149	(0.417)	0.134	0.015
25	2.08	0.80	0.132	(0.417)	0.119	0.013
26	2.17	0.90	0.149	(0.417)	0.134	0.015
27	2.25	0.90	0.149	(0.417)	0.134	0.015
28	2.33	0.90	0.149	(0.417)	0.134	0.015
29	2.42	0.90	0.149	(0.417)	0.134	0.015
30	2.50	0.90	0.149	(0.417)	0.134	0.015
31	2.58	0.90	0.149	(0.417)	0.134	0.015
32	2.67	0.90	0.149	(0.417)	0.134	0.015
33	2.75	1.00	0.166	(0.417)	0.149	0.017
34	2.83	1.00	0.166	(0.417)	0.149	0.017
35	2.92	1.00	0.166	(0.417)	0.149	0.017
36	3.00	1.00	0.166	(0.417)	0.149	0.017
37	3.08	1.00	0.166	(0.417)	0.149	0.017
38	3.17	1.10	0.182	(0.417)	0.164	0.018
39	3.25	1.10	0.182	(0.417)	0.164	0.018
40	3.33	1.10	0.182	(0.417)	0.164	0.018
41	3.42	1.20	0.199	(0.417)	0.179	0.020
42	3.50	1.30	0.215	(0.417)	0.194	0.022
43	3.58	1.40	0.232	(0.417)	0.209	0.023
44	3.67	1.40	0.232	(0.417)	0.209	0.023
45	3.75	1.50	0.248	(0.417)	0.224	0.025
46	3.83	1.50	0.248	(0.417)	0.224	0.025
47	3.92	1.60	0.265	(0.417)	0.238	0.026

48	4.00	1.60	0.265	(0.417)	0.238	0.026
49	4.08	1.70	0.281	(0.417)	0.253	0.028
50	4.17	1.80	0.298	(0.417)	0.268	0.030
51	4.25	1.90	0.315	(0.417)	0.283	0.031
52	4.33	2.00	0.331	(0.417)	0.298	0.033
53	4.42	2.10	0.348	(0.417)	0.313	0.035
54	4.50	2.10	0.348	(0.417)	0.313	0.035
55	4.58	2.20	0.364	(0.417)	0.328	0.036
56	4.67	2.30	0.381	(0.417)	0.343	0.038
57	4.75	2.40	0.397	(0.417)	0.358	0.040
58	4.83	2.40	0.397	(0.417)	0.358	0.040
59	4.92	2.50	0.414	(0.417)	0.373	0.041
60	5.00	2.60	0.430	(0.417)	0.387	0.043
61	5.08	3.10	0.513	0.417 (0.462)		0.096
62	5.17	3.60	0.596	0.417 (0.536)		0.179
63	5.25	3.90	0.646	0.417 (0.581)		0.229
64	5.33	4.20	0.695	0.417 (0.626)		0.278
65	5.42	4.70	0.778	0.417 (0.700)		0.361
66	5.50	5.60	0.927	0.417 (0.834)		0.510
67	5.58	1.90	0.315	(0.417)	0.283	0.031
68	5.67	0.90	0.149	(0.417)	0.134	0.015
69	5.75	0.60	0.099	(0.417)	0.089	0.010
70	5.83	0.50	0.083	(0.417)	0.075	0.008
71	5.92	0.30	0.050	(0.417)	0.045	0.005
72	6.00	0.20	0.033	(0.417)	0.030	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.9

Flood volume = Effective rainfall 0.24(In)
times area 67.2(Ac.)/[(In)/(Ft.)) = 1.4(Ac.Ft)
Total soil loss = 1.14(In)
Total soil loss = 6.376(Ac.Ft)
Total rainfall = 1.38(In)
Flood volume = 58821.1 Cubic Feet
Total soil loss = 277732.8 Cubic Feet

Peak flow rate of this hydrograph = 22.153(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0003	0.05	Q				
0+10	0.0020	0.24	Q				
0+15	0.0050	0.43	Q				
0+20	0.0085	0.52	Q				
0+25	0.0124	0.57	Q				
0+30	0.0166	0.60	Q				
0+35	0.0211	0.66	Q				
0+40	0.0260	0.71	Q				

0+45	0.0311	0.73	Q						
0+50	0.0362	0.75	QV						
0+55	0.0414	0.76	Q						
1+ 0	0.0468	0.78	Q						
1+ 5	0.0524	0.82	Q						
1+10	0.0583	0.86	Q						
1+15	0.0643	0.87	Q						
1+20	0.0704	0.88	QV						
1+25	0.0765	0.88	QV						
1+30	0.0826	0.89	QV						
1+35	0.0887	0.89	QV						
1+40	0.0949	0.89	QV						
1+45	0.1010	0.89	QV						
1+50	0.1072	0.90	Q V						
1+55	0.1134	0.90	Q V						
2+ 0	0.1196	0.91	Q V						
2+ 5	0.1261	0.94	Q V						
2+10	0.1325	0.94	Q V						
2+15	0.1391	0.96	Q V						
2+20	0.1459	0.98	Q V						
2+25	0.1527	0.99	Q V						
2+30	0.1595	1.00	Q V						
2+35	0.1664	1.00	Q V						
2+40	0.1733	1.00	Q V						
2+45	0.1803	1.01	Q V						
2+50	0.1876	1.05	Q V						
2+55	0.1950	1.08	Q V						
3+ 0	0.2026	1.10	Q V						
3+ 5	0.2102	1.10	Q V						
3+10	0.2179	1.12	Q V						
3+15	0.2259	1.16	Q V						
3+20	0.2341	1.19	Q V						
3+25	0.2424	1.21	Q V						
3+30	0.2512	1.27	Q V						
3+35	0.2605	1.35	Q V						
3+40	0.2704	1.44	Q V						
3+45	0.2807	1.50	Q V						
3+50	0.2914	1.56	Q V						
3+55	0.3026	1.62	Q V						
4+ 0	0.3141	1.68	Q V						
4+ 5	0.3260	1.73	Q V						
4+10	0.3384	1.80	Q V						
4+15	0.3515	1.89	Q V						
4+20	0.3652	1.99	Q V						
4+25	0.3796	2.09	Q V						
4+30	0.3947	2.19	Q V						
4+35	0.4102	2.26	Q V						
4+40	0.4263	2.34	Q V						
4+45	0.4431	2.44	Q V						
4+50	0.4606	2.53	Q V						
4+55	0.4785	2.60	Q V						
5+ 0	0.4969	2.68	Q V						
5+ 5	0.5180	3.06	Q V						
5+10	0.5509	4.78	Q V						

5+15	0.6055	7.93			Q	V				
5+20	0.6828	11.23				Q	V			
5+25	0.7828	14.53					Q	V		
5+30	0.9136	18.98						Q	V	
5+35	1.0661	22.15							Q	V
5+40	1.1698	15.05					Q			V
5+45	1.2234	7.78			Q					V
5+50	1.2588	5.15								V
5+55	1.2845	3.72								V
6+ 0	1.3034	2.76								V
6+ 5	1.3175	2.04								V
6+10	1.3281	1.54								V
6+15	1.3359	1.12								V
6+20	1.3415	0.81								V
6+25	1.3454	0.57								V
6+30	1.3481	0.40								V
6+35	1.3498	0.24								V
6+40	1.3501	0.04								V
6+45	1.3502	0.02								V
6+50	1.3503	0.01								V
6+55	1.3503	0.01								V
7+ 0	1.3503	0.00								V
7+ 5	1.3503	0.00								V

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 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]
67.20	2.48	166.66

100 YEAR Area rainfall data:

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

67.20

6.90

463.68

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 2.480 (In)
 Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 2.480 (In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 2.480 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417
 Minimum soil loss rate ((In/Hr)) = 0.209
 (for 24 hour storm duration)
 Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum =		100.000	Sum= 67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.020	(0.739)	0.018	0.002
2	0.17	0.07	0.020	(0.736)	0.018	0.002
3	0.25	0.07	0.020	(0.734)	0.018	0.002
4	0.33	0.10	0.030	(0.731)	0.027	0.003
5	0.42	0.10	0.030	(0.728)	0.027	0.003
6	0.50	0.10	0.030	(0.725)	0.027	0.003
7	0.58	0.10	0.030	(0.722)	0.027	0.003
8	0.67	0.10	0.030	(0.719)	0.027	0.003
9	0.75	0.10	0.030	(0.717)	0.027	0.003
10	0.83	0.13	0.040	(0.714)	0.036	0.004
11	0.92	0.13	0.040	(0.711)	0.036	0.004
12	1.00	0.13	0.040	(0.708)	0.036	0.004
13	1.08	0.10	0.030	(0.705)	0.027	0.003
14	1.17	0.10	0.030	(0.703)	0.027	0.003
15	1.25	0.10	0.030	(0.700)	0.027	0.003
16	1.33	0.10	0.030	(0.697)	0.027	0.003
17	1.42	0.10	0.030	(0.694)	0.027	0.003
18	1.50	0.10	0.030	(0.691)	0.027	0.003
19	1.58	0.10	0.030	(0.689)	0.027	0.003
20	1.67	0.10	0.030	(0.686)	0.027	0.003
21	1.75	0.10	0.030	(0.683)	0.027	0.003
22	1.83	0.13	0.040	(0.680)	0.036	0.004
23	1.92	0.13	0.040	(0.678)	0.036	0.004
24	2.00	0.13	0.040	(0.675)	0.036	0.004
25	2.08	0.13	0.040	(0.672)	0.036	0.004
26	2.17	0.13	0.040	(0.669)	0.036	0.004
27	2.25	0.13	0.040	(0.667)	0.036	0.004
28	2.33	0.13	0.040	(0.664)	0.036	0.004
29	2.42	0.13	0.040	(0.661)	0.036	0.004
30	2.50	0.13	0.040	(0.659)	0.036	0.004
31	2.58	0.17	0.050	(0.656)	0.045	0.005
32	2.67	0.17	0.050	(0.653)	0.045	0.005
33	2.75	0.17	0.050	(0.651)	0.045	0.005
34	2.83	0.17	0.050	(0.648)	0.045	0.005
35	2.92	0.17	0.050	(0.645)	0.045	0.005
36	3.00	0.17	0.050	(0.643)	0.045	0.005
37	3.08	0.17	0.050	(0.640)	0.045	0.005
38	3.17	0.17	0.050	(0.637)	0.045	0.005
39	3.25	0.17	0.050	(0.635)	0.045	0.005
40	3.33	0.17	0.050	(0.632)	0.045	0.005
41	3.42	0.17	0.050	(0.629)	0.045	0.005
42	3.50	0.17	0.050	(0.627)	0.045	0.005
43	3.58	0.17	0.050	(0.624)	0.045	0.005
44	3.67	0.17	0.050	(0.621)	0.045	0.005
45	3.75	0.17	0.050	(0.619)	0.045	0.005
46	3.83	0.20	0.060	(0.616)	0.054	0.006
47	3.92	0.20	0.060	(0.614)	0.054	0.006

48	4.00	0.20	0.060	(0.611)	0.054	0.006
49	4.08	0.20	0.060	(0.608)	0.054	0.006
50	4.17	0.20	0.060	(0.606)	0.054	0.006
51	4.25	0.20	0.060	(0.603)	0.054	0.006
52	4.33	0.23	0.069	(0.601)	0.062	0.007
53	4.42	0.23	0.069	(0.598)	0.062	0.007
54	4.50	0.23	0.069	(0.596)	0.062	0.007
55	4.58	0.23	0.069	(0.593)	0.062	0.007
56	4.67	0.23	0.069	(0.590)	0.062	0.007
57	4.75	0.23	0.069	(0.588)	0.062	0.007
58	4.83	0.27	0.079	(0.585)	0.071	0.008
59	4.92	0.27	0.079	(0.583)	0.071	0.008
60	5.00	0.27	0.079	(0.580)	0.071	0.008
61	5.08	0.20	0.060	(0.578)	0.054	0.006
62	5.17	0.20	0.060	(0.575)	0.054	0.006
63	5.25	0.20	0.060	(0.573)	0.054	0.006
64	5.33	0.23	0.069	(0.570)	0.062	0.007
65	5.42	0.23	0.069	(0.568)	0.062	0.007
66	5.50	0.23	0.069	(0.565)	0.062	0.007
67	5.58	0.27	0.079	(0.563)	0.071	0.008
68	5.67	0.27	0.079	(0.560)	0.071	0.008
69	5.75	0.27	0.079	(0.558)	0.071	0.008
70	5.83	0.27	0.079	(0.555)	0.071	0.008
71	5.92	0.27	0.079	(0.553)	0.071	0.008
72	6.00	0.27	0.079	(0.550)	0.071	0.008
73	6.08	0.30	0.089	(0.548)	0.080	0.009
74	6.17	0.30	0.089	(0.546)	0.080	0.009
75	6.25	0.30	0.089	(0.543)	0.080	0.009
76	6.33	0.30	0.089	(0.541)	0.080	0.009
77	6.42	0.30	0.089	(0.538)	0.080	0.009
78	6.50	0.30	0.089	(0.536)	0.080	0.009
79	6.58	0.33	0.099	(0.533)	0.089	0.010
80	6.67	0.33	0.099	(0.531)	0.089	0.010
81	6.75	0.33	0.099	(0.529)	0.089	0.010
82	6.83	0.33	0.099	(0.526)	0.089	0.010
83	6.92	0.33	0.099	(0.524)	0.089	0.010
84	7.00	0.33	0.099	(0.522)	0.089	0.010
85	7.08	0.33	0.099	(0.519)	0.089	0.010
86	7.17	0.33	0.099	(0.517)	0.089	0.010
87	7.25	0.33	0.099	(0.514)	0.089	0.010
88	7.33	0.37	0.109	(0.512)	0.098	0.011
89	7.42	0.37	0.109	(0.510)	0.098	0.011
90	7.50	0.37	0.109	(0.507)	0.098	0.011
91	7.58	0.40	0.119	(0.505)	0.107	0.012
92	7.67	0.40	0.119	(0.503)	0.107	0.012
93	7.75	0.40	0.119	(0.500)	0.107	0.012
94	7.83	0.43	0.129	(0.498)	0.116	0.013
95	7.92	0.43	0.129	(0.496)	0.116	0.013
96	8.00	0.43	0.129	(0.494)	0.116	0.013
97	8.08	0.50	0.149	(0.491)	0.134	0.015
98	8.17	0.50	0.149	(0.489)	0.134	0.015
99	8.25	0.50	0.149	(0.487)	0.134	0.015
100	8.33	0.50	0.149	(0.484)	0.134	0.015
101	8.42	0.50	0.149	(0.482)	0.134	0.015

102	8.50	0.50	0.149	(0.480)	0.134	0.015
103	8.58	0.53	0.159	(0.478)	0.143	0.016
104	8.67	0.53	0.159	(0.475)	0.143	0.016
105	8.75	0.53	0.159	(0.473)	0.143	0.016
106	8.83	0.57	0.169	(0.471)	0.152	0.017
107	8.92	0.57	0.169	(0.469)	0.152	0.017
108	9.00	0.57	0.169	(0.466)	0.152	0.017
109	9.08	0.63	0.188	(0.464)	0.170	0.019
110	9.17	0.63	0.188	(0.462)	0.170	0.019
111	9.25	0.63	0.188	(0.460)	0.170	0.019
112	9.33	0.67	0.198	(0.458)	0.179	0.020
113	9.42	0.67	0.198	(0.455)	0.179	0.020
114	9.50	0.67	0.198	(0.453)	0.179	0.020
115	9.58	0.70	0.208	(0.451)	0.187	0.021
116	9.67	0.70	0.208	(0.449)	0.187	0.021
117	9.75	0.70	0.208	(0.447)	0.187	0.021
118	9.83	0.73	0.218	(0.445)	0.196	0.022
119	9.92	0.73	0.218	(0.442)	0.196	0.022
120	10.00	0.73	0.218	(0.440)	0.196	0.022
121	10.08	0.50	0.149	(0.438)	0.134	0.015
122	10.17	0.50	0.149	(0.436)	0.134	0.015
123	10.25	0.50	0.149	(0.434)	0.134	0.015
124	10.33	0.50	0.149	(0.432)	0.134	0.015
125	10.42	0.50	0.149	(0.430)	0.134	0.015
126	10.50	0.50	0.149	(0.428)	0.134	0.015
127	10.58	0.67	0.198	(0.426)	0.179	0.020
128	10.67	0.67	0.198	(0.424)	0.179	0.020
129	10.75	0.67	0.198	(0.421)	0.179	0.020
130	10.83	0.67	0.198	(0.419)	0.179	0.020
131	10.92	0.67	0.198	(0.417)	0.179	0.020
132	11.00	0.67	0.198	(0.415)	0.179	0.020
133	11.08	0.63	0.188	(0.413)	0.170	0.019
134	11.17	0.63	0.188	(0.411)	0.170	0.019
135	11.25	0.63	0.188	(0.409)	0.170	0.019
136	11.33	0.63	0.188	(0.407)	0.170	0.019
137	11.42	0.63	0.188	(0.405)	0.170	0.019
138	11.50	0.63	0.188	(0.403)	0.170	0.019
139	11.58	0.57	0.169	(0.401)	0.152	0.017
140	11.67	0.57	0.169	(0.399)	0.152	0.017
141	11.75	0.57	0.169	(0.397)	0.152	0.017
142	11.83	0.60	0.179	(0.395)	0.161	0.018
143	11.92	0.60	0.179	(0.393)	0.161	0.018
144	12.00	0.60	0.179	(0.391)	0.161	0.018
145	12.08	0.83	0.248	(0.389)	0.223	0.025
146	12.17	0.83	0.248	(0.387)	0.223	0.025
147	12.25	0.83	0.248	(0.385)	0.223	0.025
148	12.33	0.87	0.258	(0.383)	0.232	0.026
149	12.42	0.87	0.258	(0.382)	0.232	0.026
150	12.50	0.87	0.258	(0.380)	0.232	0.026
151	12.58	0.93	0.278	(0.378)	0.250	0.028
152	12.67	0.93	0.278	(0.376)	0.250	0.028
153	12.75	0.93	0.278	(0.374)	0.250	0.028
154	12.83	0.97	0.288	(0.372)	0.259	0.029
155	12.92	0.97	0.288	(0.370)	0.259	0.029

156	13.00	0.97	0.288	(0.368)	0.259	0.029
157	13.08	1.13	0.337	(0.366)	0.304	0.034
158	13.17	1.13	0.337	(0.365)	0.304	0.034
159	13.25	1.13	0.337	(0.363)	0.304	0.034
160	13.33	1.13	0.337	(0.361)	0.304	0.034
161	13.42	1.13	0.337	(0.359)	0.304	0.034
162	13.50	1.13	0.337	(0.357)	0.304	0.034
163	13.58	0.77	0.228	(0.355)	0.205	0.023
164	13.67	0.77	0.228	(0.354)	0.205	0.023
165	13.75	0.77	0.228	(0.352)	0.205	0.023
166	13.83	0.77	0.228	(0.350)	0.205	0.023
167	13.92	0.77	0.228	(0.348)	0.205	0.023
168	14.00	0.77	0.228	(0.346)	0.205	0.023
169	14.08	0.90	0.268	(0.345)	0.241	0.027
170	14.17	0.90	0.268	(0.343)	0.241	0.027
171	14.25	0.90	0.268	(0.341)	0.241	0.027
172	14.33	0.87	0.258	(0.339)	0.232	0.026
173	14.42	0.87	0.258	(0.338)	0.232	0.026
174	14.50	0.87	0.258	(0.336)	0.232	0.026
175	14.58	0.87	0.258	(0.334)	0.232	0.026
176	14.67	0.87	0.258	(0.332)	0.232	0.026
177	14.75	0.87	0.258	(0.331)	0.232	0.026
178	14.83	0.83	0.248	(0.329)	0.223	0.025
179	14.92	0.83	0.248	(0.327)	0.223	0.025
180	15.00	0.83	0.248	(0.326)	0.223	0.025
181	15.08	0.80	0.238	(0.324)	0.214	0.024
182	15.17	0.80	0.238	(0.322)	0.214	0.024
183	15.25	0.80	0.238	(0.321)	0.214	0.024
184	15.33	0.77	0.228	(0.319)	0.205	0.023
185	15.42	0.77	0.228	(0.317)	0.205	0.023
186	15.50	0.77	0.228	(0.316)	0.205	0.023
187	15.58	0.63	0.188	(0.314)	0.170	0.019
188	15.67	0.63	0.188	(0.313)	0.170	0.019
189	15.75	0.63	0.188	(0.311)	0.170	0.019
190	15.83	0.63	0.188	(0.309)	0.170	0.019
191	15.92	0.63	0.188	(0.308)	0.170	0.019
192	16.00	0.63	0.188	(0.306)	0.170	0.019
193	16.08	0.13	0.040	(0.305)	0.036	0.004
194	16.17	0.13	0.040	(0.303)	0.036	0.004
195	16.25	0.13	0.040	(0.302)	0.036	0.004
196	16.33	0.13	0.040	(0.300)	0.036	0.004
197	16.42	0.13	0.040	(0.298)	0.036	0.004
198	16.50	0.13	0.040	(0.297)	0.036	0.004
199	16.58	0.10	0.030	(0.295)	0.027	0.003
200	16.67	0.10	0.030	(0.294)	0.027	0.003
201	16.75	0.10	0.030	(0.292)	0.027	0.003
202	16.83	0.10	0.030	(0.291)	0.027	0.003
203	16.92	0.10	0.030	(0.290)	0.027	0.003
204	17.00	0.10	0.030	(0.288)	0.027	0.003
205	17.08	0.17	0.050	(0.287)	0.045	0.005
206	17.17	0.17	0.050	(0.285)	0.045	0.005
207	17.25	0.17	0.050	(0.284)	0.045	0.005
208	17.33	0.17	0.050	(0.282)	0.045	0.005
209	17.42	0.17	0.050	(0.281)	0.045	0.005

210	17.50	0.17	0.050	(0.279)	0.045	0.005
211	17.58	0.17	0.050	(0.278)	0.045	0.005
212	17.67	0.17	0.050	(0.277)	0.045	0.005
213	17.75	0.17	0.050	(0.275)	0.045	0.005
214	17.83	0.13	0.040	(0.274)	0.036	0.004
215	17.92	0.13	0.040	(0.273)	0.036	0.004
216	18.00	0.13	0.040	(0.271)	0.036	0.004
217	18.08	0.13	0.040	(0.270)	0.036	0.004
218	18.17	0.13	0.040	(0.269)	0.036	0.004
219	18.25	0.13	0.040	(0.267)	0.036	0.004
220	18.33	0.13	0.040	(0.266)	0.036	0.004
221	18.42	0.13	0.040	(0.265)	0.036	0.004
222	18.50	0.13	0.040	(0.263)	0.036	0.004
223	18.58	0.10	0.030	(0.262)	0.027	0.003
224	18.67	0.10	0.030	(0.261)	0.027	0.003
225	18.75	0.10	0.030	(0.260)	0.027	0.003
226	18.83	0.07	0.020	(0.258)	0.018	0.002
227	18.92	0.07	0.020	(0.257)	0.018	0.002
228	19.00	0.07	0.020	(0.256)	0.018	0.002
229	19.08	0.10	0.030	(0.255)	0.027	0.003
230	19.17	0.10	0.030	(0.253)	0.027	0.003
231	19.25	0.10	0.030	(0.252)	0.027	0.003
232	19.33	0.13	0.040	(0.251)	0.036	0.004
233	19.42	0.13	0.040	(0.250)	0.036	0.004
234	19.50	0.13	0.040	(0.249)	0.036	0.004
235	19.58	0.10	0.030	(0.248)	0.027	0.003
236	19.67	0.10	0.030	(0.247)	0.027	0.003
237	19.75	0.10	0.030	(0.245)	0.027	0.003
238	19.83	0.07	0.020	(0.244)	0.018	0.002
239	19.92	0.07	0.020	(0.243)	0.018	0.002
240	20.00	0.07	0.020	(0.242)	0.018	0.002
241	20.08	0.10	0.030	(0.241)	0.027	0.003
242	20.17	0.10	0.030	(0.240)	0.027	0.003
243	20.25	0.10	0.030	(0.239)	0.027	0.003
244	20.33	0.10	0.030	(0.238)	0.027	0.003
245	20.42	0.10	0.030	(0.237)	0.027	0.003
246	20.50	0.10	0.030	(0.236)	0.027	0.003
247	20.58	0.10	0.030	(0.235)	0.027	0.003
248	20.67	0.10	0.030	(0.234)	0.027	0.003
249	20.75	0.10	0.030	(0.233)	0.027	0.003
250	20.83	0.07	0.020	(0.232)	0.018	0.002
251	20.92	0.07	0.020	(0.231)	0.018	0.002
252	21.00	0.07	0.020	(0.230)	0.018	0.002
253	21.08	0.10	0.030	(0.229)	0.027	0.003
254	21.17	0.10	0.030	(0.228)	0.027	0.003
255	21.25	0.10	0.030	(0.227)	0.027	0.003
256	21.33	0.07	0.020	(0.227)	0.018	0.002
257	21.42	0.07	0.020	(0.226)	0.018	0.002
258	21.50	0.07	0.020	(0.225)	0.018	0.002
259	21.58	0.10	0.030	(0.224)	0.027	0.003
260	21.67	0.10	0.030	(0.223)	0.027	0.003
261	21.75	0.10	0.030	(0.222)	0.027	0.003
262	21.83	0.07	0.020	(0.222)	0.018	0.002
263	21.92	0.07	0.020	(0.221)	0.018	0.002

264	22.00	0.07	0.020	(0.220)	0.018	0.002
265	22.08	0.10	0.030	(0.219)	0.027	0.003
266	22.17	0.10	0.030	(0.219)	0.027	0.003
267	22.25	0.10	0.030	(0.218)	0.027	0.003
268	22.33	0.07	0.020	(0.217)	0.018	0.002
269	22.42	0.07	0.020	(0.217)	0.018	0.002
270	22.50	0.07	0.020	(0.216)	0.018	0.002
271	22.58	0.07	0.020	(0.215)	0.018	0.002
272	22.67	0.07	0.020	(0.215)	0.018	0.002
273	22.75	0.07	0.020	(0.214)	0.018	0.002
274	22.83	0.07	0.020	(0.214)	0.018	0.002
275	22.92	0.07	0.020	(0.213)	0.018	0.002
276	23.00	0.07	0.020	(0.213)	0.018	0.002
277	23.08	0.07	0.020	(0.212)	0.018	0.002
278	23.17	0.07	0.020	(0.212)	0.018	0.002
279	23.25	0.07	0.020	(0.211)	0.018	0.002
280	23.33	0.07	0.020	(0.211)	0.018	0.002
281	23.42	0.07	0.020	(0.210)	0.018	0.002
282	23.50	0.07	0.020	(0.210)	0.018	0.002
283	23.58	0.07	0.020	(0.210)	0.018	0.002
284	23.67	0.07	0.020	(0.209)	0.018	0.002
285	23.75	0.07	0.020	(0.209)	0.018	0.002
286	23.83	0.07	0.020	(0.209)	0.018	0.002
287	23.92	0.07	0.020	(0.209)	0.018	0.002
288	24.00	0.07	0.020	(0.209)	0.018	0.002

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.0

Flood volume = Effective rainfall 0.25(In)

times area 67.2(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)

Total soil loss = 2.23(In)

Total soil loss = 12.498(Ac.Ft)

Total rainfall = 2.48(In)

Flood volume = 60488.2 Cubic Feet

Total soil loss = 544393.7 Cubic Feet

Peak flow rate of this hydrograph = 2.244(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q				
0+10	0.0005	0.06	Q				
0+15	0.0011	0.09	Q				
0+20	0.0019	0.11	Q				
0+25	0.0028	0.14	Q				
0+30	0.0040	0.17	Q				
0+35	0.0052	0.18	Q				
0+40	0.0065	0.18	Q				

0+45	0.0078	0.19	Q
0+50	0.0091	0.20	Q
0+55	0.0107	0.22	Q
1+ 0	0.0123	0.24	Q
1+ 5	0.0140	0.25	Q
1+10	0.0156	0.23	Q
1+15	0.0171	0.21	Q
1+20	0.0185	0.21	Q
1+25	0.0200	0.21	Q
1+30	0.0214	0.21	Q
1+35	0.0228	0.21	Q
1+40	0.0242	0.20	Q
1+45	0.0256	0.20	Q
1+50	0.0271	0.21	Q
1+55	0.0286	0.23	Q
2+ 0	0.0304	0.25	Q
2+ 5	0.0321	0.25	VQ
2+10	0.0339	0.26	VQ
2+15	0.0357	0.26	Q
2+20	0.0375	0.26	Q
2+25	0.0393	0.26	Q
2+30	0.0412	0.27	Q
2+35	0.0430	0.27	Q
2+40	0.0451	0.30	Q
2+45	0.0472	0.31	Q
2+50	0.0495	0.32	Q
2+55	0.0517	0.33	Q
3+ 0	0.0540	0.33	Q
3+ 5	0.0562	0.33	Q
3+10	0.0585	0.33	Q
3+15	0.0608	0.33	Q
3+20	0.0631	0.33	Q
3+25	0.0654	0.33	Q
3+30	0.0677	0.34	Q
3+35	0.0701	0.34	QV
3+40	0.0724	0.34	QV
3+45	0.0747	0.34	QV
3+50	0.0770	0.34	QV
3+55	0.0795	0.36	QV
4+ 0	0.0822	0.38	QV
4+ 5	0.0848	0.39	QV
4+10	0.0876	0.39	QV
4+15	0.0903	0.40	QV
4+20	0.0931	0.40	QV
4+25	0.0960	0.43	QV
4+30	0.0991	0.45	QV
4+35	0.1022	0.45	QV
4+40	0.1054	0.46	Q V
4+45	0.1086	0.46	Q V
4+50	0.1118	0.47	Q V
4+55	0.1152	0.49	Q V
5+ 0	0.1187	0.51	QV
5+ 5	0.1223	0.51	QV
5+10	0.1255	0.47	Q V

5+15	0.1285	0.44	Q V			
5+20	0.1315	0.43	Q V			
5+25	0.1346	0.45	Q V			
5+30	0.1377	0.46	Q V			
5+35	0.1410	0.47	Q V			
5+40	0.1444	0.49	Q V			
5+45	0.1479	0.51	Q V			
5+50	0.1515	0.52	Q V			
5+55	0.1551	0.53	Q V			
6+ 0	0.1588	0.53	Q V			
6+ 5	0.1625	0.54	Q V			
6+10	0.1663	0.56	Q V			
6+15	0.1703	0.58	Q V			
6+20	0.1744	0.59	Q V			
6+25	0.1785	0.59	Q V			
6+30	0.1826	0.60	Q V			
6+35	0.1867	0.60	Q V			
6+40	0.1911	0.63	Q V			
6+45	0.1955	0.65	Q V			
6+50	0.2001	0.66	Q V			
6+55	0.2046	0.66	Q V			
7+ 0	0.2092	0.66	Q V			
7+ 5	0.2138	0.67	Q V			
7+10	0.2184	0.67	Q V			
7+15	0.2230	0.67	Q V			
7+20	0.2276	0.68	Q V			
7+25	0.2325	0.70	Q V			
7+30	0.2374	0.72	Q V			
7+35	0.2424	0.73	Q V			
7+40	0.2476	0.76	Q V			
7+45	0.2530	0.78	Q V			
7+50	0.2585	0.79	Q V			
7+55	0.2641	0.82	Q V			
8+ 0	0.2699	0.84	Q V			
8+ 5	0.2758	0.86	Q V			
8+10	0.2821	0.91	Q V			
8+15	0.2887	0.95	Q V			
8+20	0.2954	0.97	Q V			
8+25	0.3022	0.98	Q V			
8+30	0.3090	0.99	Q V			
8+35	0.3159	1.00	Q V			
8+40	0.3230	1.03	Q V			
8+45	0.3302	1.05	Q V			
8+50	0.3375	1.06	Q V			
8+55	0.3450	1.09	Q V			
9+ 0	0.3527	1.11	Q V			
9+ 5	0.3605	1.13	Q V			
9+10	0.3686	1.18	Q V			
9+15	0.3771	1.22	Q V			
9+20	0.3857	1.25	Q V			
9+25	0.3945	1.28	Q V			
9+30	0.4035	1.30	Q V			
9+35	0.4126	1.32	Q V			
9+40	0.4219	1.35	Q V			

9+45	0.4314	1.38	Q	V		
9+50	0.4410	1.39	Q	V		
9+55	0.4508	1.42	Q	V		
10+ 0	0.4607	1.45	Q	V		
10+ 5	0.4705	1.42	Q	V		
10+10	0.4792	1.27	Q	V		
10+15	0.4871	1.15	Q	V		
10+20	0.4947	1.10	Q	V		
10+25	0.5021	1.07	Q	V		
10+30	0.5093	1.06	Q	V		
10+35	0.5167	1.07	Q	V		
10+40	0.5248	1.17	Q	V		
10+45	0.5335	1.26	Q	V		
10+50	0.5423	1.29	Q	V		
10+55	0.5513	1.30	Q	V		
11+ 0	0.5603	1.31	Q	V		
11+ 5	0.5694	1.31	Q	V		
11+10	0.5783	1.30	Q	V		
11+15	0.5872	1.28	Q	V		
11+20	0.5960	1.28	Q	V		
11+25	0.6048	1.28	Q	V		
11+30	0.6136	1.28	Q	V		
11+35	0.6224	1.27	Q	V		
11+40	0.6308	1.22	Q	V		
11+45	0.6390	1.19	Q	V		
11+50	0.6471	1.18	Q	V		
11+55	0.6553	1.19	Q	V		
12+ 0	0.6636	1.20	Q	V		
12+ 5	0.6722	1.24	Q	V		
12+10	0.6818	1.40	Q	V		
12+15	0.6924	1.53	Q	V		
12+20	0.7033	1.58	Q	V		
12+25	0.7146	1.64	Q	V		
12+30	0.7261	1.67	Q	V		
12+35	0.7378	1.71	Q	V		
12+40	0.7500	1.76	Q	V		
12+45	0.7625	1.81	Q	V		
12+50	0.7751	1.84	Q	V		
12+55	0.7881	1.88	Q	V		
13+ 0	0.8012	1.90	Q	V		
13+ 5	0.8146	1.95	Q	V		
13+10	0.8288	2.07	Q	V		
13+15	0.8438	2.17	Q	V		
13+20	0.8589	2.20	Q	V		
13+25	0.8743	2.23	Q	V		
13+30	0.8897	2.24	Q	V		
13+35	0.9049	2.20	Q	V		
13+40	0.9183	1.96	Q	V		
13+45	0.9305	1.76	Q	V		
13+50	0.9421	1.69	Q	V		
13+55	0.9535	1.65	Q	V		
14+ 0	0.9647	1.62	Q	V		
14+ 5	0.9759	1.62	Q	V		
14+10	0.9876	1.70	Q	V		

14+15	0.9997	1.76					V
14+20	1.0119	1.77					V
14+25	1.0240	1.76					V
14+30	1.0361	1.75					V
14+35	1.0481	1.74					V
14+40	1.0601	1.74					V
14+45	1.0721	1.74					V
14+50	1.0841	1.74					V
14+55	1.0959	1.72					V
15+ 0	1.1076	1.70					V
15+ 5	1.1193	1.69					V
15+10	1.1307	1.66					V
15+15	1.1420	1.64					V
15+20	1.1532	1.63					V
15+25	1.1643	1.60					V
15+30	1.1751	1.58					V
15+35	1.1858	1.55					V
15+40	1.1957	1.45					V
15+45	1.2052	1.37					V
15+50	1.2144	1.34					V
15+55	1.2235	1.32					V
16+ 0	1.2326	1.31					V
16+ 5	1.2410	1.22					V
16+10	1.2470	0.87					V
16+15	1.2511	0.60					V
16+20	1.2545	0.49					V
16+25	1.2574	0.43					V
16+30	1.2600	0.38					V
16+35	1.2624	0.34					V
16+40	1.2645	0.30					V
16+45	1.2663	0.26					V
16+50	1.2680	0.24					V
16+55	1.2696	0.23					V
17+ 0	1.2711	0.22					V
17+ 5	1.2726	0.22					V
17+10	1.2744	0.26					V
17+15	1.2765	0.30					V
17+20	1.2786	0.31					V
17+25	1.2808	0.32					V
17+30	1.2830	0.32					V
17+35	1.2852	0.33					V
17+40	1.2875	0.33					V
17+45	1.2898	0.33					V
17+50	1.2920	0.33					V
17+55	1.2941	0.31					V
18+ 0	1.2961	0.29					V
18+ 5	1.2981	0.28					V
18+10	1.3000	0.28					V
18+15	1.3019	0.28					V
18+20	1.3038	0.27					V
18+25	1.3057	0.27					V
18+30	1.3075	0.27					V
18+35	1.3094	0.27					V
18+40	1.3110	0.24					V

18+45	1.3126	0.22	Q				V
18+50	1.3140	0.21	Q				V
18+55	1.3153	0.18	Q				V
19+ 0	1.3164	0.16	Q				V
19+ 5	1.3175	0.16	Q				V
19+10	1.3187	0.18	Q				V
19+15	1.3200	0.19	Q				V
19+20	1.3214	0.20	Q				V
19+25	1.3230	0.22	Q				V
19+30	1.3246	0.24	Q				V
19+35	1.3263	0.25	Q				V
19+40	1.3279	0.23	Q				V
19+45	1.3294	0.21	Q				V
19+50	1.3308	0.20	Q				V
19+55	1.3320	0.18	Q				V
20+ 0	1.3331	0.16	Q				V
20+ 5	1.3342	0.16	Q				V
20+10	1.3354	0.18	Q				V
20+15	1.3367	0.19	Q				V
20+20	1.3380	0.19	Q				V
20+25	1.3394	0.20	Q				V
20+30	1.3407	0.20	Q				V
20+35	1.3421	0.20	Q				V
20+40	1.3435	0.20	Q				V
20+45	1.3449	0.20	Q				V
20+50	1.3462	0.19	Q				V
20+55	1.3474	0.17	Q				V
21+ 0	1.3485	0.15	Q				V
21+ 5	1.3495	0.15	Q				V
21+10	1.3507	0.17	Q				V
21+15	1.3520	0.19	Q				V
21+20	1.3533	0.19	Q				V
21+25	1.3544	0.17	Q				V
21+30	1.3555	0.15	Q				V
21+35	1.3565	0.15	Q				V
21+40	1.3577	0.17	Q				V
21+45	1.3590	0.19	Q				V
21+50	1.3602	0.19	Q				V
21+55	1.3614	0.17	Q				V
22+ 0	1.3624	0.15	Q				V
22+ 5	1.3635	0.15	Q				V
22+10	1.3646	0.17	Q				V
22+15	1.3659	0.19	Q				V
22+20	1.3672	0.19	Q				V
22+25	1.3683	0.17	Q				V
22+30	1.3694	0.15	Q				V
22+35	1.3704	0.14	Q				V
22+40	1.3713	0.14	Q				V
22+45	1.3723	0.14	Q				V
22+50	1.3733	0.14	Q				V
22+55	1.3742	0.14	Q				V
23+ 0	1.3751	0.14	Q				V
23+ 5	1.3761	0.14	Q				V
23+10	1.3770	0.14	Q				V

23+15	1.3779	0.14	Q				V
23+20	1.3789	0.13	Q				V
23+25	1.3798	0.13	Q				V
23+30	1.3807	0.13	Q				V
23+35	1.3816	0.13	Q				V
23+40	1.3826	0.13	Q				V
23+45	1.3835	0.13	Q				V
23+50	1.3844	0.13	Q				V
23+55	1.3853	0.13	Q				V
24+ 0	1.3863	0.13	Q				V
24+ 5	1.3871	0.12	Q				V
24+10	1.3877	0.08	Q				V
24+15	1.3880	0.04	Q				V
24+20	1.3882	0.03	Q				V
24+25	1.3883	0.02	Q				V
24+30	1.3884	0.01	Q				V
24+35	1.3885	0.01	Q				V
24+40	1.3885	0.01	Q				V
24+45	1.3886	0.01	Q				V
24+50	1.3886	0.00	Q				V
24+55	1.3886	0.00	Q				V
25+ 0	1.3886	0.00	Q				V
25+ 5	1.3886	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
67.20	0.58	38.98

100 YEAR Area rainfall data:

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

67.20

1.45

97.44

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)

Areal adjustment factor = 99.94 %

Adjusted average point rain = 0.783(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %

36.500 79.00 0.000

30.700 84.00 0.000

Total Area Entered = 67.20(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417

Minimum soil loss rate ((In/Hr)) = 0.209

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm =0.4800

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum =		100.000	Sum= 67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.414	(0.417)	0.372	0.041
2	0.17	4.50	0.423	(0.417)	0.381	0.042
3	0.25	5.40	0.508	0.417	(0.457)	0.091
4	0.33	5.40	0.508	0.417	(0.457)	0.091
5	0.42	5.70	0.536	0.417	(0.482)	0.119
6	0.50	6.40	0.602	0.417	(0.541)	0.185
7	0.58	7.90	0.743	0.417	(0.668)	0.326
8	0.67	9.10	0.855	0.417	(0.770)	0.438
9	0.75	12.80	1.203	0.417	(1.083)	0.786
10	0.83	25.60	2.406	0.417	(2.166)	1.989
11	0.92	7.90	0.743	0.417	(0.668)	0.326
12	1.00	4.90	0.461	(0.417)	0.415	0.046

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.5

Flood volume = Effective rainfall 0.37(In)

times area 67.2(Ac.)/[(In)/(Ft.)] = 2.1(Ac.Ft)

Total soil loss = 0.41(In)

Total soil loss = 2.296(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 91050.4 Cubic Feet

Total soil loss = 100024.1 Cubic Feet

Peak flow rate of this hydrograph = 66.801(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0016	0.23	Q				
0+10	0.0096	1.17	Q				
0+15	0.0249	2.21	VQ				
0+20	0.0498	3.62	V Q				
0+25	0.0830	4.82	VQ				
0+30	0.1263	6.29	VQ				
0+35	0.1907	9.35	V Q				
0+40	0.2924	14.77	V Q				
0+45	0.4476	22.53	V Q	Q			
0+50	0.7267	40.53		V	Q		
0+55	1.1868	66.80			V	VQ	Q
1+ 0	1.5503	52.78				VQ	

1+ 5	1.7341	26.70			Q			V	
1+10	1.8402	15.40			Q			V	
1+15	1.9103	10.18			Q			V	
1+20	1.9602	7.25			Q			V	
1+25	1.9965	5.27			Q			V	
1+30	2.0249	4.12			Q			V	
1+35	2.0463	3.10		Q				V	
1+40	2.0623	2.33		Q				V	
1+45	2.0739	1.68	Q					V	
1+50	2.0828	1.29	Q					V	
1+55	2.0891	0.92	Q					V	
2+ 0	2.0901	0.14	Q					V	
2+ 5	2.0902	0.02	Q					V	

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20(Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20(Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00(Ft.)
Length along longest watercourse measured to centroid = 2257.00(Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00(Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 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]
67.20	0.98	65.86

100 YEAR Area rainfall data:

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

67.20

2.48

166.66

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 0.980 (In)
 Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.331 (In)
 Areal adjustment factor = 99.97 %
 Adjusted average point rain = 1.331 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417

Minimum soil loss rate ((In/Hr)) = 0.209

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum = 100.000		Sum=	67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.208	(0.417)	0.187	0.021
2	0.17	1.30	0.208	(0.417)	0.187	0.021
3	0.25	1.10	0.176	(0.417)	0.158	0.018
4	0.33	1.50	0.240	(0.417)	0.216	0.024
5	0.42	1.50	0.240	(0.417)	0.216	0.024
6	0.50	1.80	0.287	(0.417)	0.259	0.029
7	0.58	1.50	0.240	(0.417)	0.216	0.024
8	0.67	1.80	0.287	(0.417)	0.259	0.029
9	0.75	1.80	0.287	(0.417)	0.259	0.029
10	0.83	1.50	0.240	(0.417)	0.216	0.024
11	0.92	1.60	0.256	(0.417)	0.230	0.026
12	1.00	1.80	0.287	(0.417)	0.259	0.029
13	1.08	2.20	0.351	(0.417)	0.316	0.035
14	1.17	2.20	0.351	(0.417)	0.316	0.035
15	1.25	2.20	0.351	(0.417)	0.316	0.035
16	1.33	2.00	0.319	(0.417)	0.287	0.032
17	1.42	2.60	0.415	(0.417)	0.374	0.042
18	1.50	2.70	0.431	(0.417)	0.388	0.043
19	1.58	2.40	0.383	(0.417)	0.345	0.038
20	1.67	2.70	0.431	(0.417)	0.388	0.043
21	1.75	3.30	0.527	0.417	(0.474)	0.110
22	1.83	3.10	0.495	0.417	(0.446)	0.078
23	1.92	2.90	0.463	(0.417)	0.417	0.046
24	2.00	3.00	0.479	0.417	(0.431)	0.062
25	2.08	3.10	0.495	0.417	(0.446)	0.078
26	2.17	4.20	0.671	0.417	(0.604)	0.254
27	2.25	5.00	0.799	0.417	(0.719)	0.382
28	2.33	3.50	0.559	0.417	(0.503)	0.142
29	2.42	6.80	1.086	0.417	(0.977)	0.669
30	2.50	7.30	1.166	0.417	(1.049)	0.749
31	2.58	8.20	1.310	0.417	(1.179)	0.893
32	2.67	5.90	0.942	0.417	(0.848)	0.525
33	2.75	2.00	0.319	(0.417)	0.287	0.032
34	2.83	1.80	0.287	(0.417)	0.259	0.029
35	2.92	1.80	0.287	(0.417)	0.259	0.029
36	3.00	0.60	0.096	(0.417)	0.086	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.7

Flood volume = Effective rainfall 0.39(In)

times area 67.2(Ac.) / [(In)/(Ft.)] = 2.2(Ac.Ft)

Total soil loss = 0.94(In)

Total soil loss = 5.267(Ac.Ft)

Total rainfall = 1.33(In)

Flood volume = 95254.1 Cubic Feet

Total soil loss = 229411.3 Cubic Feet

Peak flow rate of this hydrograph = 44.018(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0008		0.11	Q				
0+10	0.0048		0.59	Q				
0+15	0.0113		0.95	Q				
0+20	0.0186		1.05	Q				
0+25	0.0270		1.23	Q				
0+30	0.0367		1.41	VQ				
0+35	0.0475		1.56	VQ				
0+40	0.0586		1.61	Q				
0+45	0.0703		1.70	Q				
0+50	0.0826		1.78	Q				
0+55	0.0944		1.72	Q				
1+ 0	0.1063		1.72	Q				
1+ 5	0.1190		1.85	QV				
1+10	0.1332		2.06	QV				
1+15	0.1483		2.20	QV				
1+20	0.1638		2.24	QV				
1+25	0.1793		2.26	Q V				
1+30	0.1962		2.45	Q V				
1+35	0.2143		2.63	QV				
1+40	0.2325		2.64	Q V				
1+45	0.2537		3.08	Q V				
1+50	0.2848		4.52	Q V				
1+55	0.3184		4.87	Q V				
2+ 0	0.3469		4.15	Q V				
2+ 5	0.3751		4.09	Q V				
2+10	0.4133		5.55	Q V				
2+15	0.4861		10.57	Q				
2+20	0.5926		15.47	V Q				
2+25	0.7066		16.55	VQ				
2+30	0.8879		26.32	V		Q		
2+35	1.1486		37.86	V		V		
2+40	1.4518		44.02			V	Q	
2+45	1.7146		38.17			QV	Q	
2+50	1.8732		23.02		Q		V	
2+55	1.9644		13.25		Q		V	
3+ 0	2.0287		9.34	Q			V	
3+ 5	2.0751		6.73	Q			V	
3+10	2.1078		4.76	Q			V	
3+15	2.1321		3.53	Q			V	
3+20	2.1502		2.63	Q			V	
3+25	2.1632		1.89	Q			V	
3+30	2.1732		1.45	Q			V	
3+35	2.1800		0.99	Q			V	
3+40	2.1844		0.63	Q			V	

3+45	2.1861	0.26	Q				V
3+50	2.1864	0.04	Q				V
3+55	2.1866	0.03	Q				V
4+ 0	2.1867	0.01	Q				V
4+ 5	2.1867	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
67.20	1.38	92.74

100 YEAR Area rainfall data:

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

67.20

3.48

233.86

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.872(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.871(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417

Minimum soil loss rate ((In/Hr)) = 0.209

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum = 100.000		Sum=	67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.112	(0.417)	0.101	0.011
2	0.17	0.60	0.135	(0.417)	0.121	0.013
3	0.25	0.60	0.135	(0.417)	0.121	0.013
4	0.33	0.60	0.135	(0.417)	0.121	0.013
5	0.42	0.60	0.135	(0.417)	0.121	0.013
6	0.50	0.70	0.157	(0.417)	0.141	0.016
7	0.58	0.70	0.157	(0.417)	0.141	0.016
8	0.67	0.70	0.157	(0.417)	0.141	0.016
9	0.75	0.70	0.157	(0.417)	0.141	0.016
10	0.83	0.70	0.157	(0.417)	0.141	0.016
11	0.92	0.70	0.157	(0.417)	0.141	0.016
12	1.00	0.80	0.180	(0.417)	0.162	0.018
13	1.08	0.80	0.180	(0.417)	0.162	0.018
14	1.17	0.80	0.180	(0.417)	0.162	0.018
15	1.25	0.80	0.180	(0.417)	0.162	0.018
16	1.33	0.80	0.180	(0.417)	0.162	0.018
17	1.42	0.80	0.180	(0.417)	0.162	0.018
18	1.50	0.80	0.180	(0.417)	0.162	0.018
19	1.58	0.80	0.180	(0.417)	0.162	0.018
20	1.67	0.80	0.180	(0.417)	0.162	0.018
21	1.75	0.80	0.180	(0.417)	0.162	0.018
22	1.83	0.80	0.180	(0.417)	0.162	0.018
23	1.92	0.80	0.180	(0.417)	0.162	0.018
24	2.00	0.90	0.202	(0.417)	0.182	0.020
25	2.08	0.80	0.180	(0.417)	0.162	0.018
26	2.17	0.90	0.202	(0.417)	0.182	0.020
27	2.25	0.90	0.202	(0.417)	0.182	0.020
28	2.33	0.90	0.202	(0.417)	0.182	0.020
29	2.42	0.90	0.202	(0.417)	0.182	0.020
30	2.50	0.90	0.202	(0.417)	0.182	0.020
31	2.58	0.90	0.202	(0.417)	0.182	0.020
32	2.67	0.90	0.202	(0.417)	0.182	0.020
33	2.75	1.00	0.225	(0.417)	0.202	0.022
34	2.83	1.00	0.225	(0.417)	0.202	0.022
35	2.92	1.00	0.225	(0.417)	0.202	0.022
36	3.00	1.00	0.225	(0.417)	0.202	0.022
37	3.08	1.00	0.225	(0.417)	0.202	0.022
38	3.17	1.10	0.247	(0.417)	0.222	0.025
39	3.25	1.10	0.247	(0.417)	0.222	0.025
40	3.33	1.10	0.247	(0.417)	0.222	0.025
41	3.42	1.20	0.269	(0.417)	0.243	0.027
42	3.50	1.30	0.292	(0.417)	0.263	0.029
43	3.58	1.40	0.314	(0.417)	0.283	0.031
44	3.67	1.40	0.314	(0.417)	0.283	0.031
45	3.75	1.50	0.337	(0.417)	0.303	0.034
46	3.83	1.50	0.337	(0.417)	0.303	0.034
47	3.92	1.60	0.359	(0.417)	0.323	0.036

48	4.00	1.60	0.359	(0.417)	0.323	0.036
49	4.08	1.70	0.382	(0.417)	0.344	0.038
50	4.17	1.80	0.404	(0.417)	0.364	0.040
51	4.25	1.90	0.427	(0.417)	0.384	0.043
52	4.33	2.00	0.449	(0.417)	0.404	0.045
53	4.42	2.10	0.472	0.417	(0.424)	0.055
54	4.50	2.10	0.472	0.417	(0.424)	0.055
55	4.58	2.20	0.494	0.417	(0.445)	0.077
56	4.67	2.30	0.517	0.417	(0.465)	0.100
57	4.75	2.40	0.539	0.417	(0.485)	0.122
58	4.83	2.40	0.539	0.417	(0.485)	0.122
59	4.92	2.50	0.561	0.417	(0.505)	0.144
60	5.00	2.60	0.584	0.417	(0.525)	0.167
61	5.08	3.10	0.696	0.417	(0.627)	0.279
62	5.17	3.60	0.808	0.417	(0.728)	0.391
63	5.25	3.90	0.876	0.417	(0.788)	0.459
64	5.33	4.20	0.943	0.417	(0.849)	0.526
65	5.42	4.70	1.055	0.417	(0.950)	0.638
66	5.50	5.60	1.258	0.417	(1.132)	0.841
67	5.58	1.90	0.427	(0.417)	0.384	0.043
68	5.67	0.90	0.202	(0.417)	0.182	0.020
69	5.75	0.60	0.135	(0.417)	0.121	0.013
70	5.83	0.50	0.112	(0.417)	0.101	0.011
71	5.92	0.30	0.067	(0.417)	0.061	0.007
72	6.00	0.20	0.045	(0.417)	0.040	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 5.2

Flood volume = Effective rainfall 0.44(In)
times area 67.2(Ac.)/[(In)/(Ft.)) = 2.4(Ac.Ft)
Total soil loss = 1.43(In)
Total soil loss = 8.035(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 106519.5 Cubic Feet
Total soil loss = 349991.8 Cubic Feet

Peak flow rate of this hydrograph = 38.904(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0004	0.06	Q				
0+10	0.0027	0.33	Q				
0+15	0.0067	0.58	Q				
0+20	0.0116	0.70	Q				
0+25	0.0168	0.77	Q				
0+30	0.0225	0.82	Q				
0+35	0.0287	0.90	Q				
0+40	0.0353	0.96	Q				

0+45	0.0421	0.99	Q				
0+50	0.0491	1.01	VQ				
0+55	0.0562	1.03	VQ				
1+ 0	0.0635	1.05	Q				
1+ 5	0.0711	1.11	Q				
1+10	0.0791	1.16	Q				
1+15	0.0873	1.18	Q				
1+20	0.0955	1.19	Q				
1+25	0.1037	1.20	Q				
1+30	0.1120	1.20	Q				
1+35	0.1204	1.21	Q				
1+40	0.1287	1.21	QV				
1+45	0.1371	1.21	QV				
1+50	0.1454	1.21	QV				
1+55	0.1538	1.22	QV				
2+ 0	0.1623	1.23	QV				
2+ 5	0.1710	1.27	QV				
2+10	0.1797	1.27	QV				
2+15	0.1887	1.30	Q V				
2+20	0.1978	1.33	Q V				
2+25	0.2071	1.34	Q V				
2+30	0.2164	1.35	Q V				
2+35	0.2257	1.36	Q V				
2+40	0.2351	1.36	Q V				
2+45	0.2446	1.37	Q V				
2+50	0.2544	1.43	Q V				
2+55	0.2645	1.47	Q V				
3+ 0	0.2748	1.49	Q V				
3+ 5	0.2851	1.50	Q V				
3+10	0.2955	1.52	Q V				
3+15	0.3064	1.57	Q V				
3+20	0.3175	1.62	Q V				
3+25	0.3289	1.65	Q V				
3+30	0.3407	1.72	Q V				
3+35	0.3534	1.83	Q V				
3+40	0.3668	1.95	Q V				
3+45	0.3807	2.03	Q V				
3+50	0.3953	2.12	Q V				
3+55	0.4104	2.19	Q V				
4+ 0	0.4261	2.27	Q V				
4+ 5	0.4422	2.35	Q V				
4+10	0.4590	2.44	Q V				
4+15	0.4767	2.57	Q V				
4+20	0.4953	2.70	Q V				
4+25	0.5152	2.88	Q V				
4+30	0.5371	3.18	Q V				
4+35	0.5613	3.52	Q V				
4+40	0.5906	4.25	Q V				
4+45	0.6275	5.35	Q V				
4+50	0.6720	6.47	Q V				
4+55	0.7222	7.28	Q V				
5+ 0	0.7790	8.25	Q V				
5+ 5	0.8479	10.00	Q V				
5+10	0.9436	13.89	Q V				

199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 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]
67.20	2.48	166.66

100 YEAR Area rainfall data:

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

67.20

6.90

463.68

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 2.480 (In)
 Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 3.515 (In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 3.515 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	61.8	0.451	0.000	0.451	0.543	0.245
84.0	68.6	0.377	0.000	0.377	0.457	0.172
Sum (F) =						0.417

Area averaged mean soil loss (F) (In/Hr) = 0.417

Minimum soil loss rate ((In/Hr)) = 0.209

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum =		100.000	Sum= 67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.028	(0.739)	0.025	0.003
2	0.17	0.07	0.028	(0.736)	0.025	0.003
3	0.25	0.07	0.028	(0.734)	0.025	0.003
4	0.33	0.10	0.042	(0.731)	0.038	0.004
5	0.42	0.10	0.042	(0.728)	0.038	0.004
6	0.50	0.10	0.042	(0.725)	0.038	0.004
7	0.58	0.10	0.042	(0.722)	0.038	0.004
8	0.67	0.10	0.042	(0.719)	0.038	0.004
9	0.75	0.10	0.042	(0.717)	0.038	0.004
10	0.83	0.13	0.056	(0.714)	0.051	0.006
11	0.92	0.13	0.056	(0.711)	0.051	0.006
12	1.00	0.13	0.056	(0.708)	0.051	0.006
13	1.08	0.10	0.042	(0.705)	0.038	0.004
14	1.17	0.10	0.042	(0.703)	0.038	0.004
15	1.25	0.10	0.042	(0.700)	0.038	0.004
16	1.33	0.10	0.042	(0.697)	0.038	0.004
17	1.42	0.10	0.042	(0.694)	0.038	0.004
18	1.50	0.10	0.042	(0.691)	0.038	0.004
19	1.58	0.10	0.042	(0.689)	0.038	0.004
20	1.67	0.10	0.042	(0.686)	0.038	0.004
21	1.75	0.10	0.042	(0.683)	0.038	0.004
22	1.83	0.13	0.056	(0.680)	0.051	0.006
23	1.92	0.13	0.056	(0.678)	0.051	0.006
24	2.00	0.13	0.056	(0.675)	0.051	0.006
25	2.08	0.13	0.056	(0.672)	0.051	0.006
26	2.17	0.13	0.056	(0.669)	0.051	0.006
27	2.25	0.13	0.056	(0.667)	0.051	0.006
28	2.33	0.13	0.056	(0.664)	0.051	0.006
29	2.42	0.13	0.056	(0.661)	0.051	0.006
30	2.50	0.13	0.056	(0.659)	0.051	0.006
31	2.58	0.17	0.070	(0.656)	0.063	0.007
32	2.67	0.17	0.070	(0.653)	0.063	0.007
33	2.75	0.17	0.070	(0.651)	0.063	0.007
34	2.83	0.17	0.070	(0.648)	0.063	0.007
35	2.92	0.17	0.070	(0.645)	0.063	0.007
36	3.00	0.17	0.070	(0.643)	0.063	0.007
37	3.08	0.17	0.070	(0.640)	0.063	0.007
38	3.17	0.17	0.070	(0.637)	0.063	0.007
39	3.25	0.17	0.070	(0.635)	0.063	0.007
40	3.33	0.17	0.070	(0.632)	0.063	0.007
41	3.42	0.17	0.070	(0.629)	0.063	0.007
42	3.50	0.17	0.070	(0.627)	0.063	0.007
43	3.58	0.17	0.070	(0.624)	0.063	0.007
44	3.67	0.17	0.070	(0.621)	0.063	0.007
45	3.75	0.17	0.070	(0.619)	0.063	0.007
46	3.83	0.20	0.084	(0.616)	0.076	0.008
47	3.92	0.20	0.084	(0.614)	0.076	0.008

48	4.00	0.20	0.084	(0.611)	0.076	0.008
49	4.08	0.20	0.084	(0.608)	0.076	0.008
50	4.17	0.20	0.084	(0.606)	0.076	0.008
51	4.25	0.20	0.084	(0.603)	0.076	0.008
52	4.33	0.23	0.098	(0.601)	0.089	0.010
53	4.42	0.23	0.098	(0.598)	0.089	0.010
54	4.50	0.23	0.098	(0.596)	0.089	0.010
55	4.58	0.23	0.098	(0.593)	0.089	0.010
56	4.67	0.23	0.098	(0.590)	0.089	0.010
57	4.75	0.23	0.098	(0.588)	0.089	0.010
58	4.83	0.27	0.112	(0.585)	0.101	0.011
59	4.92	0.27	0.112	(0.583)	0.101	0.011
60	5.00	0.27	0.112	(0.580)	0.101	0.011
61	5.08	0.20	0.084	(0.578)	0.076	0.008
62	5.17	0.20	0.084	(0.575)	0.076	0.008
63	5.25	0.20	0.084	(0.573)	0.076	0.008
64	5.33	0.23	0.098	(0.570)	0.089	0.010
65	5.42	0.23	0.098	(0.568)	0.089	0.010
66	5.50	0.23	0.098	(0.565)	0.089	0.010
67	5.58	0.27	0.112	(0.563)	0.101	0.011
68	5.67	0.27	0.112	(0.560)	0.101	0.011
69	5.75	0.27	0.112	(0.558)	0.101	0.011
70	5.83	0.27	0.112	(0.555)	0.101	0.011
71	5.92	0.27	0.112	(0.553)	0.101	0.011
72	6.00	0.27	0.112	(0.550)	0.101	0.011
73	6.08	0.30	0.127	(0.548)	0.114	0.013
74	6.17	0.30	0.127	(0.546)	0.114	0.013
75	6.25	0.30	0.127	(0.543)	0.114	0.013
76	6.33	0.30	0.127	(0.541)	0.114	0.013
77	6.42	0.30	0.127	(0.538)	0.114	0.013
78	6.50	0.30	0.127	(0.536)	0.114	0.013
79	6.58	0.33	0.141	(0.533)	0.127	0.014
80	6.67	0.33	0.141	(0.531)	0.127	0.014
81	6.75	0.33	0.141	(0.529)	0.127	0.014
82	6.83	0.33	0.141	(0.526)	0.127	0.014
83	6.92	0.33	0.141	(0.524)	0.127	0.014
84	7.00	0.33	0.141	(0.522)	0.127	0.014
85	7.08	0.33	0.141	(0.519)	0.127	0.014
86	7.17	0.33	0.141	(0.517)	0.127	0.014
87	7.25	0.33	0.141	(0.514)	0.127	0.014
88	7.33	0.37	0.155	(0.512)	0.139	0.015
89	7.42	0.37	0.155	(0.510)	0.139	0.015
90	7.50	0.37	0.155	(0.507)	0.139	0.015
91	7.58	0.40	0.169	(0.505)	0.152	0.017
92	7.67	0.40	0.169	(0.503)	0.152	0.017
93	7.75	0.40	0.169	(0.500)	0.152	0.017
94	7.83	0.43	0.183	(0.498)	0.164	0.018
95	7.92	0.43	0.183	(0.496)	0.164	0.018
96	8.00	0.43	0.183	(0.494)	0.164	0.018
97	8.08	0.50	0.211	(0.491)	0.190	0.021
98	8.17	0.50	0.211	(0.489)	0.190	0.021
99	8.25	0.50	0.211	(0.487)	0.190	0.021
100	8.33	0.50	0.211	(0.484)	0.190	0.021
101	8.42	0.50	0.211	(0.482)	0.190	0.021

102	8.50	0.50	0.211	(0.480)	0.190	0.021
103	8.58	0.53	0.225	(0.478)	0.202	0.022
104	8.67	0.53	0.225	(0.475)	0.202	0.022
105	8.75	0.53	0.225	(0.473)	0.202	0.022
106	8.83	0.57	0.239	(0.471)	0.215	0.024
107	8.92	0.57	0.239	(0.469)	0.215	0.024
108	9.00	0.57	0.239	(0.466)	0.215	0.024
109	9.08	0.63	0.267	(0.464)	0.240	0.027
110	9.17	0.63	0.267	(0.462)	0.240	0.027
111	9.25	0.63	0.267	(0.460)	0.240	0.027
112	9.33	0.67	0.281	(0.458)	0.253	0.028
113	9.42	0.67	0.281	(0.455)	0.253	0.028
114	9.50	0.67	0.281	(0.453)	0.253	0.028
115	9.58	0.70	0.295	(0.451)	0.266	0.030
116	9.67	0.70	0.295	(0.449)	0.266	0.030
117	9.75	0.70	0.295	(0.447)	0.266	0.030
118	9.83	0.73	0.309	(0.445)	0.278	0.031
119	9.92	0.73	0.309	(0.442)	0.278	0.031
120	10.00	0.73	0.309	(0.440)	0.278	0.031
121	10.08	0.50	0.211	(0.438)	0.190	0.021
122	10.17	0.50	0.211	(0.436)	0.190	0.021
123	10.25	0.50	0.211	(0.434)	0.190	0.021
124	10.33	0.50	0.211	(0.432)	0.190	0.021
125	10.42	0.50	0.211	(0.430)	0.190	0.021
126	10.50	0.50	0.211	(0.428)	0.190	0.021
127	10.58	0.67	0.281	(0.426)	0.253	0.028
128	10.67	0.67	0.281	(0.424)	0.253	0.028
129	10.75	0.67	0.281	(0.421)	0.253	0.028
130	10.83	0.67	0.281	(0.419)	0.253	0.028
131	10.92	0.67	0.281	(0.417)	0.253	0.028
132	11.00	0.67	0.281	(0.415)	0.253	0.028
133	11.08	0.63	0.267	(0.413)	0.240	0.027
134	11.17	0.63	0.267	(0.411)	0.240	0.027
135	11.25	0.63	0.267	(0.409)	0.240	0.027
136	11.33	0.63	0.267	(0.407)	0.240	0.027
137	11.42	0.63	0.267	(0.405)	0.240	0.027
138	11.50	0.63	0.267	(0.403)	0.240	0.027
139	11.58	0.57	0.239	(0.401)	0.215	0.024
140	11.67	0.57	0.239	(0.399)	0.215	0.024
141	11.75	0.57	0.239	(0.397)	0.215	0.024
142	11.83	0.60	0.253	(0.395)	0.228	0.025
143	11.92	0.60	0.253	(0.393)	0.228	0.025
144	12.00	0.60	0.253	(0.391)	0.228	0.025
145	12.08	0.83	0.351	(0.389)	0.316	0.035
146	12.17	0.83	0.351	(0.387)	0.316	0.035
147	12.25	0.83	0.351	(0.385)	0.316	0.035
148	12.33	0.87	0.366	(0.383)	0.329	0.037
149	12.42	0.87	0.366	(0.382)	0.329	0.037
150	12.50	0.87	0.366	(0.380)	0.329	0.037
151	12.58	0.93	0.394	(0.378)	0.354	0.039
152	12.67	0.93	0.394	(0.376)	0.354	0.039
153	12.75	0.93	0.394	(0.374)	0.354	0.039
154	12.83	0.97	0.408	(0.372)	0.367	0.041
155	12.92	0.97	0.408	(0.370)	0.367	0.041

156	13.00	0.97	0.408	(0.368)	0.367	0.041
157	13.08	1.13	0.478	0.366	(0.430)	0.112
158	13.17	1.13	0.478	0.365	(0.430)	0.113
159	13.25	1.13	0.478	0.363	(0.430)	0.115
160	13.33	1.13	0.478	0.361	(0.430)	0.117
161	13.42	1.13	0.478	0.359	(0.430)	0.119
162	13.50	1.13	0.478	0.357	(0.430)	0.121
163	13.58	0.77	0.323	(0.355)	0.291	0.032
164	13.67	0.77	0.323	(0.354)	0.291	0.032
165	13.75	0.77	0.323	(0.352)	0.291	0.032
166	13.83	0.77	0.323	(0.350)	0.291	0.032
167	13.92	0.77	0.323	(0.348)	0.291	0.032
168	14.00	0.77	0.323	(0.346)	0.291	0.032
169	14.08	0.90	0.380	(0.345)	0.342	0.038
170	14.17	0.90	0.380	(0.343)	0.342	0.038
171	14.25	0.90	0.380	0.341	(0.342)	0.038
172	14.33	0.87	0.366	(0.339)	0.329	0.037
173	14.42	0.87	0.366	(0.338)	0.329	0.037
174	14.50	0.87	0.366	(0.336)	0.329	0.037
175	14.58	0.87	0.366	(0.334)	0.329	0.037
176	14.67	0.87	0.366	(0.332)	0.329	0.037
177	14.75	0.87	0.366	(0.331)	0.329	0.037
178	14.83	0.83	0.351	(0.329)	0.316	0.035
179	14.92	0.83	0.351	(0.327)	0.316	0.035
180	15.00	0.83	0.351	(0.326)	0.316	0.035
181	15.08	0.80	0.337	(0.324)	0.304	0.034
182	15.17	0.80	0.337	(0.322)	0.304	0.034
183	15.25	0.80	0.337	(0.321)	0.304	0.034
184	15.33	0.77	0.323	(0.319)	0.291	0.032
185	15.42	0.77	0.323	(0.317)	0.291	0.032
186	15.50	0.77	0.323	(0.316)	0.291	0.032
187	15.58	0.63	0.267	(0.314)	0.240	0.027
188	15.67	0.63	0.267	(0.313)	0.240	0.027
189	15.75	0.63	0.267	(0.311)	0.240	0.027
190	15.83	0.63	0.267	(0.309)	0.240	0.027
191	15.92	0.63	0.267	(0.308)	0.240	0.027
192	16.00	0.63	0.267	(0.306)	0.240	0.027
193	16.08	0.13	0.056	(0.305)	0.051	0.006
194	16.17	0.13	0.056	(0.303)	0.051	0.006
195	16.25	0.13	0.056	(0.302)	0.051	0.006
196	16.33	0.13	0.056	(0.300)	0.051	0.006
197	16.42	0.13	0.056	(0.298)	0.051	0.006
198	16.50	0.13	0.056	(0.297)	0.051	0.006
199	16.58	0.10	0.042	(0.295)	0.038	0.004
200	16.67	0.10	0.042	(0.294)	0.038	0.004
201	16.75	0.10	0.042	(0.292)	0.038	0.004
202	16.83	0.10	0.042	(0.291)	0.038	0.004
203	16.92	0.10	0.042	(0.290)	0.038	0.004
204	17.00	0.10	0.042	(0.288)	0.038	0.004
205	17.08	0.17	0.070	(0.287)	0.063	0.007
206	17.17	0.17	0.070	(0.285)	0.063	0.007
207	17.25	0.17	0.070	(0.284)	0.063	0.007
208	17.33	0.17	0.070	(0.282)	0.063	0.007
209	17.42	0.17	0.070	(0.281)	0.063	0.007

210	17.50	0.17	0.070	(0.279)	0.063	0.007
211	17.58	0.17	0.070	(0.278)	0.063	0.007
212	17.67	0.17	0.070	(0.277)	0.063	0.007
213	17.75	0.17	0.070	(0.275)	0.063	0.007
214	17.83	0.13	0.056	(0.274)	0.051	0.006
215	17.92	0.13	0.056	(0.273)	0.051	0.006
216	18.00	0.13	0.056	(0.271)	0.051	0.006
217	18.08	0.13	0.056	(0.270)	0.051	0.006
218	18.17	0.13	0.056	(0.269)	0.051	0.006
219	18.25	0.13	0.056	(0.267)	0.051	0.006
220	18.33	0.13	0.056	(0.266)	0.051	0.006
221	18.42	0.13	0.056	(0.265)	0.051	0.006
222	18.50	0.13	0.056	(0.263)	0.051	0.006
223	18.58	0.10	0.042	(0.262)	0.038	0.004
224	18.67	0.10	0.042	(0.261)	0.038	0.004
225	18.75	0.10	0.042	(0.260)	0.038	0.004
226	18.83	0.07	0.028	(0.258)	0.025	0.003
227	18.92	0.07	0.028	(0.257)	0.025	0.003
228	19.00	0.07	0.028	(0.256)	0.025	0.003
229	19.08	0.10	0.042	(0.255)	0.038	0.004
230	19.17	0.10	0.042	(0.253)	0.038	0.004
231	19.25	0.10	0.042	(0.252)	0.038	0.004
232	19.33	0.13	0.056	(0.251)	0.051	0.006
233	19.42	0.13	0.056	(0.250)	0.051	0.006
234	19.50	0.13	0.056	(0.249)	0.051	0.006
235	19.58	0.10	0.042	(0.248)	0.038	0.004
236	19.67	0.10	0.042	(0.247)	0.038	0.004
237	19.75	0.10	0.042	(0.245)	0.038	0.004
238	19.83	0.07	0.028	(0.244)	0.025	0.003
239	19.92	0.07	0.028	(0.243)	0.025	0.003
240	20.00	0.07	0.028	(0.242)	0.025	0.003
241	20.08	0.10	0.042	(0.241)	0.038	0.004
242	20.17	0.10	0.042	(0.240)	0.038	0.004
243	20.25	0.10	0.042	(0.239)	0.038	0.004
244	20.33	0.10	0.042	(0.238)	0.038	0.004
245	20.42	0.10	0.042	(0.237)	0.038	0.004
246	20.50	0.10	0.042	(0.236)	0.038	0.004
247	20.58	0.10	0.042	(0.235)	0.038	0.004
248	20.67	0.10	0.042	(0.234)	0.038	0.004
249	20.75	0.10	0.042	(0.233)	0.038	0.004
250	20.83	0.07	0.028	(0.232)	0.025	0.003
251	20.92	0.07	0.028	(0.231)	0.025	0.003
252	21.00	0.07	0.028	(0.230)	0.025	0.003
253	21.08	0.10	0.042	(0.229)	0.038	0.004
254	21.17	0.10	0.042	(0.228)	0.038	0.004
255	21.25	0.10	0.042	(0.227)	0.038	0.004
256	21.33	0.07	0.028	(0.227)	0.025	0.003
257	21.42	0.07	0.028	(0.226)	0.025	0.003
258	21.50	0.07	0.028	(0.225)	0.025	0.003
259	21.58	0.10	0.042	(0.224)	0.038	0.004
260	21.67	0.10	0.042	(0.223)	0.038	0.004
261	21.75	0.10	0.042	(0.222)	0.038	0.004
262	21.83	0.07	0.028	(0.222)	0.025	0.003
263	21.92	0.07	0.028	(0.221)	0.025	0.003

264	22.00	0.07	0.028	(0.220)	0.025	0.003
265	22.08	0.10	0.042	(0.219)	0.038	0.004
266	22.17	0.10	0.042	(0.219)	0.038	0.004
267	22.25	0.10	0.042	(0.218)	0.038	0.004
268	22.33	0.07	0.028	(0.217)	0.025	0.003
269	22.42	0.07	0.028	(0.217)	0.025	0.003
270	22.50	0.07	0.028	(0.216)	0.025	0.003
271	22.58	0.07	0.028	(0.215)	0.025	0.003
272	22.67	0.07	0.028	(0.215)	0.025	0.003
273	22.75	0.07	0.028	(0.214)	0.025	0.003
274	22.83	0.07	0.028	(0.214)	0.025	0.003
275	22.92	0.07	0.028	(0.213)	0.025	0.003
276	23.00	0.07	0.028	(0.213)	0.025	0.003
277	23.08	0.07	0.028	(0.212)	0.025	0.003
278	23.17	0.07	0.028	(0.212)	0.025	0.003
279	23.25	0.07	0.028	(0.211)	0.025	0.003
280	23.33	0.07	0.028	(0.211)	0.025	0.003
281	23.42	0.07	0.028	(0.210)	0.025	0.003
282	23.50	0.07	0.028	(0.210)	0.025	0.003
283	23.58	0.07	0.028	(0.210)	0.025	0.003
284	23.67	0.07	0.028	(0.209)	0.025	0.003
285	23.75	0.07	0.028	(0.209)	0.025	0.003
286	23.83	0.07	0.028	(0.209)	0.025	0.003
287	23.92	0.07	0.028	(0.209)	0.025	0.003
288	24.00	0.07	0.028	(0.209)	0.025	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.39(In)

times area 67.2(Ac.)/[(In)/(Ft.)] = 2.2(Ac.Ft)

Total soil loss = 3.13(In)

Total soil loss = 17.523(Ac.Ft)

Total rainfall = 3.51(In)

Flood volume = 94097.8 Cubic Feet

Total soil loss = 763290.9 Cubic Feet

Peak flow rate of this hydrograph = 7.388(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.02	Q				
0+10	0.0007	0.08	Q				
0+15	0.0016	0.13	Q				
0+20	0.0026	0.16	Q				
0+25	0.0040	0.20	Q				
0+30	0.0056	0.23	Q				
0+35	0.0074	0.25	VQ				
0+40	0.0092	0.26	VQ				

0+45	0.0110	0.27	VQ
0+50	0.0129	0.28	VQ
0+55	0.0151	0.32	VQ
1+ 0	0.0175	0.34	VQ
1+ 5	0.0199	0.35	VQ
1+10	0.0221	0.33	VQ
1+15	0.0242	0.30	VQ
1+20	0.0263	0.30	VQ
1+25	0.0283	0.29	VQ
1+30	0.0303	0.29	VQ
1+35	0.0323	0.29	VQ
1+40	0.0343	0.29	VQ
1+45	0.0363	0.29	VQ
1+50	0.0383	0.30	VQ
1+55	0.0406	0.33	VQ
2+ 0	0.0430	0.35	VQ
2+ 5	0.0455	0.36	VQ
2+10	0.0480	0.37	VQ
2+15	0.0506	0.37	VQ
2+20	0.0532	0.37	VQ
2+25	0.0558	0.38	Q
2+30	0.0584	0.38	Q
2+35	0.0610	0.39	Q
2+40	0.0639	0.42	Q
2+45	0.0670	0.45	Q
2+50	0.0701	0.46	Q
2+55	0.0733	0.46	Q
3+ 0	0.0765	0.47	Q
3+ 5	0.0797	0.47	Q
3+10	0.0830	0.47	Q
3+15	0.0862	0.47	Q
3+20	0.0895	0.47	Q
3+25	0.0927	0.47	Q
3+30	0.0960	0.48	Q
3+35	0.0993	0.48	Q
3+40	0.1026	0.48	Q
3+45	0.1059	0.48	Q
3+50	0.1092	0.48	QV
3+55	0.1127	0.52	Q
4+ 0	0.1165	0.54	Q
4+ 5	0.1203	0.55	Q
4+10	0.1241	0.56	Q
4+15	0.1280	0.56	Q
4+20	0.1319	0.57	Q
4+25	0.1361	0.61	Q
4+30	0.1404	0.63	Q
4+35	0.1449	0.64	Q
4+40	0.1494	0.65	Q
4+45	0.1539	0.66	Q
4+50	0.1585	0.67	Q
4+55	0.1633	0.70	QV
5+ 0	0.1683	0.73	QV
5+ 5	0.1733	0.72	QV
5+10	0.1779	0.67	QV

5+15	0.1822	0.62	QV				
5+20	0.1864	0.61	QV				
5+25	0.1907	0.63	QV				
5+30	0.1952	0.65	QV				
5+35	0.1998	0.67	QV				
5+40	0.2047	0.70	QV				
5+45	0.2097	0.73	QV				
5+50	0.2148	0.74	QV				
5+55	0.2199	0.75	Q V				
6+ 0	0.2251	0.75	QV				
6+ 5	0.2303	0.76	QV				
6+10	0.2358	0.79	QV				
6+15	0.2414	0.82	QV				
6+20	0.2472	0.83	QV				
6+25	0.2530	0.84	QV				
6+30	0.2588	0.85	QV				
6+35	0.2647	0.86	QV				
6+40	0.2708	0.89	Q V				
6+45	0.2772	0.92	Q V				
6+50	0.2836	0.93	Q V				
6+55	0.2900	0.94	Q V				
7+ 0	0.2965	0.94	Q V				
7+ 5	0.3030	0.94	Q V				
7+10	0.3095	0.95	Q V				
7+15	0.3161	0.95	Q V				
7+20	0.3227	0.96	Q V				
7+25	0.3295	0.99	Q V				
7+30	0.3365	1.02	Q V				
7+35	0.3436	1.03	Q V				
7+40	0.3510	1.07	Q V				
7+45	0.3586	1.10	Q V				
7+50	0.3663	1.12	Q V				
7+55	0.3743	1.16	Q V				
8+ 0	0.3826	1.19	Q V				
8+ 5	0.3910	1.22	Q V				
8+10	0.3999	1.30	Q V				
8+15	0.4092	1.35	Q V				
8+20	0.4187	1.38	Q V				
8+25	0.4283	1.39	Q V				
8+30	0.4380	1.40	Q V				
8+35	0.4478	1.42	Q V				
8+40	0.4578	1.46	Q V				
8+45	0.4680	1.49	Q V				
8+50	0.4784	1.51	Q V				
8+55	0.4890	1.55	Q V				
9+ 0	0.4999	1.58	Q V				
9+ 5	0.5110	1.61	Q V				
9+10	0.5225	1.68	Q V				
9+15	0.5345	1.74	Q V				
9+20	0.5466	1.77	Q V				
9+25	0.5591	1.81	Q V				
9+30	0.5719	1.85	Q V				
9+35	0.5848	1.87	Q V				
9+40	0.5980	1.92	Q V				

9+45	0.6114	1.95	Q	V					
9+50	0.6250	1.97	Q	V					
9+55	0.6389	2.02	Q	V					
10+ 0	0.6530	2.05	Q	V					
10+ 5	0.6669	2.01	Q	V					
10+10	0.6792	1.80	Q	V					
10+15	0.6904	1.62	Q	V					
10+20	0.7012	1.56	Q	V					
10+25	0.7117	1.52	Q	V					
10+30	0.7220	1.50	Q	V					
10+35	0.7324	1.52	Q	V					
10+40	0.7439	1.66	Q	V					
10+45	0.7561	1.78	Q	V					
10+50	0.7687	1.82	Q	V					
10+55	0.7814	1.85	Q	V					
11+ 0	0.7942	1.86	Q	V					
11+ 5	0.8071	1.86	Q	V					
11+10	0.8197	1.84	Q	V					
11+15	0.8323	1.82	Q	V					
11+20	0.8448	1.82	Q	V					
11+25	0.8573	1.82	Q	V					
11+30	0.8698	1.81	Q	V					
11+35	0.8822	1.80	Q	V					
11+40	0.8941	1.74	Q	V					
11+45	0.9057	1.68	Q	V					
11+50	0.9172	1.67	Q	V					
11+55	0.9289	1.69	Q	V					
12+ 0	0.9406	1.71	Q	V					
12+ 5	0.9528	1.76	Q	V					
12+10	0.9665	1.99	Q	V					
12+15	0.9814	2.17	Q	V					
12+20	0.9969	2.25	Q	V					
12+25	1.0128	2.32	Q	V					
12+30	1.0292	2.37	Q	V					
12+35	1.0458	2.42	Q	V					
12+40	1.0631	2.50	Q	V					
12+45	1.0807	2.57	Q	V					
12+50	1.0987	2.61	Q	V					
12+55	1.1170	2.66	Q	V					
13+ 0	1.1356	2.70	Q	V					
13+ 5	1.1570	3.11	Q	V					
13+10	1.1897	4.75			Q				
13+15	1.2317	6.09				Q			
13+20	1.2777	6.68					Q		
13+25	1.3265	7.08						Q	
13+30	1.3773	7.39							Q
13+35	1.4266	7.15							
13+40	1.4631	5.30				Q			
13+45	1.4893	3.81			Q				
13+50	1.5118	3.27		Q					
13+55	1.5322	2.96	Q						
14+ 0	1.5512	2.76	Q						
14+ 5	1.5695	2.65	Q						
14+10	1.5880	2.69	Q						

14+15	1.6066	2.69			Q		V
14+20	1.6249	2.66			Q		V
14+25	1.6428	2.59			Q		V
14+30	1.6602	2.54			Q		V
14+35	1.6775	2.50			Q		V
14+40	1.6945	2.47			Q		V
14+45	1.7115	2.47			Q		V
14+50	1.7285	2.47			Q		V
14+55	1.7453	2.44			Q		V
15+ 0	1.7619	2.41			Q		V
15+ 5	1.7784	2.39			Q		V
15+10	1.7946	2.36			Q		V
15+15	1.8107	2.33			Q		V
15+20	1.8266	2.31			Q		V
15+25	1.8422	2.27			Q		V
15+30	1.8576	2.24			Q		V
15+35	1.8726	2.19			Q		V
15+40	1.8868	2.05			Q		V
15+45	1.9002	1.95			Q		V
15+50	1.9133	1.90			Q		V
15+55	1.9262	1.87			Q		V
16+ 0	1.9390	1.86			Q		V
16+ 5	1.9509	1.73			Q		V
16+10	1.9594	1.24			Q		V
16+15	1.9653	0.85			Q		V
16+20	1.9700	0.69			Q		V
16+25	1.9742	0.60			Q		V
16+30	1.9779	0.54			Q		V
16+35	1.9813	0.49			Q		V
16+40	1.9842	0.42			Q		V
16+45	1.9868	0.37			Q		V
16+50	1.9892	0.35			Q		V
16+55	1.9914	0.33			Q		V
17+ 0	1.9936	0.31			Q		V
17+ 5	1.9958	0.32			Q		V
17+10	1.9983	0.37			Q		V
17+15	2.0012	0.42			Q		V
17+20	2.0042	0.44			Q		V
17+25	2.0073	0.45			Q		V
17+30	2.0105	0.46			Q		V
17+35	2.0137	0.46			Q		V
17+40	2.0169	0.47			Q		V
17+45	2.0201	0.47			Q		V
17+50	2.0233	0.46			Q		V
17+55	2.0263	0.43			Q		V
18+ 0	2.0291	0.41			Q		V
18+ 5	2.0318	0.40			Q		V
18+10	2.0346	0.40			Q		V
18+15	2.0373	0.39			Q		V
18+20	2.0399	0.39			Q		V
18+25	2.0426	0.39			Q		V
18+30	2.0452	0.38			Q		V
18+35	2.0478	0.38			Q		V
18+40	2.0502	0.34			Q		V

18+45	2.0524	0.32	Q				V
18+50	2.0544	0.30	Q				V
18+55	2.0562	0.26	Q				V
19+ 0	2.0578	0.23	Q				V
19+ 5	2.0594	0.23	Q				V
19+10	2.0611	0.25	Q				V
19+15	2.0630	0.27	Q				V
19+20	2.0649	0.28	Q				V
19+25	2.0671	0.32	Q				V
19+30	2.0695	0.35	Q				V
19+35	2.0719	0.35	Q				V
19+40	2.0741	0.32	Q				V
19+45	2.0762	0.30	Q				V
19+50	2.0782	0.29	Q				V
19+55	2.0799	0.25	Q				V
20+ 0	2.0815	0.23	Q				V
20+ 5	2.0830	0.22	Q				V
20+10	2.0847	0.25	Q				V
20+15	2.0866	0.27	Q				V
20+20	2.0885	0.28	Q				V
20+25	2.0904	0.28	Q				V
20+30	2.0923	0.28	Q				V
20+35	2.0943	0.28	Q				V
20+40	2.0962	0.28	Q				V
20+45	2.0982	0.28	Q				V
20+50	2.1001	0.28	Q				V
20+55	2.1017	0.24	Q				V
21+ 0	2.1033	0.22	Q				V
21+ 5	2.1048	0.22	Q				V
21+10	2.1064	0.24	Q				V
21+15	2.1083	0.27	Q				V
21+20	2.1101	0.27	Q				V
21+25	2.1117	0.24	Q				V
21+30	2.1132	0.21	Q				V
21+35	2.1147	0.21	Q				V
21+40	2.1163	0.24	Q				V
21+45	2.1182	0.26	Q				V
21+50	2.1200	0.26	Q				V
21+55	2.1216	0.24	Q				V
22+ 0	2.1231	0.21	Q				V
22+ 5	2.1245	0.21	Q				V
22+10	2.1262	0.24	Q				V
22+15	2.1280	0.26	Q				V
22+20	2.1298	0.26	Q				V
22+25	2.1314	0.24	Q				V
22+30	2.1329	0.21	Q				V
22+35	2.1343	0.21	Q				V
22+40	2.1357	0.20	Q				V
22+45	2.1371	0.20	Q				V
22+50	2.1384	0.20	Q				V
22+55	2.1397	0.19	Q				V
23+ 0	2.1411	0.19	Q				V
23+ 5	2.1424	0.19	Q				V
23+10	2.1437	0.19	Q				V

23+15	2.1451	0.19	Q				V
23+20	2.1464	0.19	Q				V
23+25	2.1477	0.19	Q				V
23+30	2.1490	0.19	Q				V
23+35	2.1503	0.19	Q				V
23+40	2.1516	0.19	Q				V
23+45	2.1529	0.19	Q				V
23+50	2.1542	0.19	Q				V
23+55	2.1556	0.19	Q				V
24+ 0	2.1569	0.19	Q				V
24+ 5	2.1581	0.18	Q				V
24+10	2.1588	0.11	Q				V
24+15	2.1593	0.06	Q				V
24+20	2.1595	0.04	Q				V
24+25	2.1597	0.03	Q				V
24+30	2.1599	0.02	Q				V
24+35	2.1600	0.02	Q				V
24+40	2.1600	0.01	Q				V
24+45	2.1601	0.01	Q				V
24+50	2.1601	0.01	Q				V
24+55	2.1602	0.00	Q				V
25+ 0	2.1602	0.00	Q				V
25+ 5	2.1602	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
67.20	0.58	38.98

100 YEAR Area rainfall data:

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

67.20

1.45

97.44

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)

Areal adjustment factor = 99.94 %

Adjusted average point rain = 0.937(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	79.0	0.256	0.000	0.256	0.543	0.139
84.0	84.0	0.198	0.000	0.198	0.457	0.091
Sum (F) =						0.230

Area averaged mean soil loss (F) (In/Hr) = 0.230

Minimum soil loss rate ((In/Hr)) = 0.115

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum = 100.000		Sum=	67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.495	0.230	(0.445)	0.265
2	0.17	4.50	0.506	0.230	(0.456)	0.277
3	0.25	5.40	0.607	0.230	(0.547)	0.378
4	0.33	5.40	0.607	0.230	(0.547)	0.378
5	0.42	5.70	0.641	0.230	(0.577)	0.412
6	0.50	6.40	0.720	0.230	(0.648)	0.490
7	0.58	7.90	0.889	0.230	(0.800)	0.659
8	0.67	9.10	1.024	0.230	(0.921)	0.794
9	0.75	12.80	1.440	0.230	(1.296)	1.210
10	0.83	25.60	2.880	0.230	(2.592)	2.650
11	0.92	7.90	0.889	0.230	(0.800)	0.659
12	1.00	4.90	0.551	0.230	(0.496)	0.322

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.5

Flood volume = Effective rainfall 0.71(In)
times area 67.2(Ac.)/[(In)/(Ft.)] = 4.0(Ac.Ft)
Total soil loss = 0.23(In)
Total soil loss = 1.286(Ac.Ft)
Total rainfall = 0.94(In)
Flood volume = 172652.2 Cubic Feet
Total soil loss = 56002.1 Cubic Feet

Peak flow rate of this hydrograph = 97.784(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	25.0	50.0	75.0	100.0
0+ 5	0.0100	1.45	Q					
0+10	0.0620	7.55	V Q					
0+15	0.1528	13.18	V Q					
0+20	0.2737	17.55	V Q					
0+25	0.4166	20.76	V Q					
0+30	0.5782	23.46	V Q					
0+35	0.7695	27.78	V Q					
0+40	1.0085	34.70	V Q					
0+45	1.3139	44.34	V Q					
0+50	1.7694	66.15	V Q					
0+55	2.4429	97.78	V Q					
1+ 0	3.0016	81.13	V Q					

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Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 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]
67.20	0.98	65.86

100 YEAR Area rainfall data:

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

67.20

2.48

166.66

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 1.597(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %

36.500 79.00 0.000

30.700 84.00 0.000

Total Area Entered = 67.20(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	79.0	0.256	0.000	0.256	0.543	0.139
84.0	84.0	0.198	0.000	0.198	0.457	0.091
Sum (F) =						0.230

Area averaged mean soil loss (F) (In/Hr) = 0.230

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
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum =		100.000	Sum= 67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.230)	0.224	0.025
2	0.17	1.30	0.249	(0.230)	0.224	0.025
3	0.25	1.10	0.211	(0.230)	0.190	0.021
4	0.33	1.50	0.287	0.230	(0.259)	0.058
5	0.42	1.50	0.287	0.230	(0.259)	0.058
6	0.50	1.80	0.345	0.230	(0.310)	0.115
7	0.58	1.50	0.287	0.230	(0.259)	0.058
8	0.67	1.80	0.345	0.230	(0.310)	0.115
9	0.75	1.80	0.345	0.230	(0.310)	0.115
10	0.83	1.50	0.287	0.230	(0.259)	0.058
11	0.92	1.60	0.307	0.230	(0.276)	0.077
12	1.00	1.80	0.345	0.230	(0.310)	0.115
13	1.08	2.20	0.422	0.230	(0.379)	0.192
14	1.17	2.20	0.422	0.230	(0.379)	0.192
15	1.25	2.20	0.422	0.230	(0.379)	0.192
16	1.33	2.00	0.383	0.230	(0.345)	0.154
17	1.42	2.60	0.498	0.230	(0.448)	0.269
18	1.50	2.70	0.517	0.230	(0.466)	0.288
19	1.58	2.40	0.460	0.230	(0.414)	0.230
20	1.67	2.70	0.517	0.230	(0.466)	0.288
21	1.75	3.30	0.632	0.230	(0.569)	0.403
22	1.83	3.10	0.594	0.230	(0.535)	0.364
23	1.92	2.90	0.556	0.230	(0.500)	0.326
24	2.00	3.00	0.575	0.230	(0.517)	0.345
25	2.08	3.10	0.594	0.230	(0.535)	0.364
26	2.17	4.20	0.805	0.230	(0.724)	0.575
27	2.25	5.00	0.958	0.230	(0.862)	0.728
28	2.33	3.50	0.671	0.230	(0.604)	0.441
29	2.42	6.80	1.303	0.230	(1.173)	1.073
30	2.50	7.30	1.399	0.230	(1.259)	1.169
31	2.58	8.20	1.571	0.230	(1.414)	1.342
32	2.67	5.90	1.130	0.230	(1.017)	0.901
33	2.75	2.00	0.383	0.230	(0.345)	0.154
34	2.83	1.80	0.345	0.230	(0.310)	0.115
35	2.92	1.80	0.345	0.230	(0.310)	0.115
36	3.00	0.60	0.115	(0.230)	0.103	0.011

(Loss Rate Not Used)

Sum = 100.0

Sum = 11.1

Flood volume = Effective rainfall 0.92(In)

times area 67.2(Ac.)/[(In)/(Ft.)] = 5.2(Ac.Ft)

Total soil loss = 0.67(In)

Total soil loss = 3.774(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 225066.8 Cubic Feet

Total soil loss = 164411.8 Cubic Feet

Peak flow rate of this hydrograph = 71.099(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0009		0.14	Q				
0+10	0.0058		0.70	Q				
0+15	0.0136		1.13	Q				
0+20	0.0234		1.42	Q				
0+25	0.0392		2.29	VQ				
0+30	0.0621		3.32	VQ				
0+35	0.0938		4.60	V Q				
0+40	0.1270		4.83	V Q				
0+45	0.1658		5.63	VQ				
0+50	0.2090		6.28	V Q				
0+55	0.2466		5.47	VQ				
1+ 0	0.2832		5.31	Q				
1+ 5	0.3295		6.71	VQ				
1+10	0.3927		9.18	VQ				
1+15	0.4674		10.84	V Q				
1+20	0.5455		11.34	VQ				
1+25	0.6249		11.53	VQ				
1+30	0.7202		13.84	VQ				
1+35	0.8303		15.99	VQ				
1+40	0.9414		16.12	VQ				
1+45	1.0630		17.65	Q				
1+50	1.2083		21.10	VQ				
1+55	1.3636		22.56	VQ				
2+ 0	1.5165		22.20	Q				
2+ 5	1.6712		22.47	QV				
2+10	1.8397		24.46	Q	V			
2+15	2.0507		30.63		Q			
2+20	2.3030		36.63			VQ		
2+25	2.5647		38.01			Q		
2+30	2.9079		49.82			V	Q	
2+35	3.3465		63.69				V	
2+40	3.8362		71.10				V	Q
2+45	4.2719		63.26				Q	V
2+50	4.5568		41.38			Q		V
2+55	4.7362		26.05		Q			V
3+ 0	4.8685		19.20		Q			V
3+ 5	4.9604		13.35			Q		V
3+10	5.0219		8.94		Q			V
3+15	5.0666		6.48		Q			V
3+20	5.0994		4.78		Q			V
3+25	5.1231		3.43	Q				V
3+30	5.1408		2.57	Q				V
3+35	5.1530		1.77	Q				V
3+40	5.1609		1.14	Q				V

3+45	5.1646	0.55	Q				V
3+50	5.1658	0.17	Q				V
3+55	5.1665	0.10	Q				V
4+ 0	5.1668	0.05	Q				V
4+ 5	5.1668	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
67.20	1.38	92.74

100 YEAR Area rainfall data:

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

67.20

3.48

233.86

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 2.244 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 2.243 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	79.0	0.256	0.000	0.256	0.543	0.139
84.0	84.0	0.198	0.000	0.198	0.457	0.091
Sum (F) =						0.230

Area averaged mean soil loss (F) (In/Hr) = 0.230

Minimum soil loss rate ((In/Hr)) = 0.115

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum = 100.000		Sum=	67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.135	(0.230)	0.121	0.013
2	0.17	0.60	0.162	(0.230)	0.145	0.016
3	0.25	0.60	0.162	(0.230)	0.145	0.016
4	0.33	0.60	0.162	(0.230)	0.145	0.016
5	0.42	0.60	0.162	(0.230)	0.145	0.016
6	0.50	0.70	0.188	(0.230)	0.170	0.019
7	0.58	0.70	0.188	(0.230)	0.170	0.019
8	0.67	0.70	0.188	(0.230)	0.170	0.019
9	0.75	0.70	0.188	(0.230)	0.170	0.019
10	0.83	0.70	0.188	(0.230)	0.170	0.019
11	0.92	0.70	0.188	(0.230)	0.170	0.019
12	1.00	0.80	0.215	(0.230)	0.194	0.022
13	1.08	0.80	0.215	(0.230)	0.194	0.022
14	1.17	0.80	0.215	(0.230)	0.194	0.022
15	1.25	0.80	0.215	(0.230)	0.194	0.022
16	1.33	0.80	0.215	(0.230)	0.194	0.022
17	1.42	0.80	0.215	(0.230)	0.194	0.022
18	1.50	0.80	0.215	(0.230)	0.194	0.022
19	1.58	0.80	0.215	(0.230)	0.194	0.022
20	1.67	0.80	0.215	(0.230)	0.194	0.022
21	1.75	0.80	0.215	(0.230)	0.194	0.022
22	1.83	0.80	0.215	(0.230)	0.194	0.022
23	1.92	0.80	0.215	(0.230)	0.194	0.022
24	2.00	0.90	0.242	(0.230)	0.218	0.024
25	2.08	0.80	0.215	(0.230)	0.194	0.022
26	2.17	0.90	0.242	(0.230)	0.218	0.024
27	2.25	0.90	0.242	(0.230)	0.218	0.024
28	2.33	0.90	0.242	(0.230)	0.218	0.024
29	2.42	0.90	0.242	(0.230)	0.218	0.024
30	2.50	0.90	0.242	(0.230)	0.218	0.024
31	2.58	0.90	0.242	(0.230)	0.218	0.024
32	2.67	0.90	0.242	(0.230)	0.218	0.024
33	2.75	1.00	0.269	0.230	(0.242)	0.040
34	2.83	1.00	0.269	0.230	(0.242)	0.040
35	2.92	1.00	0.269	0.230	(0.242)	0.040
36	3.00	1.00	0.269	0.230	(0.242)	0.040
37	3.08	1.00	0.269	0.230	(0.242)	0.040
38	3.17	1.10	0.296	0.230	(0.267)	0.067
39	3.25	1.10	0.296	0.230	(0.267)	0.067
40	3.33	1.10	0.296	0.230	(0.267)	0.067
41	3.42	1.20	0.323	0.230	(0.291)	0.093
42	3.50	1.30	0.350	0.230	(0.315)	0.120
43	3.58	1.40	0.377	0.230	(0.339)	0.147
44	3.67	1.40	0.377	0.230	(0.339)	0.147
45	3.75	1.50	0.404	0.230	(0.363)	0.174
46	3.83	1.50	0.404	0.230	(0.363)	0.174
47	3.92	1.60	0.431	0.230	(0.388)	0.201

48	4.00	1.60	0.431	0.230	(0.388)	0.201
49	4.08	1.70	0.458	0.230	(0.412)	0.228
50	4.17	1.80	0.485	0.230	(0.436)	0.255
51	4.25	1.90	0.512	0.230	(0.460)	0.282
52	4.33	2.00	0.538	0.230	(0.485)	0.309
53	4.42	2.10	0.565	0.230	(0.509)	0.336
54	4.50	2.10	0.565	0.230	(0.509)	0.336
55	4.58	2.20	0.592	0.230	(0.533)	0.363
56	4.67	2.30	0.619	0.230	(0.557)	0.390
57	4.75	2.40	0.646	0.230	(0.581)	0.417
58	4.83	2.40	0.646	0.230	(0.581)	0.417
59	4.92	2.50	0.673	0.230	(0.606)	0.443
60	5.00	2.60	0.700	0.230	(0.630)	0.470
61	5.08	3.10	0.835	0.230	(0.751)	0.605
62	5.17	3.60	0.969	0.230	(0.872)	0.740
63	5.25	3.90	1.050	0.230	(0.945)	0.820
64	5.33	4.20	1.131	0.230	(1.018)	0.901
65	5.42	4.70	1.265	0.230	(1.139)	1.036
66	5.50	5.60	1.508	0.230	(1.357)	1.278
67	5.58	1.90	0.512	0.230	(0.460)	0.282
68	5.67	0.90	0.242	(0.230)	0.218	0.024
69	5.75	0.60	0.162	(0.230)	0.145	0.016
70	5.83	0.50	0.135	(0.230)	0.121	0.013
71	5.92	0.30	0.081	(0.230)	0.073	0.008
72	6.00	0.20	0.054	(0.230)	0.048	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.3

Flood volume = Effective rainfall 1.02(In)
times area 67.2(Ac.)/[(In)/(Ft.)] = 5.7(Ac.Ft)
Total soil loss = 1.22(In)
Total soil loss = 6.825(Ac.Ft)
Total rainfall = 2.24(In)
Flood volume = 249947.8 Cubic Feet
Total soil loss = 297307.6 Cubic Feet

Peak flow rate of this hydrograph = 64.737(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0005	0.07	Q				
0+10	0.0032	0.39	Q				
0+15	0.0080	0.70	Q				
0+20	0.0139	0.84	Q				
0+25	0.0202	0.92	Q				
0+30	0.0270	0.98	Q				
0+35	0.0344	1.08	Q				
0+40	0.0423	1.15	Q				

0+45	0.0505	1.19	Q					
0+50	0.0589	1.22	Q					
0+55	0.0674	1.23	Q					
1+ 0	0.0761	1.26	Q					
1+ 5	0.0853	1.33	Q					
1+10	0.0949	1.39	Q					
1+15	0.1046	1.42	Q					
1+20	0.1145	1.43	Q					
1+25	0.1244	1.44	Q					
1+30	0.1343	1.44	Q					
1+35	0.1443	1.45	QV					
1+40	0.1543	1.45	QV					
1+45	0.1643	1.45	QV					
1+50	0.1743	1.46	QV					
1+55	0.1844	1.46	QV					
2+ 0	0.1945	1.47	QV					
2+ 5	0.2050	1.52	QV					
2+10	0.2155	1.52	QV					
2+15	0.2262	1.55	QV					
2+20	0.2372	1.60	QV					
2+25	0.2483	1.61	QV					
2+30	0.2594	1.62	QV					
2+35	0.2706	1.63	QV					
2+40	0.2818	1.63	QV					
2+45	0.2937	1.72	Q V					
2+50	0.3079	2.07	QV					
2+55	0.3241	2.35	QV					
3+ 0	0.3411	2.46	QV					
3+ 5	0.3585	2.53	QV					
3+10	0.3772	2.72	QV					
3+15	0.4004	3.36	QV					
3+20	0.4271	3.87	Q					
3+25	0.4562	4.23	QV					
3+30	0.4914	5.11	QV					
3+35	0.5358	6.45	Q					
3+40	0.5895	7.80	Q					
3+45	0.6500	8.78	VQ					
3+50	0.7176	9.81	Q					
3+55	0.7913	10.71	VQ					
4+ 0	0.8719	11.70	Q					
4+ 5	0.9585	12.58	VQ					
4+10	1.0529	13.71	Q					
4+15	1.1577	15.21	Q					
4+20	1.2735	16.81	VQ					
4+25	1.4008	18.49	VQ					
4+30	1.5390	20.06	VQ					
4+35	1.6850	21.20	VQ					
4+40	1.8398	22.48	Q					
4+45	2.0055	24.06	Q					
4+50	2.1818	25.60	QV					
4+55	2.3658	26.71	QV					
5+ 0	2.5585	27.98	Q V					
5+ 5	2.7662	30.16	Q V					
5+10	3.0065	34.88	QV					

[illegible]

Unit Hydrograph Analysis

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Study date 04/25/14 File: 32786A2N2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 2 Existing Condition

Drainage Area = 67.20 (Ac.) = 0.105 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 67.20 (Ac.) = 0.105 Sq. Mi.
Length along longest watercourse = 3448.00 (Ft.)
Length along longest watercourse measured to centroid = 2257.00 (Ft.)
Length along longest watercourse = 0.653 Mi.
Length along longest watercourse measured to centroid = 0.427 Mi.
Difference in elevation = 280.00 (Ft.)
Slope along watercourse = 428.7703 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.140 Hr.
Lag time = 8.41 Min.
25% of lag time = 2.10 Min.
40% of lag time = 3.36 Min.
Unit time = 5.00 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]
67.20	2.48	166.66

100 YEAR Area rainfall data:

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

67.20

6.90

463.68

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 4.298 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 4.298 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
36.500	79.00	0.000
30.700	84.00	0.000
Total Area Entered = 67.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
79.0	79.0	0.256	0.000	0.256	0.543	0.139
84.0	84.0	0.198	0.000	0.198	0.457	0.091
Sum (F) =						0.230

Area averaged mean soil loss (F) (In/Hr) = 0.230

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
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	59.456	8.092
2	0.167	118.911	33.581
3	0.250	178.367	26.758
4	0.333	237.823	10.402
5	0.417	297.278	6.129
6	0.500	356.734	4.151
7	0.583	416.190	2.964
8	0.667	475.645	2.080
9	0.750	535.101	1.720
10	0.833	594.557	1.281
11	0.917	654.012	0.979
12	1.000	713.468	0.699
13	1.083	772.924	0.595
14	1.167	832.379	0.568
Sum =		100.000	Sum= 67.725

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.034	(0.407)	0.031	0.003
2	0.17	0.07	0.034	(0.405)	0.031	0.003
3	0.25	0.07	0.034	(0.404)	0.031	0.003
4	0.33	0.10	0.052	(0.402)	0.046	0.005
5	0.42	0.10	0.052	(0.401)	0.046	0.005
6	0.50	0.10	0.052	(0.399)	0.046	0.005
7	0.58	0.10	0.052	(0.398)	0.046	0.005
8	0.67	0.10	0.052	(0.396)	0.046	0.005
9	0.75	0.10	0.052	(0.394)	0.046	0.005
10	0.83	0.13	0.069	(0.393)	0.062	0.007
11	0.92	0.13	0.069	(0.391)	0.062	0.007
12	1.00	0.13	0.069	(0.390)	0.062	0.007
13	1.08	0.10	0.052	(0.388)	0.046	0.005
14	1.17	0.10	0.052	(0.387)	0.046	0.005
15	1.25	0.10	0.052	(0.385)	0.046	0.005
16	1.33	0.10	0.052	(0.384)	0.046	0.005
17	1.42	0.10	0.052	(0.382)	0.046	0.005
18	1.50	0.10	0.052	(0.381)	0.046	0.005
19	1.58	0.10	0.052	(0.379)	0.046	0.005
20	1.67	0.10	0.052	(0.378)	0.046	0.005
21	1.75	0.10	0.052	(0.376)	0.046	0.005
22	1.83	0.13	0.069	(0.375)	0.062	0.007
23	1.92	0.13	0.069	(0.373)	0.062	0.007
24	2.00	0.13	0.069	(0.372)	0.062	0.007
25	2.08	0.13	0.069	(0.370)	0.062	0.007
26	2.17	0.13	0.069	(0.369)	0.062	0.007
27	2.25	0.13	0.069	(0.367)	0.062	0.007
28	2.33	0.13	0.069	(0.366)	0.062	0.007
29	2.42	0.13	0.069	(0.364)	0.062	0.007
30	2.50	0.13	0.069	(0.363)	0.062	0.007
31	2.58	0.17	0.086	(0.361)	0.077	0.009
32	2.67	0.17	0.086	(0.360)	0.077	0.009
33	2.75	0.17	0.086	(0.358)	0.077	0.009
34	2.83	0.17	0.086	(0.357)	0.077	0.009
35	2.92	0.17	0.086	(0.355)	0.077	0.009
36	3.00	0.17	0.086	(0.354)	0.077	0.009
37	3.08	0.17	0.086	(0.352)	0.077	0.009
38	3.17	0.17	0.086	(0.351)	0.077	0.009
39	3.25	0.17	0.086	(0.349)	0.077	0.009
40	3.33	0.17	0.086	(0.348)	0.077	0.009
41	3.42	0.17	0.086	(0.346)	0.077	0.009
42	3.50	0.17	0.086	(0.345)	0.077	0.009
43	3.58	0.17	0.086	(0.344)	0.077	0.009
44	3.67	0.17	0.086	(0.342)	0.077	0.009
45	3.75	0.17	0.086	(0.341)	0.077	0.009
46	3.83	0.20	0.103	(0.339)	0.093	0.010
47	3.92	0.20	0.103	(0.338)	0.093	0.010

48	4.00	0.20	0.103	(0.336)	0.093	0.010
49	4.08	0.20	0.103	(0.335)	0.093	0.010
50	4.17	0.20	0.103	(0.334)	0.093	0.010
51	4.25	0.20	0.103	(0.332)	0.093	0.010
52	4.33	0.23	0.120	(0.331)	0.108	0.012
53	4.42	0.23	0.120	(0.329)	0.108	0.012
54	4.50	0.23	0.120	(0.328)	0.108	0.012
55	4.58	0.23	0.120	(0.326)	0.108	0.012
56	4.67	0.23	0.120	(0.325)	0.108	0.012
57	4.75	0.23	0.120	(0.324)	0.108	0.012
58	4.83	0.27	0.138	(0.322)	0.124	0.014
59	4.92	0.27	0.138	(0.321)	0.124	0.014
60	5.00	0.27	0.138	(0.319)	0.124	0.014
61	5.08	0.20	0.103	(0.318)	0.093	0.010
62	5.17	0.20	0.103	(0.317)	0.093	0.010
63	5.25	0.20	0.103	(0.315)	0.093	0.010
64	5.33	0.23	0.120	(0.314)	0.108	0.012
65	5.42	0.23	0.120	(0.313)	0.108	0.012
66	5.50	0.23	0.120	(0.311)	0.108	0.012
67	5.58	0.27	0.138	(0.310)	0.124	0.014
68	5.67	0.27	0.138	(0.308)	0.124	0.014
69	5.75	0.27	0.138	(0.307)	0.124	0.014
70	5.83	0.27	0.138	(0.306)	0.124	0.014
71	5.92	0.27	0.138	(0.304)	0.124	0.014
72	6.00	0.27	0.138	(0.303)	0.124	0.014
73	6.08	0.30	0.155	(0.302)	0.139	0.015
74	6.17	0.30	0.155	(0.300)	0.139	0.015
75	6.25	0.30	0.155	(0.299)	0.139	0.015
76	6.33	0.30	0.155	(0.298)	0.139	0.015
77	6.42	0.30	0.155	(0.296)	0.139	0.015
78	6.50	0.30	0.155	(0.295)	0.139	0.015
79	6.58	0.33	0.172	(0.294)	0.155	0.017
80	6.67	0.33	0.172	(0.292)	0.155	0.017
81	6.75	0.33	0.172	(0.291)	0.155	0.017
82	6.83	0.33	0.172	(0.290)	0.155	0.017
83	6.92	0.33	0.172	(0.288)	0.155	0.017
84	7.00	0.33	0.172	(0.287)	0.155	0.017
85	7.08	0.33	0.172	(0.286)	0.155	0.017
86	7.17	0.33	0.172	(0.285)	0.155	0.017
87	7.25	0.33	0.172	(0.283)	0.155	0.017
88	7.33	0.37	0.189	(0.282)	0.170	0.019
89	7.42	0.37	0.189	(0.281)	0.170	0.019
90	7.50	0.37	0.189	(0.279)	0.170	0.019
91	7.58	0.40	0.206	(0.278)	0.186	0.021
92	7.67	0.40	0.206	(0.277)	0.186	0.021
93	7.75	0.40	0.206	(0.276)	0.186	0.021
94	7.83	0.43	0.223	(0.274)	0.201	0.022
95	7.92	0.43	0.223	(0.273)	0.201	0.022
96	8.00	0.43	0.223	(0.272)	0.201	0.022
97	8.08	0.50	0.258	(0.270)	0.232	0.026
98	8.17	0.50	0.258	(0.269)	0.232	0.026
99	8.25	0.50	0.258	(0.268)	0.232	0.026
100	8.33	0.50	0.258	(0.267)	0.232	0.026
101	8.42	0.50	0.258	(0.265)	0.232	0.026

102	8.50	0.50	0.258	(0.264)	0.232	0.026
103	8.58	0.53	0.275	(0.263)	0.248	0.028
104	8.67	0.53	0.275	(0.262)	0.248	0.028
105	8.75	0.53	0.275	(0.260)	0.248	0.028
106	8.83	0.57	0.292	0.259	(0.263)	0.033
107	8.92	0.57	0.292	0.258	(0.263)	0.034
108	9.00	0.57	0.292	0.257	(0.263)	0.035
109	9.08	0.63	0.327	0.256	(0.294)	0.071
110	9.17	0.63	0.327	0.254	(0.294)	0.072
111	9.25	0.63	0.327	0.253	(0.294)	0.073
112	9.33	0.67	0.344	0.252	(0.309)	0.092
113	9.42	0.67	0.344	0.251	(0.309)	0.093
114	9.50	0.67	0.344	0.250	(0.309)	0.094
115	9.58	0.70	0.361	0.248	(0.325)	0.113
116	9.67	0.70	0.361	0.247	(0.325)	0.114
117	9.75	0.70	0.361	0.246	(0.325)	0.115
118	9.83	0.73	0.378	0.245	(0.340)	0.133
119	9.92	0.73	0.378	0.244	(0.340)	0.135
120	10.00	0.73	0.378	0.242	(0.340)	0.136
121	10.08	0.50	0.258	(0.241)	0.232	0.026
122	10.17	0.50	0.258	(0.240)	0.232	0.026
123	10.25	0.50	0.258	(0.239)	0.232	0.026
124	10.33	0.50	0.258	(0.238)	0.232	0.026
125	10.42	0.50	0.258	(0.237)	0.232	0.026
126	10.50	0.50	0.258	(0.235)	0.232	0.026
127	10.58	0.67	0.344	0.234	(0.309)	0.110
128	10.67	0.67	0.344	0.233	(0.309)	0.111
129	10.75	0.67	0.344	0.232	(0.309)	0.112
130	10.83	0.67	0.344	0.231	(0.309)	0.113
131	10.92	0.67	0.344	0.230	(0.309)	0.114
132	11.00	0.67	0.344	0.229	(0.309)	0.115
133	11.08	0.63	0.327	0.227	(0.294)	0.099
134	11.17	0.63	0.327	0.226	(0.294)	0.100
135	11.25	0.63	0.327	0.225	(0.294)	0.101
136	11.33	0.63	0.327	0.224	(0.294)	0.102
137	11.42	0.63	0.327	0.223	(0.294)	0.104
138	11.50	0.63	0.327	0.222	(0.294)	0.105
139	11.58	0.57	0.292	0.221	(0.263)	0.071
140	11.67	0.57	0.292	0.220	(0.263)	0.073
141	11.75	0.57	0.292	0.219	(0.263)	0.074
142	11.83	0.60	0.309	0.218	(0.279)	0.092
143	11.92	0.60	0.309	0.216	(0.279)	0.093
144	12.00	0.60	0.309	0.215	(0.279)	0.094
145	12.08	0.83	0.430	0.214	(0.387)	0.215
146	12.17	0.83	0.430	0.213	(0.387)	0.217
147	12.25	0.83	0.430	0.212	(0.387)	0.218
148	12.33	0.87	0.447	0.211	(0.402)	0.236
149	12.42	0.87	0.447	0.210	(0.402)	0.237
150	12.50	0.87	0.447	0.209	(0.402)	0.238
151	12.58	0.93	0.481	0.208	(0.433)	0.273
152	12.67	0.93	0.481	0.207	(0.433)	0.274
153	12.75	0.93	0.481	0.206	(0.433)	0.276
154	12.83	0.97	0.499	0.205	(0.449)	0.294
155	12.92	0.97	0.499	0.204	(0.449)	0.295

156	13.00	0.97	0.499	0.203	(0.449)	0.296
157	13.08	1.13	0.585	0.202	(0.526)	0.383
158	13.17	1.13	0.585	0.201	(0.526)	0.384
159	13.25	1.13	0.585	0.200	(0.526)	0.385
160	13.33	1.13	0.585	0.199	(0.526)	0.386
161	13.42	1.13	0.585	0.198	(0.526)	0.387
162	13.50	1.13	0.585	0.197	(0.526)	0.388
163	13.58	0.77	0.395	0.196	(0.356)	0.200
164	13.67	0.77	0.395	0.195	(0.356)	0.201
165	13.75	0.77	0.395	0.194	(0.356)	0.202
166	13.83	0.77	0.395	0.193	(0.356)	0.203
167	13.92	0.77	0.395	0.192	(0.356)	0.204
168	14.00	0.77	0.395	0.191	(0.356)	0.205
169	14.08	0.90	0.464	0.190	(0.418)	0.274
170	14.17	0.90	0.464	0.189	(0.418)	0.275
171	14.25	0.90	0.464	0.188	(0.418)	0.276
172	14.33	0.87	0.447	0.187	(0.402)	0.260
173	14.42	0.87	0.447	0.186	(0.402)	0.261
174	14.50	0.87	0.447	0.185	(0.402)	0.262
175	14.58	0.87	0.447	0.184	(0.402)	0.263
176	14.67	0.87	0.447	0.183	(0.402)	0.264
177	14.75	0.87	0.447	0.182	(0.402)	0.265
178	14.83	0.83	0.430	0.181	(0.387)	0.249
179	14.92	0.83	0.430	0.180	(0.387)	0.250
180	15.00	0.83	0.430	0.179	(0.387)	0.250
181	15.08	0.80	0.413	0.178	(0.371)	0.234
182	15.17	0.80	0.413	0.177	(0.371)	0.235
183	15.25	0.80	0.413	0.177	(0.371)	0.236
184	15.33	0.77	0.395	0.176	(0.356)	0.220
185	15.42	0.77	0.395	0.175	(0.356)	0.221
186	15.50	0.77	0.395	0.174	(0.356)	0.222
187	15.58	0.63	0.327	0.173	(0.294)	0.154
188	15.67	0.63	0.327	0.172	(0.294)	0.155
189	15.75	0.63	0.327	0.171	(0.294)	0.155
190	15.83	0.63	0.327	0.170	(0.294)	0.156
191	15.92	0.63	0.327	0.169	(0.294)	0.157
192	16.00	0.63	0.327	0.169	(0.294)	0.158
193	16.08	0.13	0.069	(0.168)	0.062	0.007
194	16.17	0.13	0.069	(0.167)	0.062	0.007
195	16.25	0.13	0.069	(0.166)	0.062	0.007
196	16.33	0.13	0.069	(0.165)	0.062	0.007
197	16.42	0.13	0.069	(0.164)	0.062	0.007
198	16.50	0.13	0.069	(0.163)	0.062	0.007
199	16.58	0.10	0.052	(0.163)	0.046	0.005
200	16.67	0.10	0.052	(0.162)	0.046	0.005
201	16.75	0.10	0.052	(0.161)	0.046	0.005
202	16.83	0.10	0.052	(0.160)	0.046	0.005
203	16.92	0.10	0.052	(0.159)	0.046	0.005
204	17.00	0.10	0.052	(0.159)	0.046	0.005
205	17.08	0.17	0.086	(0.158)	0.077	0.009
206	17.17	0.17	0.086	(0.157)	0.077	0.009
207	17.25	0.17	0.086	(0.156)	0.077	0.009
208	17.33	0.17	0.086	(0.155)	0.077	0.009
209	17.42	0.17	0.086	(0.155)	0.077	0.009

210	17.50	0.17	0.086	(0.154)	0.077	0.009
211	17.58	0.17	0.086	(0.153)	0.077	0.009
212	17.67	0.17	0.086	(0.152)	0.077	0.009
213	17.75	0.17	0.086	(0.152)	0.077	0.009
214	17.83	0.13	0.069	(0.151)	0.062	0.007
215	17.92	0.13	0.069	(0.150)	0.062	0.007
216	18.00	0.13	0.069	(0.149)	0.062	0.007
217	18.08	0.13	0.069	(0.149)	0.062	0.007
218	18.17	0.13	0.069	(0.148)	0.062	0.007
219	18.25	0.13	0.069	(0.147)	0.062	0.007
220	18.33	0.13	0.069	(0.146)	0.062	0.007
221	18.42	0.13	0.069	(0.146)	0.062	0.007
222	18.50	0.13	0.069	(0.145)	0.062	0.007
223	18.58	0.10	0.052	(0.144)	0.046	0.005
224	18.67	0.10	0.052	(0.144)	0.046	0.005
225	18.75	0.10	0.052	(0.143)	0.046	0.005
226	18.83	0.07	0.034	(0.142)	0.031	0.003
227	18.92	0.07	0.034	(0.142)	0.031	0.003
228	19.00	0.07	0.034	(0.141)	0.031	0.003
229	19.08	0.10	0.052	(0.140)	0.046	0.005
230	19.17	0.10	0.052	(0.140)	0.046	0.005
231	19.25	0.10	0.052	(0.139)	0.046	0.005
232	19.33	0.13	0.069	(0.138)	0.062	0.007
233	19.42	0.13	0.069	(0.138)	0.062	0.007
234	19.50	0.13	0.069	(0.137)	0.062	0.007
235	19.58	0.10	0.052	(0.136)	0.046	0.005
236	19.67	0.10	0.052	(0.136)	0.046	0.005
237	19.75	0.10	0.052	(0.135)	0.046	0.005
238	19.83	0.07	0.034	(0.135)	0.031	0.003
239	19.92	0.07	0.034	(0.134)	0.031	0.003
240	20.00	0.07	0.034	(0.133)	0.031	0.003
241	20.08	0.10	0.052	(0.133)	0.046	0.005
242	20.17	0.10	0.052	(0.132)	0.046	0.005
243	20.25	0.10	0.052	(0.132)	0.046	0.005
244	20.33	0.10	0.052	(0.131)	0.046	0.005
245	20.42	0.10	0.052	(0.130)	0.046	0.005
246	20.50	0.10	0.052	(0.130)	0.046	0.005
247	20.58	0.10	0.052	(0.129)	0.046	0.005
248	20.67	0.10	0.052	(0.129)	0.046	0.005
249	20.75	0.10	0.052	(0.128)	0.046	0.005
250	20.83	0.07	0.034	(0.128)	0.031	0.003
251	20.92	0.07	0.034	(0.127)	0.031	0.003
252	21.00	0.07	0.034	(0.127)	0.031	0.003
253	21.08	0.10	0.052	(0.126)	0.046	0.005
254	21.17	0.10	0.052	(0.126)	0.046	0.005
255	21.25	0.10	0.052	(0.125)	0.046	0.005
256	21.33	0.07	0.034	(0.125)	0.031	0.003
257	21.42	0.07	0.034	(0.124)	0.031	0.003
258	21.50	0.07	0.034	(0.124)	0.031	0.003
259	21.58	0.10	0.052	(0.123)	0.046	0.005
260	21.67	0.10	0.052	(0.123)	0.046	0.005
261	21.75	0.10	0.052	(0.122)	0.046	0.005
262	21.83	0.07	0.034	(0.122)	0.031	0.003
263	21.92	0.07	0.034	(0.122)	0.031	0.003

264	22.00	0.07	0.034	(0.121)	0.031	0.003
265	22.08	0.10	0.052	(0.121)	0.046	0.005
266	22.17	0.10	0.052	(0.120)	0.046	0.005
267	22.25	0.10	0.052	(0.120)	0.046	0.005
268	22.33	0.07	0.034	(0.120)	0.031	0.003
269	22.42	0.07	0.034	(0.119)	0.031	0.003
270	22.50	0.07	0.034	(0.119)	0.031	0.003
271	22.58	0.07	0.034	(0.119)	0.031	0.003
272	22.67	0.07	0.034	(0.118)	0.031	0.003
273	22.75	0.07	0.034	(0.118)	0.031	0.003
274	22.83	0.07	0.034	(0.118)	0.031	0.003
275	22.92	0.07	0.034	(0.117)	0.031	0.003
276	23.00	0.07	0.034	(0.117)	0.031	0.003
277	23.08	0.07	0.034	(0.117)	0.031	0.003
278	23.17	0.07	0.034	(0.117)	0.031	0.003
279	23.25	0.07	0.034	(0.116)	0.031	0.003
280	23.33	0.07	0.034	(0.116)	0.031	0.003
281	23.42	0.07	0.034	(0.116)	0.031	0.003
282	23.50	0.07	0.034	(0.116)	0.031	0.003
283	23.58	0.07	0.034	(0.115)	0.031	0.003
284	23.67	0.07	0.034	(0.115)	0.031	0.003
285	23.75	0.07	0.034	(0.115)	0.031	0.003
286	23.83	0.07	0.034	(0.115)	0.031	0.003
287	23.92	0.07	0.034	(0.115)	0.031	0.003
288	24.00	0.07	0.034	(0.115)	0.031	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 17.1

Flood volume = Effective rainfall 1.43(In)

times area 67.2(Ac.)/[(In)/(Ft.)) = 8.0(Ac.Ft)

Total soil loss = 2.87(In)

Total soil loss = 16.080(Ac.Ft)

Total rainfall = 4.30(In)

Flood volume = 347956.3 Cubic Feet

Total soil loss = 700446.4 Cubic Feet

Peak flow rate of this hydrograph = 25.399(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0001	0.02	Q				
0+10	0.0008	0.10	Q				
0+15	0.0019	0.16	Q				
0+20	0.0032	0.19	Q				
0+25	0.0049	0.25	Q				
0+30	0.0069	0.29	Q				
0+35	0.0090	0.31	Q				
0+40	0.0112	0.32	Q				

0+45	0.0135	0.33	Q
0+50	0.0158	0.34	Q
0+55	0.0185	0.39	Q
1+ 0	0.0214	0.42	Q
1+ 5	0.0243	0.43	Q
1+10	0.0271	0.40	Q
1+15	0.0296	0.37	Q
1+20	0.0321	0.36	Q
1+25	0.0346	0.36	Q
1+30	0.0371	0.36	Q
1+35	0.0395	0.36	Q
1+40	0.0420	0.35	Q
1+45	0.0444	0.35	Q
1+50	0.0469	0.36	Q
1+55	0.0496	0.40	Q
2+ 0	0.0526	0.43	Q
2+ 5	0.0557	0.44	Q
2+10	0.0587	0.45	Q
2+15	0.0619	0.45	Q
2+20	0.0650	0.46	Q
2+25	0.0682	0.46	Q
2+30	0.0714	0.46	Q
2+35	0.0746	0.47	Q
2+40	0.0781	0.51	Q
2+45	0.0819	0.54	Q
2+50	0.0857	0.56	Q
2+55	0.0896	0.56	Q
3+ 0	0.0935	0.57	Q
3+ 5	0.0975	0.57	Q
3+10	0.1014	0.58	Q
3+15	0.1054	0.58	Q
3+20	0.1094	0.58	Q
3+25	0.1134	0.58	Q
3+30	0.1174	0.58	Q
3+35	0.1214	0.58	Q
3+40	0.1254	0.58	Q
3+45	0.1294	0.58	Q
3+50	0.1335	0.59	Q
3+55	0.1379	0.63	Q
4+ 0	0.1424	0.66	Q
4+ 5	0.1471	0.67	Q
4+10	0.1518	0.68	Q
4+15	0.1565	0.69	Q
4+20	0.1613	0.70	Q
4+25	0.1664	0.74	Q
4+30	0.1717	0.77	VQ
4+35	0.1772	0.79	VQ
4+40	0.1826	0.80	VQ
4+45	0.1882	0.80	VQ
4+50	0.1938	0.81	VQ
4+55	0.1997	0.86	VQ
5+ 0	0.2058	0.89	Q
5+ 5	0.2119	0.89	Q
5+10	0.2175	0.82	Q

5+15	0.2227	0.76	Q				
5+20	0.2279	0.75	QV				
5+25	0.2332	0.78	Q				
5+30	0.2387	0.80	Q				
5+35	0.2443	0.82	Q				
5+40	0.2503	0.86	Q				
5+45	0.2564	0.89	Q				
5+50	0.2626	0.90	Q				
5+55	0.2689	0.91	Q				
6+ 0	0.2752	0.92	Q				
6+ 5	0.2816	0.93	Q				
6+10	0.2883	0.97	Q				
6+15	0.2952	1.01	Q				
6+20	0.3023	1.02	Q				
6+25	0.3093	1.03	Q				
6+30	0.3165	1.03	Q				
6+35	0.3237	1.05	Q				
6+40	0.3312	1.09	Q				
6+45	0.3389	1.12	Q				
6+50	0.3468	1.14	Q				
6+55	0.3546	1.15	Q				
7+ 0	0.3626	1.15	Q				
7+ 5	0.3705	1.16	Q				
7+10	0.3785	1.16	Q				
7+15	0.3865	1.16	Q				
7+20	0.3946	1.17	Q				
7+25	0.4029	1.21	QV				
7+30	0.4115	1.24	QV				
7+35	0.4202	1.27	QV				
7+40	0.4292	1.31	QV				
7+45	0.4385	1.35	QV				
7+50	0.4480	1.37	QV				
7+55	0.4577	1.42	QV				
8+ 0	0.4678	1.46	QV				
8+ 5	0.4781	1.50	QV				
8+10	0.4890	1.58	Q				
8+15	0.5004	1.65	Q				
8+20	0.5120	1.68	Q				
8+25	0.5238	1.70	Q				
8+30	0.5356	1.72	Q				
8+35	0.5475	1.73	Q				
8+40	0.5598	1.78	Q				
8+45	0.5723	1.82	Q				
8+50	0.5851	1.86	Q				
8+55	0.5989	2.00	Q				
9+ 0	0.6137	2.14	QV				
9+ 5	0.6304	2.43	Q				
9+10	0.6532	3.31	VQ				
9+15	0.6809	4.02	V Q				
9+20	0.7115	4.44	V Q				
9+25	0.7463	5.06	V Q				
9+30	0.7846	5.55	V Q				
9+35	0.8254	5.92	V Q				
9+40	0.8702	6.51	V Q				

9+45	0.9184	7.00	V	Q					
9+50	0.9691	7.36	V	Q					
9+55	1.0239	7.95	V	Q					
10+ 0	1.0819	8.43	V		Q				
10+ 5	1.1376	8.08	V		Q				
10+10	1.1771	5.75	V	Q					
10+15	1.2037	3.85	QV						
10+20	1.2254	3.15	Q	V					
10+25	1.2443	2.75	Q	V					
10+30	1.2614	2.48	Q	V					
10+35	1.2803	2.74	Q	V					
10+40	1.3115	4.52	Q						
10+45	1.3525	5.96	VQ						
10+50	1.3973	6.51	V	Q					
10+55	1.4446	6.86	V	Q					
11+ 0	1.4935	7.11	V	Q					
11+ 5	1.5431	7.21	V	Q					
11+10	1.5911	6.96	V	Q					
11+15	1.6380	6.82	VQ						
11+20	1.6852	6.84	VQ						
11+25	1.7327	6.90	VQ						
11+30	1.7807	6.97	VQ						
11+35	1.8279	6.85	Q						
11+40	1.8702	6.15	QV						
11+45	1.9087	5.58	Q	V					
11+50	1.9465	5.49	Q	V					
11+55	1.9865	5.81	Q	V					
12+ 0	2.0284	6.09	Q	V					
12+ 5	2.0757	6.87	QV						
12+10	2.1425	9.69	V	Q					
12+15	2.2248	11.96	V		Q				
12+20	2.3142	12.98	V			Q			
12+25	2.4102	13.94	V				Q		
12+30	2.5112	14.67	V					Q	
12+35	2.6165	15.29	V						Q
12+40	2.7294	16.39	V						
12+45	2.8484	17.28	V						Q
12+50	2.9712	17.83	V						Q
12+55	3.0989	18.55	V						Q
13+ 0	3.2304	19.10	V						Q
13+ 5	3.3675	19.90	V						Q
13+10	3.5197	22.10	V						Q
13+15	3.6838	23.83	V						Q
13+20	3.8530	24.57	V						Q
13+25	4.0255	25.05	V						Q
13+30	4.2005	25.40	V						Q
13+35	4.3701	24.63	V						Q
13+40	4.5116	20.54	V						Q
13+45	4.6307	17.29							Q
13+50	4.7416	16.11							Q
13+55	4.8480	15.45							Q
14+ 0	4.9515	15.03							Q
14+ 5	5.0557	15.13							Q
14+10	5.1695	16.52							Q

14+15	5.2909	17.62
14+20	5.4142	17.91
14+25	5.5364	17.74
14+30	5.6576	17.60
14+35	5.7789	17.61
14+40	5.9003	17.62
14+45	6.0223	17.72
14+50	6.1443	17.72
14+55	6.2642	17.41
15+ 0	6.3825	17.17
15+ 5	6.4998	17.03
15+10	6.6145	16.65
15+15	6.7270	16.34
15+20	6.8383	16.15
15+25	6.9465	15.72
15+30	7.0526	15.40
15+35	7.1553	14.91
15+40	7.2469	13.30
15+45	7.3298	12.04
15+50	7.4094	11.56
15+55	7.4871	11.29
16+ 0	7.5638	11.13
16+ 5	7.6340	10.19
16+10	7.6799	6.67
16+15	7.7065	3.86
16+20	7.7254	2.74
16+25	7.7397	2.07
16+30	7.7509	1.62
16+35	7.7597	1.28
16+40	7.7667	1.01
16+45	7.7722	0.80
16+50	7.7768	0.66
16+55	7.7806	0.56
17+ 0	7.7839	0.48
17+ 5	7.7869	0.44
17+10	7.7901	0.45
17+15	7.7936	0.51
17+20	7.7973	0.54
17+25	7.8011	0.55
17+30	7.8049	0.56
17+35	7.8088	0.56
17+40	7.8127	0.57
17+45	7.8167	0.57
17+50	7.8206	0.57
17+55	7.8242	0.53
18+ 0	7.8277	0.50
18+ 5	7.8310	0.49
18+10	7.8344	0.48
18+15	7.8377	0.48
18+20	7.8409	0.48
18+25	7.8442	0.47
18+30	7.8474	0.47
18+35	7.8506	0.46
18+40	7.8535	0.42

18+45	7.8562	0.39	Q				V
18+50	7.8587	0.37	Q				V
18+55	7.8609	0.32	Q				V
19+ 0	7.8628	0.28	Q				V
19+ 5	7.8647	0.28	Q				V
19+10	7.8668	0.31	Q				V
19+15	7.8691	0.33	Q				V
19+20	7.8715	0.35	Q				V
19+25	7.8742	0.39	Q				V
19+30	7.8771	0.42	Q				V
19+35	7.8800	0.43	Q				V
19+40	7.8827	0.40	Q				V
19+45	7.8853	0.37	Q				V
19+50	7.8877	0.35	Q				V
19+55	7.8898	0.31	Q				V
20+ 0	7.8917	0.28	Q				V
20+ 5	7.8936	0.27	Q				V
20+10	7.8957	0.30	Q				V
20+15	7.8980	0.33	Q				V
20+20	7.9003	0.34	Q				V
20+25	7.9026	0.34	Q				V
20+30	7.9050	0.34	Q				V
20+35	7.9074	0.34	Q				V
20+40	7.9097	0.34	Q				V
20+45	7.9121	0.35	Q				V
20+50	7.9145	0.34	Q				V
20+55	7.9165	0.30	Q				V
21+ 0	7.9184	0.27	Q				V
21+ 5	7.9202	0.27	Q				V
21+10	7.9223	0.30	Q				V
21+15	7.9245	0.33	Q				V
21+20	7.9267	0.32	Q				V
21+25	7.9287	0.29	Q				V
21+30	7.9305	0.26	Q				V
21+35	7.9323	0.26	Q				V
21+40	7.9344	0.29	Q				V
21+45	7.9366	0.32	Q				V
21+50	7.9388	0.32	Q				V
21+55	7.9408	0.29	Q				V
22+ 0	7.9426	0.26	Q				V
22+ 5	7.9444	0.26	Q				V
22+10	7.9464	0.29	Q				V
22+15	7.9486	0.32	Q				V
22+20	7.9508	0.32	Q				V
22+25	7.9528	0.29	Q				V
22+30	7.9546	0.26	Q				V
22+35	7.9563	0.25	Q				V
22+40	7.9580	0.25	Q				V
22+45	7.9597	0.24	Q				V
22+50	7.9613	0.24	Q				V
22+55	7.9630	0.24	Q				V
23+ 0	7.9646	0.24	Q				V
23+ 5	7.9662	0.24	Q				V
23+10	7.9679	0.24	Q				V

23+15	7.9695	0.23	Q				V
23+20	7.9711	0.23	Q				V
23+25	7.9727	0.23	Q				V
23+30	7.9743	0.23	Q				V
23+35	7.9759	0.23	Q				V
23+40	7.9775	0.23	Q				V
23+45	7.9791	0.23	Q				V
23+50	7.9807	0.23	Q				V
23+55	7.9823	0.23	Q				V
24+ 0	7.9839	0.23	Q				V
24+ 5	7.9854	0.21	Q				V
24+10	7.9863	0.14	Q				V
24+15	7.9868	0.07	Q				V
24+20	7.9872	0.05	Q				V
24+25	7.9874	0.04	Q				V
24+30	7.9876	0.03	Q				V
24+35	7.9877	0.02	Q				V
24+40	7.9878	0.01	Q				V
24+45	7.9879	0.01	Q				V
24+50	7.9879	0.01	Q				V
24+55	7.9879	0.00	Q				V
25+ 0	7.9880	0.00	Q				V
25+ 5	7.9880	0.00	Q				V

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
47.10	0.58	27.32

100 YEAR Area rainfall data:

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

47.10

1.45

68.30

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.313)	0.153	0.153
2	0.17	4.50	0.313	(0.313)	0.157	0.157
3	0.25	5.40	0.376	(0.313)	0.188	0.188
4	0.33	5.40	0.376	(0.313)	0.188	0.188
5	0.42	5.70	0.397	(0.313)	0.198	0.198
6	0.50	6.40	0.445	(0.313)	0.223	0.223
7	0.58	7.90	0.550	(0.313)	0.275	0.275
8	0.67	9.10	0.633	0.313	(0.317)	0.320
9	0.75	12.80	0.890	0.313	(0.445)	0.577
10	0.83	25.60	1.781	0.313	(0.890)	1.468
11	0.92	7.90	0.550	(0.313)	0.275	0.275
12	1.00	4.90	0.341	(0.313)	0.170	0.170

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.2

Flood volume = Effective rainfall 0.35(In)
times area 47.1(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.23(In)
Total soil loss = 0.904(Ac.Ft)
Total rainfall = 0.58(In)
Flood volume = 59723.7 Cubic Feet
Total soil loss = 39398.4 Cubic Feet

Peak flow rate of this hydrograph = 42.043(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0148	2.15	VQ				
0+10	0.0539	5.68	V Q				
0+15	0.1027	7.08	V Q				
0+20	0.1592	8.20	V Q				
0+25	0.2195	8.75	VQ				
0+30	0.2854	9.57	QV				
0+35	0.3608	10.96	Q V				
0+40	0.4503	12.98	Q	V			
0+45	0.5742	18.00		Q V			
0+50	0.8276	36.79			V	Q	
0+55	1.1172	42.04				VQ	
1+ 0	1.2500	19.28		Q			V
1+ 5	1.3210	10.32		Q			V
1+10	1.3506	4.29	Q				V
1+15	1.3664	2.29	Q				V
1+20	1.3699	0.51	Q				V
1+25	1.3711	0.17	Q				V

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 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]
47.10	0.98	46.16

100 YEAR Area rainfall data:

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

47.10

2.48

116.81

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 0.980 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 0.980 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	1.30	0.153	(0.313)	0.076	0.076
2	0.17	1.30	0.153	(0.313)	0.076	0.076
3	0.25	1.10	0.129	(0.313)	0.065	0.065
4	0.33	1.50	0.176	(0.313)	0.088	0.088
5	0.42	1.50	0.176	(0.313)	0.088	0.088
6	0.50	1.80	0.212	(0.313)	0.106	0.106
7	0.58	1.50	0.176	(0.313)	0.088	0.088
8	0.67	1.80	0.212	(0.313)	0.106	0.106
9	0.75	1.80	0.212	(0.313)	0.106	0.106
10	0.83	1.50	0.176	(0.313)	0.088	0.088
11	0.92	1.60	0.188	(0.313)	0.094	0.094
12	1.00	1.80	0.212	(0.313)	0.106	0.106
13	1.08	2.20	0.259	(0.313)	0.129	0.129
14	1.17	2.20	0.259	(0.313)	0.129	0.129
15	1.25	2.20	0.259	(0.313)	0.129	0.129
16	1.33	2.00	0.235	(0.313)	0.118	0.118
17	1.42	2.60	0.306	(0.313)	0.153	0.153
18	1.50	2.70	0.317	(0.313)	0.159	0.159
19	1.58	2.40	0.282	(0.313)	0.141	0.141
20	1.67	2.70	0.317	(0.313)	0.159	0.159
21	1.75	3.30	0.388	(0.313)	0.194	0.194
22	1.83	3.10	0.364	(0.313)	0.182	0.182
23	1.92	2.90	0.341	(0.313)	0.170	0.170
24	2.00	3.00	0.353	(0.313)	0.176	0.176
25	2.08	3.10	0.364	(0.313)	0.182	0.182
26	2.17	4.20	0.494	(0.313)	0.247	0.247
27	2.25	5.00	0.588	(0.313)	0.294	0.294
28	2.33	3.50	0.412	(0.313)	0.206	0.206
29	2.42	6.80	0.800	0.313	(0.400)	0.487
30	2.50	7.30	0.858	0.313	(0.429)	0.545
31	2.58	8.20	0.964	0.313	(0.482)	0.651
32	2.67	5.90	0.694	0.313	(0.347)	0.381
33	2.75	2.00	0.235	(0.313)	0.118	0.118
34	2.83	1.80	0.212	(0.313)	0.106	0.106
35	2.92	1.80	0.212	(0.313)	0.106	0.106
36	3.00	0.60	0.071	(0.313)	0.035	0.035

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.3

Flood volume = Effective rainfall 0.52(In)

times area 47.1(Ac.)/[(In)/(Ft.)] = 2.1(Ac.Ft)

Total soil loss = 0.46(In)

Total soil loss = 1.790(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 89541.3 Cubic Feet

Total soil loss = 77977.8 Cubic Feet

Peak flow rate of this hydrograph = 25.532(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0074	1.07	VQ					
0+10	0.0268	2.81	V Q					
0+15	0.0480	3.09	V Q					
0+20	0.0711	3.34	V Q					
0+25	0.0980	3.92	V Q					
0+30	0.1280	4.35	V Q					
0+35	0.1593	4.55	V Q					
0+40	0.1904	4.51	V Q					
0+45	0.2240	4.88	V Q					
0+50	0.2565	4.72	V Q					
0+55	0.2870	4.43	Q					
1+ 0	0.3189	4.64	Q					
1+ 5	0.3551	5.24	Q					
1+10	0.3953	5.84	Q					
1+15	0.4365	5.99	QV					
1+20	0.4772	5.91	Q V					
1+25	0.5198	6.18	Q V					
1+30	0.5682	7.02	Q V					
1+35	0.6169	7.08	Q V					
1+40	0.6654	7.04	Q V					
1+45	0.7197	7.88	Q V					
1+50	0.7790	8.62	Q V					
1+55	0.8370	8.42	Q V					
2+ 0	0.8939	8.26	Q V					
2+ 5	0.9521	8.45	Q V					
2+10	1.0176	9.51	Q V					
2+15	1.0979	11.66	Q					
2+20	1.1797	11.88	Q					
2+25	1.2779	14.26	Q					
2+30	1.4239	21.19	Q					
2+35	1.5997	25.53	Q					
2+40	1.7728	25.13	Q					
2+45	1.8853	16.33	Q					
2+50	1.9490	9.25	Q					
2+55	1.9971	6.99	Q					
3+ 0	2.0315	4.99	Q					
3+ 5	2.0468	2.23	Q					
3+10	2.0519	0.74	Q					
3+15	2.0543	0.34	Q					
3+20	2.0553	0.16	Q					
3+25	2.0556	0.04	Q					

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
47.10	1.38	65.00

100 YEAR Area rainfall data:

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

47.10

3.48

163.91

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	0.50	0.083	(0.313)	0.041	0.041
2	0.17	0.60	0.099	(0.313)	0.050	0.050
3	0.25	0.60	0.099	(0.313)	0.050	0.050
4	0.33	0.60	0.099	(0.313)	0.050	0.050
5	0.42	0.60	0.099	(0.313)	0.050	0.050
6	0.50	0.70	0.116	(0.313)	0.058	0.058
7	0.58	0.70	0.116	(0.313)	0.058	0.058
8	0.67	0.70	0.116	(0.313)	0.058	0.058
9	0.75	0.70	0.116	(0.313)	0.058	0.058
10	0.83	0.70	0.116	(0.313)	0.058	0.058
11	0.92	0.70	0.116	(0.313)	0.058	0.058
12	1.00	0.80	0.132	(0.313)	0.066	0.066
13	1.08	0.80	0.132	(0.313)	0.066	0.066
14	1.17	0.80	0.132	(0.313)	0.066	0.066
15	1.25	0.80	0.132	(0.313)	0.066	0.066
16	1.33	0.80	0.132	(0.313)	0.066	0.066
17	1.42	0.80	0.132	(0.313)	0.066	0.066
18	1.50	0.80	0.132	(0.313)	0.066	0.066
19	1.58	0.80	0.132	(0.313)	0.066	0.066
20	1.67	0.80	0.132	(0.313)	0.066	0.066
21	1.75	0.80	0.132	(0.313)	0.066	0.066
22	1.83	0.80	0.132	(0.313)	0.066	0.066
23	1.92	0.80	0.132	(0.313)	0.066	0.066
24	2.00	0.90	0.149	(0.313)	0.075	0.075
25	2.08	0.80	0.132	(0.313)	0.066	0.066
26	2.17	0.90	0.149	(0.313)	0.075	0.075
27	2.25	0.90	0.149	(0.313)	0.075	0.075
28	2.33	0.90	0.149	(0.313)	0.075	0.075
29	2.42	0.90	0.149	(0.313)	0.075	0.075
30	2.50	0.90	0.149	(0.313)	0.075	0.075
31	2.58	0.90	0.149	(0.313)	0.075	0.075
32	2.67	0.90	0.149	(0.313)	0.075	0.075
33	2.75	1.00	0.166	(0.313)	0.083	0.083
34	2.83	1.00	0.166	(0.313)	0.083	0.083
35	2.92	1.00	0.166	(0.313)	0.083	0.083
36	3.00	1.00	0.166	(0.313)	0.083	0.083
37	3.08	1.00	0.166	(0.313)	0.083	0.083
38	3.17	1.10	0.182	(0.313)	0.091	0.091
39	3.25	1.10	0.182	(0.313)	0.091	0.091
40	3.33	1.10	0.182	(0.313)	0.091	0.091
41	3.42	1.20	0.199	(0.313)	0.099	0.099
42	3.50	1.30	0.215	(0.313)	0.108	0.108
43	3.58	1.40	0.232	(0.313)	0.116	0.116
44	3.67	1.40	0.232	(0.313)	0.116	0.116
45	3.75	1.50	0.248	(0.313)	0.124	0.124
46	3.83	1.50	0.248	(0.313)	0.124	0.124
47	3.92	1.60	0.265	(0.313)	0.132	0.132
48	4.00	1.60	0.265	(0.313)	0.132	0.132
49	4.08	1.70	0.281	(0.313)	0.141	0.141
50	4.17	1.80	0.298	(0.313)	0.149	0.149
51	4.25	1.90	0.315	(0.313)	0.157	0.157
52	4.33	2.00	0.331	(0.313)	0.166	0.166
53	4.42	2.10	0.348	(0.313)	0.174	0.174

54	4.50	2.10	0.348	(0.313)	0.174	0.174
55	4.58	2.20	0.364	(0.313)	0.182	0.182
56	4.67	2.30	0.381	(0.313)	0.190	0.190
57	4.75	2.40	0.397	(0.313)	0.199	0.199
58	4.83	2.40	0.397	(0.313)	0.199	0.199
59	4.92	2.50	0.414	(0.313)	0.207	0.207
60	5.00	2.60	0.430	(0.313)	0.215	0.215
61	5.08	3.10	0.513	(0.313)	0.257	0.257
62	5.17	3.60	0.596	(0.313)	0.298	0.298
63	5.25	3.90	0.646	0.313	(0.323)	0.333
64	5.33	4.20	0.695	0.313	(0.348)	0.382
65	5.42	4.70	0.778	0.313	(0.389)	0.465
66	5.50	5.60	0.927	0.313	(0.464)	0.614
67	5.58	1.90	0.315	(0.313)	0.157	0.157
68	5.67	0.90	0.149	(0.313)	0.075	0.075
69	5.75	0.60	0.099	(0.313)	0.050	0.050
70	5.83	0.50	0.083	(0.313)	0.041	0.041
71	5.92	0.30	0.050	(0.313)	0.025	0.025
72	6.00	0.20	0.033	(0.313)	0.017	0.017

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.5

Flood volume = Effective rainfall 0.71(In)
times area 47.1(Ac.)/[(In)/(Ft.)] = 2.8(Ac.Ft)

Total soil loss = 0.67(In)

Total soil loss = 2.619(Ac.Ft)

Total rainfall = 1.38(In)

Flood volume = 121817.1 Cubic Feet

Total soil loss = 114087.5 Cubic Feet

Peak flow rate of this hydrograph = 22.929(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0040	0.58	Q				
0+10	0.0153	1.64	V Q				
0+15	0.0295	2.07	V Q				
0+20	0.0448	2.22	V Q				
0+25	0.0606	2.30	V Q				
0+30	0.0776	2.47	V Q				
0+35	0.0960	2.66	V Q				
0+40	0.1146	2.71	V Q				
0+45	0.1335	2.73	V Q				
0+50	0.1524	2.74	VQ				
0+55	0.1713	2.75	VQ				
1+ 0	0.1911	2.87	VQ				
1+ 5	0.2121	3.06	VQ				
1+10	0.2335	3.10	VQ				

1+15	0.2550	3.13	VQ						
1+20	0.2766	3.14	VQ						
1+25	0.2983	3.15	Q						
1+30	0.3200	3.15	Q						
1+35	0.3416	3.15	Q						
1+40	0.3633	3.15	QV						
1+45	0.3849	3.15	QV						
1+50	0.4066	3.15	QV						
1+55	0.4283	3.15	Q V						
2+ 0	0.4507	3.26	Q V						
2+ 5	0.4737	3.33	Q V						
2+10	0.4965	3.31	Q V						
2+15	0.5204	3.47	Q V						
2+20	0.5446	3.51	Q V						
2+25	0.5688	3.53	Q V						
2+30	0.5932	3.53	Q V						
2+35	0.6175	3.54	Q V						
2+40	0.6419	3.54	Q V						
2+45	0.6671	3.65	Q V						
2+50	0.6935	3.84	Q V						
2+55	0.7203	3.89	Q V						
3+ 0	0.7473	3.91	Q V						
3+ 5	0.7743	3.92	Q V						
3+10	0.8022	4.05	Q V						
3+15	0.8314	4.24	Q V						
3+20	0.8609	4.28	Q V						
3+25	0.8913	4.42	Q V						
3+30	0.9239	4.74	Q V						
3+35	0.9590	5.10	Q V						
3+40	0.9959	5.36	Q V						
3+45	1.0342	5.55	Q V						
3+50	1.0740	5.78	Q V						
3+55	1.1151	5.96	Q V						
4+ 0	1.1576	6.18	Q V						
4+ 5	1.2014	6.36	Q V						
4+10	1.2475	6.69	Q V						
4+15	1.2961	7.06	Q V						
4+20	1.3473	7.44	Q V						
4+25	1.4012	7.82	Q V						
4+30	1.4570	8.10	Q V						
4+35	1.5142	8.30	Q V						
4+40	1.5737	8.65	Q V						
4+45	1.6359	9.02	Q V						
4+50	1.6998	9.29	Q V						
4+55	1.7651	9.48	Q V						
5+ 0	1.8328	9.83	Q V						
5+ 5	1.9063	10.67	Q V						
5+10	1.9908	12.27	Q V						
5+15	2.0869	13.97	Q V						
5+20	2.1959	15.82	Q V						
5+25	2.3231	18.48	Q V						
5+30	2.4811	22.93	Q V						
5+35	2.6230	20.61	Q V						
5+40	2.6933	10.21	Q V						

100 90 80 70 60 50 40 30 20 10 0

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 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]
47.10	2.48	116.81

100 YEAR Area rainfall data:

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

47.10

6.90

324.99

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 2.480(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	0.07	0.020	(0.555)	0.010	0.010
2	0.17	0.07	0.020	(0.553)	0.010	0.010
3	0.25	0.07	0.020	(0.551)	0.010	0.010
4	0.33	0.10	0.030	(0.548)	0.015	0.015
5	0.42	0.10	0.030	(0.546)	0.015	0.015
6	0.50	0.10	0.030	(0.544)	0.015	0.015
7	0.58	0.10	0.030	(0.542)	0.015	0.015
8	0.67	0.10	0.030	(0.540)	0.015	0.015
9	0.75	0.10	0.030	(0.538)	0.015	0.015
10	0.83	0.13	0.040	(0.536)	0.020	0.020
11	0.92	0.13	0.040	(0.534)	0.020	0.020
12	1.00	0.13	0.040	(0.531)	0.020	0.020
13	1.08	0.10	0.030	(0.529)	0.015	0.015
14	1.17	0.10	0.030	(0.527)	0.015	0.015
15	1.25	0.10	0.030	(0.525)	0.015	0.015
16	1.33	0.10	0.030	(0.523)	0.015	0.015
17	1.42	0.10	0.030	(0.521)	0.015	0.015
18	1.50	0.10	0.030	(0.519)	0.015	0.015
19	1.58	0.10	0.030	(0.517)	0.015	0.015
20	1.67	0.10	0.030	(0.515)	0.015	0.015
21	1.75	0.10	0.030	(0.513)	0.015	0.015
22	1.83	0.13	0.040	(0.511)	0.020	0.020
23	1.92	0.13	0.040	(0.509)	0.020	0.020
24	2.00	0.13	0.040	(0.507)	0.020	0.020
25	2.08	0.13	0.040	(0.505)	0.020	0.020
26	2.17	0.13	0.040	(0.502)	0.020	0.020
27	2.25	0.13	0.040	(0.500)	0.020	0.020
28	2.33	0.13	0.040	(0.498)	0.020	0.020
29	2.42	0.13	0.040	(0.496)	0.020	0.020
30	2.50	0.13	0.040	(0.494)	0.020	0.020
31	2.58	0.17	0.050	(0.492)	0.025	0.025
32	2.67	0.17	0.050	(0.490)	0.025	0.025
33	2.75	0.17	0.050	(0.488)	0.025	0.025
34	2.83	0.17	0.050	(0.486)	0.025	0.025
35	2.92	0.17	0.050	(0.484)	0.025	0.025
36	3.00	0.17	0.050	(0.482)	0.025	0.025
37	3.08	0.17	0.050	(0.480)	0.025	0.025
38	3.17	0.17	0.050	(0.478)	0.025	0.025
39	3.25	0.17	0.050	(0.476)	0.025	0.025
40	3.33	0.17	0.050	(0.474)	0.025	0.025
41	3.42	0.17	0.050	(0.472)	0.025	0.025
42	3.50	0.17	0.050	(0.470)	0.025	0.025
43	3.58	0.17	0.050	(0.468)	0.025	0.025
44	3.67	0.17	0.050	(0.466)	0.025	0.025
45	3.75	0.17	0.050	(0.464)	0.025	0.025
46	3.83	0.20	0.060	(0.462)	0.030	0.030
47	3.92	0.20	0.060	(0.461)	0.030	0.030
48	4.00	0.20	0.060	(0.459)	0.030	0.030
49	4.08	0.20	0.060	(0.457)	0.030	0.030
50	4.17	0.20	0.060	(0.455)	0.030	0.030
51	4.25	0.20	0.060	(0.453)	0.030	0.030
52	4.33	0.23	0.069	(0.451)	0.035	0.035
53	4.42	0.23	0.069	(0.449)	0.035	0.035

54	4.50	0.23	0.069	(0.447)	0.035	0.035
55	4.58	0.23	0.069	(0.445)	0.035	0.035
56	4.67	0.23	0.069	(0.443)	0.035	0.035
57	4.75	0.23	0.069	(0.441)	0.035	0.035
58	4.83	0.27	0.079	(0.439)	0.040	0.040
59	4.92	0.27	0.079	(0.437)	0.040	0.040
60	5.00	0.27	0.079	(0.436)	0.040	0.040
61	5.08	0.20	0.060	(0.434)	0.030	0.030
62	5.17	0.20	0.060	(0.432)	0.030	0.030
63	5.25	0.20	0.060	(0.430)	0.030	0.030
64	5.33	0.23	0.069	(0.428)	0.035	0.035
65	5.42	0.23	0.069	(0.426)	0.035	0.035
66	5.50	0.23	0.069	(0.424)	0.035	0.035
67	5.58	0.27	0.079	(0.422)	0.040	0.040
68	5.67	0.27	0.079	(0.421)	0.040	0.040
69	5.75	0.27	0.079	(0.419)	0.040	0.040
70	5.83	0.27	0.079	(0.417)	0.040	0.040
71	5.92	0.27	0.079	(0.415)	0.040	0.040
72	6.00	0.27	0.079	(0.413)	0.040	0.040
73	6.08	0.30	0.089	(0.411)	0.045	0.045
74	6.17	0.30	0.089	(0.409)	0.045	0.045
75	6.25	0.30	0.089	(0.408)	0.045	0.045
76	6.33	0.30	0.089	(0.406)	0.045	0.045
77	6.42	0.30	0.089	(0.404)	0.045	0.045
78	6.50	0.30	0.089	(0.402)	0.045	0.045
79	6.58	0.33	0.099	(0.400)	0.050	0.050
80	6.67	0.33	0.099	(0.399)	0.050	0.050
81	6.75	0.33	0.099	(0.397)	0.050	0.050
82	6.83	0.33	0.099	(0.395)	0.050	0.050
83	6.92	0.33	0.099	(0.393)	0.050	0.050
84	7.00	0.33	0.099	(0.391)	0.050	0.050
85	7.08	0.33	0.099	(0.390)	0.050	0.050
86	7.17	0.33	0.099	(0.388)	0.050	0.050
87	7.25	0.33	0.099	(0.386)	0.050	0.050
88	7.33	0.37	0.109	(0.384)	0.055	0.055
89	7.42	0.37	0.109	(0.383)	0.055	0.055
90	7.50	0.37	0.109	(0.381)	0.055	0.055
91	7.58	0.40	0.119	(0.379)	0.060	0.060
92	7.67	0.40	0.119	(0.377)	0.060	0.060
93	7.75	0.40	0.119	(0.376)	0.060	0.060
94	7.83	0.43	0.129	(0.374)	0.064	0.064
95	7.92	0.43	0.129	(0.372)	0.064	0.064
96	8.00	0.43	0.129	(0.370)	0.064	0.064
97	8.08	0.50	0.149	(0.369)	0.074	0.074
98	8.17	0.50	0.149	(0.367)	0.074	0.074
99	8.25	0.50	0.149	(0.365)	0.074	0.074
100	8.33	0.50	0.149	(0.364)	0.074	0.074
101	8.42	0.50	0.149	(0.362)	0.074	0.074
102	8.50	0.50	0.149	(0.360)	0.074	0.074
103	8.58	0.53	0.159	(0.358)	0.079	0.079
104	8.67	0.53	0.159	(0.357)	0.079	0.079
105	8.75	0.53	0.159	(0.355)	0.079	0.079
106	8.83	0.57	0.169	(0.353)	0.084	0.084
107	8.92	0.57	0.169	(0.352)	0.084	0.084

108	9.00	0.57	0.169	(0.350)	0.084	0.084
109	9.08	0.63	0.188	(0.348)	0.094	0.094
110	9.17	0.63	0.188	(0.347)	0.094	0.094
111	9.25	0.63	0.188	(0.345)	0.094	0.094
112	9.33	0.67	0.198	(0.344)	0.099	0.099
113	9.42	0.67	0.198	(0.342)	0.099	0.099
114	9.50	0.67	0.198	(0.340)	0.099	0.099
115	9.58	0.70	0.208	(0.339)	0.104	0.104
116	9.67	0.70	0.208	(0.337)	0.104	0.104
117	9.75	0.70	0.208	(0.335)	0.104	0.104
118	9.83	0.73	0.218	(0.334)	0.109	0.109
119	9.92	0.73	0.218	(0.332)	0.109	0.109
120	10.00	0.73	0.218	(0.331)	0.109	0.109
121	10.08	0.50	0.149	(0.329)	0.074	0.074
122	10.17	0.50	0.149	(0.327)	0.074	0.074
123	10.25	0.50	0.149	(0.326)	0.074	0.074
124	10.33	0.50	0.149	(0.324)	0.074	0.074
125	10.42	0.50	0.149	(0.323)	0.074	0.074
126	10.50	0.50	0.149	(0.321)	0.074	0.074
127	10.58	0.67	0.198	(0.319)	0.099	0.099
128	10.67	0.67	0.198	(0.318)	0.099	0.099
129	10.75	0.67	0.198	(0.316)	0.099	0.099
130	10.83	0.67	0.198	(0.315)	0.099	0.099
131	10.92	0.67	0.198	(0.313)	0.099	0.099
132	11.00	0.67	0.198	(0.312)	0.099	0.099
133	11.08	0.63	0.188	(0.310)	0.094	0.094
134	11.17	0.63	0.188	(0.309)	0.094	0.094
135	11.25	0.63	0.188	(0.307)	0.094	0.094
136	11.33	0.63	0.188	(0.306)	0.094	0.094
137	11.42	0.63	0.188	(0.304)	0.094	0.094
138	11.50	0.63	0.188	(0.303)	0.094	0.094
139	11.58	0.57	0.169	(0.301)	0.084	0.084
140	11.67	0.57	0.169	(0.300)	0.084	0.084
141	11.75	0.57	0.169	(0.298)	0.084	0.084
142	11.83	0.60	0.179	(0.297)	0.089	0.089
143	11.92	0.60	0.179	(0.295)	0.089	0.089
144	12.00	0.60	0.179	(0.294)	0.089	0.089
145	12.08	0.83	0.248	(0.292)	0.124	0.124
146	12.17	0.83	0.248	(0.291)	0.124	0.124
147	12.25	0.83	0.248	(0.289)	0.124	0.124
148	12.33	0.87	0.258	(0.288)	0.129	0.129
149	12.42	0.87	0.258	(0.286)	0.129	0.129
150	12.50	0.87	0.258	(0.285)	0.129	0.129
151	12.58	0.93	0.278	(0.283)	0.139	0.139
152	12.67	0.93	0.278	(0.282)	0.139	0.139
153	12.75	0.93	0.278	(0.281)	0.139	0.139
154	12.83	0.97	0.288	(0.279)	0.144	0.144
155	12.92	0.97	0.288	(0.278)	0.144	0.144
156	13.00	0.97	0.288	(0.276)	0.144	0.144
157	13.08	1.13	0.337	(0.275)	0.169	0.169
158	13.17	1.13	0.337	(0.274)	0.169	0.169
159	13.25	1.13	0.337	(0.272)	0.169	0.169
160	13.33	1.13	0.337	(0.271)	0.169	0.169
161	13.42	1.13	0.337	(0.269)	0.169	0.169

162	13.50	1.13	0.337	(0.268)	0.169	0.169
163	13.58	0.77	0.228	(0.267)	0.114	0.114
164	13.67	0.77	0.228	(0.265)	0.114	0.114
165	13.75	0.77	0.228	(0.264)	0.114	0.114
166	13.83	0.77	0.228	(0.263)	0.114	0.114
167	13.92	0.77	0.228	(0.261)	0.114	0.114
168	14.00	0.77	0.228	(0.260)	0.114	0.114
169	14.08	0.90	0.268	(0.259)	0.134	0.134
170	14.17	0.90	0.268	(0.257)	0.134	0.134
171	14.25	0.90	0.268	(0.256)	0.134	0.134
172	14.33	0.87	0.258	(0.255)	0.129	0.129
173	14.42	0.87	0.258	(0.253)	0.129	0.129
174	14.50	0.87	0.258	(0.252)	0.129	0.129
175	14.58	0.87	0.258	(0.251)	0.129	0.129
176	14.67	0.87	0.258	(0.250)	0.129	0.129
177	14.75	0.87	0.258	(0.248)	0.129	0.129
178	14.83	0.83	0.248	(0.247)	0.124	0.124
179	14.92	0.83	0.248	(0.246)	0.124	0.124
180	15.00	0.83	0.248	(0.244)	0.124	0.124
181	15.08	0.80	0.238	(0.243)	0.119	0.119
182	15.17	0.80	0.238	(0.242)	0.119	0.119
183	15.25	0.80	0.238	(0.241)	0.119	0.119
184	15.33	0.77	0.228	(0.239)	0.114	0.114
185	15.42	0.77	0.228	(0.238)	0.114	0.114
186	15.50	0.77	0.228	(0.237)	0.114	0.114
187	15.58	0.63	0.188	(0.236)	0.094	0.094
188	15.67	0.63	0.188	(0.235)	0.094	0.094
189	15.75	0.63	0.188	(0.233)	0.094	0.094
190	15.83	0.63	0.188	(0.232)	0.094	0.094
191	15.92	0.63	0.188	(0.231)	0.094	0.094
192	16.00	0.63	0.188	(0.230)	0.094	0.094
193	16.08	0.13	0.040	(0.229)	0.020	0.020
194	16.17	0.13	0.040	(0.228)	0.020	0.020
195	16.25	0.13	0.040	(0.226)	0.020	0.020
196	16.33	0.13	0.040	(0.225)	0.020	0.020
197	16.42	0.13	0.040	(0.224)	0.020	0.020
198	16.50	0.13	0.040	(0.223)	0.020	0.020
199	16.58	0.10	0.030	(0.222)	0.015	0.015
200	16.67	0.10	0.030	(0.221)	0.015	0.015
201	16.75	0.10	0.030	(0.220)	0.015	0.015
202	16.83	0.10	0.030	(0.218)	0.015	0.015
203	16.92	0.10	0.030	(0.217)	0.015	0.015
204	17.00	0.10	0.030	(0.216)	0.015	0.015
205	17.08	0.17	0.050	(0.215)	0.025	0.025
206	17.17	0.17	0.050	(0.214)	0.025	0.025
207	17.25	0.17	0.050	(0.213)	0.025	0.025
208	17.33	0.17	0.050	(0.212)	0.025	0.025
209	17.42	0.17	0.050	(0.211)	0.025	0.025
210	17.50	0.17	0.050	(0.210)	0.025	0.025
211	17.58	0.17	0.050	(0.209)	0.025	0.025
212	17.67	0.17	0.050	(0.208)	0.025	0.025
213	17.75	0.17	0.050	(0.207)	0.025	0.025
214	17.83	0.13	0.040	(0.206)	0.020	0.020
215	17.92	0.13	0.040	(0.205)	0.020	0.020

216	18.00	0.13	0.040	(0.204)	0.020	0.020
217	18.08	0.13	0.040	(0.203)	0.020	0.020
218	18.17	0.13	0.040	(0.202)	0.020	0.020
219	18.25	0.13	0.040	(0.201)	0.020	0.020
220	18.33	0.13	0.040	(0.200)	0.020	0.020
221	18.42	0.13	0.040	(0.199)	0.020	0.020
222	18.50	0.13	0.040	(0.198)	0.020	0.020
223	18.58	0.10	0.030	(0.197)	0.015	0.015
224	18.67	0.10	0.030	(0.196)	0.015	0.015
225	18.75	0.10	0.030	(0.195)	0.015	0.015
226	18.83	0.07	0.020	(0.194)	0.010	0.010
227	18.92	0.07	0.020	(0.193)	0.010	0.010
228	19.00	0.07	0.020	(0.192)	0.010	0.010
229	19.08	0.10	0.030	(0.191)	0.015	0.015
230	19.17	0.10	0.030	(0.190)	0.015	0.015
231	19.25	0.10	0.030	(0.189)	0.015	0.015
232	19.33	0.13	0.040	(0.188)	0.020	0.020
233	19.42	0.13	0.040	(0.188)	0.020	0.020
234	19.50	0.13	0.040	(0.187)	0.020	0.020
235	19.58	0.10	0.030	(0.186)	0.015	0.015
236	19.67	0.10	0.030	(0.185)	0.015	0.015
237	19.75	0.10	0.030	(0.184)	0.015	0.015
238	19.83	0.07	0.020	(0.183)	0.010	0.010
239	19.92	0.07	0.020	(0.183)	0.010	0.010
240	20.00	0.07	0.020	(0.182)	0.010	0.010
241	20.08	0.10	0.030	(0.181)	0.015	0.015
242	20.17	0.10	0.030	(0.180)	0.015	0.015
243	20.25	0.10	0.030	(0.179)	0.015	0.015
244	20.33	0.10	0.030	(0.179)	0.015	0.015
245	20.42	0.10	0.030	(0.178)	0.015	0.015
246	20.50	0.10	0.030	(0.177)	0.015	0.015
247	20.58	0.10	0.030	(0.176)	0.015	0.015
248	20.67	0.10	0.030	(0.176)	0.015	0.015
249	20.75	0.10	0.030	(0.175)	0.015	0.015
250	20.83	0.07	0.020	(0.174)	0.010	0.010
251	20.92	0.07	0.020	(0.173)	0.010	0.010
252	21.00	0.07	0.020	(0.173)	0.010	0.010
253	21.08	0.10	0.030	(0.172)	0.015	0.015
254	21.17	0.10	0.030	(0.171)	0.015	0.015
255	21.25	0.10	0.030	(0.171)	0.015	0.015
256	21.33	0.07	0.020	(0.170)	0.010	0.010
257	21.42	0.07	0.020	(0.169)	0.010	0.010
258	21.50	0.07	0.020	(0.169)	0.010	0.010
259	21.58	0.10	0.030	(0.168)	0.015	0.015
260	21.67	0.10	0.030	(0.168)	0.015	0.015
261	21.75	0.10	0.030	(0.167)	0.015	0.015
262	21.83	0.07	0.020	(0.166)	0.010	0.010
263	21.92	0.07	0.020	(0.166)	0.010	0.010
264	22.00	0.07	0.020	(0.165)	0.010	0.010
265	22.08	0.10	0.030	(0.165)	0.015	0.015
266	22.17	0.10	0.030	(0.164)	0.015	0.015
267	22.25	0.10	0.030	(0.164)	0.015	0.015
268	22.33	0.07	0.020	(0.163)	0.010	0.010
269	22.42	0.07	0.020	(0.163)	0.010	0.010

270	22.50	0.07	0.020	(0.162)	0.010	0.010
271	22.58	0.07	0.020	(0.162)	0.010	0.010
272	22.67	0.07	0.020	(0.161)	0.010	0.010
273	22.75	0.07	0.020	(0.161)	0.010	0.010
274	22.83	0.07	0.020	(0.160)	0.010	0.010
275	22.92	0.07	0.020	(0.160)	0.010	0.010
276	23.00	0.07	0.020	(0.160)	0.010	0.010
277	23.08	0.07	0.020	(0.159)	0.010	0.010
278	23.17	0.07	0.020	(0.159)	0.010	0.010
279	23.25	0.07	0.020	(0.159)	0.010	0.010
280	23.33	0.07	0.020	(0.158)	0.010	0.010
281	23.42	0.07	0.020	(0.158)	0.010	0.010
282	23.50	0.07	0.020	(0.158)	0.010	0.010
283	23.58	0.07	0.020	(0.157)	0.010	0.010
284	23.67	0.07	0.020	(0.157)	0.010	0.010
285	23.75	0.07	0.020	(0.157)	0.010	0.010
286	23.83	0.07	0.020	(0.157)	0.010	0.010
287	23.92	0.07	0.020	(0.157)	0.010	0.010
288	24.00	0.07	0.020	(0.157)	0.010	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 14.9

Flood volume = Effective rainfall 1.24(In)

times area 47.1(Ac.)/[(In)/(Ft.)) = 4.9(Ac.Ft)

Total soil loss = 1.24(In)

Total soil loss = 4.867(Ac.Ft)

Total rainfall = 2.48(In)

Flood volume = 211987.0 Cubic Feet

Total soil loss = 211987.0 Cubic Feet

Peak flow rate of this hydrograph = 8.008(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0010	0.14	Q				
0+10	0.0035	0.37	VQ				
0+15	0.0064	0.42	VQ				
0+20	0.0099	0.52	V Q				
0+25	0.0144	0.64	V Q				
0+30	0.0191	0.68	V Q				
0+35	0.0239	0.69	V Q				
0+40	0.0287	0.70	V Q				
0+45	0.0336	0.71	V Q				
0+50	0.0389	0.78	V Q				
0+55	0.0450	0.89	V Q				
1+ 0	0.0513	0.92	V Q				
1+ 5	0.0573	0.86	V Q				
1+10	0.0625	0.75	V Q				

1+15	0.0675	0.73	V Q
1+20	0.0725	0.72	V Q
1+25	0.0774	0.71	V Q
1+30	0.0822	0.71	V Q
1+35	0.0871	0.71	V Q
1+40	0.0920	0.71	V Q
1+45	0.0968	0.71	V Q
1+50	0.1022	0.78	V Q
1+55	0.1083	0.89	V Q
2+ 0	0.1146	0.92	V Q
2+ 5	0.1210	0.93	V Q
2+10	0.1275	0.94	V Q
2+15	0.1340	0.94	V Q
2+20	0.1404	0.94	V Q
2+25	0.1469	0.94	V Q
2+30	0.1534	0.94	V Q
2+35	0.1604	1.01	V Q
2+40	0.1681	1.12	V Q
2+45	0.1761	1.15	V Q
2+50	0.1841	1.17	V Q
2+55	0.1922	1.17	V Q
3+ 0	0.2003	1.18	V Q
3+ 5	0.2084	1.18	V Q
3+10	0.2165	1.18	V Q
3+15	0.2246	1.18	V Q
3+20	0.2327	1.18	V Q
3+25	0.2409	1.18	V Q
3+30	0.2490	1.18	V Q
3+35	0.2571	1.18	V Q
3+40	0.2652	1.18	V Q
3+45	0.2733	1.18	V Q
3+50	0.2819	1.25	V Q
3+55	0.2913	1.36	V Q
4+ 0	0.3008	1.39	V Q
4+ 5	0.3105	1.40	V Q
4+10	0.3202	1.41	V Q
4+15	0.3299	1.41	V Q
4+20	0.3401	1.48	V Q
4+25	0.3511	1.60	V Q
4+30	0.3623	1.62	V Q
4+35	0.3736	1.64	V Q
4+40	0.3849	1.64	V Q
4+45	0.3962	1.65	V Q
4+50	0.4081	1.72	V Q
4+55	0.4207	1.83	V Q
5+ 0	0.4335	1.86	V Q
5+ 5	0.4454	1.73	V Q
5+10	0.4559	1.51	V Q
5+15	0.4659	1.46	V Q
5+20	0.4763	1.51	V Q
5+25	0.4874	1.61	V Q
5+30	0.4986	1.62	V Q
5+35	0.5103	1.71	V Q
5+40	0.5229	1.83	V Q

5+45	0.5357	1.86	V	Q					
5+50	0.5486	1.87	V	Q					
5+55	0.5615	1.88	V	Q					
6+ 0	0.5745	1.88	V	Q					
6+ 5	0.5880	1.95	V	Q					
6+10	0.6022	2.07	V	Q					
6+15	0.6166	2.10	V	Q					
6+20	0.6312	2.11	V	Q					
6+25	0.6457	2.11	V	Q					
6+30	0.6603	2.12	V	Q					
6+35	0.6754	2.19	V	Q					
6+40	0.6913	2.30	V	Q					
6+45	0.7073	2.33	V	Q					
6+50	0.7234	2.34	V	Q					
6+55	0.7396	2.35	V	Q					
7+ 0	0.7559	2.36	V	Q					
7+ 5	0.7721	2.36	V	Q					
7+10	0.7883	2.36	V	Q					
7+15	0.8045	2.36	V	Q					
7+20	0.8212	2.42	V	Q					
7+25	0.8387	2.54	V	Q					
7+30	0.8564	2.57	V	Q					
7+35	0.8746	2.65	V	Q					
7+40	0.8937	2.77	V	Q					
7+45	0.9130	2.80	V	Q					
7+50	0.9328	2.88	V	Q					
7+55	0.9535	3.00	V	Q					
8+ 0	0.9745	3.04	V	Q					
8+ 5	0.9964	3.19	V	Q					
8+10	1.0200	3.42	V	Q					
8+15	1.0440	3.48	V	Q					
8+20	1.0682	3.51	V	Q					
8+25	1.0924	3.52	V	Q					
8+30	1.1168	3.53	V	Q					
8+35	1.1416	3.60	V	Q					
8+40	1.1672	3.72	V	Q					
8+45	1.1929	3.74	V	Q					
8+50	1.2193	3.83	V	Q					
8+55	1.2465	3.95	V	Q					
9+ 0	1.2739	3.98	V	Q					
9+ 5	1.3023	4.13	V	Q					
9+10	1.3324	4.36	V	Q					
9+15	1.3629	4.43	V	Q					
9+20	1.3940	4.52	V	Q					
9+25	1.4260	4.65	V	Q					
9+30	1.4583	4.69	V	Q					
9+35	1.4911	4.77	V	Q					
9+40	1.5248	4.89	V	Q					
9+45	1.5587	4.92	V	Q					
9+50	1.5932	5.00	V	Q					
9+55	1.6285	5.12	V	Q					
10+ 0	1.6640	5.16	V	Q					
10+ 5	1.6962	4.68	V	Q					
10+10	1.7231	3.90	VQ						

10+15	1.7486	3.70	Q		
10+20	1.7735	3.62	Q		
10+25	1.7981	3.57	Q		
10+30	1.8224	3.53	Q		
10+35	1.8491	3.88	Q		
10+40	1.8797	4.45	V Q		
10+45	1.9114	4.59	V Q		
10+50	1.9434	4.65	V Q		
10+55	1.9757	4.69	V Q		
11+ 0	2.0081	4.71	V Q		
11+ 5	2.0401	4.64	V Q		
11+10	2.0713	4.53	VQ		
11+15	2.1022	4.50	Q		
11+20	2.1331	4.49	Q		
11+25	2.1640	4.48	Q		
11+30	2.1948	4.48	QV		
11+35	2.2247	4.34	QV		
11+40	2.2530	4.11	Q V		
11+45	2.2809	4.05	Q V		
11+50	2.3091	4.10	Q V		
11+55	2.3380	4.20	Q V		
12+ 0	2.3671	4.22	Q V		
12+ 5	2.3995	4.71	QV		
12+10	2.4375	5.51	V Q		
12+15	2.4769	5.72	V Q		
12+20	2.5173	5.88	V Q		
12+25	2.5589	6.04	V Q		
12+30	2.6009	6.10	V Q		
12+35	2.6440	6.25	V Q		
12+40	2.6886	6.48	V Q		
12+45	2.7337	6.55	V Q		
12+50	2.7794	6.64	V Q		
12+55	2.8261	6.77	V Q		
13+ 0	2.8729	6.81	V Q		
13+ 5	2.9223	7.17	V Q		
13+10	2.9756	7.74	V Q		
13+15	3.0299	7.89	V Q		
13+20	3.0846	7.95	V Q		
13+25	3.1396	7.98	V Q		
13+30	3.1948	8.01	V Q		
13+35	3.2447	7.24	V Q		
13+40	3.2860	6.00	Q V		
13+45	3.3252	5.69	Q V		
13+50	3.3634	5.55	Q V		
13+55	3.4010	5.47	Q V		
14+ 0	3.4384	5.42	Q V		
14+ 5	3.4776	5.70	Q V		
14+10	3.5199	6.15	Q V		
14+15	3.5630	6.26	Q V		
14+20	3.6060	6.24	Q V		
14+25	3.6484	6.16	Q V		
14+30	3.6908	6.15	Q V		
14+35	3.7330	6.14	Q V		
14+40	3.7753	6.13	Q V		

14+45	3.8174	6.12				Q	V
14+50	3.8591	6.05				Q	V
14+55	3.9001	5.94				Q	V
15+ 0	3.9408	5.91				Q	V
15+ 5	3.9809	5.83				Q	V
15+10	4.0203	5.71				Q	V
15+15	4.0594	5.68				Q	V
15+20	4.0979	5.60				Q	V
15+25	4.1356	5.48				Q	V
15+30	4.1731	5.44				Q	V
15+35	4.2086	5.15			Q		V
15+40	4.2409	4.69			Q		V
15+45	4.2724	4.57			Q		V
15+50	4.3035	4.52			Q		V
15+55	4.3345	4.50			Q		V
16+ 0	4.3653	4.48			Q		V
16+ 5	4.3889	3.43		Q			V
16+10	4.4009	1.74					V
16+15	4.4099	1.31		Q			V
16+20	4.4176	1.12		Q			V
16+25	4.4246	1.02		Q			V
16+30	4.4311	0.94		Q			V
16+35	4.4371	0.87		Q			V
16+40	4.4424	0.76		Q			V
16+45	4.4474	0.73	Q				V
16+50	4.4523	0.72	Q				V
16+55	4.4573	0.71	Q				V
17+ 0	4.4621	0.71	Q				V
17+ 5	4.4679	0.85	Q				V
17+10	4.4753	1.07	Q				V
17+15	4.4831	1.13	Q				V
17+20	4.4910	1.15	Q				V
17+25	4.4991	1.17	Q				V
17+30	4.5072	1.18	Q				V
17+35	4.5153	1.18	Q				V
17+40	4.5234	1.18	Q				V
17+45	4.5315	1.18	Q				V
17+50	4.5392	1.11	Q				V
17+55	4.5460	1.00	Q				V
18+ 0	4.5527	0.97	Q				V
18+ 5	4.5592	0.95	Q				V
18+10	4.5658	0.95	Q				V
18+15	4.5723	0.94	Q				V
18+20	4.5787	0.94	Q				V
18+25	4.5852	0.94	Q				V
18+30	4.5917	0.94	Q				V
18+35	4.5977	0.87	Q				V
18+40	4.6030	0.76	Q				V
18+45	4.6080	0.73	Q				V
18+50	4.6125	0.65	Q				V
18+55	4.6161	0.53	Q				V
19+ 0	4.6195	0.50	Q				V
19+ 5	4.6233	0.55	Q				V
19+10	4.6279	0.66	Q				V

19+15	4.6326	0.68	Q				V
19+20	4.6378	0.76	Q				V
19+25	4.6439	0.88	Q				V
19+30	4.6502	0.92	Q				V
19+35	4.6562	0.86	Q				V
19+40	4.6614	0.75	Q				V
19+45	4.6664	0.73	Q				V
19+50	4.6709	0.65	Q				V
19+55	4.6745	0.53	Q				V
20+ 0	4.6779	0.50	Q				V
20+ 5	4.6817	0.55	Q				V
20+10	4.6863	0.66	Q				V
20+15	4.6910	0.68	Q				V
20+20	4.6957	0.69	Q				V
20+25	4.7006	0.70	Q				V
20+30	4.7054	0.71	Q				V
20+35	4.7103	0.71	Q				V
20+40	4.7152	0.71	Q				V
20+45	4.7200	0.71	Q				V
20+50	4.7244	0.64	Q				V
20+55	4.7280	0.52	Q				V
21+ 0	4.7315	0.50	Q				V
21+ 5	4.7353	0.55	Q				V
21+10	4.7398	0.66	Q				V
21+15	4.7445	0.68	Q				V
21+20	4.7488	0.63	Q				V
21+25	4.7524	0.52	Q				V
21+30	4.7558	0.50	Q				V
21+35	4.7596	0.55	Q				V
21+40	4.7641	0.66	Q				V
21+45	4.7688	0.68	Q				V
21+50	4.7731	0.63	Q				V
21+55	4.7767	0.52	Q				V
22+ 0	4.7801	0.50	Q				V
22+ 5	4.7839	0.55	Q				V
22+10	4.7885	0.66	Q				V
22+15	4.7932	0.68	Q				V
22+20	4.7975	0.63	Q				V
22+25	4.8010	0.52	Q				V
22+30	4.8045	0.50	Q				V
22+35	4.8078	0.48	Q				V
22+40	4.8111	0.48	Q				V
22+45	4.8143	0.47	Q				V
22+50	4.8175	0.47	Q				V
22+55	4.8208	0.47	Q				V
23+ 0	4.8240	0.47	Q				V
23+ 5	4.8273	0.47	Q				V
23+10	4.8305	0.47	Q				V
23+15	4.8338	0.47	Q				V
23+20	4.8370	0.47	Q				V
23+25	4.8403	0.47	Q				V
23+30	4.8435	0.47	Q				V
23+35	4.8467	0.47	Q				V
23+40	4.8500	0.47	Q				V

23+45	4.8532	0.47	Q				V
23+50	4.8565	0.47	Q				V
23+55	4.8597	0.47	Q				V
24+ 0	4.8630	0.47	Q				V
24+ 5	4.8653	0.33	Q				V
24+10	4.8660	0.11	Q				V
24+15	4.8663	0.05	Q				V
24+20	4.8665	0.02	Q				V
24+25	4.8666	0.01	Q				V

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786Adev15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
47.10	0.58	27.32

100 YEAR Area rainfall data:

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

47.10

1.45

68.30

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.784 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.783 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	135.603	14.016
2	0.167	271.206	22.775
3	0.250	406.809	5.745
4	0.333	542.412	2.545
5	0.417	678.015	1.381
6	0.500	813.619	1.006
Sum =		100.000	Sum= 47.468

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.414	(0.313)	0.207	0.207
2	0.17	4.50	0.423	(0.313)	0.212	0.212
3	0.25	5.40	0.508	(0.313)	0.254	0.254
4	0.33	5.40	0.508	(0.313)	0.254	0.254
5	0.42	5.70	0.536	(0.313)	0.268	0.268
6	0.50	6.40	0.602	(0.313)	0.301	0.301
7	0.58	7.90	0.743	0.313	(0.371)	0.430
8	0.67	9.10	0.856	0.313	(0.428)	0.543
9	0.75	12.80	1.203	0.313	(0.602)	0.890
10	0.83	25.60	2.407	0.313	(1.203)	2.094
11	0.92	7.90	0.743	0.313	(0.371)	0.430
12	1.00	4.90	0.461	(0.313)	0.230	0.230

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.1

Flood volume = Effective rainfall 0.51(In)
times area 47.1(Ac.)/[(In)/(Ft.)] = 2.0(Ac.Ft)

Total soil loss = 0.27(In)

Total soil loss = 1.076(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 87069.8 Cubic Feet

Total soil loss = 46877.3 Cubic Feet

Peak flow rate of this hydrograph = 61.131(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0200	2.90	VQ				
0+10	0.0729	7.68	V Q				
0+15	0.1388	9.57	V Q				
0+20	0.2151	11.09	V Q				
0+25	0.2966	11.82	VQ				
0+30	0.3856	12.93	Q				
0+35	0.4933	15.63	QV				
0+40	0.6339	20.42	QV				
0+45	0.8316	28.71		Q			
0+50	1.2073	54.55			V	Q	
0+55	1.6283	61.13				V Q	
1+ 0	1.8246	28.50		Q			V
1+ 5	1.9267	14.83		Q			V
1+10	1.9694	6.21	Q				V
1+15	1.9921	3.29	Q				V
1+20	1.9973	0.75	Q				V
1+25	1.9988	0.23	Q				V

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 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]
47.10	0.98	46.16

100 YEAR Area rainfall data:

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

47.10

2.48

116.81

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	1.30	0.208	(0.313)	0.104	0.104
2	0.17	1.30	0.208	(0.313)	0.104	0.104
3	0.25	1.10	0.176	(0.313)	0.088	0.088
4	0.33	1.50	0.240	(0.313)	0.120	0.120
5	0.42	1.50	0.240	(0.313)	0.120	0.120
6	0.50	1.80	0.288	(0.313)	0.144	0.144
7	0.58	1.50	0.240	(0.313)	0.120	0.120
8	0.67	1.80	0.288	(0.313)	0.144	0.144
9	0.75	1.80	0.288	(0.313)	0.144	0.144
10	0.83	1.50	0.240	(0.313)	0.120	0.120
11	0.92	1.60	0.256	(0.313)	0.128	0.128
12	1.00	1.80	0.288	(0.313)	0.144	0.144
13	1.08	2.20	0.351	(0.313)	0.176	0.176
14	1.17	2.20	0.351	(0.313)	0.176	0.176
15	1.25	2.20	0.351	(0.313)	0.176	0.176
16	1.33	2.00	0.319	(0.313)	0.160	0.160
17	1.42	2.60	0.415	(0.313)	0.208	0.208
18	1.50	2.70	0.431	(0.313)	0.216	0.216
19	1.58	2.40	0.383	(0.313)	0.192	0.192
20	1.67	2.70	0.431	(0.313)	0.216	0.216
21	1.75	3.30	0.527	(0.313)	0.264	0.264
22	1.83	3.10	0.495	(0.313)	0.248	0.248
23	1.92	2.90	0.463	(0.313)	0.232	0.232
24	2.00	3.00	0.479	(0.313)	0.240	0.240
25	2.08	3.10	0.495	(0.313)	0.248	0.248
26	2.17	4.20	0.671	0.313	(0.335)	0.358
27	2.25	5.00	0.799	0.313	(0.399)	0.486
28	2.33	3.50	0.559	(0.313)	0.280	0.280
29	2.42	6.80	1.086	0.313	(0.543)	0.773
30	2.50	7.30	1.166	0.313	(0.583)	0.853
31	2.58	8.20	1.310	0.313	(0.655)	0.997
32	2.67	5.90	0.942	0.313	(0.471)	0.629
33	2.75	2.00	0.319	(0.313)	0.160	0.160
34	2.83	1.80	0.288	(0.313)	0.144	0.144
35	2.92	1.80	0.288	(0.313)	0.144	0.144
36	3.00	0.60	0.096	(0.313)	0.048	0.048

(Loss Rate Not Used)

Sum = 100.0 Sum = 9.1

Flood volume = Effective rainfall 0.76(In)
times area 47.1(Ac.) / [(In)/(Ft.)] = 3.0(Ac.Ft)
Total soil loss = 0.57(In)
Total soil loss = 2.250(Ac.Ft)
Total rainfall = 1.33(In)
Flood volume = 129586.8 Cubic Feet
Total soil loss = 97988.8 Cubic Feet

Peak flow rate of this hydrograph = 39.602(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0100	1.46	VQ					
0+10	0.0363	3.82	V Q					
0+15	0.0652	4.19	V Q					
0+20	0.0965	4.54	V Q					
0+25	0.1332	5.32	V Q					
0+30	0.1739	5.91	V Q					
0+35	0.2164	6.18	V Q					
0+40	0.2586	6.13	V Q					
0+45	0.3043	6.63	V Q					
0+50	0.3484	6.41	V Q					
0+55	0.3899	6.02	VQ					
1+ 0	0.4333	6.30	VQ					
1+ 5	0.4823	7.12	VQ					
1+10	0.5370	7.93	Q					
1+15	0.5930	8.14	VQ					
1+20	0.6483	8.03	Q					
1+25	0.7061	8.40	QV					
1+30	0.7718	9.54	QV					
1+35	0.8381	9.62	Q V					
1+40	0.9039	9.56	Q V					
1+45	0.9777	10.71	Q V					
1+50	1.0583	11.71	Q V					
1+55	1.1371	11.44	Q V					
2+ 0	1.2144	11.22	Q V					
2+ 5	1.2934	11.47	Q V					
2+10	1.3845	13.23	Q V					
2+15	1.5055	17.57	Q V					
2+20	1.6311	18.24	Q V					
2+25	1.7792	21.50	Q V					
2+30	2.0076	33.17	Q V					
2+35	2.2803	39.60	Q V					
2+40	2.5509	39.29	Q V					
2+45	2.7288	25.83	Q V					
2+50	2.8236	13.77	Q V					
2+55	2.8928	10.05	Q V					
3+ 0	2.9414	7.05	Q V					
3+ 5	2.9630	3.14	Q V					
3+10	2.9699	1.00	Q V					
3+15	2.9731	0.47	Q V					
3+20	2.9746	0.21	Q V					
3+25	2.9749	0.05	Q V					

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
47.10	1.38	65.00

100 YEAR Area rainfall data:

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

47.10

3.48

163.91

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.872 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.872 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	0.50	0.112	(0.313)	0.056	0.056
2	0.17	0.60	0.135	(0.313)	0.067	0.067
3	0.25	0.60	0.135	(0.313)	0.067	0.067
4	0.33	0.60	0.135	(0.313)	0.067	0.067
5	0.42	0.60	0.135	(0.313)	0.067	0.067
6	0.50	0.70	0.157	(0.313)	0.079	0.079
7	0.58	0.70	0.157	(0.313)	0.079	0.079
8	0.67	0.70	0.157	(0.313)	0.079	0.079
9	0.75	0.70	0.157	(0.313)	0.079	0.079
10	0.83	0.70	0.157	(0.313)	0.079	0.079
11	0.92	0.70	0.157	(0.313)	0.079	0.079
12	1.00	0.80	0.180	(0.313)	0.090	0.090
13	1.08	0.80	0.180	(0.313)	0.090	0.090
14	1.17	0.80	0.180	(0.313)	0.090	0.090
15	1.25	0.80	0.180	(0.313)	0.090	0.090
16	1.33	0.80	0.180	(0.313)	0.090	0.090
17	1.42	0.80	0.180	(0.313)	0.090	0.090
18	1.50	0.80	0.180	(0.313)	0.090	0.090
19	1.58	0.80	0.180	(0.313)	0.090	0.090
20	1.67	0.80	0.180	(0.313)	0.090	0.090
21	1.75	0.80	0.180	(0.313)	0.090	0.090
22	1.83	0.80	0.180	(0.313)	0.090	0.090
23	1.92	0.80	0.180	(0.313)	0.090	0.090
24	2.00	0.90	0.202	(0.313)	0.101	0.101
25	2.08	0.80	0.180	(0.313)	0.090	0.090
26	2.17	0.90	0.202	(0.313)	0.101	0.101
27	2.25	0.90	0.202	(0.313)	0.101	0.101
28	2.33	0.90	0.202	(0.313)	0.101	0.101
29	2.42	0.90	0.202	(0.313)	0.101	0.101
30	2.50	0.90	0.202	(0.313)	0.101	0.101
31	2.58	0.90	0.202	(0.313)	0.101	0.101
32	2.67	0.90	0.202	(0.313)	0.101	0.101
33	2.75	1.00	0.225	(0.313)	0.112	0.112
34	2.83	1.00	0.225	(0.313)	0.112	0.112
35	2.92	1.00	0.225	(0.313)	0.112	0.112
36	3.00	1.00	0.225	(0.313)	0.112	0.112
37	3.08	1.00	0.225	(0.313)	0.112	0.112
38	3.17	1.10	0.247	(0.313)	0.124	0.124
39	3.25	1.10	0.247	(0.313)	0.124	0.124
40	3.33	1.10	0.247	(0.313)	0.124	0.124
41	3.42	1.20	0.270	(0.313)	0.135	0.135
42	3.50	1.30	0.292	(0.313)	0.146	0.146
43	3.58	1.40	0.314	(0.313)	0.157	0.157
44	3.67	1.40	0.314	(0.313)	0.157	0.157
45	3.75	1.50	0.337	(0.313)	0.168	0.168
46	3.83	1.50	0.337	(0.313)	0.168	0.168
47	3.92	1.60	0.359	(0.313)	0.180	0.180
48	4.00	1.60	0.359	(0.313)	0.180	0.180
49	4.08	1.70	0.382	(0.313)	0.191	0.191
50	4.17	1.80	0.404	(0.313)	0.202	0.202
51	4.25	1.90	0.427	(0.313)	0.213	0.213
52	4.33	2.00	0.449	(0.313)	0.225	0.225
53	4.42	2.10	0.472	(0.313)	0.236	0.236

54	4.50	2.10	0.472	(0.313)	0.236	0.236
55	4.58	2.20	0.494	(0.313)	0.247	0.247
56	4.67	2.30	0.517	(0.313)	0.258	0.258
57	4.75	2.40	0.539	(0.313)	0.270	0.270
58	4.83	2.40	0.539	(0.313)	0.270	0.270
59	4.92	2.50	0.561	(0.313)	0.281	0.281
60	5.00	2.60	0.584	(0.313)	0.292	0.292
61	5.08	3.10	0.696	0.313 (0.348)		0.383
62	5.17	3.60	0.809	0.313 (0.404)		0.496
63	5.25	3.90	0.876	0.313 (0.438)		0.563
64	5.33	4.20	0.943	0.313 (0.472)		0.630
65	5.42	4.70	1.056	0.313 (0.528)		0.743
66	5.50	5.60	1.258	0.313 (0.629)		0.945
67	5.58	1.90	0.427	(0.313)	0.213	0.213
68	5.67	0.90	0.202	(0.313)	0.101	0.101
69	5.75	0.60	0.135	(0.313)	0.067	0.067
70	5.83	0.50	0.112	(0.313)	0.056	0.056
71	5.92	0.30	0.067	(0.313)	0.034	0.034
72	6.00	0.20	0.045	(0.313)	0.022	0.022

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.2

Flood volume = Effective rainfall 1.01(In)
times area 47.1(Ac.)/[(In)/(Ft.)) = 4.0(Ac.Ft)

Total soil loss = 0.86(In)

Total soil loss = 3.365(Ac.Ft)

Total rainfall = 1.87(In)

Flood volume = 173394.6 Cubic Feet

Total soil loss = 146593.0 Cubic Feet

Peak flow rate of this hydrograph = 36.295(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0054	0.79	Q				
0+10	0.0207	2.22	V Q				
0+15	0.0400	2.80	V Q				
0+20	0.0608	3.01	V Q				
0+25	0.0822	3.12	V Q				
0+30	0.1053	3.35	V Q				
0+35	0.1302	3.61	V Q				
0+40	0.1555	3.68	V Q				
0+45	0.1810	3.71	V Q				
0+50	0.2067	3.72	VQ				
0+55	0.2324	3.73	VQ				
1+ 0	0.2592	3.89	VQ				
1+ 5	0.2877	4.15	V Q				
1+10	0.3167	4.21	VQ				

5+45	3.8930	8.54			Q					V	
5+50	3.9308	5.50			Q					V	
5+55	3.9559	3.64		Q						V	
6+ 0	3.9692	1.93		Q						V	
6+ 5	3.9764	1.04		Q						V	
6+10	3.9789	0.36		Q						V	
6+15	3.9800	0.16		Q						V	
6+20	3.9804	0.06		Q						V	
6+25	3.9806	0.02		Q						V	

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 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]
47.10	2.48	116.81

100 YEAR Area rainfall data:

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

47.10

6.90

324.99

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.204	0.079
69.0	49.8	0.574	0.500	0.316	0.363	0.115
75.0	57.0	0.501	0.500	0.275	0.433	0.119
Sum (F) =						0.313

Area averaged mean soil loss (F) (In/Hr) = 0.313

Minimum soil loss rate ((In/Hr)) = 0.157

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	0.07	0.028	(0.555)	0.014	0.014
2	0.17	0.07	0.028	(0.553)	0.014	0.014
3	0.25	0.07	0.028	(0.551)	0.014	0.014
4	0.33	0.10	0.042	(0.548)	0.021	0.021
5	0.42	0.10	0.042	(0.546)	0.021	0.021
6	0.50	0.10	0.042	(0.544)	0.021	0.021
7	0.58	0.10	0.042	(0.542)	0.021	0.021
8	0.67	0.10	0.042	(0.540)	0.021	0.021
9	0.75	0.10	0.042	(0.538)	0.021	0.021
10	0.83	0.13	0.056	(0.536)	0.028	0.028
11	0.92	0.13	0.056	(0.534)	0.028	0.028
12	1.00	0.13	0.056	(0.531)	0.028	0.028
13	1.08	0.10	0.042	(0.529)	0.021	0.021
14	1.17	0.10	0.042	(0.527)	0.021	0.021
15	1.25	0.10	0.042	(0.525)	0.021	0.021
16	1.33	0.10	0.042	(0.523)	0.021	0.021
17	1.42	0.10	0.042	(0.521)	0.021	0.021
18	1.50	0.10	0.042	(0.519)	0.021	0.021
19	1.58	0.10	0.042	(0.517)	0.021	0.021
20	1.67	0.10	0.042	(0.515)	0.021	0.021
21	1.75	0.10	0.042	(0.513)	0.021	0.021
22	1.83	0.13	0.056	(0.511)	0.028	0.028
23	1.92	0.13	0.056	(0.509)	0.028	0.028
24	2.00	0.13	0.056	(0.507)	0.028	0.028
25	2.08	0.13	0.056	(0.505)	0.028	0.028
26	2.17	0.13	0.056	(0.502)	0.028	0.028
27	2.25	0.13	0.056	(0.500)	0.028	0.028
28	2.33	0.13	0.056	(0.498)	0.028	0.028
29	2.42	0.13	0.056	(0.496)	0.028	0.028
30	2.50	0.13	0.056	(0.494)	0.028	0.028
31	2.58	0.17	0.070	(0.492)	0.035	0.035
32	2.67	0.17	0.070	(0.490)	0.035	0.035
33	2.75	0.17	0.070	(0.488)	0.035	0.035
34	2.83	0.17	0.070	(0.486)	0.035	0.035
35	2.92	0.17	0.070	(0.484)	0.035	0.035
36	3.00	0.17	0.070	(0.482)	0.035	0.035
37	3.08	0.17	0.070	(0.480)	0.035	0.035
38	3.17	0.17	0.070	(0.478)	0.035	0.035
39	3.25	0.17	0.070	(0.476)	0.035	0.035
40	3.33	0.17	0.070	(0.474)	0.035	0.035
41	3.42	0.17	0.070	(0.472)	0.035	0.035
42	3.50	0.17	0.070	(0.470)	0.035	0.035
43	3.58	0.17	0.070	(0.468)	0.035	0.035
44	3.67	0.17	0.070	(0.466)	0.035	0.035
45	3.75	0.17	0.070	(0.464)	0.035	0.035
46	3.83	0.20	0.084	(0.462)	0.042	0.042
47	3.92	0.20	0.084	(0.461)	0.042	0.042
48	4.00	0.20	0.084	(0.459)	0.042	0.042
49	4.08	0.20	0.084	(0.457)	0.042	0.042
50	4.17	0.20	0.084	(0.455)	0.042	0.042
51	4.25	0.20	0.084	(0.453)	0.042	0.042
52	4.33	0.23	0.098	(0.451)	0.049	0.049
53	4.42	0.23	0.098	(0.449)	0.049	0.049

54	4.50	0.23	0.098	(0.447)	0.049	0.049
55	4.58	0.23	0.098	(0.445)	0.049	0.049
56	4.67	0.23	0.098	(0.443)	0.049	0.049
57	4.75	0.23	0.098	(0.441)	0.049	0.049
58	4.83	0.27	0.112	(0.439)	0.056	0.056
59	4.92	0.27	0.112	(0.437)	0.056	0.056
60	5.00	0.27	0.112	(0.436)	0.056	0.056
61	5.08	0.20	0.084	(0.434)	0.042	0.042
62	5.17	0.20	0.084	(0.432)	0.042	0.042
63	5.25	0.20	0.084	(0.430)	0.042	0.042
64	5.33	0.23	0.098	(0.428)	0.049	0.049
65	5.42	0.23	0.098	(0.426)	0.049	0.049
66	5.50	0.23	0.098	(0.424)	0.049	0.049
67	5.58	0.27	0.112	(0.422)	0.056	0.056
68	5.67	0.27	0.112	(0.421)	0.056	0.056
69	5.75	0.27	0.112	(0.419)	0.056	0.056
70	5.83	0.27	0.112	(0.417)	0.056	0.056
71	5.92	0.27	0.112	(0.415)	0.056	0.056
72	6.00	0.27	0.112	(0.413)	0.056	0.056
73	6.08	0.30	0.127	(0.411)	0.063	0.063
74	6.17	0.30	0.127	(0.409)	0.063	0.063
75	6.25	0.30	0.127	(0.408)	0.063	0.063
76	6.33	0.30	0.127	(0.406)	0.063	0.063
77	6.42	0.30	0.127	(0.404)	0.063	0.063
78	6.50	0.30	0.127	(0.402)	0.063	0.063
79	6.58	0.33	0.141	(0.400)	0.070	0.070
80	6.67	0.33	0.141	(0.399)	0.070	0.070
81	6.75	0.33	0.141	(0.397)	0.070	0.070
82	6.83	0.33	0.141	(0.395)	0.070	0.070
83	6.92	0.33	0.141	(0.393)	0.070	0.070
84	7.00	0.33	0.141	(0.391)	0.070	0.070
85	7.08	0.33	0.141	(0.390)	0.070	0.070
86	7.17	0.33	0.141	(0.388)	0.070	0.070
87	7.25	0.33	0.141	(0.386)	0.070	0.070
88	7.33	0.37	0.155	(0.384)	0.077	0.077
89	7.42	0.37	0.155	(0.383)	0.077	0.077
90	7.50	0.37	0.155	(0.381)	0.077	0.077
91	7.58	0.40	0.169	(0.379)	0.084	0.084
92	7.67	0.40	0.169	(0.377)	0.084	0.084
93	7.75	0.40	0.169	(0.376)	0.084	0.084
94	7.83	0.43	0.183	(0.374)	0.091	0.091
95	7.92	0.43	0.183	(0.372)	0.091	0.091
96	8.00	0.43	0.183	(0.370)	0.091	0.091
97	8.08	0.50	0.211	(0.369)	0.105	0.105
98	8.17	0.50	0.211	(0.367)	0.105	0.105
99	8.25	0.50	0.211	(0.365)	0.105	0.105
100	8.33	0.50	0.211	(0.364)	0.105	0.105
101	8.42	0.50	0.211	(0.362)	0.105	0.105
102	8.50	0.50	0.211	(0.360)	0.105	0.105
103	8.58	0.53	0.225	(0.358)	0.112	0.112
104	8.67	0.53	0.225	(0.357)	0.112	0.112
105	8.75	0.53	0.225	(0.355)	0.112	0.112
106	8.83	0.57	0.239	(0.353)	0.120	0.120
107	8.92	0.57	0.239	(0.352)	0.120	0.120

108	9.00	0.57	0.239	(0.350)	0.120	0.120
109	9.08	0.63	0.267	(0.348)	0.134	0.134
110	9.17	0.63	0.267	(0.347)	0.134	0.134
111	9.25	0.63	0.267	(0.345)	0.134	0.134
112	9.33	0.67	0.281	(0.344)	0.141	0.141
113	9.42	0.67	0.281	(0.342)	0.141	0.141
114	9.50	0.67	0.281	(0.340)	0.141	0.141
115	9.58	0.70	0.295	(0.339)	0.148	0.148
116	9.67	0.70	0.295	(0.337)	0.148	0.148
117	9.75	0.70	0.295	(0.335)	0.148	0.148
118	9.83	0.73	0.309	(0.334)	0.155	0.155
119	9.92	0.73	0.309	(0.332)	0.155	0.155
120	10.00	0.73	0.309	(0.331)	0.155	0.155
121	10.08	0.50	0.211	(0.329)	0.105	0.105
122	10.17	0.50	0.211	(0.327)	0.105	0.105
123	10.25	0.50	0.211	(0.326)	0.105	0.105
124	10.33	0.50	0.211	(0.324)	0.105	0.105
125	10.42	0.50	0.211	(0.323)	0.105	0.105
126	10.50	0.50	0.211	(0.321)	0.105	0.105
127	10.58	0.67	0.281	(0.319)	0.141	0.141
128	10.67	0.67	0.281	(0.318)	0.141	0.141
129	10.75	0.67	0.281	(0.316)	0.141	0.141
130	10.83	0.67	0.281	(0.315)	0.141	0.141
131	10.92	0.67	0.281	(0.313)	0.141	0.141
132	11.00	0.67	0.281	(0.312)	0.141	0.141
133	11.08	0.63	0.267	(0.310)	0.134	0.134
134	11.17	0.63	0.267	(0.309)	0.134	0.134
135	11.25	0.63	0.267	(0.307)	0.134	0.134
136	11.33	0.63	0.267	(0.306)	0.134	0.134
137	11.42	0.63	0.267	(0.304)	0.134	0.134
138	11.50	0.63	0.267	(0.303)	0.134	0.134
139	11.58	0.57	0.239	(0.301)	0.120	0.120
140	11.67	0.57	0.239	(0.300)	0.120	0.120
141	11.75	0.57	0.239	(0.298)	0.120	0.120
142	11.83	0.60	0.253	(0.297)	0.127	0.127
143	11.92	0.60	0.253	(0.295)	0.127	0.127
144	12.00	0.60	0.253	(0.294)	0.127	0.127
145	12.08	0.83	0.351	(0.292)	0.176	0.176
146	12.17	0.83	0.351	(0.291)	0.176	0.176
147	12.25	0.83	0.351	(0.289)	0.176	0.176
148	12.33	0.87	0.366	(0.288)	0.183	0.183
149	12.42	0.87	0.366	(0.286)	0.183	0.183
150	12.50	0.87	0.366	(0.285)	0.183	0.183
151	12.58	0.93	0.394	(0.283)	0.197	0.197
152	12.67	0.93	0.394	(0.282)	0.197	0.197
153	12.75	0.93	0.394	(0.281)	0.197	0.197
154	12.83	0.97	0.408	(0.279)	0.204	0.204
155	12.92	0.97	0.408	(0.278)	0.204	0.204
156	13.00	0.97	0.408	(0.276)	0.204	0.204
157	13.08	1.13	0.478	(0.275)	0.239	0.239
158	13.17	1.13	0.478	(0.274)	0.239	0.239
159	13.25	1.13	0.478	(0.272)	0.239	0.239
160	13.33	1.13	0.478	(0.271)	0.239	0.239
161	13.42	1.13	0.478	(0.269)	0.239	0.239

162	13.50	1.13	0.478	(0.268)	0.239	0.239
163	13.58	0.77	0.323	(0.267)	0.162	0.162
164	13.67	0.77	0.323	(0.265)	0.162	0.162
165	13.75	0.77	0.323	(0.264)	0.162	0.162
166	13.83	0.77	0.323	(0.263)	0.162	0.162
167	13.92	0.77	0.323	(0.261)	0.162	0.162
168	14.00	0.77	0.323	(0.260)	0.162	0.162
169	14.08	0.90	0.380	(0.259)	0.190	0.190
170	14.17	0.90	0.380	(0.257)	0.190	0.190
171	14.25	0.90	0.380	(0.256)	0.190	0.190
172	14.33	0.87	0.366	(0.255)	0.183	0.183
173	14.42	0.87	0.366	(0.253)	0.183	0.183
174	14.50	0.87	0.366	(0.252)	0.183	0.183
175	14.58	0.87	0.366	(0.251)	0.183	0.183
176	14.67	0.87	0.366	(0.250)	0.183	0.183
177	14.75	0.87	0.366	(0.248)	0.183	0.183
178	14.83	0.83	0.351	(0.247)	0.176	0.176
179	14.92	0.83	0.351	(0.246)	0.176	0.176
180	15.00	0.83	0.351	(0.244)	0.176	0.176
181	15.08	0.80	0.337	(0.243)	0.169	0.169
182	15.17	0.80	0.337	(0.242)	0.169	0.169
183	15.25	0.80	0.337	(0.241)	0.169	0.169
184	15.33	0.77	0.323	(0.239)	0.162	0.162
185	15.42	0.77	0.323	(0.238)	0.162	0.162
186	15.50	0.77	0.323	(0.237)	0.162	0.162
187	15.58	0.63	0.267	(0.236)	0.134	0.134
188	15.67	0.63	0.267	(0.235)	0.134	0.134
189	15.75	0.63	0.267	(0.233)	0.134	0.134
190	15.83	0.63	0.267	(0.232)	0.134	0.134
191	15.92	0.63	0.267	(0.231)	0.134	0.134
192	16.00	0.63	0.267	(0.230)	0.134	0.134
193	16.08	0.13	0.056	(0.229)	0.028	0.028
194	16.17	0.13	0.056	(0.228)	0.028	0.028
195	16.25	0.13	0.056	(0.226)	0.028	0.028
196	16.33	0.13	0.056	(0.225)	0.028	0.028
197	16.42	0.13	0.056	(0.224)	0.028	0.028
198	16.50	0.13	0.056	(0.223)	0.028	0.028
199	16.58	0.10	0.042	(0.222)	0.021	0.021
200	16.67	0.10	0.042	(0.221)	0.021	0.021
201	16.75	0.10	0.042	(0.220)	0.021	0.021
202	16.83	0.10	0.042	(0.218)	0.021	0.021
203	16.92	0.10	0.042	(0.217)	0.021	0.021
204	17.00	0.10	0.042	(0.216)	0.021	0.021
205	17.08	0.17	0.070	(0.215)	0.035	0.035
206	17.17	0.17	0.070	(0.214)	0.035	0.035
207	17.25	0.17	0.070	(0.213)	0.035	0.035
208	17.33	0.17	0.070	(0.212)	0.035	0.035
209	17.42	0.17	0.070	(0.211)	0.035	0.035
210	17.50	0.17	0.070	(0.210)	0.035	0.035
211	17.58	0.17	0.070	(0.209)	0.035	0.035
212	17.67	0.17	0.070	(0.208)	0.035	0.035
213	17.75	0.17	0.070	(0.207)	0.035	0.035
214	17.83	0.13	0.056	(0.206)	0.028	0.028
215	17.92	0.13	0.056	(0.205)	0.028	0.028

216	18.00	0.13	0.056	(0.204)	0.028	0.028
217	18.08	0.13	0.056	(0.203)	0.028	0.028
218	18.17	0.13	0.056	(0.202)	0.028	0.028
219	18.25	0.13	0.056	(0.201)	0.028	0.028
220	18.33	0.13	0.056	(0.200)	0.028	0.028
221	18.42	0.13	0.056	(0.199)	0.028	0.028
222	18.50	0.13	0.056	(0.198)	0.028	0.028
223	18.58	0.10	0.042	(0.197)	0.021	0.021
224	18.67	0.10	0.042	(0.196)	0.021	0.021
225	18.75	0.10	0.042	(0.195)	0.021	0.021
226	18.83	0.07	0.028	(0.194)	0.014	0.014
227	18.92	0.07	0.028	(0.193)	0.014	0.014
228	19.00	0.07	0.028	(0.192)	0.014	0.014
229	19.08	0.10	0.042	(0.191)	0.021	0.021
230	19.17	0.10	0.042	(0.190)	0.021	0.021
231	19.25	0.10	0.042	(0.189)	0.021	0.021
232	19.33	0.13	0.056	(0.188)	0.028	0.028
233	19.42	0.13	0.056	(0.188)	0.028	0.028
234	19.50	0.13	0.056	(0.187)	0.028	0.028
235	19.58	0.10	0.042	(0.186)	0.021	0.021
236	19.67	0.10	0.042	(0.185)	0.021	0.021
237	19.75	0.10	0.042	(0.184)	0.021	0.021
238	19.83	0.07	0.028	(0.183)	0.014	0.014
239	19.92	0.07	0.028	(0.183)	0.014	0.014
240	20.00	0.07	0.028	(0.182)	0.014	0.014
241	20.08	0.10	0.042	(0.181)	0.021	0.021
242	20.17	0.10	0.042	(0.180)	0.021	0.021
243	20.25	0.10	0.042	(0.179)	0.021	0.021
244	20.33	0.10	0.042	(0.179)	0.021	0.021
245	20.42	0.10	0.042	(0.178)	0.021	0.021
246	20.50	0.10	0.042	(0.177)	0.021	0.021
247	20.58	0.10	0.042	(0.176)	0.021	0.021
248	20.67	0.10	0.042	(0.176)	0.021	0.021
249	20.75	0.10	0.042	(0.175)	0.021	0.021
250	20.83	0.07	0.028	(0.174)	0.014	0.014
251	20.92	0.07	0.028	(0.173)	0.014	0.014
252	21.00	0.07	0.028	(0.173)	0.014	0.014
253	21.08	0.10	0.042	(0.172)	0.021	0.021
254	21.17	0.10	0.042	(0.171)	0.021	0.021
255	21.25	0.10	0.042	(0.171)	0.021	0.021
256	21.33	0.07	0.028	(0.170)	0.014	0.014
257	21.42	0.07	0.028	(0.169)	0.014	0.014
258	21.50	0.07	0.028	(0.169)	0.014	0.014
259	21.58	0.10	0.042	(0.168)	0.021	0.021
260	21.67	0.10	0.042	(0.168)	0.021	0.021
261	21.75	0.10	0.042	(0.167)	0.021	0.021
262	21.83	0.07	0.028	(0.166)	0.014	0.014
263	21.92	0.07	0.028	(0.166)	0.014	0.014
264	22.00	0.07	0.028	(0.165)	0.014	0.014
265	22.08	0.10	0.042	(0.165)	0.021	0.021
266	22.17	0.10	0.042	(0.164)	0.021	0.021
267	22.25	0.10	0.042	(0.164)	0.021	0.021
268	22.33	0.07	0.028	(0.163)	0.014	0.014
269	22.42	0.07	0.028	(0.163)	0.014	0.014

270	22.50	0.07	0.028	(0.162)	0.014	0.014
271	22.58	0.07	0.028	(0.162)	0.014	0.014
272	22.67	0.07	0.028	(0.161)	0.014	0.014
273	22.75	0.07	0.028	(0.161)	0.014	0.014
274	22.83	0.07	0.028	(0.160)	0.014	0.014
275	22.92	0.07	0.028	(0.160)	0.014	0.014
276	23.00	0.07	0.028	(0.160)	0.014	0.014
277	23.08	0.07	0.028	(0.159)	0.014	0.014
278	23.17	0.07	0.028	(0.159)	0.014	0.014
279	23.25	0.07	0.028	(0.159)	0.014	0.014
280	23.33	0.07	0.028	(0.158)	0.014	0.014
281	23.42	0.07	0.028	(0.158)	0.014	0.014
282	23.50	0.07	0.028	(0.158)	0.014	0.014
283	23.58	0.07	0.028	(0.157)	0.014	0.014
284	23.67	0.07	0.028	(0.157)	0.014	0.014
285	23.75	0.07	0.028	(0.157)	0.014	0.014
286	23.83	0.07	0.028	(0.157)	0.014	0.014
287	23.92	0.07	0.028	(0.157)	0.014	0.014
288	24.00	0.07	0.028	(0.157)	0.014	0.014

(Loss Rate Not Used)

Sum = 100.0

Sum = 21.1

Flood volume = Effective rainfall 1.76(In)
times area 47.1(Ac.)/[(In)/(Ft.)] = 6.9(Ac.Ft)

Total soil loss = 1.76(In)

Total soil loss = 6.898(Ac.Ft)

Total rainfall = 3.51(In)

Flood volume = 300480.6 Cubic Feet

Total soil loss = 300480.6 Cubic Feet

Peak flow rate of this hydrograph = 11.351(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0014	0.20	Q				
0+10	0.0049	0.52	VQ				
0+15	0.0090	0.60	VQ				
0+20	0.0141	0.73	VQ				
0+25	0.0204	0.91	VQ				
0+30	0.0270	0.97	VQ				
0+35	0.0338	0.98	VQ				
0+40	0.0407	0.99	VQ				
0+45	0.0476	1.00	V Q				
0+50	0.0551	1.10	V Q				
0+55	0.0638	1.26	V Q				
1+ 0	0.0728	1.30	V Q				
1+ 5	0.0812	1.22	V Q				
1+10	0.0885	1.07	V Q				

1+15	0.0957	1.04	V Q
1+20	0.1027	1.02	V Q
1+25	0.1096	1.01	V Q
1+30	0.1165	1.00	V Q
1+35	0.1234	1.00	V Q
1+40	0.1303	1.00	V Q
1+45	0.1372	1.00	V Q
1+50	0.1448	1.10	V Q
1+55	0.1535	1.26	V Q
2+ 0	0.1625	1.30	V Q
2+ 5	0.1715	1.32	V Q
2+10	0.1807	1.33	VQ
2+15	0.1899	1.34	VQ
2+20	0.1991	1.34	VQ
2+25	0.2083	1.34	VQ
2+30	0.2175	1.34	VQ
2+35	0.2274	1.43	VQ
2+40	0.2383	1.59	V Q
2+45	0.2496	1.63	V Q
2+50	0.2610	1.65	V Q
2+55	0.2724	1.66	V Q
3+ 0	0.2839	1.67	V Q
3+ 5	0.2954	1.67	V Q
3+10	0.3069	1.67	V Q
3+15	0.3184	1.67	V Q
3+20	0.3299	1.67	V Q
3+25	0.3414	1.67	V Q
3+30	0.3529	1.67	VQ
3+35	0.3644	1.67	VQ
3+40	0.3759	1.67	VQ
3+45	0.3874	1.67	VQ
3+50	0.3996	1.77	VQ
3+55	0.4128	1.93	VQ
4+ 0	0.4264	1.97	VQ
4+ 5	0.4401	1.99	VQ
4+10	0.4538	2.00	VQ
4+15	0.4676	2.00	V Q
4+20	0.4821	2.10	V Q
4+25	0.4977	2.26	V Q
4+30	0.5135	2.30	V Q
4+35	0.5295	2.32	VQ
4+40	0.5456	2.33	VQ
4+45	0.5617	2.34	VQ
4+50	0.5784	2.44	VQ
4+55	0.5963	2.60	V Q
5+ 0	0.6145	2.64	V Q
5+ 5	0.6314	2.46	VQ
5+10	0.6462	2.15	VQ
5+15	0.6604	2.07	VQ
5+20	0.6751	2.14	VQ
5+25	0.6908	2.28	Q
5+30	0.7067	2.30	Q
5+35	0.7233	2.42	Q
5+40	0.7412	2.59	VQ

5+45	0.7593	2.64	VQ				
5+50	0.7776	2.65	VQ				
5+55	0.7959	2.66	VQ				
6+ 0	0.8143	2.67	VQ				
6+ 5	0.8334	2.77	VQ				
6+10	0.8536	2.93	VQ				
6+15	0.8740	2.97	Q				
6+20	0.8946	2.99	Q				
6+25	0.9153	3.00	Q				
6+30	0.9360	3.00	VQ				
6+35	0.9573	3.10	VQ				
6+40	0.9798	3.26	VQ				
6+45	1.0026	3.30	VQ				
6+50	1.0254	3.32	VQ				
6+55	1.0484	3.33	Q				
7+ 0	1.0714	3.34	Q				
7+ 5	1.0944	3.34	Q				
7+10	1.1174	3.34	Q				
7+15	1.1404	3.34	Q				
7+20	1.1640	3.44	Q				
7+25	1.1888	3.60	VQ				
7+30	1.2139	3.64	Q				
7+35	1.2397	3.75	Q				
7+40	1.2668	3.92	Q				
7+45	1.2941	3.97	Q				
7+50	1.3223	4.09	VQ				
7+55	1.3516	4.26	VQ				
8+ 0	1.3812	4.31	Q				
8+ 5	1.4124	4.52	VQ				
8+10	1.4458	4.85	VQ				
8+15	1.4798	4.94	VQ				
8+20	1.5141	4.97	VQ				
8+25	1.5484	4.99	VQ				
8+30	1.5829	5.01	VQ				
8+35	1.6181	5.11	VQ				
8+40	1.6544	5.27	VQ				
8+45	1.6909	5.31	VQ				
8+50	1.7283	5.42	Q				
8+55	1.7668	5.59	VQ				
9+ 0	1.8057	5.64	VQ				
9+ 5	1.8460	5.86	VQ				
9+10	1.8886	6.19	V Q				
9+15	1.9318	6.27	VQ				
9+20	1.9759	6.41	VQ				
9+25	2.0213	6.59	V Q				
9+30	2.0671	6.64	V Q				
9+35	2.1136	6.76	VQ				
9+40	2.1613	6.93	VQ				
9+45	2.2094	6.98	VQ				
9+50	2.2582	7.09	VQ				
9+55	2.3082	7.26	VQ				
10+ 0	2.3586	7.31	VQ				
10+ 5	2.4043	6.64	Q				
10+10	2.4424	5.53	Q V				

10+15	2.4785	5.25	Q	V				
10+20	2.5138	5.13	Q	V				
10+25	2.5487	5.06	Q	V				
10+30	2.5832	5.01	Q	V				
10+35	2.6210	5.50	Q	V				
10+40	2.6644	6.30	Q	V				
10+45	2.7092	6.50	Q	V				
10+50	2.7546	6.59	Q	V				
10+55	2.8004	6.64	Q	V				
11+ 0	2.8464	6.68	Q	V				
11+ 5	2.8917	6.58	Q	V				
11+10	2.9359	6.42	Q	V				
11+15	2.9798	6.38	Q	V				
11+20	3.0236	6.36	Q	V				
11+25	3.0674	6.35	Q	V				
11+30	3.1110	6.34	Q	V				
11+35	3.1534	6.15	Q	V				
11+40	3.1935	5.83	Q	V				
11+45	3.2331	5.75	Q	V				
11+50	3.2731	5.81	Q	V				
11+55	3.3140	5.95	Q	V				
12+ 0	3.3552	5.97	Q	V				
12+ 5	3.4012	6.68	Q	V				
12+10	3.4550	7.81	Q	V				
12+15	3.5108	8.10	Q	V				
12+20	3.5682	8.33	Q	V				
12+25	3.6271	8.56	Q	V				
12+30	3.6867	8.65	Q	V				
12+35	3.7477	8.86	Q	V				
12+40	3.8110	9.19	Q	V				
12+45	3.8749	9.28	Q	V				
12+50	3.9397	9.41	Q	V				
12+55	4.0058	9.59	Q	V				
13+ 0	4.0722	9.65	Q	V				
13+ 5	4.1422	10.16	Q	V				
13+10	4.2177	10.97	Q	V				
13+15	4.2947	11.18	Q	V				
13+20	4.3723	11.27	Q	V				
13+25	4.4503	11.32	Q	V				
13+30	4.5284	11.35	Q	V				
13+35	4.5991	10.27	Q	V				
13+40	4.6577	8.50	Q	V				
13+45	4.7132	8.06	Q	V				
13+50	4.7674	7.86	Q	V				
13+55	4.8208	7.76	Q	V				
14+ 0	4.8737	7.68	Q	V				
14+ 5	4.9293	8.07	Q	V				
14+10	4.9893	8.71	Q	V				
14+15	5.0504	8.88	Q	V				
14+20	5.1114	8.85	Q	V				
14+25	5.1715	8.73	Q	V				
14+30	5.2315	8.72	Q	V				
14+35	5.2914	8.70	Q	V				
14+40	5.3512	8.69	Q	V				

14+45	5.4110	8.68					V
14+50	5.4701	8.58					V
14+55	5.5281	8.42					V
15+ 0	5.5858	8.38					V
15+ 5	5.6428	8.26					V
15+10	5.6985	8.09					V
15+15	5.7539	8.05					V
15+20	5.8086	7.93					V
15+25	5.8620	7.76					V
15+30	5.9151	7.71					V
15+35	5.9654	7.30					V
15+40	6.0112	6.65					V
15+45	6.0559	6.48					V
15+50	6.1000	6.41					V
15+55	6.1439	6.37					V
16+ 0	6.1876	6.34					V
16+ 5	6.2211	4.86					V
16+10	6.2381	2.46					V
16+15	6.2508	1.86					V
16+20	6.2618	1.59					V
16+25	6.2717	1.44					V
16+30	6.2809	1.34					V
16+35	6.2894	1.24					V
16+40	6.2968	1.08					V
16+45	6.3040	1.04					V
16+50	6.3110	1.02					V
16+55	6.3179	1.01					V
17+ 0	6.3248	1.00					V
17+ 5	6.3331	1.20					V
17+10	6.3435	1.52					V
17+15	6.3546	1.60					V
17+20	6.3658	1.64					V
17+25	6.3772	1.66					V
17+30	6.3887	1.67					V
17+35	6.4002	1.67					V
17+40	6.4117	1.67					V
17+45	6.4232	1.67					V
17+50	6.4340	1.57					V
17+55	6.4437	1.41					V
18+ 0	6.4532	1.37					V
18+ 5	6.4625	1.35					V
18+10	6.4717	1.34					V
18+15	6.4809	1.34					V
18+20	6.4901	1.34					V
18+25	6.4993	1.34					V
18+30	6.5085	1.34					V
18+35	6.5170	1.24					V
18+40	6.5245	1.08					V
18+45	6.5316	1.04					V
18+50	6.5379	0.92					V
18+55	6.5431	0.75					V
19+ 0	6.5479	0.70					V
19+ 5	6.5533	0.78					V
19+10	6.5598	0.93					V

19+15	6.5664	0.97	Q				V
19+20	6.5739	1.08	Q				V
19+25	6.5825	1.25	Q				V
19+30	6.5915	1.30	Q				V
19+35	6.5999	1.22	Q				V
19+40	6.6072	1.07	Q				V
19+45	6.6144	1.04	Q				V
19+50	6.6207	0.92	Q				V
19+55	6.6259	0.75	Q				V
20+ 0	6.6307	0.70	Q				V
20+ 5	6.6361	0.78	Q				V
20+10	6.6425	0.93	Q				V
20+15	6.6492	0.97	Q				V
20+20	6.6560	0.98	Q				V
20+25	6.6628	0.99	Q				V
20+30	6.6697	1.00	Q				V
20+35	6.6766	1.00	Q				V
20+40	6.6835	1.00	Q				V
20+45	6.6904	1.00	Q				V
20+50	6.6966	0.90	Q				V
20+55	6.7018	0.74	Q				V
21+ 0	6.7066	0.70	Q				V
21+ 5	6.7120	0.78	Q				V
21+10	6.7184	0.93	Q				V
21+15	6.7251	0.97	Q				V
21+20	6.7312	0.89	Q				V
21+25	6.7362	0.74	Q				V
21+30	6.7411	0.70	Q				V
21+35	6.7465	0.78	Q				V
21+40	6.7529	0.93	Q				V
21+45	6.7596	0.97	Q				V
21+50	6.7657	0.89	Q				V
21+55	6.7707	0.74	Q				V
22+ 0	6.7756	0.70	Q				V
22+ 5	6.7810	0.78	Q				V
22+10	6.7874	0.93	Q				V
22+15	6.7941	0.97	Q				V
22+20	6.8002	0.89	Q				V
22+25	6.8052	0.74	Q				V
22+30	6.8101	0.70	Q				V
22+35	6.8148	0.68	Q				V
22+40	6.8194	0.67	Q				V
22+45	6.8240	0.67	Q				V
22+50	6.8286	0.67	Q				V
22+55	6.8332	0.67	Q				V
23+ 0	6.8378	0.67	Q				V
23+ 5	6.8424	0.67	Q				V
23+10	6.8470	0.67	Q				V
23+15	6.8516	0.67	Q				V
23+20	6.8562	0.67	Q				V
23+25	6.8608	0.67	Q				V
23+30	6.8654	0.67	Q				V
23+35	6.8700	0.67	Q				V
23+40	6.8746	0.67	Q				V

23+45	6.8792	0.67	Q				V
23+50	6.8838	0.67	Q				V
23+55	6.8884	0.67	Q				V
24+ 0	6.8930	0.67	Q				V
24+ 5	6.8962	0.47	Q				V
24+10	6.8973	0.15	Q				V
24+15	6.8978	0.07	Q				V
24+20	6.8980	0.03	Q				V
24+25	6.8981	0.01	Q				V

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786Adev110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
47.10	0.58	27.32

100 YEAR Area rainfall data:

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

47.10

1.45

68.30

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.938(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.204	0.057
69.0	69.0	0.373	0.500	0.205	0.363	0.074
75.0	75.0	0.303	0.500	0.167	0.433	0.072
Sum (F) =						0.204

Area averaged mean soil loss (F) (In/Hr) = 0.204

Minimum soil loss rate ((In/Hr)) = 0.102

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.495	0.204	(0.248)	0.291
2	0.17	4.50	0.506	0.204	(0.253)	0.302
3	0.25	5.40	0.608	0.204	(0.304)	0.404
4	0.33	5.40	0.608	0.204	(0.304)	0.404
5	0.42	5.70	0.641	0.204	(0.321)	0.437
6	0.50	6.40	0.720	0.204	(0.360)	0.516
7	0.58	7.90	0.889	0.204	(0.444)	0.685
8	0.67	9.10	1.024	0.204	(0.512)	0.820
9	0.75	12.80	1.440	0.204	(0.720)	1.236
10	0.83	25.60	2.880	0.204	(1.440)	2.676
11	0.92	7.90	0.889	0.204	(0.444)	0.685
12	1.00	4.90	0.551	0.204	(0.276)	0.347

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.8

Flood volume = Effective rainfall 0.73(In)
times area 47.1(Ac.)/[(In)/(Ft.)] = 2.9(Ac.Ft)

Total soil loss = 0.20(In)

Total soil loss = 0.800(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 125433.0 Cubic Feet

Total soil loss = 34858.4 Cubic Feet

Peak flow rate of this hydrograph = 81.245(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0
0+ 5	0.0281	4.08	VQ				
0+10	0.1030	10.87	V Q				
0+15	0.2010	14.22	V Q				
0+20	0.3204	17.34	V Q				
0+25	0.4500	18.82	V Q				
0+30	0.5965	21.26	VQ				
0+35	0.7739	25.77	VQ				
0+40	0.9953	32.15	VQ				
0+45	1.2865	42.28	VQ				
0+50	1.7914	73.31	V				
0+55	2.3509	81.25	V				
1+ 0	2.6321	40.83					
1+ 5	2.7781	21.20					
1+10	2.8379	8.68					
1+15	2.8691	4.52					
1+20	2.8771	1.17					
1+25	2.8795	0.35					

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 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]
47.10	0.98	46.16

100 YEAR Area rainfall data:

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

47.10

2.48

116.81

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.597 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.597 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.204	0.057
69.0	69.0	0.373	0.500	0.205	0.363	0.074
75.0	75.0	0.303	0.500	0.167	0.433	0.072
Sum (F) =						0.204

Area averaged mean soil loss (F) (In/Hr) = 0.204

Minimum soil loss rate ((In/Hr)) = 0.102

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.603	29.528
2	0.167	271.206	47.980
3	0.250	406.809	12.102
4	0.333	542.412	5.361
5	0.417	678.015	2.910
6	0.500	813.619	2.118
Sum =		100.000	Sum= 47.468

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	0.08	1.30	0.249	(0.204)	0.125	0.125
2	0.17	1.30	0.249	(0.204)	0.125	0.125
3	0.25	1.10	0.211	(0.204)	0.105	0.105
4	0.33	1.50	0.287	(0.204)	0.144	0.144
5	0.42	1.50	0.287	(0.204)	0.144	0.144
6	0.50	1.80	0.345	(0.204)	0.172	0.172
7	0.58	1.50	0.287	(0.204)	0.144	0.144
8	0.67	1.80	0.345	(0.204)	0.172	0.172
9	0.75	1.80	0.345	(0.204)	0.172	0.172
10	0.83	1.50	0.287	(0.204)	0.144	0.144
11	0.92	1.60	0.307	(0.204)	0.153	0.153
12	1.00	1.80	0.345	(0.204)	0.172	0.172
13	1.08	2.20	0.422	0.204	(0.211)	0.218
14	1.17	2.20	0.422	0.204	(0.211)	0.218
15	1.25	2.20	0.422	0.204	(0.211)	0.218
16	1.33	2.00	0.383	(0.204)	0.192	0.192
17	1.42	2.60	0.498	0.204	(0.249)	0.294
18	1.50	2.70	0.517	0.204	(0.259)	0.313
19	1.58	2.40	0.460	0.204	(0.230)	0.256
20	1.67	2.70	0.517	0.204	(0.259)	0.313
21	1.75	3.30	0.632	0.204	(0.316)	0.428
22	1.83	3.10	0.594	0.204	(0.297)	0.390
23	1.92	2.90	0.556	0.204	(0.278)	0.352
24	2.00	3.00	0.575	0.204	(0.287)	0.371
25	2.08	3.10	0.594	0.204	(0.297)	0.390
26	2.17	4.20	0.805	0.204	(0.402)	0.601
27	2.25	5.00	0.958	0.204	(0.479)	0.754
28	2.33	3.50	0.671	0.204	(0.335)	0.467
29	2.42	6.80	1.303	0.204	(0.651)	1.099
30	2.50	7.30	1.399	0.204	(0.699)	1.195
31	2.58	8.20	1.571	0.204	(0.786)	1.367
32	2.67	5.90	1.131	0.204	(0.565)	0.927
33	2.75	2.00	0.383	(0.204)	0.192	0.192
34	2.83	1.80	0.345	(0.204)	0.172	0.172
35	2.92	1.80	0.345	(0.204)	0.172	0.172
36	3.00	0.60	0.115	(0.204)	0.057	0.057

(Loss Rate Not Used)

Sum = 100.0 Sum = 12.7

Flood volume = Effective rainfall 1.06(In)
times area 47.1(Ac.)/[(In)/(Ft.)] = 4.2(Ac.Ft)
Total soil loss = 0.54(In)
Total soil loss = 2.104(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 181367.9 Cubic Feet
Total soil loss = 91638.9 Cubic Feet

Peak flow rate of this hydrograph = 55.556(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0120	1.75	VQ					
0+10	0.0436	4.58	V Q					
0+15	0.0783	5.03	V Q					
0+20	0.1158	5.45	V Q					
0+25	0.1598	6.39	V Q					
0+30	0.2086	7.08	V Q					
0+35	0.2596	7.41	V Q					
0+40	0.3102	7.35	V Q					
0+45	0.3650	7.96	V Q					
0+50	0.4180	7.69	VQ					
0+55	0.4677	7.23	Q					
1+ 0	0.5198	7.56	VQ					
1+ 5	0.5793	8.64	Q					
1+10	0.6466	9.77	Q					
1+15	0.7158	10.06	Q					
1+20	0.7836	9.84	QV					
1+25	0.8578	10.77	QV					
1+30	0.9493	13.28	QV					
1+35	1.0418	13.43	Q V					
1+40	1.1331	13.26	Q V					
1+45	1.2435	16.02	QV					
1+50	1.3703	18.42	QV					
1+55	1.4926	17.75	Q V					
2+ 0	1.6113	17.24	Q V					
2+ 5	1.7342	17.85	Q V					
2+10	1.8810	21.31	Q V					
2+15	2.0762	28.33	QV					
2+20	2.2762	29.05	Q V					
2+25	2.5023	32.83	Q V					
2+30	2.8303	47.63	Q V					
2+35	3.2129	55.56	Q V					
2+40	3.5932	55.22	Q V					
2+45	3.8459	36.69	Q V					
2+50	3.9723	18.35	Q					
2+55	4.0612	12.90	Q					
3+ 0	4.1223	8.87	Q					
3+ 5	4.1494	3.94	Q					
3+10	4.1576	1.20	Q					
3+15	4.1615	0.56	Q					
3+20	4.1632	0.25	Q					
3+25	4.1636	0.06	Q					

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786Adev610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
47.10	1.38	65.00

100 YEAR Area rainfall data:

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

47.10

3.48

163.91

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 2.244(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 2.244(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.204	0.057
69.0	69.0	0.373	0.500	0.205	0.363	0.074
75.0	75.0	0.303	0.500	0.167	0.433	0.072
Sum (F) =						0.204

Area averaged mean soil loss (F) (In/Hr) = 0.204

Minimum soil loss rate ((In/Hr)) = 0.102

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

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 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	0.50	0.135	(0.204)	0.067	0.067
2	0.17	0.60	0.162	(0.204)	0.081	0.081
3	0.25	0.60	0.162	(0.204)	0.081	0.081
4	0.33	0.60	0.162	(0.204)	0.081	0.081
5	0.42	0.60	0.162	(0.204)	0.081	0.081
6	0.50	0.70	0.188	(0.204)	0.094	0.094
7	0.58	0.70	0.188	(0.204)	0.094	0.094
8	0.67	0.70	0.188	(0.204)	0.094	0.094
9	0.75	0.70	0.188	(0.204)	0.094	0.094
10	0.83	0.70	0.188	(0.204)	0.094	0.094
11	0.92	0.70	0.188	(0.204)	0.094	0.094
12	1.00	0.80	0.215	(0.204)	0.108	0.108
13	1.08	0.80	0.215	(0.204)	0.108	0.108
14	1.17	0.80	0.215	(0.204)	0.108	0.108
15	1.25	0.80	0.215	(0.204)	0.108	0.108
16	1.33	0.80	0.215	(0.204)	0.108	0.108
17	1.42	0.80	0.215	(0.204)	0.108	0.108
18	1.50	0.80	0.215	(0.204)	0.108	0.108
19	1.58	0.80	0.215	(0.204)	0.108	0.108
20	1.67	0.80	0.215	(0.204)	0.108	0.108
21	1.75	0.80	0.215	(0.204)	0.108	0.108
22	1.83	0.80	0.215	(0.204)	0.108	0.108
23	1.92	0.80	0.215	(0.204)	0.108	0.108
24	2.00	0.90	0.242	(0.204)	0.121	0.121
25	2.08	0.80	0.215	(0.204)	0.108	0.108
26	2.17	0.90	0.242	(0.204)	0.121	0.121
27	2.25	0.90	0.242	(0.204)	0.121	0.121
28	2.33	0.90	0.242	(0.204)	0.121	0.121
29	2.42	0.90	0.242	(0.204)	0.121	0.121
30	2.50	0.90	0.242	(0.204)	0.121	0.121
31	2.58	0.90	0.242	(0.204)	0.121	0.121
32	2.67	0.90	0.242	(0.204)	0.121	0.121
33	2.75	1.00	0.269	(0.204)	0.135	0.135
34	2.83	1.00	0.269	(0.204)	0.135	0.135
35	2.92	1.00	0.269	(0.204)	0.135	0.135
36	3.00	1.00	0.269	(0.204)	0.135	0.135
37	3.08	1.00	0.269	(0.204)	0.135	0.135
38	3.17	1.10	0.296	(0.204)	0.148	0.148
39	3.25	1.10	0.296	(0.204)	0.148	0.148
40	3.33	1.10	0.296	(0.204)	0.148	0.148
41	3.42	1.20	0.323	(0.204)	0.162	0.162
42	3.50	1.30	0.350	(0.204)	0.175	0.175
43	3.58	1.40	0.377	(0.204)	0.188	0.188
44	3.67	1.40	0.377	(0.204)	0.188	0.188
45	3.75	1.50	0.404	(0.204)	0.202	0.202
46	3.83	1.50	0.404	(0.204)	0.202	0.202
47	3.92	1.60	0.431	0.204 (0.215)	0.227	0.227
48	4.00	1.60	0.431	0.204 (0.215)	0.227	0.227
49	4.08	1.70	0.458	0.204 (0.229)	0.254	0.254
50	4.17	1.80	0.485	0.204 (0.242)	0.281	0.281
51	4.25	1.90	0.512	0.204 (0.256)	0.308	0.308
52	4.33	2.00	0.538	0.204 (0.269)	0.335	0.335
53	4.42	2.10	0.565	0.204 (0.283)	0.362	0.362

54	4.50	2.10	0.565	0.204	(0.283)	0.362
55	4.58	2.20	0.592	0.204	(0.296)	0.388
56	4.67	2.30	0.619	0.204	(0.310)	0.415
57	4.75	2.40	0.646	0.204	(0.323)	0.442
58	4.83	2.40	0.646	0.204	(0.323)	0.442
59	4.92	2.50	0.673	0.204	(0.337)	0.469
60	5.00	2.60	0.700	0.204	(0.350)	0.496
61	5.08	3.10	0.835	0.204	(0.417)	0.631
62	5.17	3.60	0.969	0.204	(0.485)	0.765
63	5.25	3.90	1.050	0.204	(0.525)	0.846
64	5.33	4.20	1.131	0.204	(0.565)	0.927
65	5.42	4.70	1.265	0.204	(0.633)	1.062
66	5.50	5.60	1.508	0.204	(0.754)	1.304
67	5.58	1.90	0.512	0.204	(0.256)	0.308
68	5.67	0.90	0.242	(0.204)	0.121	0.121
69	5.75	0.60	0.162	(0.204)	0.081	0.081
70	5.83	0.50	0.135	(0.204)	0.067	0.067
71	5.92	0.30	0.081	(0.204)	0.040	0.040
72	6.00	0.20	0.054	(0.204)	0.027	0.027

(Loss Rate Not Used)

Sum = 100.0

Sum = 16.7

Flood volume = Effective rainfall 1.40(In)
times area 47.1(Ac.)/[(In)/(Ft.)) = 5.5(Ac.Ft)
Total soil loss = 0.85(In)
Total soil loss = 3.329(Ac.Ft)
Total rainfall = 2.24(In)
Flood volume = 238584.6 Cubic Feet
Total soil loss = 145009.3 Cubic Feet

Peak flow rate of this hydrograph = 51.647(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0065	0.94	Q				
0+10	0.0249	2.67	VQ				
0+15	0.0480	3.36	V Q				
0+20	0.0729	3.61	V Q				
0+25	0.0986	3.74	V Q				
0+30	0.1262	4.01	V Q				
0+35	0.1560	4.33	VQ				
0+40	0.1864	4.41	VQ				
0+45	0.2170	4.44	VQ				
0+50	0.2477	4.46	VQ				
0+55	0.2786	4.48	Q				
1+ 0	0.3107	4.66	VQ				
1+ 5	0.3449	4.97	VQ				
1+10	0.3797	5.05	VQ				

Unit Hydrograph Analysis

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Study date 08/23/13 File: 32786ADev2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 3 Developed Condition

Drainage Area = 47.10 (Ac.) = 0.074 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 47.10 (Ac.) = 0.074 Sq. Mi.
Length along longest watercourse = 3121.00 (Ft.)
Length along longest watercourse measured to centroid = 768.00 (Ft.)
Length along longest watercourse = 0.591 Mi.
Length along longest watercourse measured to centroid = 0.145 Mi.
Difference in elevation = 48.00 (Ft.)
Slope along watercourse = 81.2047 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.061 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.47 Min.
Unit time = 5.00 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]
47.10	2.48	116.81

100 YEAR Area rainfall data:

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

47.10

6.90

324.99

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 4.298(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 4.298(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
9.600	56.00	0.500
17.100	69.00	0.500
20.400	75.00	0.500
Total Area Entered = 47.10(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.204	0.057
69.0	69.0	0.373	0.500	0.205	0.363	0.074
75.0	75.0	0.303	0.500	0.167	0.433	0.072
Sum (F) =						0.204

Area averaged mean soil loss (F) (In/Hr) = 0.204

Minimum soil loss rate ((In/Hr)) = 0.102

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
V A L L E Y S - C u r v e

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.603	29.528	14.016
2 0.167	271.206	47.980	22.775
3 0.250	406.809	12.102	5.745
4 0.333	542.412	5.361	2.545
5 0.417	678.015	2.910	1.381
6 0.500	813.619	2.118	1.006
Sum = 100.000		Sum=	47.468

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	0.08	0.07	0.034	(0.361)	0.017	0.017
2	0.17	0.07	0.034	(0.360)	0.017	0.017
3	0.25	0.07	0.034	(0.359)	0.017	0.017
4	0.33	0.10	0.052	(0.357)	0.026	0.026
5	0.42	0.10	0.052	(0.356)	0.026	0.026
6	0.50	0.10	0.052	(0.354)	0.026	0.026
7	0.58	0.10	0.052	(0.353)	0.026	0.026
8	0.67	0.10	0.052	(0.352)	0.026	0.026
9	0.75	0.10	0.052	(0.350)	0.026	0.026
10	0.83	0.13	0.069	(0.349)	0.034	0.034
11	0.92	0.13	0.069	(0.348)	0.034	0.034
12	1.00	0.13	0.069	(0.346)	0.034	0.034
13	1.08	0.10	0.052	(0.345)	0.026	0.026
14	1.17	0.10	0.052	(0.343)	0.026	0.026
15	1.25	0.10	0.052	(0.342)	0.026	0.026
16	1.33	0.10	0.052	(0.341)	0.026	0.026
17	1.42	0.10	0.052	(0.339)	0.026	0.026
18	1.50	0.10	0.052	(0.338)	0.026	0.026
19	1.58	0.10	0.052	(0.337)	0.026	0.026
20	1.67	0.10	0.052	(0.335)	0.026	0.026
21	1.75	0.10	0.052	(0.334)	0.026	0.026
22	1.83	0.13	0.069	(0.333)	0.034	0.034
23	1.92	0.13	0.069	(0.331)	0.034	0.034
24	2.00	0.13	0.069	(0.330)	0.034	0.034
25	2.08	0.13	0.069	(0.329)	0.034	0.034
26	2.17	0.13	0.069	(0.327)	0.034	0.034
27	2.25	0.13	0.069	(0.326)	0.034	0.034
28	2.33	0.13	0.069	(0.325)	0.034	0.034
29	2.42	0.13	0.069	(0.323)	0.034	0.034
30	2.50	0.13	0.069	(0.322)	0.034	0.034
31	2.58	0.17	0.086	(0.321)	0.043	0.043
32	2.67	0.17	0.086	(0.319)	0.043	0.043
33	2.75	0.17	0.086	(0.318)	0.043	0.043
34	2.83	0.17	0.086	(0.317)	0.043	0.043
35	2.92	0.17	0.086	(0.315)	0.043	0.043
36	3.00	0.17	0.086	(0.314)	0.043	0.043
37	3.08	0.17	0.086	(0.313)	0.043	0.043
38	3.17	0.17	0.086	(0.312)	0.043	0.043
39	3.25	0.17	0.086	(0.310)	0.043	0.043
40	3.33	0.17	0.086	(0.309)	0.043	0.043
41	3.42	0.17	0.086	(0.308)	0.043	0.043
42	3.50	0.17	0.086	(0.306)	0.043	0.043
43	3.58	0.17	0.086	(0.305)	0.043	0.043
44	3.67	0.17	0.086	(0.304)	0.043	0.043
45	3.75	0.17	0.086	(0.303)	0.043	0.043
46	3.83	0.20	0.103	(0.301)	0.052	0.052
47	3.92	0.20	0.103	(0.300)	0.052	0.052
48	4.00	0.20	0.103	(0.299)	0.052	0.052
49	4.08	0.20	0.103	(0.297)	0.052	0.052
50	4.17	0.20	0.103	(0.296)	0.052	0.052
51	4.25	0.20	0.103	(0.295)	0.052	0.052
52	4.33	0.23	0.120	(0.294)	0.060	0.060
53	4.42	0.23	0.120	(0.292)	0.060	0.060

54	4.50	0.23	0.120	(0.291)	0.060	0.060
55	4.58	0.23	0.120	(0.290)	0.060	0.060
56	4.67	0.23	0.120	(0.289)	0.060	0.060
57	4.75	0.23	0.120	(0.287)	0.060	0.060
58	4.83	0.27	0.138	(0.286)	0.069	0.069
59	4.92	0.27	0.138	(0.285)	0.069	0.069
60	5.00	0.27	0.138	(0.284)	0.069	0.069
61	5.08	0.20	0.103	(0.282)	0.052	0.052
62	5.17	0.20	0.103	(0.281)	0.052	0.052
63	5.25	0.20	0.103	(0.280)	0.052	0.052
64	5.33	0.23	0.120	(0.279)	0.060	0.060
65	5.42	0.23	0.120	(0.278)	0.060	0.060
66	5.50	0.23	0.120	(0.276)	0.060	0.060
67	5.58	0.27	0.138	(0.275)	0.069	0.069
68	5.67	0.27	0.138	(0.274)	0.069	0.069
69	5.75	0.27	0.138	(0.273)	0.069	0.069
70	5.83	0.27	0.138	(0.272)	0.069	0.069
71	5.92	0.27	0.138	(0.270)	0.069	0.069
72	6.00	0.27	0.138	(0.269)	0.069	0.069
73	6.08	0.30	0.155	(0.268)	0.077	0.077
74	6.17	0.30	0.155	(0.267)	0.077	0.077
75	6.25	0.30	0.155	(0.266)	0.077	0.077
76	6.33	0.30	0.155	(0.264)	0.077	0.077
77	6.42	0.30	0.155	(0.263)	0.077	0.077
78	6.50	0.30	0.155	(0.262)	0.077	0.077
79	6.58	0.33	0.172	(0.261)	0.086	0.086
80	6.67	0.33	0.172	(0.260)	0.086	0.086
81	6.75	0.33	0.172	(0.258)	0.086	0.086
82	6.83	0.33	0.172	(0.257)	0.086	0.086
83	6.92	0.33	0.172	(0.256)	0.086	0.086
84	7.00	0.33	0.172	(0.255)	0.086	0.086
85	7.08	0.33	0.172	(0.254)	0.086	0.086
86	7.17	0.33	0.172	(0.253)	0.086	0.086
87	7.25	0.33	0.172	(0.252)	0.086	0.086
88	7.33	0.37	0.189	(0.250)	0.095	0.095
89	7.42	0.37	0.189	(0.249)	0.095	0.095
90	7.50	0.37	0.189	(0.248)	0.095	0.095
91	7.58	0.40	0.206	(0.247)	0.103	0.103
92	7.67	0.40	0.206	(0.246)	0.103	0.103
93	7.75	0.40	0.206	(0.245)	0.103	0.103
94	7.83	0.43	0.223	(0.244)	0.112	0.112
95	7.92	0.43	0.223	(0.242)	0.112	0.112
96	8.00	0.43	0.223	(0.241)	0.112	0.112
97	8.08	0.50	0.258	(0.240)	0.129	0.129
98	8.17	0.50	0.258	(0.239)	0.129	0.129
99	8.25	0.50	0.258	(0.238)	0.129	0.129
100	8.33	0.50	0.258	(0.237)	0.129	0.129
101	8.42	0.50	0.258	(0.236)	0.129	0.129
102	8.50	0.50	0.258	(0.235)	0.129	0.129
103	8.58	0.53	0.275	(0.234)	0.138	0.138
104	8.67	0.53	0.275	(0.232)	0.138	0.138
105	8.75	0.53	0.275	(0.231)	0.138	0.138
106	8.83	0.57	0.292	(0.230)	0.146	0.146
107	8.92	0.57	0.292	(0.229)	0.146	0.146

108	9.00	0.57	0.292	(0.228)	0.146	0.146
109	9.08	0.63	0.327	(0.227)	0.163	0.163
110	9.17	0.63	0.327	(0.226)	0.163	0.163
111	9.25	0.63	0.327	(0.225)	0.163	0.163
112	9.33	0.67	0.344	(0.224)	0.172	0.172
113	9.42	0.67	0.344	(0.223)	0.172	0.172
114	9.50	0.67	0.344	(0.222)	0.172	0.172
115	9.58	0.70	0.361	(0.221)	0.181	0.181
116	9.67	0.70	0.361	(0.219)	0.181	0.181
117	9.75	0.70	0.361	(0.218)	0.181	0.181
118	9.83	0.73	0.378	(0.217)	0.189	0.189
119	9.92	0.73	0.378	(0.216)	0.189	0.189
120	10.00	0.73	0.378	(0.215)	0.189	0.189
121	10.08	0.50	0.258	(0.214)	0.129	0.129
122	10.17	0.50	0.258	(0.213)	0.129	0.129
123	10.25	0.50	0.258	(0.212)	0.129	0.129
124	10.33	0.50	0.258	(0.211)	0.129	0.129
125	10.42	0.50	0.258	(0.210)	0.129	0.129
126	10.50	0.50	0.258	(0.209)	0.129	0.129
127	10.58	0.67	0.344	(0.208)	0.172	0.172
128	10.67	0.67	0.344	(0.207)	0.172	0.172
129	10.75	0.67	0.344	(0.206)	0.172	0.172
130	10.83	0.67	0.344	(0.205)	0.172	0.172
131	10.92	0.67	0.344	(0.204)	0.172	0.172
132	11.00	0.67	0.344	(0.203)	0.172	0.172
133	11.08	0.63	0.327	(0.202)	0.163	0.163
134	11.17	0.63	0.327	(0.201)	0.163	0.163
135	11.25	0.63	0.327	(0.200)	0.163	0.163
136	11.33	0.63	0.327	(0.199)	0.163	0.163
137	11.42	0.63	0.327	(0.198)	0.163	0.163
138	11.50	0.63	0.327	(0.197)	0.163	0.163
139	11.58	0.57	0.292	(0.196)	0.146	0.146
140	11.67	0.57	0.292	(0.195)	0.146	0.146
141	11.75	0.57	0.292	(0.194)	0.146	0.146
142	11.83	0.60	0.309	(0.193)	0.155	0.155
143	11.92	0.60	0.309	(0.192)	0.155	0.155
144	12.00	0.60	0.309	(0.191)	0.155	0.155
145	12.08	0.83	0.430	0.190	(0.215)	0.239
146	12.17	0.83	0.430	0.189	(0.215)	0.240
147	12.25	0.83	0.430	0.188	(0.215)	0.241
148	12.33	0.87	0.447	0.187	(0.223)	0.260
149	12.42	0.87	0.447	0.187	(0.223)	0.260
150	12.50	0.87	0.447	0.186	(0.223)	0.261
151	12.58	0.93	0.481	0.185	(0.241)	0.297
152	12.67	0.93	0.481	0.184	(0.241)	0.298
153	12.75	0.93	0.481	0.183	(0.241)	0.299
154	12.83	0.97	0.499	0.182	(0.249)	0.317
155	12.92	0.97	0.499	0.181	(0.249)	0.318
156	13.00	0.97	0.499	0.180	(0.249)	0.319
157	13.08	1.13	0.585	0.179	(0.292)	0.405
158	13.17	1.13	0.585	0.178	(0.292)	0.406
159	13.25	1.13	0.585	0.177	(0.292)	0.407
160	13.33	1.13	0.585	0.176	(0.292)	0.408
161	13.42	1.13	0.585	0.176	(0.292)	0.409

162	13.50	1.13	0.585	0.175	(0.292)	0.410
163	13.58	0.77	0.395	0.174	(0.198)	0.222
164	13.67	0.77	0.395	0.173	(0.198)	0.223
165	13.75	0.77	0.395	0.172	(0.198)	0.223
166	13.83	0.77	0.395	0.171	(0.198)	0.224
167	13.92	0.77	0.395	0.170	(0.198)	0.225
168	14.00	0.77	0.395	0.169	(0.198)	0.226
169	14.08	0.90	0.464	0.168	(0.232)	0.296
170	14.17	0.90	0.464	0.168	(0.232)	0.297
171	14.25	0.90	0.464	0.167	(0.232)	0.297
172	14.33	0.87	0.447	0.166	(0.223)	0.281
173	14.42	0.87	0.447	0.165	(0.223)	0.282
174	14.50	0.87	0.447	0.164	(0.223)	0.283
175	14.58	0.87	0.447	0.163	(0.223)	0.284
176	14.67	0.87	0.447	0.163	(0.223)	0.284
177	14.75	0.87	0.447	0.162	(0.223)	0.285
178	14.83	0.83	0.430	0.161	(0.215)	0.269
179	14.92	0.83	0.430	0.160	(0.215)	0.270
180	15.00	0.83	0.430	0.159	(0.215)	0.271
181	15.08	0.80	0.413	0.158	(0.206)	0.254
182	15.17	0.80	0.413	0.158	(0.206)	0.255
183	15.25	0.80	0.413	0.157	(0.206)	0.256
184	15.33	0.77	0.395	0.156	(0.198)	0.239
185	15.42	0.77	0.395	0.155	(0.198)	0.240
186	15.50	0.77	0.395	0.154	(0.198)	0.241
187	15.58	0.63	0.327	0.154	(0.163)	0.173
188	15.67	0.63	0.327	0.153	(0.163)	0.174
189	15.75	0.63	0.327	0.152	(0.163)	0.175
190	15.83	0.63	0.327	0.151	(0.163)	0.175
191	15.92	0.63	0.327	0.150	(0.163)	0.176
192	16.00	0.63	0.327	0.150	(0.163)	0.177
193	16.08	0.13	0.069	(0.149)	0.034	0.034
194	16.17	0.13	0.069	(0.148)	0.034	0.034
195	16.25	0.13	0.069	(0.147)	0.034	0.034
196	16.33	0.13	0.069	(0.147)	0.034	0.034
197	16.42	0.13	0.069	(0.146)	0.034	0.034
198	16.50	0.13	0.069	(0.145)	0.034	0.034
199	16.58	0.10	0.052	(0.144)	0.026	0.026
200	16.67	0.10	0.052	(0.144)	0.026	0.026
201	16.75	0.10	0.052	(0.143)	0.026	0.026
202	16.83	0.10	0.052	(0.142)	0.026	0.026
203	16.92	0.10	0.052	(0.142)	0.026	0.026
204	17.00	0.10	0.052	(0.141)	0.026	0.026
205	17.08	0.17	0.086	(0.140)	0.043	0.043
206	17.17	0.17	0.086	(0.139)	0.043	0.043
207	17.25	0.17	0.086	(0.139)	0.043	0.043
208	17.33	0.17	0.086	(0.138)	0.043	0.043
209	17.42	0.17	0.086	(0.137)	0.043	0.043
210	17.50	0.17	0.086	(0.137)	0.043	0.043
211	17.58	0.17	0.086	(0.136)	0.043	0.043
212	17.67	0.17	0.086	(0.135)	0.043	0.043
213	17.75	0.17	0.086	(0.135)	0.043	0.043
214	17.83	0.13	0.069	(0.134)	0.034	0.034
215	17.92	0.13	0.069	(0.133)	0.034	0.034

216	18.00	0.13	0.069	(0.133)	0.034	0.034
217	18.08	0.13	0.069	(0.132)	0.034	0.034
218	18.17	0.13	0.069	(0.131)	0.034	0.034
219	18.25	0.13	0.069	(0.131)	0.034	0.034
220	18.33	0.13	0.069	(0.130)	0.034	0.034
221	18.42	0.13	0.069	(0.129)	0.034	0.034
222	18.50	0.13	0.069	(0.129)	0.034	0.034
223	18.58	0.10	0.052	(0.128)	0.026	0.026
224	18.67	0.10	0.052	(0.128)	0.026	0.026
225	18.75	0.10	0.052	(0.127)	0.026	0.026
226	18.83	0.07	0.034	(0.126)	0.017	0.017
227	18.92	0.07	0.034	(0.126)	0.017	0.017
228	19.00	0.07	0.034	(0.125)	0.017	0.017
229	19.08	0.10	0.052	(0.125)	0.026	0.026
230	19.17	0.10	0.052	(0.124)	0.026	0.026
231	19.25	0.10	0.052	(0.123)	0.026	0.026
232	19.33	0.13	0.069	(0.123)	0.034	0.034
233	19.42	0.13	0.069	(0.122)	0.034	0.034
234	19.50	0.13	0.069	(0.122)	0.034	0.034
235	19.58	0.10	0.052	(0.121)	0.026	0.026
236	19.67	0.10	0.052	(0.121)	0.026	0.026
237	19.75	0.10	0.052	(0.120)	0.026	0.026
238	19.83	0.07	0.034	(0.119)	0.017	0.017
239	19.92	0.07	0.034	(0.119)	0.017	0.017
240	20.00	0.07	0.034	(0.118)	0.017	0.017
241	20.08	0.10	0.052	(0.118)	0.026	0.026
242	20.17	0.10	0.052	(0.117)	0.026	0.026
243	20.25	0.10	0.052	(0.117)	0.026	0.026
244	20.33	0.10	0.052	(0.116)	0.026	0.026
245	20.42	0.10	0.052	(0.116)	0.026	0.026
246	20.50	0.10	0.052	(0.115)	0.026	0.026
247	20.58	0.10	0.052	(0.115)	0.026	0.026
248	20.67	0.10	0.052	(0.114)	0.026	0.026
249	20.75	0.10	0.052	(0.114)	0.026	0.026
250	20.83	0.07	0.034	(0.113)	0.017	0.017
251	20.92	0.07	0.034	(0.113)	0.017	0.017
252	21.00	0.07	0.034	(0.113)	0.017	0.017
253	21.08	0.10	0.052	(0.112)	0.026	0.026
254	21.17	0.10	0.052	(0.112)	0.026	0.026
255	21.25	0.10	0.052	(0.111)	0.026	0.026
256	21.33	0.07	0.034	(0.111)	0.017	0.017
257	21.42	0.07	0.034	(0.110)	0.017	0.017
258	21.50	0.07	0.034	(0.110)	0.017	0.017
259	21.58	0.10	0.052	(0.110)	0.026	0.026
260	21.67	0.10	0.052	(0.109)	0.026	0.026
261	21.75	0.10	0.052	(0.109)	0.026	0.026
262	21.83	0.07	0.034	(0.108)	0.017	0.017
263	21.92	0.07	0.034	(0.108)	0.017	0.017
264	22.00	0.07	0.034	(0.108)	0.017	0.017
265	22.08	0.10	0.052	(0.107)	0.026	0.026
266	22.17	0.10	0.052	(0.107)	0.026	0.026
267	22.25	0.10	0.052	(0.107)	0.026	0.026
268	22.33	0.07	0.034	(0.106)	0.017	0.017
269	22.42	0.07	0.034	(0.106)	0.017	0.017

270	22.50	0.07	0.034	(0.106)	0.017	0.017
271	22.58	0.07	0.034	(0.105)	0.017	0.017
272	22.67	0.07	0.034	(0.105)	0.017	0.017
273	22.75	0.07	0.034	(0.105)	0.017	0.017
274	22.83	0.07	0.034	(0.104)	0.017	0.017
275	22.92	0.07	0.034	(0.104)	0.017	0.017
276	23.00	0.07	0.034	(0.104)	0.017	0.017
277	23.08	0.07	0.034	(0.104)	0.017	0.017
278	23.17	0.07	0.034	(0.103)	0.017	0.017
279	23.25	0.07	0.034	(0.103)	0.017	0.017
280	23.33	0.07	0.034	(0.103)	0.017	0.017
281	23.42	0.07	0.034	(0.103)	0.017	0.017
282	23.50	0.07	0.034	(0.103)	0.017	0.017
283	23.58	0.07	0.034	(0.103)	0.017	0.017
284	23.67	0.07	0.034	(0.102)	0.017	0.017
285	23.75	0.07	0.034	(0.102)	0.017	0.017
286	23.83	0.07	0.034	(0.102)	0.017	0.017
287	23.92	0.07	0.034	(0.102)	0.017	0.017
288	24.00	0.07	0.034	(0.102)	0.017	0.017

(Loss Rate Not Used)

Sum = 100.0

Sum = 28.3

Flood volume = Effective rainfall 2.36(In)
times area 47.1(Ac.)/[(In)/(Ft.)] = 9.2(Ac.Ft)

Total soil loss = 1.94(In)

Total soil loss = 7.626(Ac.Ft)

Total rainfall = 4.30(In)

Flood volume = 402648.8 Cubic Feet

Total soil loss = 332198.0 Cubic Feet

Peak flow rate of this hydrograph = 19.420(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0017	0.24	Q				
0+10	0.0060	0.63	VQ				
0+15	0.0111	0.73	VQ				
0+20	0.0172	0.90	VQ				
0+25	0.0249	1.12	V Q				
0+30	0.0331	1.18	V Q				
0+35	0.0413	1.20	V Q				
0+40	0.0497	1.22	V Q				
0+45	0.0582	1.22	V Q				
0+50	0.0674	1.35	V Q				
0+55	0.0780	1.54	V Q				
1+ 0	0.0890	1.59	V Q				
1+ 5	0.0993	1.49	V Q				
1+10	0.1083	1.31	V Q				

1+15	0.1170	1.27	V Q
1+20	0.1256	1.25	V Q
1+25	0.1341	1.23	V Q
1+30	0.1425	1.22	V Q
1+35	0.1509	1.22	V Q
1+40	0.1594	1.22	V Q
1+45	0.1678	1.22	V Q
1+50	0.1771	1.35	V Q
1+55	0.1877	1.54	V Q
2+ 0	0.1986	1.59	V Q
2+ 5	0.2098	1.61	V Q
2+10	0.2209	1.62	V Q
2+15	0.2322	1.63	V Q
2+20	0.2434	1.63	V Q
2+25	0.2547	1.63	V Q
2+30	0.2659	1.63	V Q
2+35	0.2780	1.75	V Q
2+40	0.2914	1.95	V Q
2+45	0.3052	2.00	V Q
2+50	0.3191	2.02	V Q
2+55	0.3331	2.03	V Q
3+ 0	0.3472	2.04	V Q
3+ 5	0.3612	2.04	V Q
3+10	0.3753	2.04	V Q
3+15	0.3893	2.04	V Q
3+20	0.4034	2.04	V Q
3+25	0.4175	2.04	V Q
3+30	0.4315	2.04	V Q
3+35	0.4456	2.04	V Q
3+40	0.4596	2.04	V Q
3+45	0.4737	2.04	V Q
3+50	0.4886	2.16	V Q
3+55	0.5048	2.36	V Q
4+ 0	0.5214	2.41	V Q
4+ 5	0.5381	2.43	V Q
4+10	0.5549	2.44	V Q
4+15	0.5718	2.45	V Q
4+20	0.5895	2.57	V Q
4+25	0.6085	2.77	V Q
4+30	0.6279	2.82	V Q
4+35	0.6475	2.84	V Q
4+40	0.6671	2.85	V Q
4+45	0.6868	2.86	V Q
4+50	0.7073	2.98	V Q
4+55	0.7292	3.17	V Q
5+ 0	0.7514	3.22	V Q
5+ 5	0.7720	3.00	V Q
5+10	0.7901	2.62	V Q
5+15	0.8076	2.53	V Q
5+20	0.8256	2.61	V Q
5+25	0.8447	2.78	V Q
5+30	0.8641	2.82	V Q
5+35	0.8845	2.96	V Q
5+40	0.9063	3.17	V Q

5+45	0.9285	3.22	V Q				
5+50	0.9508	3.25	V Q				
5+55	0.9733	3.26	V Q				
6+ 0	0.9958	3.27	V Q				
6+ 5	1.0191	3.39	V Q				
6+10	1.0438	3.58	V Q				
6+15	1.0688	3.63	V Q				
6+20	1.0939	3.65	V Q				
6+25	1.1192	3.67	V Q				
6+30	1.1445	3.67	V Q				
6+35	1.1706	3.79	V Q				
6+40	1.1981	3.99	V Q				
6+45	1.2259	4.04	V Q				
6+50	1.2539	4.06	V Q				
6+55	1.2820	4.07	V Q				
7+ 0	1.3101	4.08	V Q				
7+ 5	1.3382	4.08	V Q				
7+10	1.3663	4.08	V Q				
7+15	1.3944	4.08	V Q				
7+20	1.4234	4.20	V Q				
7+25	1.4537	4.40	V Q				
7+30	1.4843	4.45	V Q				
7+35	1.5159	4.59	V Q				
7+40	1.5490	4.80	V Q				
7+45	1.5824	4.86	V Q				
7+50	1.6168	5.00	V Q				
7+55	1.6527	5.21	V Q				
8+ 0	1.6890	5.26	V Q				
8+ 5	1.7270	5.53	V Q				
8+10	1.7679	5.93	V Q				
8+15	1.8095	6.04	V Q				
8+20	1.8514	6.08	V Q				
8+25	1.8934	6.11	V Q				
8+30	1.9356	6.12	V Q				
8+35	1.9786	6.24	V Q				
8+40	2.0230	6.44	V Q				
8+45	2.0676	6.49	V Q				
8+50	2.1133	6.63	V Q				
8+55	2.1604	6.84	V Q				
9+ 0	2.2079	6.90	V Q				
9+ 5	2.2572	7.16	V Q				
9+10	2.3093	7.56	V Q				
9+15	2.3622	7.67	V Q				
9+20	2.4162	7.84	V Q				
9+25	2.4716	8.06	V Q				
9+30	2.5276	8.12	V Q				
9+35	2.5845	8.26	V Q				
9+40	2.6428	8.47	V Q				
9+45	2.7016	8.53	V Q				
9+50	2.7613	8.67	V Q				
9+55	2.8225	8.88	V Q				
10+ 0	2.8841	8.94	V Q				
10+ 5	2.9400	8.12	V Q				
10+10	2.9865	6.76	VQ				

10+15	3.0307	6.42	QV						
10+20	3.0739	6.27	QV						
10+25	3.1165	6.18	QV						
10+30	3.1587	6.12	QV						
10+35	3.2050	6.73	Q						
10+40	3.2580	7.71	VQ						
10+45	3.3128	7.95	VQ						
10+50	3.3683	8.06	V Q						
10+55	3.4243	8.12	V Q						
11+ 0	3.4805	8.16	VQ						
11+ 5	3.5359	8.04	VQ						
11+10	3.5900	7.85	Q						
11+15	3.6437	7.80	Q						
11+20	3.6972	7.78	Q						
11+25	3.7507	7.77	QV						
11+30	3.8041	7.76	QV						
11+35	3.8559	7.52	QV						
11+40	3.9050	7.12	Q V						
11+45	3.9534	7.03	Q V						
11+50	4.0023	7.10	Q V						
11+55	4.0524	7.27	Q V						
12+ 0	4.1027	7.31	Q V						
12+ 5	4.1613	8.52	QV						
12+10	4.2335	10.47	V Q						
12+15	4.3092	11.00	V Q						
12+20	4.3884	11.50	V Q						
12+25	4.4715	12.05	V Q						
12+30	4.5560	12.28	V Q						
12+35	4.6445	12.85	V Q						
12+40	4.7389	13.70	V Q						
12+45	4.8351	13.96	V Q						
12+50	4.9338	14.33	V Q						
12+55	5.0358	14.82	V Q						
13+ 0	5.1391	14.99	V Q						
13+ 5	5.2513	16.29	V Q						
13+10	5.3774	18.31	V Q						
13+15	5.5073	18.87	V Q						
13+20	5.6391	19.13	V Q						
13+25	5.7720	19.29	V Q						
13+30	5.9057	19.42	V Q						
13+35	6.0215	16.81	V Q						
13+40	6.1079	12.54	V Q						
13+45	6.1871	11.50	V Q						
13+50	6.2632	11.06	V Q						
13+55	6.3379	10.84	V Q						
14+ 0	6.4115	10.69	V Q						
14+ 5	6.4921	11.70	V Q						
14+10	6.5837	13.30	V Q						
14+15	6.6783	13.74	V Q						
14+20	6.7728	13.72	V Q						
14+25	6.8655	13.46	V Q						
14+30	6.9582	13.47	V Q						
14+35	7.0510	13.47	V Q						
14+40	7.1438	13.48	V Q						

19+15	8.8380	1.18	Q				V
19+20	8.8471	1.32	Q				V
19+25	8.8577	1.53	Q				V
19+30	8.8686	1.59	Q				V
19+35	8.8789	1.49	Q				V
19+40	8.8879	1.31	Q				V
19+45	8.8966	1.27	Q				V
19+50	8.9044	1.12	Q				V
19+55	8.9107	0.92	Q				V
20+ 0	8.9166	0.86	Q				V
20+ 5	8.9232	0.96	Q				V
20+10	8.9311	1.14	Q				V
20+15	8.9392	1.18	Q				V
20+20	8.9475	1.20	Q				V
20+25	8.9559	1.22	Q				V
20+30	8.9643	1.22	Q				V
20+35	8.9727	1.22	Q				V
20+40	8.9812	1.22	Q				V
20+45	8.9896	1.22	Q				V
20+50	8.9972	1.10	Q				V
20+55	9.0035	0.91	Q				V
21+ 0	9.0094	0.86	Q				V
21+ 5	9.0160	0.96	Q				V
21+10	9.0238	1.14	Q				V
21+15	9.0320	1.18	Q				V
21+20	9.0395	1.08	Q				V
21+25	9.0456	0.90	Q				V
21+30	9.0516	0.86	Q				V
21+35	9.0582	0.96	Q				V
21+40	9.0660	1.14	Q				V
21+45	9.0742	1.18	Q				V
21+50	9.0816	1.08	Q				V
21+55	9.0878	0.90	Q				V
22+ 0	9.0937	0.86	Q				V
22+ 5	9.1003	0.96	Q				V
22+10	9.1082	1.14	Q				V
22+15	9.1163	1.18	Q				V
22+20	9.1238	1.08	Q				V
22+25	9.1300	0.90	Q				V
22+30	9.1359	0.86	Q				V
22+35	9.1417	0.84	Q				V
22+40	9.1474	0.83	Q				V
22+45	9.1530	0.82	Q				V
22+50	9.1586	0.82	Q				V
22+55	9.1642	0.82	Q				V
23+ 0	9.1699	0.82	Q				V
23+ 5	9.1755	0.82	Q				V
23+10	9.1811	0.82	Q				V
23+15	9.1867	0.82	Q				V
23+20	9.1923	0.82	Q				V
23+25	9.1980	0.82	Q				V
23+30	9.2036	0.82	Q				V
23+35	9.2092	0.82	Q				V
23+40	9.2148	0.82	Q				V

23+45	9.2205	0.82	Q					V
23+50	9.2261	0.82	Q					V
23+55	9.2317	0.82	Q					V
24+ 0	9.2373	0.82	Q					V
24+ 5	9.2413	0.58	Q					V
24+10	9.2426	0.18	Q					V
24+15	9.2431	0.08	Q					V
24+20	9.2434	0.04	Q					V
24+25	9.2435	0.02	Q					V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea 4 Existing Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1287.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.244 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.90 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
42.00	0.58	24.36

100 YEAR Area rainfall data:

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

42.00

1.45

60.90

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.580 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.580 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.856

Slope of intensity-duration curve for a 1 hour storm = 0.4800

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	0.083	72.509	4.772
2	0.167	145.019	17.504
3	0.250	217.528	9.437
4	0.333	290.038	3.721
5	0.417	362.547	2.260
6	0.500	435.056	1.479
7	0.583	507.566	1.011
8	0.667	580.075	0.764
9	0.750	652.584	0.541
10	0.833	725.094	0.369
11	0.917	797.603	0.307
12	1.000	870.113	0.164

Sum = 100.000 Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.406)	0.262	0.044
2	0.17	4.50	0.313	(0.406)	0.268	0.045
3	0.25	5.40	0.376	(0.406)	0.322	0.054
4	0.33	5.40	0.376	(0.406)	0.322	0.054
5	0.42	5.70	0.397	(0.406)	0.340	0.057
6	0.50	6.40	0.445	(0.406)	0.381	0.064
7	0.58	7.90	0.550	0.406	(0.471)	0.144
8	0.67	9.10	0.633	0.406	(0.542)	0.227
9	0.75	12.80	0.891	0.406	(0.762)	0.485
10	0.83	25.60	1.781	0.406	(1.525)	1.375
11	0.92	7.90	0.550	0.406	(0.471)	0.144
12	1.00	4.90	0.341	(0.406)	0.292	0.049

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.7

Flood volume = Effective rainfall 0.23(In)
times area 42.0(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)

Total soil loss = 0.35(In)

Total soil loss = 1.229(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 34837.7 Cubic Feet

Total soil loss = 53555.4 Cubic Feet

Peak flow rate of this hydrograph = 30.772(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0014	0.21	Q				
0+10	0.0082	0.99	Q				
0+15	0.0183	1.46	VQ				
0+20	0.0307	1.79	Q				
0+25	0.0444	2.00	QV				
0+30	0.0594	2.18	Q				
0+35	0.0786	2.78	QV				
0+40	0.1110	4.70	QV				
0+45	0.1675	8.21	Q				
0+50	0.2922	18.10		V	Q		

0+55	0.5041	30.77					V	Q		
1+ 0	0.6312	18.45				Q		V		
1+ 5	0.6934	9.04			Q				V	
1+10	0.7296	5.25			Q				V	
1+15	0.7525	3.33		Q					V	
1+20	0.7683	2.29		Q					V	
1+25	0.7798	1.67		Q					V	
1+30	0.7879	1.18		Q					V	
1+35	0.7935	0.81		Q					V	
1+40	0.7975	0.58		Q					V	
1+45	0.7994	0.29		Q					V	
1+50	0.7997	0.04		Q					V	
1+55	0.7998	0.01		Q					V	

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea 4 Existing Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1287.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.244 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.90 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 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]
42.00	0.98	41.16

100 YEAR Area rainfall data:

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

42.00

2.48

104.16

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 0.980 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 0.980 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203
(for 24 hour storm duration)

Soil loss rate (decimal) = 0.856

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	72.509	4.772
2	0.167	145.019	17.504
3	0.250	217.528	9.437
4	0.333	290.038	3.721
5	0.417	362.547	2.260
6	0.500	435.056	1.479
7	0.583	507.566	1.011
8	0.667	580.075	0.764
9	0.750	652.584	0.541
10	0.833	725.094	0.369
11	0.917	797.603	0.307
12	1.000	870.113	0.164
Sum = 100.000		Sum=	42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.406)	0.131	0.022
2	0.17	1.30	0.153	(0.406)	0.131	0.022
3	0.25	1.10	0.129	(0.406)	0.111	0.019
4	0.33	1.50	0.176	(0.406)	0.151	0.025
5	0.42	1.50	0.176	(0.406)	0.151	0.025
6	0.50	1.80	0.212	(0.406)	0.181	0.030
7	0.58	1.50	0.176	(0.406)	0.151	0.025
8	0.67	1.80	0.212	(0.406)	0.181	0.030
9	0.75	1.80	0.212	(0.406)	0.181	0.030
10	0.83	1.50	0.176	(0.406)	0.151	0.025
11	0.92	1.60	0.188	(0.406)	0.161	0.027
12	1.00	1.80	0.212	(0.406)	0.181	0.030
13	1.08	2.20	0.259	(0.406)	0.221	0.037
14	1.17	2.20	0.259	(0.406)	0.221	0.037
15	1.25	2.20	0.259	(0.406)	0.221	0.037
16	1.33	2.00	0.235	(0.406)	0.201	0.034
17	1.42	2.60	0.306	(0.406)	0.262	0.044
18	1.50	2.70	0.317	(0.406)	0.272	0.046
19	1.58	2.40	0.282	(0.406)	0.242	0.041
20	1.67	2.70	0.317	(0.406)	0.272	0.046
21	1.75	3.30	0.388	(0.406)	0.332	0.056
22	1.83	3.10	0.364	(0.406)	0.312	0.052
23	1.92	2.90	0.341	(0.406)	0.292	0.049
24	2.00	3.00	0.353	(0.406)	0.302	0.051
25	2.08	3.10	0.364	(0.406)	0.312	0.052
26	2.17	4.20	0.494	0.406	(0.423)	0.088
27	2.25	5.00	0.588	0.406	(0.503)	0.182
28	2.33	3.50	0.412	(0.406)	0.352	0.059
29	2.42	6.80	0.800	0.406	(0.685)	0.394
30	2.50	7.30	0.858	0.406	(0.735)	0.452
31	2.58	8.20	0.964	0.406	(0.825)	0.558
32	2.67	5.90	0.694	0.406	(0.594)	0.288
33	2.75	2.00	0.235	(0.406)	0.201	0.034
34	2.83	1.80	0.212	(0.406)	0.181	0.030
35	2.92	1.80	0.212	(0.406)	0.181	0.030
36	3.00	0.60	0.071	(0.406)	0.060	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.0

Flood volume = Effective rainfall 0.25(In)

times area 42.0(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)

Total soil loss = 0.73(In)

Total soil loss = 2.548(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 38380.6 Cubic Feet

Total soil loss = 111002.8 Cubic Feet

 Peak flow rate of this hydrograph = 17.494 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0007		0.10	Q				
0+10	0.0041		0.49	Q				
0+15	0.0088		0.68	VQ				
0+20	0.0139		0.74	VQ				
0+25	0.0199		0.87	VQ				
0+30	0.0266		0.98	Q				
0+35	0.0341		1.08	VQ				
0+40	0.0416		1.10	VQ				
0+45	0.0497		1.17	Q				
0+50	0.0580		1.20	Q				
0+55	0.0659		1.15	Q				
1+ 0	0.0739		1.16	QV				
1+ 5	0.0825		1.26	QV				
1+10	0.0922		1.41	Q V				
1+15	0.1024		1.48	Q V				
1+20	0.1127		1.50	Q V				
1+25	0.1231		1.51	Q V				
1+30	0.1347		1.67	Q V				
1+35	0.1469		1.77	Q V				
1+40	0.1590		1.76	Q V				
1+45	0.1719		1.88	Q V				
1+50	0.1863		2.09	Q V				
1+55	0.2010		2.13	Q V				
2+ 0	0.2154		2.10	Q V				
2+ 5	0.2300		2.12	Q V				
2+10	0.2461		2.34	Q V				
2+15	0.2697		3.43	Q V				
2+20	0.3031		4.84	Q V				
2+25	0.3397		5.31	Q V				
2+30	0.4135		10.73	Q V				
2+35	0.5184		15.23	Q V				
2+40	0.6389		17.49	Q V				
2+45	0.7316		13.46	Q V				
2+50	0.7828		7.43	Q V				
2+55	0.8145		4.60	Q V				
3+ 0	0.8376		3.37	Q V				
3+ 5	0.8535		2.30	Q V				
3+10	0.8637		1.48	Q V				
3+15	0.8706		1.01	Q V				
3+20	0.8754		0.69	Q V				
3+25	0.8784		0.44	Q V				
3+30	0.8800		0.24	Q V				

3+35	0.8807	0.09	Q				V
3+40	0.8809	0.03	Q				V
3+45	0.8810	0.02	Q				V
3+50	0.8811	0.01	Q				V
3+55	0.8811	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea 4 Existing Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1287.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.244 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.90 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
42.00	1.38	57.96

100 YEAR Area rainfall data:

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

42.00

3.48

146.16

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1 0.083	72.509	11.274	4.772
2 0.167	145.019	41.353	17.504
3 0.250	217.528	22.294	9.437
4 0.333	290.038	8.792	3.721
5 0.417	362.547	5.339	2.260
6 0.500	435.056	3.494	1.479
7 0.583	507.566	2.388	1.011
8 0.667	580.075	1.806	0.764
9 0.750	652.584	1.278	0.541
10 0.833	725.094	0.871	0.369
11 0.917	797.603	0.725	0.307
12 1.000	870.113	0.387	0.164
Sum = 100.000		Sum=	42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.083	(0.406)	0.071	0.012
2	0.17	0.60	0.099	(0.406)	0.085	0.014
3	0.25	0.60	0.099	(0.406)	0.085	0.014
4	0.33	0.60	0.099	(0.406)	0.085	0.014
5	0.42	0.60	0.099	(0.406)	0.085	0.014
6	0.50	0.70	0.116	(0.406)	0.099	0.017
7	0.58	0.70	0.116	(0.406)	0.099	0.017
8	0.67	0.70	0.116	(0.406)	0.099	0.017
9	0.75	0.70	0.116	(0.406)	0.099	0.017
10	0.83	0.70	0.116	(0.406)	0.099	0.017
11	0.92	0.70	0.116	(0.406)	0.099	0.017
12	1.00	0.80	0.132	(0.406)	0.113	0.019
13	1.08	0.80	0.132	(0.406)	0.113	0.019
14	1.17	0.80	0.132	(0.406)	0.113	0.019
15	1.25	0.80	0.132	(0.406)	0.113	0.019
16	1.33	0.80	0.132	(0.406)	0.113	0.019
17	1.42	0.80	0.132	(0.406)	0.113	0.019
18	1.50	0.80	0.132	(0.406)	0.113	0.019
19	1.58	0.80	0.132	(0.406)	0.113	0.019
20	1.67	0.80	0.132	(0.406)	0.113	0.019
21	1.75	0.80	0.132	(0.406)	0.113	0.019
22	1.83	0.80	0.132	(0.406)	0.113	0.019
23	1.92	0.80	0.132	(0.406)	0.113	0.019
24	2.00	0.90	0.149	(0.406)	0.128	0.021
25	2.08	0.80	0.132	(0.406)	0.113	0.019
26	2.17	0.90	0.149	(0.406)	0.128	0.021
27	2.25	0.90	0.149	(0.406)	0.128	0.021
28	2.33	0.90	0.149	(0.406)	0.128	0.021
29	2.42	0.90	0.149	(0.406)	0.128	0.021
30	2.50	0.90	0.149	(0.406)	0.128	0.021
31	2.58	0.90	0.149	(0.406)	0.128	0.021
32	2.67	0.90	0.149	(0.406)	0.128	0.021
33	2.75	1.00	0.166	(0.406)	0.142	0.024
34	2.83	1.00	0.166	(0.406)	0.142	0.024
35	2.92	1.00	0.166	(0.406)	0.142	0.024
36	3.00	1.00	0.166	(0.406)	0.142	0.024
37	3.08	1.00	0.166	(0.406)	0.142	0.024
38	3.17	1.10	0.182	(0.406)	0.156	0.026
39	3.25	1.10	0.182	(0.406)	0.156	0.026
40	3.33	1.10	0.182	(0.406)	0.156	0.026
41	3.42	1.20	0.199	(0.406)	0.170	0.029
42	3.50	1.30	0.215	(0.406)	0.184	0.031
43	3.58	1.40	0.232	(0.406)	0.198	0.033
44	3.67	1.40	0.232	(0.406)	0.198	0.033
45	3.75	1.50	0.248	(0.406)	0.213	0.036

46	3.83	1.50	0.248	(0.406)	0.213	0.036
47	3.92	1.60	0.265	(0.406)	0.227	0.038
48	4.00	1.60	0.265	(0.406)	0.227	0.038
49	4.08	1.70	0.281	(0.406)	0.241	0.040
50	4.17	1.80	0.298	(0.406)	0.255	0.043
51	4.25	1.90	0.315	(0.406)	0.269	0.045
52	4.33	2.00	0.331	(0.406)	0.284	0.048
53	4.42	2.10	0.348	(0.406)	0.298	0.050
54	4.50	2.10	0.348	(0.406)	0.298	0.050
55	4.58	2.20	0.364	(0.406)	0.312	0.052
56	4.67	2.30	0.381	(0.406)	0.326	0.055
57	4.75	2.40	0.397	(0.406)	0.340	0.057
58	4.83	2.40	0.397	(0.406)	0.340	0.057
59	4.92	2.50	0.414	(0.406)	0.354	0.060
60	5.00	2.60	0.430	(0.406)	0.369	0.062
61	5.08	3.10	0.513	0.406	(0.439)	0.107
62	5.17	3.60	0.596	0.406	(0.510)	0.190
63	5.25	3.90	0.646	0.406	(0.553)	0.240
64	5.33	4.20	0.695	0.406	(0.595)	0.290
65	5.42	4.70	0.778	0.406	(0.666)	0.372
66	5.50	5.60	0.927	0.406	(0.794)	0.521
67	5.58	1.90	0.315	(0.406)	0.269	0.045
68	5.67	0.90	0.149	(0.406)	0.128	0.021
69	5.75	0.60	0.099	(0.406)	0.085	0.014
70	5.83	0.50	0.083	(0.406)	0.071	0.012
71	5.92	0.30	0.050	(0.406)	0.043	0.007
72	6.00	0.20	0.033	(0.406)	0.028	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.5

Flood volume = Effective rainfall 0.29(In)
times area 42.0(Ac.)/[(In)/(Ft.)) = 1.0(Ac.Ft)
Total soil loss = 1.09(In)
Total soil loss = 3.807(Ac.Ft)
Total rainfall = 1.38(In)
Flood volume = 44522.9 Cubic Feet
Total soil loss = 165841.5 Cubic Feet

Peak flow rate of this hydrograph = 15.001(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0004	0.06	Q				
0+10	0.0023	0.28	Q				
0+15	0.0053	0.43	Q				
0+20	0.0087	0.50	Q				
0+25	0.0124	0.53	VQ				
0+30	0.0163	0.57	VQ				

0+35	0.0206	0.63	VQ					
0+40	0.0251	0.66	VQ					
0+45	0.0298	0.68	Q					
0+50	0.0345	0.69	Q					
0+55	0.0393	0.70	Q					
1+ 0	0.0442	0.71	Q					
1+ 5	0.0494	0.76	Q					
1+10	0.0548	0.78	QV					
1+15	0.0602	0.79	QV					
1+20	0.0657	0.80	QV					
1+25	0.0712	0.80	QV					
1+30	0.0767	0.80	Q V					
1+35	0.0822	0.80	Q V					
1+40	0.0878	0.80	Q V					
1+45	0.0933	0.81	Q V					
1+50	0.0989	0.81	Q V					
1+55	0.1044	0.81	Q V					
2+ 0	0.1101	0.82	Q V					
2+ 5	0.1159	0.85	Q V					
2+10	0.1217	0.84	Q V					
2+15	0.1277	0.87	Q V					
2+20	0.1338	0.89	Q V					
2+25	0.1400	0.89	Q V					
2+30	0.1461	0.90	Q V					
2+35	0.1524	0.90	Q V					
2+40	0.1586	0.90	Q V					
2+45	0.1649	0.92	Q V					
2+50	0.1715	0.96	Q V					
2+55	0.1783	0.98	Q V					
3+ 0	0.1851	0.99	Q V					
3+ 5	0.1920	1.00	Q V					
3+10	0.1989	1.01	Q V					
3+15	0.2062	1.06	Q V					
3+20	0.2137	1.08	Q V					
3+25	0.2212	1.10	Q V					
3+30	0.2292	1.16	Q V					
3+35	0.2378	1.24	Q V					
3+40	0.2469	1.32	Q V					
3+45	0.2563	1.37	Q V					
3+50	0.2661	1.43	Q V					
3+55	0.2763	1.47	Q V					
4+ 0	0.2868	1.53	Q V					
4+ 5	0.2977	1.58	Q V					
4+10	0.3090	1.65	Q V					
4+15	0.3210	1.73	Q V					
4+20	0.3335	1.83	Q V					
4+25	0.3468	1.92	Q V					
4+30	0.3606	2.01	Q V					
4+35	0.3748	2.06	Q V					
4+40	0.3895	2.14	Q V					
4+45	0.4048	2.23	Q V					
4+50	0.4208	2.31	Q V					
4+55	0.4371	2.37	Q V					
5+ 0	0.4539	2.44	Q V					

[illegible]

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea 4 Existing Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1287.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.244 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.90 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 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]
42.00	2.48	104.16

100 YEAR Area rainfall data:

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

42.00

6.90

289.80

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 2.480 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 2.480 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.856

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	72.509	11.274
2	0.167	145.019	41.353
3	0.250	217.528	22.294
4	0.333	290.038	8.792
5	0.417	362.547	5.339
6	0.500	435.056	3.494
7	0.583	507.566	2.388
8	0.667	580.075	1.806
9	0.750	652.584	1.278
10	0.833	725.094	0.871
11	0.917	797.603	0.725
12	1.000	870.113	0.387
Sum =		100.000	Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.020	(0.719)	0.017	0.003
2	0.17	0.07	0.020	(0.717)	0.017	0.003
3	0.25	0.07	0.020	(0.714)	0.017	0.003
4	0.33	0.10	0.030	(0.711)	0.025	0.004
5	0.42	0.10	0.030	(0.708)	0.025	0.004
6	0.50	0.10	0.030	(0.706)	0.025	0.004
7	0.58	0.10	0.030	(0.703)	0.025	0.004
8	0.67	0.10	0.030	(0.700)	0.025	0.004
9	0.75	0.10	0.030	(0.697)	0.025	0.004
10	0.83	0.13	0.040	(0.695)	0.034	0.006
11	0.92	0.13	0.040	(0.692)	0.034	0.006
12	1.00	0.13	0.040	(0.689)	0.034	0.006
13	1.08	0.10	0.030	(0.686)	0.025	0.004
14	1.17	0.10	0.030	(0.684)	0.025	0.004
15	1.25	0.10	0.030	(0.681)	0.025	0.004
16	1.33	0.10	0.030	(0.678)	0.025	0.004
17	1.42	0.10	0.030	(0.676)	0.025	0.004
18	1.50	0.10	0.030	(0.673)	0.025	0.004
19	1.58	0.10	0.030	(0.670)	0.025	0.004
20	1.67	0.10	0.030	(0.667)	0.025	0.004
21	1.75	0.10	0.030	(0.665)	0.025	0.004
22	1.83	0.13	0.040	(0.662)	0.034	0.006
23	1.92	0.13	0.040	(0.659)	0.034	0.006
24	2.00	0.13	0.040	(0.657)	0.034	0.006
25	2.08	0.13	0.040	(0.654)	0.034	0.006
26	2.17	0.13	0.040	(0.651)	0.034	0.006
27	2.25	0.13	0.040	(0.649)	0.034	0.006
28	2.33	0.13	0.040	(0.646)	0.034	0.006
29	2.42	0.13	0.040	(0.644)	0.034	0.006
30	2.50	0.13	0.040	(0.641)	0.034	0.006
31	2.58	0.17	0.050	(0.638)	0.042	0.007
32	2.67	0.17	0.050	(0.636)	0.042	0.007
33	2.75	0.17	0.050	(0.633)	0.042	0.007
34	2.83	0.17	0.050	(0.630)	0.042	0.007
35	2.92	0.17	0.050	(0.628)	0.042	0.007
36	3.00	0.17	0.050	(0.625)	0.042	0.007
37	3.08	0.17	0.050	(0.623)	0.042	0.007
38	3.17	0.17	0.050	(0.620)	0.042	0.007
39	3.25	0.17	0.050	(0.618)	0.042	0.007
40	3.33	0.17	0.050	(0.615)	0.042	0.007
41	3.42	0.17	0.050	(0.612)	0.042	0.007
42	3.50	0.17	0.050	(0.610)	0.042	0.007
43	3.58	0.17	0.050	(0.607)	0.042	0.007
44	3.67	0.17	0.050	(0.605)	0.042	0.007
45	3.75	0.17	0.050	(0.602)	0.042	0.007

46	3.83	0.20	0.060	(0.600)	0.051	0.009
47	3.92	0.20	0.060	(0.597)	0.051	0.009
48	4.00	0.20	0.060	(0.595)	0.051	0.009
49	4.08	0.20	0.060	(0.592)	0.051	0.009
50	4.17	0.20	0.060	(0.590)	0.051	0.009
51	4.25	0.20	0.060	(0.587)	0.051	0.009
52	4.33	0.23	0.069	(0.585)	0.059	0.010
53	4.42	0.23	0.069	(0.582)	0.059	0.010
54	4.50	0.23	0.069	(0.580)	0.059	0.010
55	4.58	0.23	0.069	(0.577)	0.059	0.010
56	4.67	0.23	0.069	(0.575)	0.059	0.010
57	4.75	0.23	0.069	(0.572)	0.059	0.010
58	4.83	0.27	0.079	(0.570)	0.068	0.011
59	4.92	0.27	0.079	(0.567)	0.068	0.011
60	5.00	0.27	0.079	(0.565)	0.068	0.011
61	5.08	0.20	0.060	(0.562)	0.051	0.009
62	5.17	0.20	0.060	(0.560)	0.051	0.009
63	5.25	0.20	0.060	(0.557)	0.051	0.009
64	5.33	0.23	0.069	(0.555)	0.059	0.010
65	5.42	0.23	0.069	(0.553)	0.059	0.010
66	5.50	0.23	0.069	(0.550)	0.059	0.010
67	5.58	0.27	0.079	(0.548)	0.068	0.011
68	5.67	0.27	0.079	(0.545)	0.068	0.011
69	5.75	0.27	0.079	(0.543)	0.068	0.011
70	5.83	0.27	0.079	(0.540)	0.068	0.011
71	5.92	0.27	0.079	(0.538)	0.068	0.011
72	6.00	0.27	0.079	(0.536)	0.068	0.011
73	6.08	0.30	0.089	(0.533)	0.076	0.013
74	6.17	0.30	0.089	(0.531)	0.076	0.013
75	6.25	0.30	0.089	(0.529)	0.076	0.013
76	6.33	0.30	0.089	(0.526)	0.076	0.013
77	6.42	0.30	0.089	(0.524)	0.076	0.013
78	6.50	0.30	0.089	(0.521)	0.076	0.013
79	6.58	0.33	0.099	(0.519)	0.085	0.014
80	6.67	0.33	0.099	(0.517)	0.085	0.014
81	6.75	0.33	0.099	(0.514)	0.085	0.014
82	6.83	0.33	0.099	(0.512)	0.085	0.014
83	6.92	0.33	0.099	(0.510)	0.085	0.014
84	7.00	0.33	0.099	(0.508)	0.085	0.014
85	7.08	0.33	0.099	(0.505)	0.085	0.014
86	7.17	0.33	0.099	(0.503)	0.085	0.014
87	7.25	0.33	0.099	(0.501)	0.085	0.014
88	7.33	0.37	0.109	(0.498)	0.093	0.016
89	7.42	0.37	0.109	(0.496)	0.093	0.016
90	7.50	0.37	0.109	(0.494)	0.093	0.016
91	7.58	0.40	0.119	(0.492)	0.102	0.017
92	7.67	0.40	0.119	(0.489)	0.102	0.017
93	7.75	0.40	0.119	(0.487)	0.102	0.017
94	7.83	0.43	0.129	(0.485)	0.110	0.019
95	7.92	0.43	0.129	(0.483)	0.110	0.019
96	8.00	0.43	0.129	(0.480)	0.110	0.019
97	8.08	0.50	0.149	(0.478)	0.127	0.021
98	8.17	0.50	0.149	(0.476)	0.127	0.021
99	8.25	0.50	0.149	(0.474)	0.127	0.021

100	8.33	0.50	0.149	(0.471)	0.127	0.021
101	8.42	0.50	0.149	(0.469)	0.127	0.021
102	8.50	0.50	0.149	(0.467)	0.127	0.021
103	8.58	0.53	0.159	(0.465)	0.136	0.023
104	8.67	0.53	0.159	(0.463)	0.136	0.023
105	8.75	0.53	0.159	(0.460)	0.136	0.023
106	8.83	0.57	0.169	(0.458)	0.144	0.024
107	8.92	0.57	0.169	(0.456)	0.144	0.024
108	9.00	0.57	0.169	(0.454)	0.144	0.024
109	9.08	0.63	0.188	(0.452)	0.161	0.027
110	9.17	0.63	0.188	(0.450)	0.161	0.027
111	9.25	0.63	0.188	(0.448)	0.161	0.027
112	9.33	0.67	0.198	(0.445)	0.170	0.029
113	9.42	0.67	0.198	(0.443)	0.170	0.029
114	9.50	0.67	0.198	(0.441)	0.170	0.029
115	9.58	0.70	0.208	(0.439)	0.178	0.030
116	9.67	0.70	0.208	(0.437)	0.178	0.030
117	9.75	0.70	0.208	(0.435)	0.178	0.030
118	9.83	0.73	0.218	(0.433)	0.187	0.031
119	9.92	0.73	0.218	(0.431)	0.187	0.031
120	10.00	0.73	0.218	(0.429)	0.187	0.031
121	10.08	0.50	0.149	(0.426)	0.127	0.021
122	10.17	0.50	0.149	(0.424)	0.127	0.021
123	10.25	0.50	0.149	(0.422)	0.127	0.021
124	10.33	0.50	0.149	(0.420)	0.127	0.021
125	10.42	0.50	0.149	(0.418)	0.127	0.021
126	10.50	0.50	0.149	(0.416)	0.127	0.021
127	10.58	0.67	0.198	(0.414)	0.170	0.029
128	10.67	0.67	0.198	(0.412)	0.170	0.029
129	10.75	0.67	0.198	(0.410)	0.170	0.029
130	10.83	0.67	0.198	(0.408)	0.170	0.029
131	10.92	0.67	0.198	(0.406)	0.170	0.029
132	11.00	0.67	0.198	(0.404)	0.170	0.029
133	11.08	0.63	0.188	(0.402)	0.161	0.027
134	11.17	0.63	0.188	(0.400)	0.161	0.027
135	11.25	0.63	0.188	(0.398)	0.161	0.027
136	11.33	0.63	0.188	(0.396)	0.161	0.027
137	11.42	0.63	0.188	(0.394)	0.161	0.027
138	11.50	0.63	0.188	(0.392)	0.161	0.027
139	11.58	0.57	0.169	(0.390)	0.144	0.024
140	11.67	0.57	0.169	(0.388)	0.144	0.024
141	11.75	0.57	0.169	(0.386)	0.144	0.024
142	11.83	0.60	0.179	(0.385)	0.153	0.026
143	11.92	0.60	0.179	(0.383)	0.153	0.026
144	12.00	0.60	0.179	(0.381)	0.153	0.026
145	12.08	0.83	0.248	(0.379)	0.212	0.036
146	12.17	0.83	0.248	(0.377)	0.212	0.036
147	12.25	0.83	0.248	(0.375)	0.212	0.036
148	12.33	0.87	0.258	(0.373)	0.221	0.037
149	12.42	0.87	0.258	(0.371)	0.221	0.037
150	12.50	0.87	0.258	(0.369)	0.221	0.037
151	12.58	0.93	0.278	(0.368)	0.238	0.040
152	12.67	0.93	0.278	(0.366)	0.238	0.040
153	12.75	0.93	0.278	(0.364)	0.238	0.040

154	12.83	0.97	0.288	(0.362)	0.246	0.041
155	12.92	0.97	0.288	(0.360)	0.246	0.041
156	13.00	0.97	0.288	(0.358)	0.246	0.041
157	13.08	1.13	0.337	(0.357)	0.289	0.048
158	13.17	1.13	0.337	(0.355)	0.289	0.048
159	13.25	1.13	0.337	(0.353)	0.289	0.048
160	13.33	1.13	0.337	(0.351)	0.289	0.048
161	13.42	1.13	0.337	(0.349)	0.289	0.048
162	13.50	1.13	0.337	(0.348)	0.289	0.048
163	13.58	0.77	0.228	(0.346)	0.195	0.033
164	13.67	0.77	0.228	(0.344)	0.195	0.033
165	13.75	0.77	0.228	(0.342)	0.195	0.033
166	13.83	0.77	0.228	(0.341)	0.195	0.033
167	13.92	0.77	0.228	(0.339)	0.195	0.033
168	14.00	0.77	0.228	(0.337)	0.195	0.033
169	14.08	0.90	0.268	(0.335)	0.229	0.039
170	14.17	0.90	0.268	(0.334)	0.229	0.039
171	14.25	0.90	0.268	(0.332)	0.229	0.039
172	14.33	0.87	0.258	(0.330)	0.221	0.037
173	14.42	0.87	0.258	(0.329)	0.221	0.037
174	14.50	0.87	0.258	(0.327)	0.221	0.037
175	14.58	0.87	0.258	(0.325)	0.221	0.037
176	14.67	0.87	0.258	(0.324)	0.221	0.037
177	14.75	0.87	0.258	(0.322)	0.221	0.037
178	14.83	0.83	0.248	(0.320)	0.212	0.036
179	14.92	0.83	0.248	(0.319)	0.212	0.036
180	15.00	0.83	0.248	(0.317)	0.212	0.036
181	15.08	0.80	0.238	(0.315)	0.204	0.034
182	15.17	0.80	0.238	(0.314)	0.204	0.034
183	15.25	0.80	0.238	(0.312)	0.204	0.034
184	15.33	0.77	0.228	(0.311)	0.195	0.033
185	15.42	0.77	0.228	(0.309)	0.195	0.033
186	15.50	0.77	0.228	(0.307)	0.195	0.033
187	15.58	0.63	0.188	(0.306)	0.161	0.027
188	15.67	0.63	0.188	(0.304)	0.161	0.027
189	15.75	0.63	0.188	(0.303)	0.161	0.027
190	15.83	0.63	0.188	(0.301)	0.161	0.027
191	15.92	0.63	0.188	(0.300)	0.161	0.027
192	16.00	0.63	0.188	(0.298)	0.161	0.027
193	16.08	0.13	0.040	(0.296)	0.034	0.006
194	16.17	0.13	0.040	(0.295)	0.034	0.006
195	16.25	0.13	0.040	(0.293)	0.034	0.006
196	16.33	0.13	0.040	(0.292)	0.034	0.006
197	16.42	0.13	0.040	(0.290)	0.034	0.006
198	16.50	0.13	0.040	(0.289)	0.034	0.006
199	16.58	0.10	0.030	(0.288)	0.025	0.004
200	16.67	0.10	0.030	(0.286)	0.025	0.004
201	16.75	0.10	0.030	(0.285)	0.025	0.004
202	16.83	0.10	0.030	(0.283)	0.025	0.004
203	16.92	0.10	0.030	(0.282)	0.025	0.004
204	17.00	0.10	0.030	(0.280)	0.025	0.004
205	17.08	0.17	0.050	(0.279)	0.042	0.007
206	17.17	0.17	0.050	(0.278)	0.042	0.007
207	17.25	0.17	0.050	(0.276)	0.042	0.007

208	17.33	0.17	0.050	(0.275)	0.042	0.007
209	17.42	0.17	0.050	(0.273)	0.042	0.007
210	17.50	0.17	0.050	(0.272)	0.042	0.007
211	17.58	0.17	0.050	(0.271)	0.042	0.007
212	17.67	0.17	0.050	(0.269)	0.042	0.007
213	17.75	0.17	0.050	(0.268)	0.042	0.007
214	17.83	0.13	0.040	(0.267)	0.034	0.006
215	17.92	0.13	0.040	(0.265)	0.034	0.006
216	18.00	0.13	0.040	(0.264)	0.034	0.006
217	18.08	0.13	0.040	(0.263)	0.034	0.006
218	18.17	0.13	0.040	(0.261)	0.034	0.006
219	18.25	0.13	0.040	(0.260)	0.034	0.006
220	18.33	0.13	0.040	(0.259)	0.034	0.006
221	18.42	0.13	0.040	(0.258)	0.034	0.006
222	18.50	0.13	0.040	(0.256)	0.034	0.006
223	18.58	0.10	0.030	(0.255)	0.025	0.004
224	18.67	0.10	0.030	(0.254)	0.025	0.004
225	18.75	0.10	0.030	(0.253)	0.025	0.004
226	18.83	0.07	0.020	(0.251)	0.017	0.003
227	18.92	0.07	0.020	(0.250)	0.017	0.003
228	19.00	0.07	0.020	(0.249)	0.017	0.003
229	19.08	0.10	0.030	(0.248)	0.025	0.004
230	19.17	0.10	0.030	(0.247)	0.025	0.004
231	19.25	0.10	0.030	(0.246)	0.025	0.004
232	19.33	0.13	0.040	(0.244)	0.034	0.006
233	19.42	0.13	0.040	(0.243)	0.034	0.006
234	19.50	0.13	0.040	(0.242)	0.034	0.006
235	19.58	0.10	0.030	(0.241)	0.025	0.004
236	19.67	0.10	0.030	(0.240)	0.025	0.004
237	19.75	0.10	0.030	(0.239)	0.025	0.004
238	19.83	0.07	0.020	(0.238)	0.017	0.003
239	19.92	0.07	0.020	(0.237)	0.017	0.003
240	20.00	0.07	0.020	(0.236)	0.017	0.003
241	20.08	0.10	0.030	(0.235)	0.025	0.004
242	20.17	0.10	0.030	(0.234)	0.025	0.004
243	20.25	0.10	0.030	(0.233)	0.025	0.004
244	20.33	0.10	0.030	(0.232)	0.025	0.004
245	20.42	0.10	0.030	(0.231)	0.025	0.004
246	20.50	0.10	0.030	(0.230)	0.025	0.004
247	20.58	0.10	0.030	(0.229)	0.025	0.004
248	20.67	0.10	0.030	(0.228)	0.025	0.004
249	20.75	0.10	0.030	(0.227)	0.025	0.004
250	20.83	0.07	0.020	(0.226)	0.017	0.003
251	20.92	0.07	0.020	(0.225)	0.017	0.003
252	21.00	0.07	0.020	(0.224)	0.017	0.003
253	21.08	0.10	0.030	(0.223)	0.025	0.004
254	21.17	0.10	0.030	(0.222)	0.025	0.004
255	21.25	0.10	0.030	(0.221)	0.025	0.004
256	21.33	0.07	0.020	(0.221)	0.017	0.003
257	21.42	0.07	0.020	(0.220)	0.017	0.003
258	21.50	0.07	0.020	(0.219)	0.017	0.003
259	21.58	0.10	0.030	(0.218)	0.025	0.004
260	21.67	0.10	0.030	(0.217)	0.025	0.004
261	21.75	0.10	0.030	(0.217)	0.025	0.004

262	21.83	0.07	0.020	(0.216)	0.017	0.003
263	21.92	0.07	0.020	(0.215)	0.017	0.003
264	22.00	0.07	0.020	(0.214)	0.017	0.003
265	22.08	0.10	0.030	(0.214)	0.025	0.004
266	22.17	0.10	0.030	(0.213)	0.025	0.004
267	22.25	0.10	0.030	(0.212)	0.025	0.004
268	22.33	0.07	0.020	(0.212)	0.017	0.003
269	22.42	0.07	0.020	(0.211)	0.017	0.003
270	22.50	0.07	0.020	(0.210)	0.017	0.003
271	22.58	0.07	0.020	(0.210)	0.017	0.003
272	22.67	0.07	0.020	(0.209)	0.017	0.003
273	22.75	0.07	0.020	(0.209)	0.017	0.003
274	22.83	0.07	0.020	(0.208)	0.017	0.003
275	22.92	0.07	0.020	(0.207)	0.017	0.003
276	23.00	0.07	0.020	(0.207)	0.017	0.003
277	23.08	0.07	0.020	(0.206)	0.017	0.003
278	23.17	0.07	0.020	(0.206)	0.017	0.003
279	23.25	0.07	0.020	(0.206)	0.017	0.003
280	23.33	0.07	0.020	(0.205)	0.017	0.003
281	23.42	0.07	0.020	(0.205)	0.017	0.003
282	23.50	0.07	0.020	(0.204)	0.017	0.003
283	23.58	0.07	0.020	(0.204)	0.017	0.003
284	23.67	0.07	0.020	(0.204)	0.017	0.003
285	23.75	0.07	0.020	(0.203)	0.017	0.003
286	23.83	0.07	0.020	(0.203)	0.017	0.003
287	23.92	0.07	0.020	(0.203)	0.017	0.003
288	24.00	0.07	0.020	(0.203)	0.017	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.3

Flood volume = Effective rainfall 0.36(In)
times area 42.0(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)
Total soil loss = 2.12(In)
Total soil loss = 7.431(Ac.Ft)
Total rainfall = 2.48(In)
Flood volume = 54366.4 Cubic Feet
Total soil loss = 323703.3 Cubic Feet

Peak flow rate of this hydrograph = 2.030(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q				
0+10	0.0005	0.06	Q				
0+15	0.0012	0.09	Q				
0+20	0.0019	0.11	Q				
0+25	0.0029	0.14	Q				
0+30	0.0039	0.16	Q				

0+35	0.0051	0.17	Q
0+40	0.0063	0.17	Q
0+45	0.0075	0.17	Q
0+50	0.0087	0.18	Q
0+55	0.0102	0.21	Q
1+ 0	0.0117	0.23	Q
1+ 5	0.0133	0.22	Q
1+10	0.0147	0.20	Q
1+15	0.0160	0.19	Q
1+20	0.0173	0.19	Q
1+25	0.0186	0.19	Q
1+30	0.0198	0.18	Q
1+35	0.0211	0.18	Q
1+40	0.0224	0.18	Q
1+45	0.0236	0.18	Q
1+50	0.0249	0.19	Q
1+55	0.0264	0.21	Q
2+ 0	0.0279	0.23	Q
2+ 5	0.0295	0.23	Q
2+10	0.0312	0.24	Q
2+15	0.0328	0.24	QV
2+20	0.0344	0.24	QV
2+25	0.0361	0.24	QV
2+30	0.0377	0.24	QV
2+35	0.0394	0.25	QV
2+40	0.0413	0.27	Q
2+45	0.0433	0.29	Q
2+50	0.0453	0.29	Q
2+55	0.0473	0.30	Q
3+ 0	0.0494	0.30	Q
3+ 5	0.0515	0.30	Q
3+10	0.0535	0.30	Q
3+15	0.0556	0.30	Q
3+20	0.0577	0.30	Q
3+25	0.0597	0.30	Q
3+30	0.0618	0.30	Q
3+35	0.0639	0.30	QV
3+40	0.0660	0.30	QV
3+45	0.0681	0.30	QV
3+50	0.0702	0.31	QV
3+55	0.0725	0.33	QV
4+ 0	0.0749	0.35	QV
4+ 5	0.0773	0.35	QV
4+10	0.0798	0.36	QV
4+15	0.0822	0.36	QV
4+20	0.0848	0.37	QV
4+25	0.0875	0.39	QV
4+30	0.0903	0.41	QV
4+35	0.0931	0.41	QV
4+40	0.0960	0.42	Q V
4+45	0.0988	0.42	Q V
4+50	0.1018	0.43	Q V
4+55	0.1049	0.45	Q V
5+ 0	0.1081	0.47	Q V

5+ 5	0.1113	0.46	Q	V			
5+10	0.1141	0.41	Q	V			
5+15	0.1168	0.39	Q	V			
5+20	0.1194	0.39	Q	V			
5+25	0.1222	0.41	Q	V			
5+30	0.1251	0.42	Q	V			
5+35	0.1280	0.43	Q	V			
5+40	0.1311	0.45	Q	V			
5+45	0.1344	0.47	Q	V			
5+50	0.1376	0.47	Q	V			
5+55	0.1409	0.48	Q	V			
6+ 0	0.1442	0.48	Q	V			
6+ 5	0.1475	0.49	Q	V			
6+10	0.1510	0.51	Q	V			
6+15	0.1547	0.53	Q	V			
6+20	0.1583	0.53	Q	V			
6+25	0.1620	0.54	Q	V			
6+30	0.1658	0.54	Q	V			
6+35	0.1695	0.55	Q	V			
6+40	0.1735	0.57	Q	V			
6+45	0.1775	0.59	Q	V			
6+50	0.1816	0.59	Q	V			
6+55	0.1857	0.60	Q	V			
7+ 0	0.1899	0.60	Q	V			
7+ 5	0.1940	0.60	Q	V			
7+10	0.1981	0.60	Q	V			
7+15	0.2023	0.60	Q	V			
7+20	0.2065	0.61	Q	V			
7+25	0.2109	0.64	Q	V			
7+30	0.2153	0.65	Q	V			
7+35	0.2199	0.66	Q	V			
7+40	0.2246	0.69	Q	V			
7+45	0.2295	0.71	Q	V			
7+50	0.2345	0.72	Q	V			
7+55	0.2396	0.75	Q	V			
8+ 0	0.2449	0.76	Q	V			
8+ 5	0.2503	0.79	Q	V			
8+10	0.2561	0.84	Q	V			
8+15	0.2621	0.87	Q	V			
8+20	0.2681	0.88	Q	V			
8+25	0.2743	0.89	Q	V			
8+30	0.2804	0.90	Q	V			
8+35	0.2867	0.91	Q	V			
8+40	0.2931	0.93	Q	V			
8+45	0.2997	0.95	Q	V			
8+50	0.3063	0.96	Q	V			
8+55	0.3131	0.99	Q	V			
9+ 0	0.3200	1.01	Q	V			
9+ 5	0.3271	1.03	Q	V			
9+10	0.3346	1.08	Q	V			
9+15	0.3422	1.11	Q	V			
9+20	0.3500	1.13	Q	V			
9+25	0.3580	1.16	Q	V			
9+30	0.3662	1.18	Q	V			

9+35	0.3744	1.20	Q	V			
9+40	0.3829	1.23	Q	V			
9+45	0.3915	1.25	Q	V			
9+50	0.4002	1.26	Q	V			
9+55	0.4091	1.29	Q	V			
10+ 0	0.4181	1.31	Q	V			
10+ 5	0.4268	1.27	Q	V			
10+10	0.4344	1.10	Q	V			
10+15	0.4413	1.01	Q	V			
10+20	0.4480	0.97	Q	V			
10+25	0.4545	0.95	Q	V			
10+30	0.4610	0.94	Q	V			
10+35	0.4676	0.96	Q	V			
10+40	0.4750	1.08	Q	V			
10+45	0.4829	1.14	Q	V			
10+50	0.4909	1.16	Q	V			
10+55	0.4990	1.18	Q	V			
11+ 0	0.5072	1.19	Q	V			
11+ 5	0.5153	1.19	Q	V			
11+10	0.5234	1.17	Q	V			
11+15	0.5313	1.16	Q	V			
11+20	0.5393	1.15	Q	V			
11+25	0.5472	1.15	Q	V			
11+30	0.5552	1.15	Q	V			
11+35	0.5630	1.14	Q	V			
11+40	0.5705	1.09	Q	V			
11+45	0.5778	1.06	Q	V			
11+50	0.5850	1.05	Q	V			
11+55	0.5924	1.07	Q	V			
12+ 0	0.5998	1.08	Q	V			
12+ 5	0.6076	1.13	Q	V			
12+10	0.6166	1.31	Q	V			
12+15	0.6263	1.40	Q	V			
12+20	0.6363	1.45	Q	V			
12+25	0.6465	1.49	Q	V			
12+30	0.6570	1.52	Q	V			
12+35	0.6677	1.55	Q	V			
12+40	0.6788	1.61	Q	V			
12+45	0.6902	1.65	Q	V			
12+50	0.7017	1.67	Q	V			
12+55	0.7134	1.71	Q	V			
13+ 0	0.7253	1.73	Q	V			
13+ 5	0.7375	1.77	Q	V			
13+10	0.7506	1.90	Q	V			
13+15	0.7642	1.97	Q	V			
13+20	0.7780	2.00	Q	V			
13+25	0.7919	2.02	Q	V			
13+30	0.8058	2.03	Q	V			
13+35	0.8194	1.96	Q	V			
13+40	0.8310	1.69	Q	V			
13+45	0.8417	1.55	Q	V			
13+50	0.8520	1.49	Q	V			
13+55	0.8621	1.46	Q	V			
14+ 0	0.8720	1.44	Q	V			

14+ 5	0.8820	1.45	Q	V
14+10	0.8925	1.54	Q	V
14+15	0.9035	1.58	Q	V
14+20	0.9144	1.59	Q	V
14+25	0.9253	1.58	Q	V
14+30	0.9361	1.57	Q	V
14+35	0.9469	1.57	Q	V
14+40	0.9577	1.57	Q	V
14+45	0.9685	1.57	Q	V
14+50	0.9793	1.56	Q	V
14+55	0.9899	1.54	Q	V
15+ 0	1.0004	1.53	Q	V
15+ 5	1.0108	1.51	Q	V
15+10	1.0210	1.49	Q	V
15+15	1.0312	1.47	Q	V
15+20	1.0412	1.46	Q	V
15+25	1.0510	1.43	Q	V
15+30	1.0607	1.41	Q	V
15+35	1.0702	1.38	Q	V
15+40	1.0789	1.27	Q	V
15+45	1.0873	1.21	Q	V
15+50	1.0955	1.19	Q	V
15+55	1.1036	1.18	Q	V
16+ 0	1.1116	1.17	Q	V
16+ 5	1.1189	1.06	Q	V
16+10	1.1236	0.68	Q	V
16+15	1.1269	0.47	Q	V
16+20	1.1296	0.39	Q	V
16+25	1.1319	0.34	Q	V
16+30	1.1341	0.31	Q	V
16+35	1.1360	0.28	Q	V
16+40	1.1376	0.24	Q	V
16+45	1.1391	0.21	Q	V
16+50	1.1405	0.20	Q	V
16+55	1.1418	0.19	Q	V
17+ 0	1.1431	0.19	Q	V
17+ 5	1.1445	0.20	Q	V
17+10	1.1462	0.25	Q	V
17+15	1.1480	0.27	Q	V
17+20	1.1500	0.28	Q	V
17+25	1.1520	0.29	Q	V
17+30	1.1540	0.29	Q	V
17+35	1.1560	0.30	Q	V
17+40	1.1581	0.30	Q	V
17+45	1.1602	0.30	Q	V
17+50	1.1622	0.29	Q	V
17+55	1.1640	0.27	Q	V
18+ 0	1.1658	0.26	Q	V
18+ 5	1.1675	0.25	Q	V
18+10	1.1692	0.25	Q	V
18+15	1.1709	0.25	Q	V
18+20	1.1726	0.24	Q	V
18+25	1.1743	0.24	Q	V
18+30	1.1760	0.24	Q	V

18+35	1.1776	0.24	Q				V
18+40	1.1790	0.21	Q				V
18+45	1.1804	0.20	Q				V
18+50	1.1817	0.18	Q				V
18+55	1.1827	0.16	Q				V
19+ 0	1.1837	0.14	Q				V
19+ 5	1.1847	0.14	Q				V
19+10	1.1858	0.16	Q				V
19+15	1.1870	0.17	Q				V
19+20	1.1882	0.18	Q				V
19+25	1.1897	0.21	Q				V
19+30	1.1912	0.22	Q				V
19+35	1.1927	0.22	Q				V
19+40	1.1941	0.20	Q				V
19+45	1.1954	0.19	Q				V
19+50	1.1967	0.18	Q				V
19+55	1.1977	0.15	Q				V
20+ 0	1.1987	0.14	Q				V
20+ 5	1.1997	0.14	Q				V
20+10	1.2008	0.16	Q				V
20+15	1.2019	0.17	Q				V
20+20	1.2032	0.18	Q				V
20+25	1.2044	0.18	Q				V
20+30	1.2056	0.18	Q				V
20+35	1.2068	0.18	Q				V
20+40	1.2081	0.18	Q				V
20+45	1.2093	0.18	Q				V
20+50	1.2105	0.17	Q				V
20+55	1.2115	0.15	Q				V
21+ 0	1.2125	0.14	Q				V
21+ 5	1.2134	0.14	Q				V
21+10	1.2145	0.16	Q				V
21+15	1.2157	0.17	Q				V
21+20	1.2168	0.17	Q				V
21+25	1.2178	0.14	Q				V
21+30	1.2187	0.13	Q				V
21+35	1.2197	0.14	Q				V
21+40	1.2208	0.16	Q				V
21+45	1.2219	0.17	Q				V
21+50	1.2231	0.17	Q				V
21+55	1.2241	0.14	Q				V
22+ 0	1.2250	0.13	Q				V
22+ 5	1.2259	0.14	Q				V
22+10	1.2270	0.16	Q				V
22+15	1.2282	0.17	Q				V
22+20	1.2293	0.17	Q				V
22+25	1.2303	0.14	Q				V
22+30	1.2312	0.13	Q				V
22+35	1.2321	0.13	Q				V
22+40	1.2330	0.13	Q				V
22+45	1.2338	0.12	Q				V
22+50	1.2347	0.12	Q				V
22+55	1.2355	0.12	Q				V
23+ 0	1.2364	0.12	Q				V

23+ 5	1.2372	0.12	Q				V
23+10	1.2380	0.12	Q				V
23+15	1.2389	0.12	Q				V
23+20	1.2397	0.12	Q				V
23+25	1.2405	0.12	Q				V
23+30	1.2414	0.12	Q				V
23+35	1.2422	0.12	Q				V
23+40	1.2430	0.12	Q				V
23+45	1.2439	0.12	Q				V
23+50	1.2447	0.12	Q				V
23+55	1.2455	0.12	Q				V
24+ 0	1.2464	0.12	Q				V
24+ 5	1.2471	0.11	Q				V
24+10	1.2475	0.06	Q				V
24+15	1.2477	0.03	Q				V
24+20	1.2478	0.02	Q				V
24+25	1.2479	0.01	Q				V
24+30	1.2480	0.01	Q				V
24+35	1.2480	0.01	Q				V
24+40	1.2481	0.00	Q				V
24+45	1.2481	0.00	Q				V
24+50	1.2481	0.00	Q				V
24+55	1.2481	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea "4" **Natural Condition**

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1284.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
42.00	0.58	24.36

100 YEAR Area rainfall data:

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

42.00

1.45

60.90

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.783(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	72.574	4.779
2	0.167	145.147	17.517
3	0.250	217.721	9.428
4	0.333	290.295	3.719
5	0.417	362.869	2.258
6	0.500	435.442	1.477
7	0.583	508.016	1.010
8	0.667	580.590	0.763
9	0.750	653.163	0.540
10	0.833	725.737	0.368
11	0.917	798.311	0.307
12	1.000	870.885	0.161

Sum = 100.000 Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.414	(0.406)	0.354	0.059
2	0.17	4.50	0.423	(0.406)	0.362	0.061
3	0.25	5.40	0.508	0.406	(0.435)	0.102
4	0.33	5.40	0.508	0.406	(0.435)	0.102
5	0.42	5.70	0.536	0.406	(0.459)	0.130
6	0.50	6.40	0.602	0.406	(0.515)	0.196
7	0.58	7.90	0.743	0.406	(0.636)	0.337
8	0.67	9.10	0.856	0.406	(0.733)	0.450
9	0.75	12.80	1.203	0.406	(1.030)	0.798
10	0.83	25.60	2.407	0.406	(2.061)	2.001
11	0.92	7.90	0.743	0.406	(0.636)	0.337
12	1.00	4.90	0.461	(0.406)	0.394	0.066

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.39(In)
times area 42.0(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.40(In)
Total soil loss = 1.389(Ac.Ft)
Total rainfall = 0.78(In)
Flood volume = 58931.2 Cubic Feet
Total soil loss = 60517.7 Cubic Feet

Peak flow rate of this hydrograph = 47.233(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0020	0.28	Q				
0+10	0.0111	1.33	VQ				
0+15	0.0257	2.11	VQ				
0+20	0.0468	3.07	VQ				
0+25	0.0725	3.73	Q				
0+30	0.1054	4.78	Q				
0+35	0.1539	7.03	VQ				
0+40	0.2288	10.87	V Q				
0+45	0.3405	16.23	V Q				
0+50	0.5465	29.91		V	Q		

0+55	0.8718	47.23				V		Q
1+ 0	1.0784	30.00				Q	V	
1+ 5	1.1810	14.89			Q		V	
1+10	1.2395	8.49			Q		V	
1+15	1.2768	5.43		Q			V	
1+20	1.3025	3.73	Q				V	
1+25	1.3211	2.70	Q				V	
1+30	1.3341	1.89	Q				V	
1+35	1.3430	1.29	Q				V	
1+40	1.3492	0.90	Q				V	
1+45	1.3523	0.45	Q				V	
1+50	1.3528	0.07	Q				V	
1+55	1.3529	0.01	Q					V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea "4" Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1284.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 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]
42.00	0.98	41.16

100 YEAR Area rainfall data:

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

42.00

2.48

104.16

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

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	0.083	72.574	11.291
2	0.167	145.147	41.383
3	0.250	217.721	22.273
4	0.333	290.295	8.787
5	0.417	362.869	5.335
6	0.500	435.442	3.490
7	0.583	508.016	2.386
8	0.667	580.590	1.803
9	0.750	653.163	1.277
10	0.833	725.737	0.869
11	0.917	798.311	0.726
12	1.000	870.885	0.380
Sum =		100.000	Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.208	(0.406)	0.178	0.030
2	0.17	1.30	0.208	(0.406)	0.178	0.030
3	0.25	1.10	0.176	(0.406)	0.150	0.025
4	0.33	1.50	0.240	(0.406)	0.205	0.034
5	0.42	1.50	0.240	(0.406)	0.205	0.034
6	0.50	1.80	0.288	(0.406)	0.246	0.041
7	0.58	1.50	0.240	(0.406)	0.205	0.034
8	0.67	1.80	0.288	(0.406)	0.246	0.041
9	0.75	1.80	0.288	(0.406)	0.246	0.041
10	0.83	1.50	0.240	(0.406)	0.205	0.034
11	0.92	1.60	0.256	(0.406)	0.219	0.037
12	1.00	1.80	0.288	(0.406)	0.246	0.041
13	1.08	2.20	0.351	(0.406)	0.301	0.051
14	1.17	2.20	0.351	(0.406)	0.301	0.051
15	1.25	2.20	0.351	(0.406)	0.301	0.051
16	1.33	2.00	0.319	(0.406)	0.274	0.046
17	1.42	2.60	0.415	(0.406)	0.356	0.060
18	1.50	2.70	0.431	(0.406)	0.369	0.062
19	1.58	2.40	0.383	(0.406)	0.328	0.055
20	1.67	2.70	0.431	(0.406)	0.369	0.062
21	1.75	3.30	0.527	0.406	(0.451)	0.121
22	1.83	3.10	0.495	0.406	(0.424)	0.089
23	1.92	2.90	0.463	(0.406)	0.397	0.067
24	2.00	3.00	0.479	0.406	(0.410)	0.073
25	2.08	3.10	0.495	0.406	(0.424)	0.089
26	2.17	4.20	0.671	0.406	(0.574)	0.265
27	2.25	5.00	0.799	0.406	(0.684)	0.393
28	2.33	3.50	0.559	0.406	(0.479)	0.153
29	2.42	6.80	1.086	0.406	(0.930)	0.680
30	2.50	7.30	1.166	0.406	(0.998)	0.760
31	2.58	8.20	1.310	0.406	(1.121)	0.904
32	2.67	5.90	0.942	0.406	(0.807)	0.537
33	2.75	2.00	0.319	(0.406)	0.274	0.046
34	2.83	1.80	0.288	(0.406)	0.246	0.041
35	2.92	1.80	0.288	(0.406)	0.246	0.041
36	3.00	0.60	0.096	(0.406)	0.082	0.014

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.1

Flood volume = Effective rainfall 0.43(In)

times area 42.0(Ac.) / [(In)/(Ft.)] = 1.5(Ac.Ft)

Total soil loss = 0.90(In)

Total soil loss = 3.161(Ac.Ft)

Total rainfall = 1.33(In)

Flood volume = 65251.9 Cubic Feet

Total soil loss = 137686.3 Cubic Feet

 Peak flow rate of this hydrograph = 29.485 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0010		0.14	Q				
0+10	0.0056		0.67	Q				
0+15	0.0119		0.93	VQ				
0+20	0.0188		1.00	VQ				
0+25	0.0270		1.19	VQ				
0+30	0.0362		1.33	VQ				
0+35	0.0463		1.47	Q				
0+40	0.0566		1.49	Q				
0+45	0.0676		1.59	VQ				
0+50	0.0788		1.63	Q				
0+55	0.0895		1.56	Q				
1+ 0	0.1004		1.57	Q				
1+ 5	0.1121		1.71	Q				
1+10	0.1253		1.91	QV				
1+15	0.1392		2.02	QV				
1+20	0.1532		2.04	Q V				
1+25	0.1673		2.05	Q V				
1+30	0.1830		2.28	QV				
1+35	0.1996		2.41	Q V				
1+40	0.2160		2.39	Q V				
1+45	0.2351		2.77	Q V				
1+50	0.2607		3.72	Q V				
1+55	0.2858		3.64	Q V				
2+ 0	0.3079		3.21	Q V				
2+ 5	0.3300		3.22	Q V				
2+10	0.3599		4.34	Q V				
2+15	0.4162		8.17	QV				
2+20	0.4918		10.98	VQ				
2+25	0.5689		11.19	QV				
2+30	0.7028		19.44	V				
2+35	0.8830		26.18	V				
2+40	1.0861		29.49	V				
2+45	1.2476		23.45	Q				
2+50	1.3359		12.82	Q				
2+55	1.3887		7.67	Q				
3+ 0	1.4267		5.51	Q				
3+ 5	1.4526		3.76	Q				
3+10	1.4695		2.45	Q				
3+15	1.4809		1.66	Q				
3+20	1.4887		1.13	Q				
3+25	1.4937		0.72	Q				
3+30	1.4964		0.40	Q				

3+35	1.4974	0.15	Q				V
3+40	1.4977	0.04	Q				V
3+45	1.4979	0.02	Q				V
3+50	1.4980	0.01	Q				V
3+55	1.4980	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea "4" Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1284.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
42.00	1.38	57.96

100 YEAR Area rainfall data:

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

42.00

3.48

146.16

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.872(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.872(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	72.574	11.291
2	0.167	145.147	41.383
3	0.250	217.721	22.273
4	0.333	290.295	8.787
5	0.417	362.869	5.335
6	0.500	435.442	3.490
7	0.583	508.016	2.386
8	0.667	580.590	1.803
9	0.750	653.163	1.277
10	0.833	725.737	0.869
11	0.917	798.311	0.726
12	1.000	870.885	0.380
Sum =		100.000	Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.112	(0.406)	0.096	0.016
2	0.17	0.60	0.135	(0.406)	0.115	0.019
3	0.25	0.60	0.135	(0.406)	0.115	0.019
4	0.33	0.60	0.135	(0.406)	0.115	0.019
5	0.42	0.60	0.135	(0.406)	0.115	0.019
6	0.50	0.70	0.157	(0.406)	0.135	0.023
7	0.58	0.70	0.157	(0.406)	0.135	0.023
8	0.67	0.70	0.157	(0.406)	0.135	0.023
9	0.75	0.70	0.157	(0.406)	0.135	0.023
10	0.83	0.70	0.157	(0.406)	0.135	0.023
11	0.92	0.70	0.157	(0.406)	0.135	0.023
12	1.00	0.80	0.180	(0.406)	0.154	0.026
13	1.08	0.80	0.180	(0.406)	0.154	0.026
14	1.17	0.80	0.180	(0.406)	0.154	0.026
15	1.25	0.80	0.180	(0.406)	0.154	0.026
16	1.33	0.80	0.180	(0.406)	0.154	0.026
17	1.42	0.80	0.180	(0.406)	0.154	0.026
18	1.50	0.80	0.180	(0.406)	0.154	0.026
19	1.58	0.80	0.180	(0.406)	0.154	0.026
20	1.67	0.80	0.180	(0.406)	0.154	0.026
21	1.75	0.80	0.180	(0.406)	0.154	0.026
22	1.83	0.80	0.180	(0.406)	0.154	0.026
23	1.92	0.80	0.180	(0.406)	0.154	0.026
24	2.00	0.90	0.202	(0.406)	0.173	0.029
25	2.08	0.80	0.180	(0.406)	0.154	0.026
26	2.17	0.90	0.202	(0.406)	0.173	0.029
27	2.25	0.90	0.202	(0.406)	0.173	0.029
28	2.33	0.90	0.202	(0.406)	0.173	0.029
29	2.42	0.90	0.202	(0.406)	0.173	0.029
30	2.50	0.90	0.202	(0.406)	0.173	0.029
31	2.58	0.90	0.202	(0.406)	0.173	0.029
32	2.67	0.90	0.202	(0.406)	0.173	0.029
33	2.75	1.00	0.225	(0.406)	0.192	0.032
34	2.83	1.00	0.225	(0.406)	0.192	0.032
35	2.92	1.00	0.225	(0.406)	0.192	0.032
36	3.00	1.00	0.225	(0.406)	0.192	0.032
37	3.08	1.00	0.225	(0.406)	0.192	0.032
38	3.17	1.10	0.247	(0.406)	0.212	0.036
39	3.25	1.10	0.247	(0.406)	0.212	0.036
40	3.33	1.10	0.247	(0.406)	0.212	0.036
41	3.42	1.20	0.270	(0.406)	0.231	0.039
42	3.50	1.30	0.292	(0.406)	0.250	0.042
43	3.58	1.40	0.314	(0.406)	0.269	0.045
44	3.67	1.40	0.314	(0.406)	0.269	0.045
45	3.75	1.50	0.337	(0.406)	0.288	0.048

46	3.83	1.50	0.337	(0.406)	0.288	0.048
47	3.92	1.60	0.359	(0.406)	0.308	0.052
48	4.00	1.60	0.359	(0.406)	0.308	0.052
49	4.08	1.70	0.382	(0.406)	0.327	0.055
50	4.17	1.80	0.404	(0.406)	0.346	0.058
51	4.25	1.90	0.427	(0.406)	0.365	0.061
52	4.33	2.00	0.449	(0.406)	0.385	0.065
53	4.42	2.10	0.472	(0.406)	0.404	0.068
54	4.50	2.10	0.472	(0.406)	0.404	0.068
55	4.58	2.20	0.494	0.406	(0.423)	0.088
56	4.67	2.30	0.517	0.406	(0.442)	0.111
57	4.75	2.40	0.539	0.406	(0.462)	0.133
58	4.83	2.40	0.539	0.406	(0.462)	0.133
59	4.92	2.50	0.561	0.406	(0.481)	0.156
60	5.00	2.60	0.584	0.406	(0.500)	0.178
61	5.08	3.10	0.696	0.406	(0.596)	0.290
62	5.17	3.60	0.809	0.406	(0.692)	0.403
63	5.25	3.90	0.876	0.406	(0.750)	0.470
64	5.33	4.20	0.943	0.406	(0.808)	0.537
65	5.42	4.70	1.056	0.406	(0.904)	0.650
66	5.50	5.60	1.258	0.406	(1.077)	0.852
67	5.58	1.90	0.427	(0.406)	0.365	0.061
68	5.67	0.90	0.202	(0.406)	0.173	0.029
69	5.75	0.60	0.135	(0.406)	0.115	0.019
70	5.83	0.50	0.112	(0.406)	0.096	0.016
71	5.92	0.30	0.067	(0.406)	0.058	0.010
72	6.00	0.20	0.045	(0.406)	0.038	0.006

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.0

Flood volume = Effective rainfall 0.50(In)
times area 42.0(Ac.)/[(In)/(Ft.)) = 1.7(Ac.Ft)
Total soil loss = 1.38(In)
Total soil loss = 4.814(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 75663.5 Cubic Feet
Total soil loss = 209680.8 Cubic Feet

Peak flow rate of this hydrograph = 25.631(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0005	0.08	Q				
0+10	0.0031	0.38	Q				
0+15	0.0071	0.58	Q				
0+20	0.0118	0.68	Q				
0+25	0.0168	0.72	Q				
0+30	0.0221	0.77	VQ				

0+35	0.0279	0.85	VQ						
0+40	0.0341	0.89	VQ						
0+45	0.0404	0.92	VQ						
0+50	0.0468	0.93	Q						
0+55	0.0533	0.94	Q						
1+ 0	0.0600	0.97	Q						
1+ 5	0.0670	1.03	Q						
1+10	0.0743	1.06	Q						
1+15	0.0817	1.07	Q						
1+20	0.0891	1.08	QV						
1+25	0.0966	1.08	QV						
1+30	0.1041	1.09	QV						
1+35	0.1116	1.09	QV						
1+40	0.1191	1.09	QV						
1+45	0.1266	1.09	QV						
1+50	0.1341	1.09	Q V						
1+55	0.1417	1.09	Q V						
2+ 0	0.1493	1.11	Q V						
2+ 5	0.1572	1.15	Q V						
2+10	0.1651	1.14	Q V						
2+15	0.1732	1.18	Q V						
2+20	0.1815	1.20	Q V						
2+25	0.1899	1.21	Q V						
2+30	0.1983	1.22	Q V						
2+35	0.2067	1.22	Q V						
2+40	0.2151	1.23	Q V						
2+45	0.2237	1.24	Q V						
2+50	0.2326	1.30	Q V						
2+55	0.2418	1.33	Q V						
3+ 0	0.2511	1.34	Q V						
3+ 5	0.2604	1.35	Q V						
3+10	0.2699	1.37	Q V						
3+15	0.2797	1.43	Q V						
3+20	0.2898	1.47	Q V						
3+25	0.3001	1.50	Q V						
3+30	0.3110	1.58	Q V						
3+35	0.3226	1.68	Q V						
3+40	0.3349	1.79	Q V						
3+45	0.3476	1.85	Q V						
3+50	0.3610	1.94	Q V						
3+55	0.3748	2.00	Q V						
4+ 0	0.3891	2.08	Q V						
4+ 5	0.4038	2.14	Q V						
4+10	0.4192	2.23	Q V						
4+15	0.4354	2.35	Q V						
4+20	0.4525	2.48	Q V						
4+25	0.4704	2.60	Q V						
4+30	0.4891	2.72	Q V						
4+35	0.5089	2.88	Q V						
4+40	0.5322	3.38	Q V						
4+45	0.5604	4.09	Q V						
4+50	0.5933	4.79	Q V						
4+55	0.6294	5.24	Q V						
5+ 0	0.6702	5.92	Q V						

5+ 5	0.7196	7.17		Q	V				
5+10	0.7887	10.04			Q	V			
5+15	0.8823	13.58				Q	V		
5+20	0.9971	16.68					Q		
5+25	1.1334	19.79						Q	
5+30	1.2993	24.09						V	Q
5+35	1.4758	25.63							VQ
5+40	1.5752	14.42			Q				V
5+45	1.6281	7.69		Q					V
5+50	1.6633	5.11							V
5+55	1.6881	3.61							V
6+ 0	1.7059	2.57							V
6+ 5	1.7184	1.82							V
6+10	1.7265	1.18	Q						V
6+15	1.7316	0.74	Q						V
6+20	1.7348	0.46	Q						V
6+25	1.7363	0.21	Q						V
6+30	1.7366	0.05	Q						V
6+35	1.7368	0.03	Q						V
6+40	1.7369	0.02	Q						V
6+45	1.7370	0.01	Q						V
6+50	1.7370	0.00	Q						V
6+55	1.7370	0.00	Q						V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea "4" Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1284.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 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]
42.00	2.48	104.16

100 YEAR Area rainfall data:

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

42.00

6.90

289.80

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.500	86.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
86.0	71.6	0.343	1.000	0.034	0.012	0.000
93.0	83.4	0.205	1.000	0.021	0.043	0.001
63.0	43.0	0.641	0.000	0.641	0.024	0.015
81.0	64.4	0.422	0.000	0.422	0.921	0.389
Sum (F) =						0.406

Area averaged mean soil loss (F) (In/Hr) = 0.406

Minimum soil loss rate ((In/Hr)) = 0.203

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	72.574	11.291
2	0.167	145.147	41.383
3	0.250	217.721	22.273
4	0.333	290.295	8.787
5	0.417	362.869	5.335
6	0.500	435.442	3.490
7	0.583	508.016	2.386
8	0.667	580.590	1.803
9	0.750	653.163	1.277
10	0.833	725.737	0.869
11	0.917	798.311	0.726
12	1.000	870.885	0.380
Sum =		100.000	Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.028	(0.719)	0.024	0.004
2	0.17	0.07	0.028	(0.717)	0.024	0.004
3	0.25	0.07	0.028	(0.714)	0.024	0.004
4	0.33	0.10	0.042	(0.711)	0.036	0.006
5	0.42	0.10	0.042	(0.708)	0.036	0.006
6	0.50	0.10	0.042	(0.706)	0.036	0.006
7	0.58	0.10	0.042	(0.703)	0.036	0.006
8	0.67	0.10	0.042	(0.700)	0.036	0.006
9	0.75	0.10	0.042	(0.697)	0.036	0.006
10	0.83	0.13	0.056	(0.695)	0.048	0.008
11	0.92	0.13	0.056	(0.692)	0.048	0.008
12	1.00	0.13	0.056	(0.689)	0.048	0.008
13	1.08	0.10	0.042	(0.686)	0.036	0.006
14	1.17	0.10	0.042	(0.684)	0.036	0.006
15	1.25	0.10	0.042	(0.681)	0.036	0.006
16	1.33	0.10	0.042	(0.678)	0.036	0.006
17	1.42	0.10	0.042	(0.676)	0.036	0.006
18	1.50	0.10	0.042	(0.673)	0.036	0.006
19	1.58	0.10	0.042	(0.670)	0.036	0.006
20	1.67	0.10	0.042	(0.667)	0.036	0.006
21	1.75	0.10	0.042	(0.665)	0.036	0.006
22	1.83	0.13	0.056	(0.662)	0.048	0.008
23	1.92	0.13	0.056	(0.659)	0.048	0.008
24	2.00	0.13	0.056	(0.657)	0.048	0.008
25	2.08	0.13	0.056	(0.654)	0.048	0.008
26	2.17	0.13	0.056	(0.651)	0.048	0.008
27	2.25	0.13	0.056	(0.649)	0.048	0.008
28	2.33	0.13	0.056	(0.646)	0.048	0.008
29	2.42	0.13	0.056	(0.644)	0.048	0.008
30	2.50	0.13	0.056	(0.641)	0.048	0.008
31	2.58	0.17	0.070	(0.638)	0.060	0.010
32	2.67	0.17	0.070	(0.636)	0.060	0.010
33	2.75	0.17	0.070	(0.633)	0.060	0.010
34	2.83	0.17	0.070	(0.630)	0.060	0.010
35	2.92	0.17	0.070	(0.628)	0.060	0.010
36	3.00	0.17	0.070	(0.625)	0.060	0.010
37	3.08	0.17	0.070	(0.623)	0.060	0.010
38	3.17	0.17	0.070	(0.620)	0.060	0.010
39	3.25	0.17	0.070	(0.618)	0.060	0.010
40	3.33	0.17	0.070	(0.615)	0.060	0.010
41	3.42	0.17	0.070	(0.612)	0.060	0.010
42	3.50	0.17	0.070	(0.610)	0.060	0.010
43	3.58	0.17	0.070	(0.607)	0.060	0.010
44	3.67	0.17	0.070	(0.605)	0.060	0.010
45	3.75	0.17	0.070	(0.602)	0.060	0.010

46	3.83	0.20	0.084	(0.600)	0.072	0.012
47	3.92	0.20	0.084	(0.597)	0.072	0.012
48	4.00	0.20	0.084	(0.595)	0.072	0.012
49	4.08	0.20	0.084	(0.592)	0.072	0.012
50	4.17	0.20	0.084	(0.590)	0.072	0.012
51	4.25	0.20	0.084	(0.587)	0.072	0.012
52	4.33	0.23	0.098	(0.585)	0.084	0.014
53	4.42	0.23	0.098	(0.582)	0.084	0.014
54	4.50	0.23	0.098	(0.580)	0.084	0.014
55	4.58	0.23	0.098	(0.577)	0.084	0.014
56	4.67	0.23	0.098	(0.575)	0.084	0.014
57	4.75	0.23	0.098	(0.572)	0.084	0.014
58	4.83	0.27	0.112	(0.570)	0.096	0.016
59	4.92	0.27	0.112	(0.567)	0.096	0.016
60	5.00	0.27	0.112	(0.565)	0.096	0.016
61	5.08	0.20	0.084	(0.562)	0.072	0.012
62	5.17	0.20	0.084	(0.560)	0.072	0.012
63	5.25	0.20	0.084	(0.557)	0.072	0.012
64	5.33	0.23	0.098	(0.555)	0.084	0.014
65	5.42	0.23	0.098	(0.553)	0.084	0.014
66	5.50	0.23	0.098	(0.550)	0.084	0.014
67	5.58	0.27	0.112	(0.548)	0.096	0.016
68	5.67	0.27	0.112	(0.545)	0.096	0.016
69	5.75	0.27	0.112	(0.543)	0.096	0.016
70	5.83	0.27	0.112	(0.540)	0.096	0.016
71	5.92	0.27	0.112	(0.538)	0.096	0.016
72	6.00	0.27	0.112	(0.536)	0.096	0.016
73	6.08	0.30	0.127	(0.533)	0.108	0.018
74	6.17	0.30	0.127	(0.531)	0.108	0.018
75	6.25	0.30	0.127	(0.529)	0.108	0.018
76	6.33	0.30	0.127	(0.526)	0.108	0.018
77	6.42	0.30	0.127	(0.524)	0.108	0.018
78	6.50	0.30	0.127	(0.521)	0.108	0.018
79	6.58	0.33	0.141	(0.519)	0.120	0.020
80	6.67	0.33	0.141	(0.517)	0.120	0.020
81	6.75	0.33	0.141	(0.514)	0.120	0.020
82	6.83	0.33	0.141	(0.512)	0.120	0.020
83	6.92	0.33	0.141	(0.510)	0.120	0.020
84	7.00	0.33	0.141	(0.508)	0.120	0.020
85	7.08	0.33	0.141	(0.505)	0.120	0.020
86	7.17	0.33	0.141	(0.503)	0.120	0.020
87	7.25	0.33	0.141	(0.501)	0.120	0.020
88	7.33	0.37	0.155	(0.498)	0.132	0.022
89	7.42	0.37	0.155	(0.496)	0.132	0.022
90	7.50	0.37	0.155	(0.494)	0.132	0.022
91	7.58	0.40	0.169	(0.492)	0.144	0.024
92	7.67	0.40	0.169	(0.489)	0.144	0.024
93	7.75	0.40	0.169	(0.487)	0.144	0.024
94	7.83	0.43	0.183	(0.485)	0.156	0.026
95	7.92	0.43	0.183	(0.483)	0.156	0.026
96	8.00	0.43	0.183	(0.480)	0.156	0.026
97	8.08	0.50	0.211	(0.478)	0.181	0.030
98	8.17	0.50	0.211	(0.476)	0.181	0.030
99	8.25	0.50	0.211	(0.474)	0.181	0.030

100	8.33	0.50	0.211	(0.471)	0.181	0.030
101	8.42	0.50	0.211	(0.469)	0.181	0.030
102	8.50	0.50	0.211	(0.467)	0.181	0.030
103	8.58	0.53	0.225	(0.465)	0.193	0.032
104	8.67	0.53	0.225	(0.463)	0.193	0.032
105	8.75	0.53	0.225	(0.460)	0.193	0.032
106	8.83	0.57	0.239	(0.458)	0.205	0.034
107	8.92	0.57	0.239	(0.456)	0.205	0.034
108	9.00	0.57	0.239	(0.454)	0.205	0.034
109	9.08	0.63	0.267	(0.452)	0.229	0.038
110	9.17	0.63	0.267	(0.450)	0.229	0.038
111	9.25	0.63	0.267	(0.448)	0.229	0.038
112	9.33	0.67	0.281	(0.445)	0.241	0.040
113	9.42	0.67	0.281	(0.443)	0.241	0.040
114	9.50	0.67	0.281	(0.441)	0.241	0.040
115	9.58	0.70	0.295	(0.439)	0.253	0.042
116	9.67	0.70	0.295	(0.437)	0.253	0.042
117	9.75	0.70	0.295	(0.435)	0.253	0.042
118	9.83	0.73	0.309	(0.433)	0.265	0.044
119	9.92	0.73	0.309	(0.431)	0.265	0.044
120	10.00	0.73	0.309	(0.429)	0.265	0.044
121	10.08	0.50	0.211	(0.426)	0.181	0.030
122	10.17	0.50	0.211	(0.424)	0.181	0.030
123	10.25	0.50	0.211	(0.422)	0.181	0.030
124	10.33	0.50	0.211	(0.420)	0.181	0.030
125	10.42	0.50	0.211	(0.418)	0.181	0.030
126	10.50	0.50	0.211	(0.416)	0.181	0.030
127	10.58	0.67	0.281	(0.414)	0.241	0.040
128	10.67	0.67	0.281	(0.412)	0.241	0.040
129	10.75	0.67	0.281	(0.410)	0.241	0.040
130	10.83	0.67	0.281	(0.408)	0.241	0.040
131	10.92	0.67	0.281	(0.406)	0.241	0.040
132	11.00	0.67	0.281	(0.404)	0.241	0.040
133	11.08	0.63	0.267	(0.402)	0.229	0.038
134	11.17	0.63	0.267	(0.400)	0.229	0.038
135	11.25	0.63	0.267	(0.398)	0.229	0.038
136	11.33	0.63	0.267	(0.396)	0.229	0.038
137	11.42	0.63	0.267	(0.394)	0.229	0.038
138	11.50	0.63	0.267	(0.392)	0.229	0.038
139	11.58	0.57	0.239	(0.390)	0.205	0.034
140	11.67	0.57	0.239	(0.388)	0.205	0.034
141	11.75	0.57	0.239	(0.386)	0.205	0.034
142	11.83	0.60	0.253	(0.385)	0.217	0.036
143	11.92	0.60	0.253	(0.383)	0.217	0.036
144	12.00	0.60	0.253	(0.381)	0.217	0.036
145	12.08	0.83	0.351	(0.379)	0.301	0.051
146	12.17	0.83	0.351	(0.377)	0.301	0.051
147	12.25	0.83	0.351	(0.375)	0.301	0.051
148	12.33	0.87	0.366	(0.373)	0.313	0.053
149	12.42	0.87	0.366	(0.371)	0.313	0.053
150	12.50	0.87	0.366	(0.369)	0.313	0.053
151	12.58	0.93	0.394	(0.368)	0.337	0.057
152	12.67	0.93	0.394	(0.366)	0.337	0.057
153	12.75	0.93	0.394	(0.364)	0.337	0.057

154	12.83	0.97	0.408	(0.362)	0.349	0.059
155	12.92	0.97	0.408	(0.360)	0.349	0.059
156	13.00	0.97	0.408	(0.358)	0.349	0.059
157	13.08	1.13	0.478	0.357	(0.409)	0.121
158	13.17	1.13	0.478	0.355	(0.409)	0.123
159	13.25	1.13	0.478	0.353	(0.409)	0.125
160	13.33	1.13	0.478	0.351	(0.409)	0.127
161	13.42	1.13	0.478	0.349	(0.409)	0.129
162	13.50	1.13	0.478	0.348	(0.409)	0.130
163	13.58	0.77	0.323	(0.346)	0.277	0.047
164	13.67	0.77	0.323	(0.344)	0.277	0.047
165	13.75	0.77	0.323	(0.342)	0.277	0.047
166	13.83	0.77	0.323	(0.341)	0.277	0.047
167	13.92	0.77	0.323	(0.339)	0.277	0.047
168	14.00	0.77	0.323	(0.337)	0.277	0.047
169	14.08	0.90	0.380	(0.335)	0.325	0.055
170	14.17	0.90	0.380	(0.334)	0.325	0.055
171	14.25	0.90	0.380	(0.332)	0.325	0.055
172	14.33	0.87	0.366	(0.330)	0.313	0.053
173	14.42	0.87	0.366	(0.329)	0.313	0.053
174	14.50	0.87	0.366	(0.327)	0.313	0.053
175	14.58	0.87	0.366	(0.325)	0.313	0.053
176	14.67	0.87	0.366	(0.324)	0.313	0.053
177	14.75	0.87	0.366	(0.322)	0.313	0.053
178	14.83	0.83	0.351	(0.320)	0.301	0.051
179	14.92	0.83	0.351	(0.319)	0.301	0.051
180	15.00	0.83	0.351	(0.317)	0.301	0.051
181	15.08	0.80	0.337	(0.315)	0.289	0.049
182	15.17	0.80	0.337	(0.314)	0.289	0.049
183	15.25	0.80	0.337	(0.312)	0.289	0.049
184	15.33	0.77	0.323	(0.311)	0.277	0.047
185	15.42	0.77	0.323	(0.309)	0.277	0.047
186	15.50	0.77	0.323	(0.307)	0.277	0.047
187	15.58	0.63	0.267	(0.306)	0.229	0.038
188	15.67	0.63	0.267	(0.304)	0.229	0.038
189	15.75	0.63	0.267	(0.303)	0.229	0.038
190	15.83	0.63	0.267	(0.301)	0.229	0.038
191	15.92	0.63	0.267	(0.300)	0.229	0.038
192	16.00	0.63	0.267	(0.298)	0.229	0.038
193	16.08	0.13	0.056	(0.296)	0.048	0.008
194	16.17	0.13	0.056	(0.295)	0.048	0.008
195	16.25	0.13	0.056	(0.293)	0.048	0.008
196	16.33	0.13	0.056	(0.292)	0.048	0.008
197	16.42	0.13	0.056	(0.290)	0.048	0.008
198	16.50	0.13	0.056	(0.289)	0.048	0.008
199	16.58	0.10	0.042	(0.288)	0.036	0.006
200	16.67	0.10	0.042	(0.286)	0.036	0.006
201	16.75	0.10	0.042	(0.285)	0.036	0.006
202	16.83	0.10	0.042	(0.283)	0.036	0.006
203	16.92	0.10	0.042	(0.282)	0.036	0.006
204	17.00	0.10	0.042	(0.280)	0.036	0.006
205	17.08	0.17	0.070	(0.279)	0.060	0.010
206	17.17	0.17	0.070	(0.278)	0.060	0.010
207	17.25	0.17	0.070	(0.276)	0.060	0.010

208	17.33	0.17	0.070	(0.275)	0.060	0.010
209	17.42	0.17	0.070	(0.273)	0.060	0.010
210	17.50	0.17	0.070	(0.272)	0.060	0.010
211	17.58	0.17	0.070	(0.271)	0.060	0.010
212	17.67	0.17	0.070	(0.269)	0.060	0.010
213	17.75	0.17	0.070	(0.268)	0.060	0.010
214	17.83	0.13	0.056	(0.267)	0.048	0.008
215	17.92	0.13	0.056	(0.265)	0.048	0.008
216	18.00	0.13	0.056	(0.264)	0.048	0.008
217	18.08	0.13	0.056	(0.263)	0.048	0.008
218	18.17	0.13	0.056	(0.261)	0.048	0.008
219	18.25	0.13	0.056	(0.260)	0.048	0.008
220	18.33	0.13	0.056	(0.259)	0.048	0.008
221	18.42	0.13	0.056	(0.258)	0.048	0.008
222	18.50	0.13	0.056	(0.256)	0.048	0.008
223	18.58	0.10	0.042	(0.255)	0.036	0.006
224	18.67	0.10	0.042	(0.254)	0.036	0.006
225	18.75	0.10	0.042	(0.253)	0.036	0.006
226	18.83	0.07	0.028	(0.251)	0.024	0.004
227	18.92	0.07	0.028	(0.250)	0.024	0.004
228	19.00	0.07	0.028	(0.249)	0.024	0.004
229	19.08	0.10	0.042	(0.248)	0.036	0.006
230	19.17	0.10	0.042	(0.247)	0.036	0.006
231	19.25	0.10	0.042	(0.246)	0.036	0.006
232	19.33	0.13	0.056	(0.244)	0.048	0.008
233	19.42	0.13	0.056	(0.243)	0.048	0.008
234	19.50	0.13	0.056	(0.242)	0.048	0.008
235	19.58	0.10	0.042	(0.241)	0.036	0.006
236	19.67	0.10	0.042	(0.240)	0.036	0.006
237	19.75	0.10	0.042	(0.239)	0.036	0.006
238	19.83	0.07	0.028	(0.238)	0.024	0.004
239	19.92	0.07	0.028	(0.237)	0.024	0.004
240	20.00	0.07	0.028	(0.236)	0.024	0.004
241	20.08	0.10	0.042	(0.235)	0.036	0.006
242	20.17	0.10	0.042	(0.234)	0.036	0.006
243	20.25	0.10	0.042	(0.233)	0.036	0.006
244	20.33	0.10	0.042	(0.232)	0.036	0.006
245	20.42	0.10	0.042	(0.231)	0.036	0.006
246	20.50	0.10	0.042	(0.230)	0.036	0.006
247	20.58	0.10	0.042	(0.229)	0.036	0.006
248	20.67	0.10	0.042	(0.228)	0.036	0.006
249	20.75	0.10	0.042	(0.227)	0.036	0.006
250	20.83	0.07	0.028	(0.226)	0.024	0.004
251	20.92	0.07	0.028	(0.225)	0.024	0.004
252	21.00	0.07	0.028	(0.224)	0.024	0.004
253	21.08	0.10	0.042	(0.223)	0.036	0.006
254	21.17	0.10	0.042	(0.222)	0.036	0.006
255	21.25	0.10	0.042	(0.221)	0.036	0.006
256	21.33	0.07	0.028	(0.221)	0.024	0.004
257	21.42	0.07	0.028	(0.220)	0.024	0.004
258	21.50	0.07	0.028	(0.219)	0.024	0.004
259	21.58	0.10	0.042	(0.218)	0.036	0.006
260	21.67	0.10	0.042	(0.217)	0.036	0.006
261	21.75	0.10	0.042	(0.217)	0.036	0.006

262	21.83	0.07	0.028	(0.216)	0.024	0.004
263	21.92	0.07	0.028	(0.215)	0.024	0.004
264	22.00	0.07	0.028	(0.214)	0.024	0.004
265	22.08	0.10	0.042	(0.214)	0.036	0.006
266	22.17	0.10	0.042	(0.213)	0.036	0.006
267	22.25	0.10	0.042	(0.212)	0.036	0.006
268	22.33	0.07	0.028	(0.212)	0.024	0.004
269	22.42	0.07	0.028	(0.211)	0.024	0.004
270	22.50	0.07	0.028	(0.210)	0.024	0.004
271	22.58	0.07	0.028	(0.210)	0.024	0.004
272	22.67	0.07	0.028	(0.209)	0.024	0.004
273	22.75	0.07	0.028	(0.209)	0.024	0.004
274	22.83	0.07	0.028	(0.208)	0.024	0.004
275	22.92	0.07	0.028	(0.207)	0.024	0.004
276	23.00	0.07	0.028	(0.207)	0.024	0.004
277	23.08	0.07	0.028	(0.206)	0.024	0.004
278	23.17	0.07	0.028	(0.206)	0.024	0.004
279	23.25	0.07	0.028	(0.206)	0.024	0.004
280	23.33	0.07	0.028	(0.205)	0.024	0.004
281	23.42	0.07	0.028	(0.205)	0.024	0.004
282	23.50	0.07	0.028	(0.204)	0.024	0.004
283	23.58	0.07	0.028	(0.204)	0.024	0.004
284	23.67	0.07	0.028	(0.204)	0.024	0.004
285	23.75	0.07	0.028	(0.203)	0.024	0.004
286	23.83	0.07	0.028	(0.203)	0.024	0.004
287	23.92	0.07	0.028	(0.203)	0.024	0.004
288	24.00	0.07	0.028	(0.203)	0.024	0.004

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.4

Flood volume = Effective rainfall 0.53(In)
times area 42.0(Ac.)/[(In)/(Ft.)) = 1.9(Ac.Ft)
Total soil loss = 2.98(In)
Total soil loss = 10.433(Ac.Ft)
Total rainfall = 3.51(In)
Flood volume = 81424.3 Cubic Feet
Total soil loss = 454470.0 Cubic Feet

Peak flow rate of this hydrograph = 5.182(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.02	Q				
0+10	0.0008	0.09	Q				
0+15	0.0016	0.13	Q				
0+20	0.0027	0.15	Q				
0+25	0.0041	0.20	Q				
0+30	0.0056	0.22	Q				

0+35	0.0072	0.23	Q
0+40	0.0089	0.24	Q
0+45	0.0106	0.25	Q
0+50	0.0124	0.26	VQ
0+55	0.0144	0.30	VQ
1+ 0	0.0166	0.32	VQ
1+ 5	0.0188	0.32	VQ
1+10	0.0208	0.29	VQ
1+15	0.0227	0.27	VQ
1+20	0.0245	0.27	VQ
1+25	0.0263	0.26	VQ
1+30	0.0281	0.26	VQ
1+35	0.0299	0.26	VQ
1+40	0.0317	0.26	VQ
1+45	0.0335	0.26	VQ
1+50	0.0353	0.27	VQ
1+55	0.0374	0.30	VQ
2+ 0	0.0396	0.32	VQ
2+ 5	0.0419	0.33	VQ
2+10	0.0442	0.33	VQ
2+15	0.0465	0.34	VQ
2+20	0.0488	0.34	Q
2+25	0.0511	0.34	Q
2+30	0.0535	0.34	Q
2+35	0.0559	0.35	Q
2+40	0.0586	0.39	Q
2+45	0.0614	0.41	Q
2+50	0.0642	0.41	Q
2+55	0.0671	0.42	Q
3+ 0	0.0700	0.42	Q
3+ 5	0.0729	0.42	Q
3+10	0.0759	0.43	Q
3+15	0.0788	0.43	Q
3+20	0.0817	0.43	Q
3+25	0.0847	0.43	Q
3+30	0.0876	0.43	Q
3+35	0.0906	0.43	Q
3+40	0.0935	0.43	QV
3+45	0.0965	0.43	QV
3+50	0.0995	0.44	QV
3+55	0.1028	0.47	QV
4+ 0	0.1062	0.49	QV
4+ 5	0.1096	0.50	QV
4+10	0.1131	0.50	Q
4+15	0.1166	0.51	Q
4+20	0.1201	0.52	Q
4+25	0.1240	0.56	Q
4+30	0.1279	0.58	Q
4+35	0.1320	0.58	Q
4+40	0.1360	0.59	Q
4+45	0.1401	0.59	Q
4+50	0.1443	0.60	QV
4+55	0.1487	0.64	QV
5+ 0	0.1533	0.66	QV

5+ 5	0.1577	0.65	QV				
5+10	0.1618	0.59	QV				
5+15	0.1656	0.55	QV				
5+20	0.1693	0.55	QV				
5+25	0.1733	0.57	QV				
5+30	0.1773	0.59	QV				
5+35	0.1815	0.60	QV				
5+40	0.1859	0.64	QV				
5+45	0.1904	0.66	Q V				
5+50	0.1950	0.67	Q V				
5+55	0.1997	0.67	Q V				
6+ 0	0.2043	0.68	Q V				
6+ 5	0.2091	0.69	Q V				
6+10	0.2141	0.73	Q V				
6+15	0.2193	0.75	Q V				
6+20	0.2245	0.76	QV				
6+25	0.2297	0.76	QV				
6+30	0.2350	0.76	Q V				
6+35	0.2403	0.78	Q V				
6+40	0.2459	0.81	Q V				
6+45	0.2516	0.83	Q V				
6+50	0.2574	0.84	Q V				
6+55	0.2633	0.85	Q V				
7+ 0	0.2691	0.85	Q V				
7+ 5	0.2750	0.85	Q V				
7+10	0.2809	0.85	Q V				
7+15	0.2867	0.85	Q V				
7+20	0.2927	0.86	Q V				
7+25	0.2989	0.90	Q V				
7+30	0.3053	0.92	Q V				
7+35	0.3117	0.94	Q V				
7+40	0.3184	0.98	Q V				
7+45	0.3253	1.00	Q V				
7+50	0.3323	1.02	Q V				
7+55	0.3396	1.06	Q V				
8+ 0	0.3471	1.08	Q V				
8+ 5	0.3548	1.11	Q V				
8+10	0.3630	1.19	Q V				
8+15	0.3715	1.23	Q V				
8+20	0.3801	1.25	Q V				
8+25	0.3888	1.26	Q V				
8+30	0.3975	1.27	Q V				
8+35	0.4064	1.28	Q V				
8+40	0.4155	1.32	Q V				
8+45	0.4248	1.35	Q V				
8+50	0.4341	1.36	Q V				
8+55	0.4438	1.41	Q V				
9+ 0	0.4537	1.43	Q V				
9+ 5	0.4637	1.46	Q V				
9+10	0.4743	1.53	Q V				
9+15	0.4851	1.58	Q V				
9+20	0.4961	1.60	Q V				
9+25	0.5075	1.65	Q V				
9+30	0.5191	1.68	Q V				

9+35	0.5308	1.70	Q	V					
9+40	0.5428	1.74	Q	V					
9+45	0.5549	1.77	Q	V					
9+50	0.5672	1.79	Q	V					
9+55	0.5798	1.83	Q	V					
10+ 0	0.5926	1.85	Q	V					
10+ 5	0.6050	1.80	Q	V					
10+10	0.6157	1.56	Q	V					
10+15	0.6255	1.43	Q	V					
10+20	0.6350	1.38	Q	V					
10+25	0.6443	1.35	Q	V					
10+30	0.6534	1.33	Q	V					
10+35	0.6628	1.36	Q	V					
10+40	0.6733	1.53	Q	V					
10+45	0.6845	1.62	Q	V					
10+50	0.6958	1.65	Q	V					
10+55	0.7073	1.67	Q	V					
11+ 0	0.7189	1.68	Q	V					
11+ 5	0.7305	1.68	Q	V					
11+10	0.7419	1.65	Q	V					
11+15	0.7532	1.64	Q	V					
11+20	0.7644	1.64	Q	V					
11+25	0.7757	1.63	Q	V					
11+30	0.7869	1.63	Q	V					
11+35	0.7980	1.61	Q	V					
11+40	0.8086	1.54	Q	V					
11+45	0.8190	1.50	Q	V					
11+50	0.8293	1.49	Q	V					
11+55	0.8397	1.52	Q	V					
12+ 0	0.8503	1.53	Q	V					
12+ 5	0.8613	1.60	Q	V					
12+10	0.8741	1.85	Q	V					
12+15	0.8878	1.99	Q	V					
12+20	0.9019	2.05	Q	V					
12+25	0.9165	2.12	Q	V					
12+30	0.9313	2.16	Q	V					
12+35	0.9465	2.20	Q	V					
12+40	0.9622	2.29	Q	V					
12+45	0.9783	2.34	Q	V					
12+50	0.9946	2.37	Q	V					
12+55	1.0113	2.42	Q	V					
13+ 0	1.0282	2.45	Q	V					
13+ 5	1.0472	2.76	Q	V					
13+10	1.0739	3.88	Q	V					
13+15	1.1050	4.52	Q	V					
13+20	1.1381	4.81	Q	V					
13+25	1.1727	5.02	Q	V					
13+30	1.2084	5.18	Q	V					
13+35	1.2422	4.91	Q	V					
13+40	1.2664	3.52	Q	V					
13+45	1.2855	2.77	Q	V					
13+50	1.3027	2.50	Q	V					
13+55	1.3188	2.33	Q	V					
14+ 0	1.3341	2.22	Q	V					

14+ 5	1.3491	2.18		Q		V
14+10	1.3647	2.26		Q		V
14+15	1.3805	2.30		Q		V
14+20	1.3963	2.29		Q		V
14+25	1.4117	2.24		Q		V
14+30	1.4270	2.22		Q		V
14+35	1.4423	2.22		Q		V
14+40	1.4576	2.22		Q		V
14+45	1.4730	2.23		Q		V
14+50	1.4882	2.22		Q		V
14+55	1.5033	2.18		Q		V
15+ 0	1.5182	2.16		Q		V
15+ 5	1.5329	2.15		Q		V
15+10	1.5474	2.11		Q		V
15+15	1.5618	2.08		Q		V
15+20	1.5760	2.06		Q		V
15+25	1.5899	2.02		Q		V
15+30	1.6037	2.00		Q		V
15+35	1.6171	1.95		Q		V
15+40	1.6295	1.80		Q		V
15+45	1.6414	1.72		Q		V
15+50	1.6530	1.69		Q		V
15+55	1.6645	1.67		Q		V
16+ 0	1.6759	1.65		Q		V
16+ 5	1.6862	1.50		Q		V
16+10	1.6928	0.96		Q		V
16+15	1.6975	0.67	Q			V
16+20	1.7013	0.56	Q			V
16+25	1.7046	0.48	Q			V
16+30	1.7076	0.44	Q			V
16+35	1.7104	0.40	Q			V
16+40	1.7127	0.34	Q			V
16+45	1.7148	0.30	Q			V
16+50	1.7168	0.28	Q			V
16+55	1.7186	0.27	Q			V
17+ 0	1.7204	0.26	Q			V
17+ 5	1.7224	0.28	Q			V
17+10	1.7248	0.35	Q			V
17+15	1.7274	0.39	Q			V
17+20	1.7302	0.40	Q			V
17+25	1.7330	0.41	Q			V
17+30	1.7359	0.42	Q			V
17+35	1.7388	0.42	Q			V
17+40	1.7417	0.42	Q			V
17+45	1.7446	0.42	Q			V
17+50	1.7475	0.42	Q			V
17+55	1.7501	0.38	Q			V
18+ 0	1.7526	0.36	Q			V
18+ 5	1.7551	0.36	Q			V
18+10	1.7575	0.35	Q			V
18+15	1.7599	0.35	Q			V
18+20	1.7623	0.35	Q			V
18+25	1.7647	0.35	Q			V
18+30	1.7670	0.34	Q			V

18+35	1.7693	0.33	Q				V
18+40	1.7714	0.30	Q				V
18+45	1.7733	0.28	Q				V
18+50	1.7751	0.26	Q				V
18+55	1.7766	0.22	Q				V
19+ 0	1.7780	0.20	Q				V
19+ 5	1.7794	0.20	Q				V
19+10	1.7809	0.23	Q				V
19+15	1.7826	0.24	Q				V
19+20	1.7844	0.26	Q				V
19+25	1.7864	0.30	Q				V
19+30	1.7886	0.32	Q				V
19+35	1.7908	0.32	Q				V
19+40	1.7928	0.29	Q				V
19+45	1.7946	0.27	Q				V
19+50	1.7964	0.26	Q				V
19+55	1.7979	0.22	Q				V
20+ 0	1.7992	0.20	Q				V
20+ 5	1.8006	0.20	Q				V
20+10	1.8022	0.23	Q				V
20+15	1.8039	0.24	Q				V
20+20	1.8056	0.25	Q				V
20+25	1.8073	0.25	Q				V
20+30	1.8090	0.25	Q				V
20+35	1.8108	0.25	Q				V
20+40	1.8125	0.25	Q				V
20+45	1.8143	0.26	Q				V
20+50	1.8160	0.25	Q				V
20+55	1.8174	0.21	Q				V
21+ 0	1.8188	0.19	Q				V
21+ 5	1.8201	0.19	Q				V
21+10	1.8217	0.23	Q				V
21+15	1.8233	0.24	Q				V
21+20	1.8250	0.24	Q				V
21+25	1.8264	0.21	Q				V
21+30	1.8277	0.19	Q				V
21+35	1.8290	0.19	Q				V
21+40	1.8305	0.22	Q				V
21+45	1.8322	0.24	Q				V
21+50	1.8338	0.24	Q				V
21+55	1.8352	0.20	Q				V
22+ 0	1.8365	0.19	Q				V
22+ 5	1.8378	0.19	Q				V
22+10	1.8394	0.22	Q				V
22+15	1.8410	0.24	Q				V
22+20	1.8426	0.24	Q				V
22+25	1.8441	0.20	Q				V
22+30	1.8454	0.19	Q				V
22+35	1.8466	0.18	Q				V
22+40	1.8478	0.18	Q				V
22+45	1.8490	0.18	Q				V
22+50	1.8502	0.17	Q				V
22+55	1.8514	0.17	Q				V
23+ 0	1.8526	0.17	Q				V

23+ 5	1.8538	0.17	Q				V
23+10	1.8550	0.17	Q				V
23+15	1.8562	0.17	Q				V
23+20	1.8574	0.17	Q				V
23+25	1.8585	0.17	Q				V
23+30	1.8597	0.17	Q				V
23+35	1.8609	0.17	Q				V
23+40	1.8621	0.17	Q				V
23+45	1.8633	0.17	Q				V
23+50	1.8644	0.17	Q				V
23+55	1.8656	0.17	Q				V
24+ 0	1.8668	0.17	Q				V
24+ 5	1.8678	0.15	Q				V
24+10	1.8684	0.08	Q				V
24+15	1.8687	0.04	Q				V
24+20	1.8689	0.03	Q				V
24+25	1.8690	0.02	Q				V
24+30	1.8691	0.01	Q				V
24+35	1.8692	0.01	Q				V
24+40	1.8692	0.01	Q				V
24+45	1.8692	0.00	Q				V
24+50	1.8692	0.00	Q				V
24+55	1.8692	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "A" Subarea "A" Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1284.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
42.00	0.58	24.36

100 YEAR Area rainfall data:

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

42.00

1.45

60.90

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.938 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.938 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	89.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
89.0	89.0	0.141	1.000	0.014	0.012	0.000
93.0	93.0	0.091	1.000	0.009	0.043	0.000
63.0	63.0	0.438	0.000	0.438	0.024	0.010
81.0	81.0	0.233	0.000	0.233	0.921	0.214
Sum (F) =						0.225

Area averaged mean soil loss (F) (In/Hr) = 0.225

Minimum soil loss rate ((In/Hr)) = 0.113
(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

Slope of intensity-duration curve for a 1 hour storm = 0.4800

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	0.083	72.574	11.291
2	0.167	145.147	41.383
3	0.250	217.721	22.273
4	0.333	290.295	8.787
5	0.417	362.869	5.335
6	0.500	435.442	3.490
7	0.583	508.016	2.386
8	0.667	580.590	1.803
9	0.750	653.163	1.277
10	0.833	725.737	0.869
11	0.917	798.311	0.726
12	1.000	870.885	0.380

Sum = 100.000 Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.495	0.225	(0.424)	0.270
2	0.17	4.50	0.506	0.225	(0.433)	0.281
3	0.25	5.40	0.608	0.225	(0.520)	0.382
4	0.33	5.40	0.608	0.225	(0.520)	0.382
5	0.42	5.70	0.641	0.225	(0.549)	0.416
6	0.50	6.40	0.720	0.225	(0.617)	0.495
7	0.58	7.90	0.889	0.225	(0.761)	0.664
8	0.67	9.10	1.024	0.225	(0.877)	0.799
9	0.75	12.80	1.440	0.225	(1.233)	1.215
10	0.83	25.60	2.880	0.225	(2.466)	2.655
11	0.92	7.90	0.889	0.225	(0.761)	0.664
12	1.00	4.90	0.551	0.225	(0.472)	0.326

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.5

Flood volume = Effective rainfall 0.71(In)

times area 42.0(Ac.)/[(In)/(Ft.)] = 2.5(Ac.Ft)

Total soil loss = 0.23(In)

Total soil loss = 0.789(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 108592.1 Cubic Feet

Total soil loss = 34349.5 Cubic Feet

Peak flow rate of this hydrograph = 67.468(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0089	1.29	Q				
0+10	0.0507	6.07	V Q				
0+15	0.1147	9.30	V Q				
0+20	0.1986	12.18	V Q				
0+25	0.2947	13.95	V Q				
0+30	0.4029	15.72	V Q				
0+35	0.5320	18.74	V Q				
0+40	0.6944	23.58	V Q				
0+45	0.9021	30.15	V Q				
0+50	1.2233	46.65	V Q				

0+55	1.6880	67.47				V	Q
1+ 0	2.0105	46.83				Q	V
1+ 5	2.1989	27.35			Q		V
1+10	2.3039	15.25		Q			V
1+15	2.3673	9.20		Q			V
1+20	2.4102	6.22	Q				V
1+25	2.4406	4.41	Q				V
1+30	2.4617	3.07	Q				V
1+35	2.4761	2.09	Q				V
1+40	2.4860	1.43	Q				V
1+45	2.4911	0.75	Q				V
1+50	2.4926	0.21	Q				V
1+55	2.4929	0.05	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "A" Subarea "A" Natural Condition

Drainage Area = 42.00(Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00(Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00(Ft.)
Length along longest watercourse measured to centroid = 1284.00(Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50(Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 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]
42.00	0.98	41.16

100 YEAR Area rainfall data:

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

42.00

2.48

104.16

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 1.597(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.500	89.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
89.0	89.0	0.141	1.000	0.014	0.012	0.000
93.0	93.0	0.091	1.000	0.009	0.043	0.000
63.0	63.0	0.438	0.000	0.438	0.024	0.010
81.0	81.0	0.233	0.000	0.233	0.921	0.214
Sum (F) =						0.225

Area averaged mean soil loss (F) (In/Hr) = 0.225

Minimum soil loss rate ((In/Hr)) = 0.113

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

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	0.083	72.574	11.291
2	0.167	145.147	41.383
3	0.250	217.721	22.273
4	0.333	290.295	8.787
5	0.417	362.869	5.335
6	0.500	435.442	3.490
7	0.583	508.016	2.386
8	0.667	580.590	1.803
9	0.750	653.163	1.277
10	0.833	725.737	0.869
11	0.917	798.311	0.726
12	1.000	870.885	0.380
Sum = 100.000		Sum=	42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.225)	0.213	0.036
2	0.17	1.30	0.249	(0.225)	0.213	0.036
3	0.25	1.10	0.211	(0.225)	0.180	0.030
4	0.33	1.50	0.287	0.225	(0.246)	0.062
5	0.42	1.50	0.287	0.225	(0.246)	0.062
6	0.50	1.80	0.345	0.225	(0.295)	0.120
7	0.58	1.50	0.287	0.225	(0.246)	0.062
8	0.67	1.80	0.345	0.225	(0.295)	0.120
9	0.75	1.80	0.345	0.225	(0.295)	0.120
10	0.83	1.50	0.287	0.225	(0.246)	0.062
11	0.92	1.60	0.307	0.225	(0.263)	0.081
12	1.00	1.80	0.345	0.225	(0.295)	0.120
13	1.08	2.20	0.422	0.225	(0.361)	0.196
14	1.17	2.20	0.422	0.225	(0.361)	0.196
15	1.25	2.20	0.422	0.225	(0.361)	0.196
16	1.33	2.00	0.383	0.225	(0.328)	0.158
17	1.42	2.60	0.498	0.225	(0.427)	0.273
18	1.50	2.70	0.517	0.225	(0.443)	0.292
19	1.58	2.40	0.460	0.225	(0.394)	0.235
20	1.67	2.70	0.517	0.225	(0.443)	0.292
21	1.75	3.30	0.632	0.225	(0.541)	0.407
22	1.83	3.10	0.594	0.225	(0.509)	0.369
23	1.92	2.90	0.556	0.225	(0.476)	0.330
24	2.00	3.00	0.575	0.225	(0.492)	0.350
25	2.08	3.10	0.594	0.225	(0.509)	0.369
26	2.17	4.20	0.805	0.225	(0.689)	0.579
27	2.25	5.00	0.958	0.225	(0.820)	0.733
28	2.33	3.50	0.671	0.225	(0.574)	0.445
29	2.42	6.80	1.303	0.225	(1.116)	1.078
30	2.50	7.30	1.399	0.225	(1.198)	1.174
31	2.58	8.20	1.571	0.225	(1.345)	1.346
32	2.67	5.90	1.131	0.225	(0.968)	0.905
33	2.75	2.00	0.383	0.225	(0.328)	0.158
34	2.83	1.80	0.345	0.225	(0.295)	0.120
35	2.92	1.80	0.345	0.225	(0.295)	0.120
36	3.00	0.60	0.115	(0.225)	0.098	0.017

(Loss Rate Not Used)

Sum = 100.0

Sum = 11.2

Flood volume = Effective rainfall 0.94(In)

times area 42.0(Ac.)/[(In)/(Ft.)] = 3.3(Ac.Ft)

Total soil loss = 0.66(In)

Total soil loss = 2.309(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 142889.3 Cubic Feet

Total soil loss = 100561.7 Cubic Feet

 Peak flow rate of this hydrograph = 46.443 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0012		0.17	Q				
0+10	0.0067		0.80	Q				
0+15	0.0143		1.11	Q				
0+20	0.0233		1.30	VQ				
0+25	0.0363		1.89	VQ				
0+30	0.0534		2.49	VQ				
0+35	0.0766		3.37	V Q				
0+40	0.0992		3.27	VQ				
0+45	0.1268		4.01	V Q				
0+50	0.1559		4.23	V Q				
0+55	0.1802		3.52	Q				
1+ 0	0.2051		3.62	Q				
1+ 5	0.2375		4.71	VQ				
1+10	0.2816		6.41	V Q				
1+15	0.3317		7.27	VQ				
1+20	0.3830		7.46	VQ				
1+25	0.4350		7.55	VQ				
1+30	0.5000		9.44	VQ				
1+35	0.5727		10.55	V Q				
1+40	0.6443		10.41	VQ				
1+45	0.7253		11.75	VQ				
1+50	0.8225		14.13	VQ				
1+55	0.9230		14.58	Q				
2+ 0	1.0209		14.21	QV				
2+ 5	1.1206		14.49	Q V				
2+10	1.2309		16.01	Q	V			
2+15	1.3735		20.71		Q			
2+20	1.5398		24.15			VQ		
2+25	1.7081		24.44			QV		
2+30	1.9448		34.36			V	Q	
2+35	2.2373		42.46				V	
2+40	2.5571		46.44				V	Q
2+45	2.8219		38.45				Q	V
2+50	2.9786		22.75		Q			V
2+55	3.0785		14.51		Q			V
3+ 0	3.1521		10.68		Q			V
3+ 5	3.1995		6.88		Q			V
3+10	3.2293		4.33		Q			V
3+15	3.2495		2.92		Q			V
3+20	3.2631		1.97		Q			V
3+25	3.2717		1.26		Q			V
3+30	3.2767		0.73	Q				V

3+35	3.2789	0.32	Q				V
3+40	3.2797	0.12	Q				V
3+45	3.2801	0.06	Q				V
3+50	3.2803	0.02	Q				V
3+55	3.2803	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "A" Subarea "A" **Natural Condition**

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1284.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
42.00	1.38	57.96

100 YEAR Area rainfall data:

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

42.00

3.48

146.16

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 2.244 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 2.244 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	89.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
89.0	89.0	0.141	1.000	0.014	0.012	0.000
93.0	93.0	0.091	1.000	0.009	0.043	0.000
63.0	63.0	0.438	0.000	0.438	0.024	0.010
81.0	81.0	0.233	0.000	0.233	0.921	0.214
Sum (F) =						0.225

Area averaged mean soil loss (F) (In/Hr) = 0.225

Minimum soil loss rate ((In/Hr)) = 0.113

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.856

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	72.574	4.779
2	0.167	145.147	17.517
3	0.250	217.721	9.428
4	0.333	290.295	3.719
5	0.417	362.869	2.258
6	0.500	435.442	1.477
7	0.583	508.016	1.010
8	0.667	580.590	0.763
9	0.750	653.163	0.540
10	0.833	725.737	0.368
11	0.917	798.311	0.307
12	1.000	870.885	0.161
Sum =		100.000	Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.135	(0.225)	0.115	0.019
2	0.17	0.60	0.162	(0.225)	0.138	0.023
3	0.25	0.60	0.162	(0.225)	0.138	0.023
4	0.33	0.60	0.162	(0.225)	0.138	0.023
5	0.42	0.60	0.162	(0.225)	0.138	0.023
6	0.50	0.70	0.188	(0.225)	0.161	0.027
7	0.58	0.70	0.188	(0.225)	0.161	0.027
8	0.67	0.70	0.188	(0.225)	0.161	0.027
9	0.75	0.70	0.188	(0.225)	0.161	0.027
10	0.83	0.70	0.188	(0.225)	0.161	0.027
11	0.92	0.70	0.188	(0.225)	0.161	0.027
12	1.00	0.80	0.215	(0.225)	0.184	0.031
13	1.08	0.80	0.215	(0.225)	0.184	0.031
14	1.17	0.80	0.215	(0.225)	0.184	0.031
15	1.25	0.80	0.215	(0.225)	0.184	0.031
16	1.33	0.80	0.215	(0.225)	0.184	0.031
17	1.42	0.80	0.215	(0.225)	0.184	0.031
18	1.50	0.80	0.215	(0.225)	0.184	0.031
19	1.58	0.80	0.215	(0.225)	0.184	0.031
20	1.67	0.80	0.215	(0.225)	0.184	0.031
21	1.75	0.80	0.215	(0.225)	0.184	0.031
22	1.83	0.80	0.215	(0.225)	0.184	0.031
23	1.92	0.80	0.215	(0.225)	0.184	0.031
24	2.00	0.90	0.242	(0.225)	0.207	0.035
25	2.08	0.80	0.215	(0.225)	0.184	0.031
26	2.17	0.90	0.242	(0.225)	0.207	0.035
27	2.25	0.90	0.242	(0.225)	0.207	0.035
28	2.33	0.90	0.242	(0.225)	0.207	0.035
29	2.42	0.90	0.242	(0.225)	0.207	0.035
30	2.50	0.90	0.242	(0.225)	0.207	0.035
31	2.58	0.90	0.242	(0.225)	0.207	0.035
32	2.67	0.90	0.242	(0.225)	0.207	0.035
33	2.75	1.00	0.269	0.225	(0.231)	0.044
34	2.83	1.00	0.269	0.225	(0.231)	0.044
35	2.92	1.00	0.269	0.225	(0.231)	0.044
36	3.00	1.00	0.269	0.225	(0.231)	0.044
37	3.08	1.00	0.269	0.225	(0.231)	0.044
38	3.17	1.10	0.296	0.225	(0.254)	0.071
39	3.25	1.10	0.296	0.225	(0.254)	0.071
40	3.33	1.10	0.296	0.225	(0.254)	0.071
41	3.42	1.20	0.323	0.225	(0.277)	0.098
42	3.50	1.30	0.350	0.225	(0.300)	0.125
43	3.58	1.40	0.377	0.225	(0.323)	0.152
44	3.67	1.40	0.377	0.225	(0.323)	0.152
45	3.75	1.50	0.404	0.225	(0.346)	0.179

46	3.83	1.50	0.404	0.225	(0.346)	0.179
47	3.92	1.60	0.431	0.225	(0.369)	0.205
48	4.00	1.60	0.431	0.225	(0.369)	0.205
49	4.08	1.70	0.458	0.225	(0.392)	0.232
50	4.17	1.80	0.485	0.225	(0.415)	0.259
51	4.25	1.90	0.512	0.225	(0.438)	0.286
52	4.33	2.00	0.538	0.225	(0.461)	0.313
53	4.42	2.10	0.565	0.225	(0.484)	0.340
54	4.50	2.10	0.565	0.225	(0.484)	0.340
55	4.58	2.20	0.592	0.225	(0.507)	0.367
56	4.67	2.30	0.619	0.225	(0.530)	0.394
57	4.75	2.40	0.646	0.225	(0.553)	0.421
58	4.83	2.40	0.646	0.225	(0.553)	0.421
59	4.92	2.50	0.673	0.225	(0.576)	0.448
60	5.00	2.60	0.700	0.225	(0.599)	0.475
61	5.08	3.10	0.835	0.225	(0.715)	0.609
62	5.17	3.60	0.969	0.225	(0.830)	0.744
63	5.25	3.90	1.050	0.225	(0.899)	0.825
64	5.33	4.20	1.131	0.225	(0.968)	0.905
65	5.42	4.70	1.265	0.225	(1.083)	1.040
66	5.50	5.60	1.508	0.225	(1.291)	1.282
67	5.58	1.90	0.512	0.225	(0.438)	0.286
68	5.67	0.90	0.242	(0.225)	0.207	0.035
69	5.75	0.60	0.162	(0.225)	0.138	0.023
70	5.83	0.50	0.135	(0.225)	0.115	0.019
71	5.92	0.30	0.081	(0.225)	0.069	0.012
72	6.00	0.20	0.054	(0.225)	0.046	0.008

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.8

Flood volume = Effective rainfall 1.06(In)
times area 42.0(Ac.)/[(In)/(Ft.)) = 3.7(Ac.Ft)
Total soil loss = 1.18(In)
Total soil loss = 4.129(Ac.Ft)
Total rainfall = 2.24(In)
Flood volume = 162216.2 Cubic Feet
Total soil loss = 179848.1 Cubic Feet

Peak flow rate of this hydrograph = 41.556(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0006	0.09	Q				
0+10	0.0037	0.45	Q				
0+15	0.0086	0.70	Q				
0+20	0.0141	0.81	Q				
0+25	0.0201	0.87	Q				
0+30	0.0265	0.92	Q				

0+35	0.0335	1.02	Q				
0+40	0.0409	1.07	Q				
0+45	0.0484	1.10	Q				
0+50	0.0561	1.12	Q				
0+55	0.0639	1.13	Q				
1+ 0	0.0719	1.16	Q				
1+ 5	0.0803	1.23	Q				
1+10	0.0891	1.27	VQ				
1+15	0.0979	1.28	Q				
1+20	0.1068	1.29	Q				
1+25	0.1158	1.30	Q				
1+30	0.1247	1.30	Q				
1+35	0.1337	1.31	Q				
1+40	0.1428	1.31	Q				
1+45	0.1518	1.31	Q				
1+50	0.1608	1.31	Q				
1+55	0.1698	1.31	Q				
2+ 0	0.1790	1.33	Q				
2+ 5	0.1885	1.38	QV				
2+10	0.1979	1.37	QV				
2+15	0.2076	1.41	QV				
2+20	0.2176	1.44	QV				
2+25	0.2276	1.45	QV				
2+30	0.2377	1.46	QV				
2+35	0.2478	1.47	QV				
2+40	0.2579	1.47	QV				
2+45	0.2683	1.52	QV				
2+50	0.2799	1.68	Q V				
2+55	0.2920	1.76	Q V				
3+ 0	0.3044	1.80	Q V				
3+ 5	0.3169	1.82	Q V				
3+10	0.3304	1.96	Q V				
3+15	0.3472	2.44	Q V				
3+20	0.3658	2.70	QV				
3+25	0.3861	2.94	Q V				
3+30	0.4109	3.60	Q V				
3+35	0.4418	4.50	QV				
3+40	0.4787	5.35	QV				
3+45	0.5195	5.92	QV				
3+50	0.5650	6.60	QV				
3+55	0.6140	7.13	QV				
4+ 0	0.6677	7.79	QV				
4+ 5	0.7249	8.30	QV				
4+10	0.7875	9.09	QV				
4+15	0.8568	10.06	QV				
4+20	0.9332	11.10	Q V				
4+25	1.0171	12.17	QV				
4+30	1.1075	13.13	QV				
4+35	1.2023	13.77	QV				
4+40	1.3031	14.63	Q V				
4+45	1.4109	15.66	Q V				
4+50	1.5252	16.60	Q V				
4+55	1.6438	17.22	Q V				
5+ 0	1.7684	18.08	Q V				

5+ 5	1.9035	19.62			Q	V			
5+10	2.0624	23.08				Q	V		
5+15	2.2507	27.33				Q	V		
5+20	2.4646	31.06					Q	V	
5+25	2.7041	34.78						Q	V
5+30	2.9792	39.94							Q
5+35	3.2654	41.56						Q	V
5+40	3.4462	26.25				Q			V
5+45	3.5425	13.99			Q				V
5+50	3.6026	8.72							V
5+55	3.6440	6.01							V
6+ 0	3.6731	4.22							V
6+ 5	3.6934	2.96							V
6+10	3.7068	1.94							V
6+15	3.7152	1.23	Q						V
6+20	3.7204	0.76	Q						V
6+25	3.7229	0.36	Q						V
6+30	3.7235	0.09	Q						V
6+35	3.7237	0.03	Q						V
6+40	3.7239	0.02	Q						V
6+45	3.7239	0.01	Q						V
6+50	3.7240	0.00	Q						V
6+55	3.7240	0.00	Q						V

Unit Hydrograph Analysis

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Study date 04/24/14 File: 32786A4N2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "A" Subarea "A" Natural Condition

Drainage Area = 42.00 (Ac.) = 0.066 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 42.00 (Ac.) = 0.066 Sq. Mi.
Length along longest watercourse = 2922.00 (Ft.)
Length along longest watercourse measured to centroid = 1284.00 (Ft.)
Length along longest watercourse = 0.553 Mi.
Length along longest watercourse measured to centroid = 0.243 Mi.
Difference in elevation = 157.50 (Ft.)
Slope along watercourse = 284.5996 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.115 Hr.
Lag time = 6.89 Min.
25% of lag time = 1.72 Min.
40% of lag time = 2.76 Min.
Unit time = 5.00 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]
42.00	2.48	104.16

100 YEAR Area rainfall data:

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

42.00

6.90

289.80

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 4.298 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 4.298 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.500	89.00	1.000
1.800	93.00	1.000
1.000	63.00	0.000
38.700	81.00	0.000
Total Area Entered = 42.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
89.0	89.0	0.141	1.000	0.014	0.012	0.000
93.0	93.0	0.091	1.000	0.009	0.043	0.000
63.0	63.0	0.438	0.000	0.438	0.024	0.010
81.0	81.0	0.233	0.000	0.233	0.921	0.214
Sum (F) =						0.225

Area averaged mean soil loss (F) (In/Hr) = 0.225

Minimum soil loss rate ((In/Hr)) = 0.113

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.856

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	72.574	11.291
2	0.167	145.147	41.383
3	0.250	217.721	22.273
4	0.333	290.295	8.787
5	0.417	362.869	5.335
6	0.500	435.442	3.490
7	0.583	508.016	2.386
8	0.667	580.590	1.803
9	0.750	653.163	1.277
10	0.833	725.737	0.869
11	0.917	798.311	0.726
12	1.000	870.885	0.380
Sum =		100.000	Sum= 42.328

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.034	(0.399)	0.029	0.005
2	0.17	0.07	0.034	(0.398)	0.029	0.005
3	0.25	0.07	0.034	(0.396)	0.029	0.005
4	0.33	0.10	0.052	(0.395)	0.044	0.007
5	0.42	0.10	0.052	(0.393)	0.044	0.007
6	0.50	0.10	0.052	(0.392)	0.044	0.007
7	0.58	0.10	0.052	(0.390)	0.044	0.007
8	0.67	0.10	0.052	(0.389)	0.044	0.007
9	0.75	0.10	0.052	(0.387)	0.044	0.007
10	0.83	0.13	0.069	(0.386)	0.059	0.010
11	0.92	0.13	0.069	(0.384)	0.059	0.010
12	1.00	0.13	0.069	(0.383)	0.059	0.010
13	1.08	0.10	0.052	(0.381)	0.044	0.007
14	1.17	0.10	0.052	(0.380)	0.044	0.007
15	1.25	0.10	0.052	(0.378)	0.044	0.007
16	1.33	0.10	0.052	(0.377)	0.044	0.007
17	1.42	0.10	0.052	(0.375)	0.044	0.007
18	1.50	0.10	0.052	(0.374)	0.044	0.007
19	1.58	0.10	0.052	(0.372)	0.044	0.007
20	1.67	0.10	0.052	(0.371)	0.044	0.007
21	1.75	0.10	0.052	(0.369)	0.044	0.007
22	1.83	0.13	0.069	(0.368)	0.059	0.010
23	1.92	0.13	0.069	(0.366)	0.059	0.010
24	2.00	0.13	0.069	(0.365)	0.059	0.010
25	2.08	0.13	0.069	(0.363)	0.059	0.010
26	2.17	0.13	0.069	(0.362)	0.059	0.010
27	2.25	0.13	0.069	(0.360)	0.059	0.010
28	2.33	0.13	0.069	(0.359)	0.059	0.010
29	2.42	0.13	0.069	(0.357)	0.059	0.010
30	2.50	0.13	0.069	(0.356)	0.059	0.010
31	2.58	0.17	0.086	(0.354)	0.074	0.012
32	2.67	0.17	0.086	(0.353)	0.074	0.012
33	2.75	0.17	0.086	(0.351)	0.074	0.012
34	2.83	0.17	0.086	(0.350)	0.074	0.012
35	2.92	0.17	0.086	(0.349)	0.074	0.012
36	3.00	0.17	0.086	(0.347)	0.074	0.012
37	3.08	0.17	0.086	(0.346)	0.074	0.012
38	3.17	0.17	0.086	(0.344)	0.074	0.012
39	3.25	0.17	0.086	(0.343)	0.074	0.012
40	3.33	0.17	0.086	(0.341)	0.074	0.012
41	3.42	0.17	0.086	(0.340)	0.074	0.012
42	3.50	0.17	0.086	(0.339)	0.074	0.012
43	3.58	0.17	0.086	(0.337)	0.074	0.012
44	3.67	0.17	0.086	(0.336)	0.074	0.012
45	3.75	0.17	0.086	(0.334)	0.074	0.012

46	3.83	0.20	0.103	(0.333)	0.088	0.015
47	3.92	0.20	0.103	(0.331)	0.088	0.015
48	4.00	0.20	0.103	(0.330)	0.088	0.015
49	4.08	0.20	0.103	(0.329)	0.088	0.015
50	4.17	0.20	0.103	(0.327)	0.088	0.015
51	4.25	0.20	0.103	(0.326)	0.088	0.015
52	4.33	0.23	0.120	(0.325)	0.103	0.017
53	4.42	0.23	0.120	(0.323)	0.103	0.017
54	4.50	0.23	0.120	(0.322)	0.103	0.017
55	4.58	0.23	0.120	(0.320)	0.103	0.017
56	4.67	0.23	0.120	(0.319)	0.103	0.017
57	4.75	0.23	0.120	(0.318)	0.103	0.017
58	4.83	0.27	0.138	(0.316)	0.118	0.020
59	4.92	0.27	0.138	(0.315)	0.118	0.020
60	5.00	0.27	0.138	(0.314)	0.118	0.020
61	5.08	0.20	0.103	(0.312)	0.088	0.015
62	5.17	0.20	0.103	(0.311)	0.088	0.015
63	5.25	0.20	0.103	(0.309)	0.088	0.015
64	5.33	0.23	0.120	(0.308)	0.103	0.017
65	5.42	0.23	0.120	(0.307)	0.103	0.017
66	5.50	0.23	0.120	(0.305)	0.103	0.017
67	5.58	0.27	0.138	(0.304)	0.118	0.020
68	5.67	0.27	0.138	(0.303)	0.118	0.020
69	5.75	0.27	0.138	(0.301)	0.118	0.020
70	5.83	0.27	0.138	(0.300)	0.118	0.020
71	5.92	0.27	0.138	(0.299)	0.118	0.020
72	6.00	0.27	0.138	(0.297)	0.118	0.020
73	6.08	0.30	0.155	(0.296)	0.132	0.022
74	6.17	0.30	0.155	(0.295)	0.132	0.022
75	6.25	0.30	0.155	(0.293)	0.132	0.022
76	6.33	0.30	0.155	(0.292)	0.132	0.022
77	6.42	0.30	0.155	(0.291)	0.132	0.022
78	6.50	0.30	0.155	(0.290)	0.132	0.022
79	6.58	0.33	0.172	(0.288)	0.147	0.025
80	6.67	0.33	0.172	(0.287)	0.147	0.025
81	6.75	0.33	0.172	(0.286)	0.147	0.025
82	6.83	0.33	0.172	(0.284)	0.147	0.025
83	6.92	0.33	0.172	(0.283)	0.147	0.025
84	7.00	0.33	0.172	(0.282)	0.147	0.025
85	7.08	0.33	0.172	(0.280)	0.147	0.025
86	7.17	0.33	0.172	(0.279)	0.147	0.025
87	7.25	0.33	0.172	(0.278)	0.147	0.025
88	7.33	0.37	0.189	(0.277)	0.162	0.027
89	7.42	0.37	0.189	(0.275)	0.162	0.027
90	7.50	0.37	0.189	(0.274)	0.162	0.027
91	7.58	0.40	0.206	(0.273)	0.177	0.030
92	7.67	0.40	0.206	(0.272)	0.177	0.030
93	7.75	0.40	0.206	(0.270)	0.177	0.030
94	7.83	0.43	0.223	(0.269)	0.191	0.032
95	7.92	0.43	0.223	(0.268)	0.191	0.032
96	8.00	0.43	0.223	(0.267)	0.191	0.032
97	8.08	0.50	0.258	(0.265)	0.221	0.037
98	8.17	0.50	0.258	(0.264)	0.221	0.037
99	8.25	0.50	0.258	(0.263)	0.221	0.037

100	8.33	0.50	0.258	(0.262)	0.221	0.037
101	8.42	0.50	0.258	(0.260)	0.221	0.037
102	8.50	0.50	0.258	(0.259)	0.221	0.037
103	8.58	0.53	0.275	(0.258)	0.236	0.040
104	8.67	0.53	0.275	(0.257)	0.236	0.040
105	8.75	0.53	0.275	(0.256)	0.236	0.040
106	8.83	0.57	0.292	(0.254)	0.250	0.042
107	8.92	0.57	0.292	(0.253)	0.250	0.042
108	9.00	0.57	0.292	(0.252)	0.250	0.042
109	9.08	0.63	0.327	0.251	(0.280)	0.076
110	9.17	0.63	0.327	0.250	(0.280)	0.077
111	9.25	0.63	0.327	0.248	(0.280)	0.078
112	9.33	0.67	0.344	0.247	(0.294)	0.097
113	9.42	0.67	0.344	0.246	(0.294)	0.098
114	9.50	0.67	0.344	0.245	(0.294)	0.099
115	9.58	0.70	0.361	0.244	(0.309)	0.117
116	9.67	0.70	0.361	0.243	(0.309)	0.118
117	9.75	0.70	0.361	0.241	(0.309)	0.120
118	9.83	0.73	0.378	0.240	(0.324)	0.138
119	9.92	0.73	0.378	0.239	(0.324)	0.139
120	10.00	0.73	0.378	0.238	(0.324)	0.140
121	10.08	0.50	0.258	(0.237)	0.221	0.037
122	10.17	0.50	0.258	(0.236)	0.221	0.037
123	10.25	0.50	0.258	(0.234)	0.221	0.037
124	10.33	0.50	0.258	(0.233)	0.221	0.037
125	10.42	0.50	0.258	(0.232)	0.221	0.037
126	10.50	0.50	0.258	(0.231)	0.221	0.037
127	10.58	0.67	0.344	0.230	(0.294)	0.114
128	10.67	0.67	0.344	0.229	(0.294)	0.115
129	10.75	0.67	0.344	0.228	(0.294)	0.116
130	10.83	0.67	0.344	0.227	(0.294)	0.117
131	10.92	0.67	0.344	0.225	(0.294)	0.118
132	11.00	0.67	0.344	0.224	(0.294)	0.119
133	11.08	0.63	0.327	0.223	(0.280)	0.103
134	11.17	0.63	0.327	0.222	(0.280)	0.104
135	11.25	0.63	0.327	0.221	(0.280)	0.106
136	11.33	0.63	0.327	0.220	(0.280)	0.107
137	11.42	0.63	0.327	0.219	(0.280)	0.108
138	11.50	0.63	0.327	0.218	(0.280)	0.109
139	11.58	0.57	0.292	0.217	(0.250)	0.076
140	11.67	0.57	0.292	0.216	(0.250)	0.077
141	11.75	0.57	0.292	0.215	(0.250)	0.078
142	11.83	0.60	0.309	0.213	(0.265)	0.096
143	11.92	0.60	0.309	0.212	(0.265)	0.097
144	12.00	0.60	0.309	0.211	(0.265)	0.098
145	12.08	0.83	0.430	0.210	(0.368)	0.219
146	12.17	0.83	0.430	0.209	(0.368)	0.221
147	12.25	0.83	0.430	0.208	(0.368)	0.222
148	12.33	0.87	0.447	0.207	(0.383)	0.240
149	12.42	0.87	0.447	0.206	(0.383)	0.241
150	12.50	0.87	0.447	0.205	(0.383)	0.242
151	12.58	0.93	0.481	0.204	(0.412)	0.277
152	12.67	0.93	0.481	0.203	(0.412)	0.278
153	12.75	0.93	0.481	0.202	(0.412)	0.279

154	12.83	0.97	0.499	0.201	(0.427)	0.298
155	12.92	0.97	0.499	0.200	(0.427)	0.299
156	13.00	0.97	0.499	0.199	(0.427)	0.300
157	13.08	1.13	0.585	0.198	(0.500)	0.387
158	13.17	1.13	0.585	0.197	(0.500)	0.388
159	13.25	1.13	0.585	0.196	(0.500)	0.389
160	13.33	1.13	0.585	0.195	(0.500)	0.390
161	13.42	1.13	0.585	0.194	(0.500)	0.391
162	13.50	1.13	0.585	0.193	(0.500)	0.392
163	13.58	0.77	0.395	0.192	(0.339)	0.203
164	13.67	0.77	0.395	0.191	(0.339)	0.204
165	13.75	0.77	0.395	0.190	(0.339)	0.205
166	13.83	0.77	0.395	0.189	(0.339)	0.206
167	13.92	0.77	0.395	0.188	(0.339)	0.207
168	14.00	0.77	0.395	0.187	(0.339)	0.208
169	14.08	0.90	0.464	0.186	(0.397)	0.278
170	14.17	0.90	0.464	0.185	(0.397)	0.279
171	14.25	0.90	0.464	0.184	(0.397)	0.280
172	14.33	0.87	0.447	0.183	(0.383)	0.264
173	14.42	0.87	0.447	0.182	(0.383)	0.265
174	14.50	0.87	0.447	0.181	(0.383)	0.266
175	14.58	0.87	0.447	0.181	(0.383)	0.266
176	14.67	0.87	0.447	0.180	(0.383)	0.267
177	14.75	0.87	0.447	0.179	(0.383)	0.268
178	14.83	0.83	0.430	0.178	(0.368)	0.252
179	14.92	0.83	0.430	0.177	(0.368)	0.253
180	15.00	0.83	0.430	0.176	(0.368)	0.254
181	15.08	0.80	0.413	0.175	(0.353)	0.238
182	15.17	0.80	0.413	0.174	(0.353)	0.238
183	15.25	0.80	0.413	0.173	(0.353)	0.239
184	15.33	0.77	0.395	0.172	(0.339)	0.223
185	15.42	0.77	0.395	0.172	(0.339)	0.224
186	15.50	0.77	0.395	0.171	(0.339)	0.225
187	15.58	0.63	0.327	0.170	(0.280)	0.157
188	15.67	0.63	0.327	0.169	(0.280)	0.158
189	15.75	0.63	0.327	0.168	(0.280)	0.159
190	15.83	0.63	0.327	0.167	(0.280)	0.159
191	15.92	0.63	0.327	0.166	(0.280)	0.160
192	16.00	0.63	0.327	0.165	(0.280)	0.161
193	16.08	0.13	0.069	(0.165)	0.059	0.010
194	16.17	0.13	0.069	(0.164)	0.059	0.010
195	16.25	0.13	0.069	(0.163)	0.059	0.010
196	16.33	0.13	0.069	(0.162)	0.059	0.010
197	16.42	0.13	0.069	(0.161)	0.059	0.010
198	16.50	0.13	0.069	(0.160)	0.059	0.010
199	16.58	0.10	0.052	(0.160)	0.044	0.007
200	16.67	0.10	0.052	(0.159)	0.044	0.007
201	16.75	0.10	0.052	(0.158)	0.044	0.007
202	16.83	0.10	0.052	(0.157)	0.044	0.007
203	16.92	0.10	0.052	(0.156)	0.044	0.007
204	17.00	0.10	0.052	(0.156)	0.044	0.007
205	17.08	0.17	0.086	(0.155)	0.074	0.012
206	17.17	0.17	0.086	(0.154)	0.074	0.012
207	17.25	0.17	0.086	(0.153)	0.074	0.012

208	17.33	0.17	0.086	(0.153)	0.074	0.012
209	17.42	0.17	0.086	(0.152)	0.074	0.012
210	17.50	0.17	0.086	(0.151)	0.074	0.012
211	17.58	0.17	0.086	(0.150)	0.074	0.012
212	17.67	0.17	0.086	(0.149)	0.074	0.012
213	17.75	0.17	0.086	(0.149)	0.074	0.012
214	17.83	0.13	0.069	(0.148)	0.059	0.010
215	17.92	0.13	0.069	(0.147)	0.059	0.010
216	18.00	0.13	0.069	(0.147)	0.059	0.010
217	18.08	0.13	0.069	(0.146)	0.059	0.010
218	18.17	0.13	0.069	(0.145)	0.059	0.010
219	18.25	0.13	0.069	(0.144)	0.059	0.010
220	18.33	0.13	0.069	(0.144)	0.059	0.010
221	18.42	0.13	0.069	(0.143)	0.059	0.010
222	18.50	0.13	0.069	(0.142)	0.059	0.010
223	18.58	0.10	0.052	(0.142)	0.044	0.007
224	18.67	0.10	0.052	(0.141)	0.044	0.007
225	18.75	0.10	0.052	(0.140)	0.044	0.007
226	18.83	0.07	0.034	(0.140)	0.029	0.005
227	18.92	0.07	0.034	(0.139)	0.029	0.005
228	19.00	0.07	0.034	(0.138)	0.029	0.005
229	19.08	0.10	0.052	(0.138)	0.044	0.007
230	19.17	0.10	0.052	(0.137)	0.044	0.007
231	19.25	0.10	0.052	(0.136)	0.044	0.007
232	19.33	0.13	0.069	(0.136)	0.059	0.010
233	19.42	0.13	0.069	(0.135)	0.059	0.010
234	19.50	0.13	0.069	(0.134)	0.059	0.010
235	19.58	0.10	0.052	(0.134)	0.044	0.007
236	19.67	0.10	0.052	(0.133)	0.044	0.007
237	19.75	0.10	0.052	(0.133)	0.044	0.007
238	19.83	0.07	0.034	(0.132)	0.029	0.005
239	19.92	0.07	0.034	(0.131)	0.029	0.005
240	20.00	0.07	0.034	(0.131)	0.029	0.005
241	20.08	0.10	0.052	(0.130)	0.044	0.007
242	20.17	0.10	0.052	(0.130)	0.044	0.007
243	20.25	0.10	0.052	(0.129)	0.044	0.007
244	20.33	0.10	0.052	(0.129)	0.044	0.007
245	20.42	0.10	0.052	(0.128)	0.044	0.007
246	20.50	0.10	0.052	(0.127)	0.044	0.007
247	20.58	0.10	0.052	(0.127)	0.044	0.007
248	20.67	0.10	0.052	(0.126)	0.044	0.007
249	20.75	0.10	0.052	(0.126)	0.044	0.007
250	20.83	0.07	0.034	(0.125)	0.029	0.005
251	20.92	0.07	0.034	(0.125)	0.029	0.005
252	21.00	0.07	0.034	(0.124)	0.029	0.005
253	21.08	0.10	0.052	(0.124)	0.044	0.007
254	21.17	0.10	0.052	(0.123)	0.044	0.007
255	21.25	0.10	0.052	(0.123)	0.044	0.007
256	21.33	0.07	0.034	(0.122)	0.029	0.005
257	21.42	0.07	0.034	(0.122)	0.029	0.005
258	21.50	0.07	0.034	(0.122)	0.029	0.005
259	21.58	0.10	0.052	(0.121)	0.044	0.007
260	21.67	0.10	0.052	(0.121)	0.044	0.007
261	21.75	0.10	0.052	(0.120)	0.044	0.007

262	21.83	0.07	0.034	(0.120)	0.029	0.005
263	21.92	0.07	0.034	(0.119)	0.029	0.005
264	22.00	0.07	0.034	(0.119)	0.029	0.005
265	22.08	0.10	0.052	(0.119)	0.044	0.007
266	22.17	0.10	0.052	(0.118)	0.044	0.007
267	22.25	0.10	0.052	(0.118)	0.044	0.007
268	22.33	0.07	0.034	(0.117)	0.029	0.005
269	22.42	0.07	0.034	(0.117)	0.029	0.005
270	22.50	0.07	0.034	(0.117)	0.029	0.005
271	22.58	0.07	0.034	(0.116)	0.029	0.005
272	22.67	0.07	0.034	(0.116)	0.029	0.005
273	22.75	0.07	0.034	(0.116)	0.029	0.005
274	22.83	0.07	0.034	(0.115)	0.029	0.005
275	22.92	0.07	0.034	(0.115)	0.029	0.005
276	23.00	0.07	0.034	(0.115)	0.029	0.005
277	23.08	0.07	0.034	(0.115)	0.029	0.005
278	23.17	0.07	0.034	(0.114)	0.029	0.005
279	23.25	0.07	0.034	(0.114)	0.029	0.005
280	23.33	0.07	0.034	(0.114)	0.029	0.005
281	23.42	0.07	0.034	(0.114)	0.029	0.005
282	23.50	0.07	0.034	(0.113)	0.029	0.005
283	23.58	0.07	0.034	(0.113)	0.029	0.005
284	23.67	0.07	0.034	(0.113)	0.029	0.005
285	23.75	0.07	0.034	(0.113)	0.029	0.005
286	23.83	0.07	0.034	(0.113)	0.029	0.005
287	23.92	0.07	0.034	(0.113)	0.029	0.005
288	24.00	0.07	0.034	(0.113)	0.029	0.005

(Loss Rate Not Used)

Sum = 100.0 Sum = 18.3

Flood volume = Effective rainfall 1.52(In)
times area 42.0(Ac.)/[(In)/(Ft.)) = 5.3(Ac.Ft)

Total soil loss = 2.77(In)

Total soil loss = 9.707(Ac.Ft)

Total rainfall = 4.30(In)

Flood volume = 232440.1 Cubic Feet

Total soil loss = 422843.8 Cubic Feet

Peak flow rate of this hydrograph = 16.210(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0002	0.02	Q				
0+10	0.0009	0.11	Q				
0+15	0.0020	0.16	Q				
0+20	0.0033	0.19	Q				
0+25	0.0050	0.24	Q				
0+30	0.0068	0.27	Q				

0+35	0.0088	0.29	Q
0+40	0.0108	0.30	Q
0+45	0.0129	0.30	Q
0+50	0.0151	0.32	Q
0+55	0.0176	0.37	Q
1+ 0	0.0203	0.39	Q
1+ 5	0.0230	0.39	Q
1+10	0.0254	0.35	Q
1+15	0.0277	0.33	Q
1+20	0.0300	0.33	Q
1+25	0.0322	0.32	Q
1+30	0.0344	0.32	Q
1+35	0.0366	0.32	Q
1+40	0.0388	0.32	Q
1+45	0.0409	0.32	Q
1+50	0.0432	0.33	Q
1+55	0.0457	0.37	Q
2+ 0	0.0484	0.39	Q
2+ 5	0.0512	0.40	Q
2+10	0.0540	0.41	Q
2+15	0.0568	0.41	Q
2+20	0.0597	0.41	Q
2+25	0.0625	0.42	Q
2+30	0.0654	0.42	Q
2+35	0.0684	0.43	Q
2+40	0.0716	0.47	Q
2+45	0.0751	0.50	Q
2+50	0.0785	0.51	VQ
2+55	0.0821	0.51	VQ
3+ 0	0.0856	0.52	VQ
3+ 5	0.0892	0.52	VQ
3+10	0.0928	0.52	VQ
3+15	0.0964	0.52	VQ
3+20	0.1000	0.52	VQ
3+25	0.1036	0.52	VQ
3+30	0.1072	0.52	VQ
3+35	0.1108	0.52	VQ
3+40	0.1144	0.52	VQ
3+45	0.1180	0.52	VQ
3+50	0.1217	0.54	VQ
3+55	0.1257	0.58	VQ
4+ 0	0.1298	0.60	VQ
4+ 5	0.1340	0.61	Q
4+10	0.1383	0.62	Q
4+15	0.1425	0.62	Q
4+20	0.1469	0.63	Q
4+25	0.1516	0.68	Q
4+30	0.1564	0.70	Q
4+35	0.1614	0.71	Q
4+40	0.1663	0.72	Q
4+45	0.1713	0.73	Q
4+50	0.1764	0.74	Q
4+55	0.1818	0.78	Q
5+ 0	0.1874	0.81	Q

5+ 5	0.1929	0.80	Q
5+10	0.1978	0.72	Q
5+15	0.2024	0.67	Q
5+20	0.2070	0.67	Q
5+25	0.2119	0.70	Q
5+30	0.2168	0.72	Q
5+35	0.2219	0.74	Q
5+40	0.2273	0.78	Q
5+45	0.2329	0.81	Q
5+50	0.2385	0.82	Q
5+55	0.2442	0.82	Q
6+ 0	0.2499	0.83	Q
6+ 5	0.2557	0.84	Q
6+10	0.2618	0.89	Q
6+15	0.2681	0.91	QV
6+20	0.2745	0.92	QV
6+25	0.2809	0.93	QV
6+30	0.2873	0.93	QV
6+35	0.2938	0.95	QV
6+40	0.3007	0.99	QV
6+45	0.3077	1.02	Q
6+50	0.3148	1.03	Q
6+55	0.3219	1.04	Q
7+ 0	0.3291	1.04	Q
7+ 5	0.3362	1.04	Q
7+10	0.3434	1.04	Q
7+15	0.3506	1.04	Q
7+20	0.3579	1.06	Q
7+25	0.3655	1.10	Q
7+30	0.3733	1.13	Q
7+35	0.3812	1.15	Q
7+40	0.3894	1.20	Q
7+45	0.3978	1.22	Q
7+50	0.4064	1.25	QV
7+55	0.4153	1.30	QV
8+ 0	0.4244	1.33	QV
8+ 5	0.4338	1.36	QV
8+10	0.4438	1.46	QV
8+15	0.4542	1.51	Q
8+20	0.4648	1.53	Q
8+25	0.4754	1.54	Q
8+30	0.4861	1.55	Q
8+35	0.4969	1.57	Q
8+40	0.5081	1.62	Q
8+45	0.5194	1.64	Q
8+50	0.5309	1.67	Q
8+55	0.5427	1.72	QV
9+ 0	0.5547	1.75	QV
9+ 5	0.5679	1.92	QV
9+10	0.5853	2.52	VQ
9+15	0.6051	2.88	VQ
9+20	0.6267	3.12	V Q
9+25	0.6511	3.55	V Q
9+30	0.6773	3.81	V Q

9+35	0.7051	4.03	V	Q					
9+40	0.7357	4.45	V	Q					
9+45	0.7681	4.70	V	Q					
9+50	0.8020	4.93	V	Q					
9+55	0.8387	5.34	V	Q					
10+ 0	0.8772	5.59	V	Q					
10+ 5	0.9132	5.23	V	Q					
10+10	0.9373	3.50	QV						
10+15	0.9551	2.57	Q	V					
10+20	0.9704	2.22	Q	V					
10+25	0.9842	2.01	Q	V					
10+30	0.9971	1.88	Q	V					
10+35	1.0119	2.15	Q	V					
10+40	1.0355	3.43	QV						
10+45	1.0639	4.12	VQ						
10+50	1.0943	4.41	Q						
10+55	1.1259	4.59	VQ						
11+ 0	1.1585	4.73	VQ						
11+ 5	1.1913	4.77	VQ						
11+10	1.2228	4.57	Q						
11+15	1.2538	4.49	QV						
11+20	1.2848	4.50	Q						
11+25	1.3160	4.54	Q						
11+30	1.3475	4.57	QV						
11+35	1.3780	4.43	Q	V					
11+40	1.4046	3.86	Q	V					
11+45	1.4292	3.58	Q	V					
11+50	1.4538	3.57	Q	V					
11+55	1.4802	3.83	Q	V					
12+ 0	1.5077	3.99	Q	V					
12+ 5	1.5396	4.64	Q	V					
12+10	1.5864	6.80	V	Q					
12+15	1.6415	7.99	V	Q					
12+20	1.7005	8.57	V	Q					
12+25	1.7638	9.19	V	Q					
12+30	1.8297	9.58	V	Q					
12+35	1.8984	9.98	V	Q					
12+40	1.9725	10.76	V	Q					
12+45	2.0498	11.22	V	Q					
12+50	2.1293	11.54	V	Q					
12+55	2.2120	12.01	V	Q					
13+ 0	2.2967	12.29	V	Q					
13+ 5	2.3852	12.85	V	Q					
13+10	2.4849	14.47	V	Q					
13+15	2.5907	15.37	V	Q					
13+20	2.6993	15.77	V	Q					
13+25	2.8097	16.03	V	Q					
13+30	2.9213	16.21	V	Q					
13+35	3.0277	15.44	V	Q					
13+40	3.1120	12.24	VQ						
13+45	3.1846	10.55	Q	V					
13+50	3.2529	9.92	Q	V					
13+55	3.3187	9.56	Q	V					
14+ 0	3.3830	9.33	Q	V					

14+ 5	3.4485	9.51				Q		V		
14+10	3.5216	10.61				Q	Q	V		
14+15	3.5987	11.20				Q	Q	V		
14+20	3.6768	11.34				Q	Q	V		
14+25	3.7538	11.18				Q	Q	V		
14+30	3.8304	11.13				Q	Q	V		
14+35	3.9074	11.17				Q	Q	V		
14+40	3.9847	11.23				Q	Q	V		
14+45	4.0624	11.28				Q	Q	V		
14+50	4.1398	11.24				Q	Q	V		
14+55	4.2155	10.99				Q	Q	V		
15+ 0	4.2903	10.87				Q	Q	V		
15+ 5	4.3644	10.75				Q	Q	V		
15+10	4.4363	10.45				Q	Q	V		
15+15	4.5072	10.29				Q	Q	V		
15+20	4.5772	10.17				Q	Q	V		
15+25	4.6451	9.85				Q	Q	V		
15+30	4.7118	9.69				Q	Q	V		
15+35	4.7760	9.31				Q	Q	V		
15+40	4.8317	8.09				Q	Q	V		
15+45	4.8829	7.44				Q	Q	V		
15+50	4.9325	7.20				Q	Q	V		
15+55	4.9811	7.06				Q	Q	V		
16+ 0	5.0292	6.98				Q	Q	V		
16+ 5	5.0720	6.22				Q	Q	V		
16+10	5.0963	3.52			Q			V		
16+15	5.1105	2.06			Q			V		
16+20	5.1207	1.48		Q				V		
16+25	5.1284	1.12		Q				V		
16+30	5.1346	0.89		Q				V		
16+35	5.1396	0.73		Q				V		
16+40	5.1435	0.57		Q				V		
16+45	5.1467	0.47	Q					V		
16+50	5.1495	0.40	Q					V		
16+55	5.1519	0.35	Q					V		
17+ 0	5.1541	0.32	Q					V		
17+ 5	5.1565	0.34	Q					V		
17+10	5.1594	0.43	Q					V		
17+15	5.1627	0.47	Q					V		
17+20	5.1661	0.49	Q					V		
17+25	5.1695	0.50	Q					V		
17+30	5.1730	0.51	Q					V		
17+35	5.1766	0.51	Q					V		
17+40	5.1801	0.52	Q					V		
17+45	5.1837	0.52	Q					V		
17+50	5.1872	0.51	Q					V		
17+55	5.1904	0.47	Q					V		
18+ 0	5.1935	0.45	Q					V		
18+ 5	5.1965	0.44	Q					V		
18+10	5.1995	0.43	Q					V		
18+15	5.2024	0.43	Q					V		
18+20	5.2053	0.42	Q					V		
18+25	5.2082	0.42	Q					V		
18+30	5.2111	0.42	Q					V		

18+35	5.2139	0.41	Q				V
18+40	5.2164	0.36	Q				V
18+45	5.2188	0.34	Q				V
18+50	5.2210	0.32	Q				V
18+55	5.2228	0.27	Q				V
19+ 0	5.2245	0.24	Q				V
19+ 5	5.2262	0.24	Q				V
19+10	5.2281	0.28	Q				V
19+15	5.2302	0.30	Q				V
19+20	5.2323	0.32	Q				V
19+25	5.2348	0.36	Q				V
19+30	5.2375	0.39	Q				V
19+35	5.2402	0.39	Q				V
19+40	5.2426	0.35	Q				V
19+45	5.2448	0.33	Q				V
19+50	5.2470	0.31	Q				V
19+55	5.2488	0.27	Q				V
20+ 0	5.2505	0.24	Q				V
20+ 5	5.2522	0.24	Q				V
20+10	5.2541	0.28	Q				V
20+15	5.2561	0.30	Q				V
20+20	5.2582	0.30	Q				V
20+25	5.2603	0.31	Q				V
20+30	5.2625	0.31	Q				V
20+35	5.2646	0.31	Q				V
20+40	5.2667	0.31	Q				V
20+45	5.2689	0.31	Q				V
20+50	5.2710	0.30	Q				V
20+55	5.2727	0.26	Q				V
21+ 0	5.2744	0.24	Q				V
21+ 5	5.2760	0.24	Q				V
21+10	5.2779	0.28	Q				V
21+15	5.2799	0.30	Q				V
21+20	5.2819	0.29	Q				V
21+25	5.2837	0.25	Q				V
21+30	5.2852	0.23	Q				V
21+35	5.2869	0.23	Q				V
21+40	5.2887	0.27	Q				V
21+45	5.2908	0.29	Q				V
21+50	5.2928	0.29	Q				V
21+55	5.2945	0.25	Q				V
22+ 0	5.2961	0.23	Q				V
22+ 5	5.2977	0.23	Q				V
22+10	5.2996	0.27	Q				V
22+15	5.3016	0.29	Q				V
22+20	5.3036	0.29	Q				V
22+25	5.3053	0.25	Q				V
22+30	5.3069	0.23	Q				V
22+35	5.3084	0.22	Q				V
22+40	5.3099	0.22	Q				V
22+45	5.3114	0.22	Q				V
22+50	5.3129	0.21	Q				V
22+55	5.3143	0.21	Q				V
23+ 0	5.3158	0.21	Q				V

23+ 5	5.3172	0.21	Q				V
23+10	5.3187	0.21	Q				V
23+15	5.3201	0.21	Q				V
23+20	5.3216	0.21	Q				V
23+25	5.3230	0.21	Q				V
23+30	5.3244	0.21	Q				V
23+35	5.3259	0.21	Q				V
23+40	5.3273	0.21	Q				V
23+45	5.3288	0.21	Q				V
23+50	5.3302	0.21	Q				V
23+55	5.3317	0.21	Q				V
24+ 0	5.3331	0.21	Q				V
24+ 5	5.3344	0.19	Q				V
24+10	5.3351	0.10	Q				V
24+15	5.3354	0.05	Q				V
24+20	5.3357	0.03	Q				V
24+25	5.3358	0.02	Q				V
24+30	5.3359	0.02	Q				V
24+35	5.3360	0.01	Q				V
24+40	5.3360	0.01	Q				V
24+45	5.3361	0.00	Q				V
24+50	5.3361	0.00	Q				V
24+55	5.3361	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "A"

Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
202.90	0.58	117.68

100 YEAR Area rainfall data:

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

202.90

1.45

294.20

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)

Areal adjustment factor = 99.82 %

Adjusted average point rain = 0.579(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436

Minimum soil loss rate ((In/Hr)) = 0.218

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.858

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382

7	0.583	387.244	3.178	6.499
8	0.667	442.564	2.285	4.672
9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087
Sum = 100.000			Sum=	204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.436)	0.262	0.043
2	0.17	4.50	0.313	(0.436)	0.268	0.044
3	0.25	5.40	0.375	(0.436)	0.322	0.053
4	0.33	5.40	0.375	(0.436)	0.322	0.053
5	0.42	5.70	0.396	(0.436)	0.340	0.056
6	0.50	6.40	0.445	(0.436)	0.381	0.063
7	0.58	7.90	0.549	0.436	(0.471)	0.113
8	0.67	9.10	0.632	0.436	(0.542)	0.196
9	0.75	12.80	0.889	0.436	(0.763)	0.454
10	0.83	25.60	1.778	0.436	(1.526)	1.343
11	0.92	7.90	0.549	0.436	(0.471)	0.113
12	1.00	4.90	0.340	(0.436)	0.292	0.048

(Loss Rate Not Used)

Sum = 100.0 Sum = 2.6

Flood volume = Effective rainfall 0.22(In)
times area 202.9(Ac.)/[(In)/(Ft.)] = 3.6(Ac.Ft)

Total soil loss = 0.36(In)

Total soil loss = 6.151(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 158454.2 Cubic Feet

Total soil loss = 267945.9 Cubic Feet

Peak flow rate of this hydrograph = 118.971(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0044	0.64	Q				

0+10	0.0276	3.36	Q				
0+15	0.0692	6.04	VQ				
0+20	0.1219	7.66	Q				
0+25	0.1826	8.80	QV				
0+30	0.2493	9.70	QV				
0+35	0.3281	11.44	QV				
0+40	0.4420	16.53	QV				
0+45	0.6402	28.78	Q V				
0+50	1.0817	64.10		VQ			
0+55	1.9010	118.97			V	Q	
1+ 0	2.5884	99.81			Q		V
1+ 5	2.9320	49.88		Q			V
1+10	3.1353	29.52		Q			V
1+15	3.2694	19.48	Q				V
1+20	3.3655	13.95	Q				V
1+25	3.4358	10.20	Q				V
1+30	3.4897	7.83	Q				V
1+35	3.5328	6.26	Q				V
1+40	3.5654	4.74	Q				V
1+45	3.5905	3.64	Q				V
1+50	3.6092	2.72	Q				V
1+55	3.6247	2.24	Q				V
2+ 0	3.6360	1.65	Q				V
2+ 5	3.6372	0.18	Q				V
2+10	3.6376	0.05	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "A" **Existing Condition**

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 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]
202.90	0.98	198.84

100 YEAR Area rainfall data:

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

202.90

2.48

503.19

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 0.980 (In)
 Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 0.980 (In)
 Areal adjustment factor = 99.91 %
 Adjusted average point rain = 0.979 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436
 Minimum soil loss rate ((In/Hr)) = 0.218
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.858

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.436)	0.131	0.022
2	0.17	1.30	0.153	(0.436)	0.131	0.022
3	0.25	1.10	0.129	(0.436)	0.111	0.018
4	0.33	1.50	0.176	(0.436)	0.151	0.025
5	0.42	1.50	0.176	(0.436)	0.151	0.025
6	0.50	1.80	0.211	(0.436)	0.181	0.030
7	0.58	1.50	0.176	(0.436)	0.151	0.025
8	0.67	1.80	0.211	(0.436)	0.181	0.030
9	0.75	1.80	0.211	(0.436)	0.181	0.030
10	0.83	1.50	0.176	(0.436)	0.151	0.025
11	0.92	1.60	0.188	(0.436)	0.161	0.027
12	1.00	1.80	0.211	(0.436)	0.181	0.030
13	1.08	2.20	0.258	(0.436)	0.222	0.037
14	1.17	2.20	0.258	(0.436)	0.222	0.037
15	1.25	2.20	0.258	(0.436)	0.222	0.037
16	1.33	2.00	0.235	(0.436)	0.202	0.033
17	1.42	2.60	0.305	(0.436)	0.262	0.043
18	1.50	2.70	0.317	(0.436)	0.272	0.045
19	1.58	2.40	0.282	(0.436)	0.242	0.040
20	1.67	2.70	0.317	(0.436)	0.272	0.045
21	1.75	3.30	0.388	(0.436)	0.333	0.055
22	1.83	3.10	0.364	(0.436)	0.312	0.052
23	1.92	2.90	0.341	(0.436)	0.292	0.048
24	2.00	3.00	0.352	(0.436)	0.302	0.050
25	2.08	3.10	0.364	(0.436)	0.312	0.052
26	2.17	4.20	0.493	(0.436)	0.423	0.070
27	2.25	5.00	0.587	0.436	(0.504)	0.152
28	2.33	3.50	0.411	(0.436)	0.353	0.058
29	2.42	6.80	0.799	0.436	(0.685)	0.363
30	2.50	7.30	0.858	0.436	(0.736)	0.422
31	2.58	8.20	0.963	0.436	(0.826)	0.528
32	2.67	5.90	0.693	0.436	(0.595)	0.258
33	2.75	2.00	0.235	(0.436)	0.202	0.033
34	2.83	1.80	0.211	(0.436)	0.181	0.030
35	2.92	1.80	0.211	(0.436)	0.181	0.030
36	3.00	0.60	0.070	(0.436)	0.060	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.8

Flood volume = Effective rainfall 0.24(In)

times area 202.9(Ac.)/[(In)/(Ft.)] = 4.0(Ac.Ft)

Total soil loss = 0.74(In)

Total soil loss = 12.556(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 174216.2 Cubic Feet

Total soil loss = 546939.5 Cubic Feet

Peak flow rate of this hydrograph = 72.745(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0022	0.32	Q				
0+10	0.0137	1.67	Q				
0+15	0.0335	2.87	VQ				
0+20	0.0559	3.26	VQ				
0+25	0.0819	3.77	VQ				
0+30	0.1118	4.34	VQ				
0+35	0.1451	4.83	VQ				
0+40	0.1798	5.04	VQ				
0+45	0.2163	5.30	Q				
0+50	0.2545	5.55	Q				
0+55	0.2919	5.43	Q				
1+ 0	0.3291	5.40	QV				
1+ 5	0.3687	5.76	QV				
1+10	0.4128	6.40	QV				
1+15	0.4603	6.89	QV				
1+20	0.5088	7.04	Q V				
1+25	0.5577	7.10	Q V				
1+30	0.6103	7.65	Q V				
1+35	0.6670	8.23	Q V				
1+40	0.7243	8.32	Q V				
1+45	0.7840	8.66	Q V				
1+50	0.8496	9.53	Q V				
1+55	0.9183	9.98	Q V				
2+ 0	0.9866	9.91	Q V				
2+ 5	1.0552	9.96	Q V				
2+10	1.1272	10.45	Q V				
2+15	1.2164	12.96	Q V				
2+20	1.3390	17.80	Q V				
2+25	1.4878	21.61	Q V				
2+30	1.7517	38.31	Q V				
2+35	2.1654	60.07	Q V				
2+40	2.6664	72.74	Q V				
2+45	3.1056	63.77	Q V				

2+50	3.3817	40.10				Q		V
2+55	3.5514	24.64				Q		V
3+ 0	3.6763	18.14			Q			V
3+ 5	3.7679	13.30			Q			V
3+10	3.8319	9.29		Q				V
3+15	3.8780	6.70		Q				V
3+20	3.9134	5.14		Q				V
3+25	3.9403	3.91	Q					V
3+30	3.9603	2.91	Q					V
3+35	3.9762	2.30	Q					V
3+40	3.9874	1.63	Q					V
3+45	3.9947	1.06	Q					V
3+50	3.9977	0.43	Q					V
3+55	3.9985	0.13	Q					V
4+ 0	3.9991	0.08	Q					V
4+ 5	3.9994	0.04	Q					V
4+10	3.9995	0.01	Q					V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "A" Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
202.90	1.38	280.00

100 YEAR Area rainfall data:

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

202.90

3.48

706.09

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.380 (In)

Areal adjustment factor = 99.93 %

Adjusted average point rain = 1.379 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436

Minimum soil loss rate ((In/Hr)) = 0.218

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.083	(0.436)	0.071	0.012
2	0.17	0.60	0.099	(0.436)	0.085	0.014
3	0.25	0.60	0.099	(0.436)	0.085	0.014
4	0.33	0.60	0.099	(0.436)	0.085	0.014
5	0.42	0.60	0.099	(0.436)	0.085	0.014
6	0.50	0.70	0.116	(0.436)	0.099	0.016
7	0.58	0.70	0.116	(0.436)	0.099	0.016
8	0.67	0.70	0.116	(0.436)	0.099	0.016
9	0.75	0.70	0.116	(0.436)	0.099	0.016
10	0.83	0.70	0.116	(0.436)	0.099	0.016
11	0.92	0.70	0.116	(0.436)	0.099	0.016
12	1.00	0.80	0.132	(0.436)	0.114	0.019
13	1.08	0.80	0.132	(0.436)	0.114	0.019
14	1.17	0.80	0.132	(0.436)	0.114	0.019
15	1.25	0.80	0.132	(0.436)	0.114	0.019
16	1.33	0.80	0.132	(0.436)	0.114	0.019
17	1.42	0.80	0.132	(0.436)	0.114	0.019
18	1.50	0.80	0.132	(0.436)	0.114	0.019
19	1.58	0.80	0.132	(0.436)	0.114	0.019
20	1.67	0.80	0.132	(0.436)	0.114	0.019
21	1.75	0.80	0.132	(0.436)	0.114	0.019
22	1.83	0.80	0.132	(0.436)	0.114	0.019
23	1.92	0.80	0.132	(0.436)	0.114	0.019
24	2.00	0.90	0.149	(0.436)	0.128	0.021
25	2.08	0.80	0.132	(0.436)	0.114	0.019
26	2.17	0.90	0.149	(0.436)	0.128	0.021
27	2.25	0.90	0.149	(0.436)	0.128	0.021
28	2.33	0.90	0.149	(0.436)	0.128	0.021
29	2.42	0.90	0.149	(0.436)	0.128	0.021
30	2.50	0.90	0.149	(0.436)	0.128	0.021
31	2.58	0.90	0.149	(0.436)	0.128	0.021
32	2.67	0.90	0.149	(0.436)	0.128	0.021
33	2.75	1.00	0.165	(0.436)	0.142	0.024
34	2.83	1.00	0.165	(0.436)	0.142	0.024
35	2.92	1.00	0.165	(0.436)	0.142	0.024
36	3.00	1.00	0.165	(0.436)	0.142	0.024

37	3.08	1.00	0.165	(0.436)	0.142	0.024
38	3.17	1.10	0.182	(0.436)	0.156	0.026
39	3.25	1.10	0.182	(0.436)	0.156	0.026
40	3.33	1.10	0.182	(0.436)	0.156	0.026
41	3.42	1.20	0.199	(0.436)	0.170	0.028
42	3.50	1.30	0.215	(0.436)	0.185	0.031
43	3.58	1.40	0.232	(0.436)	0.199	0.033
44	3.67	1.40	0.232	(0.436)	0.199	0.033
45	3.75	1.50	0.248	(0.436)	0.213	0.035
46	3.83	1.50	0.248	(0.436)	0.213	0.035
47	3.92	1.60	0.265	(0.436)	0.227	0.038
48	4.00	1.60	0.265	(0.436)	0.227	0.038
49	4.08	1.70	0.281	(0.436)	0.241	0.040
50	4.17	1.80	0.298	(0.436)	0.256	0.042
51	4.25	1.90	0.314	(0.436)	0.270	0.045
52	4.33	2.00	0.331	(0.436)	0.284	0.047
53	4.42	2.10	0.348	(0.436)	0.298	0.049
54	4.50	2.10	0.348	(0.436)	0.298	0.049
55	4.58	2.20	0.364	(0.436)	0.312	0.052
56	4.67	2.30	0.381	(0.436)	0.326	0.054
57	4.75	2.40	0.397	(0.436)	0.341	0.056
58	4.83	2.40	0.397	(0.436)	0.341	0.056
59	4.92	2.50	0.414	(0.436)	0.355	0.059
60	5.00	2.60	0.430	(0.436)	0.369	0.061
61	5.08	3.10	0.513	0.436	(0.440)	0.077
62	5.17	3.60	0.596	0.436	(0.511)	0.160
63	5.25	3.90	0.645	0.436	(0.554)	0.210
64	5.33	4.20	0.695	0.436	(0.596)	0.259
65	5.42	4.70	0.778	0.436	(0.667)	0.342
66	5.50	5.60	0.927	0.436	(0.795)	0.491
67	5.58	1.90	0.314	(0.436)	0.270	0.045
68	5.67	0.90	0.149	(0.436)	0.128	0.021
69	5.75	0.60	0.099	(0.436)	0.085	0.014
70	5.83	0.50	0.083	(0.436)	0.071	0.012
71	5.92	0.30	0.050	(0.436)	0.043	0.007
72	6.00	0.20	0.033	(0.436)	0.028	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.3

Flood volume = Effective rainfall 0.28(In)
 times area 202.9(Ac.)/[(In)/(Ft.)] = 4.7(Ac.Ft)
 Total soil loss = 1.10(In)
 Total soil loss = 18.665(Ac.Ft)
 Total rainfall = 1.38(In)
 Flood volume = 202668.3 Cubic Feet
 Total soil loss = 813030.0 Cubic Feet

 Peak flow rate of this hydrograph = 62.576(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q (CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0012		0.17	Q				
0+10	0.0077		0.94	Q				
0+15	0.0198		1.76	VQ				
0+20	0.0347		2.17	VQ				
0+25	0.0511		2.38	VQ				
0+30	0.0686		2.55	VQ				
0+35	0.0879		2.79	VQ				
0+40	0.1085		3.00	VQ				
0+45	0.1299		3.10	Q				
0+50	0.1517		3.18	Q				
0+55	0.1740		3.23	Q				
1+ 0	0.1968		3.31	Q				
1+ 5	0.2208		3.48	Q				
1+10	0.2459		3.64	Q				
1+15	0.2715		3.72	Q				
1+20	0.2974		3.76	Q				
1+25	0.3234		3.78	Q				
1+30	0.3496		3.80	QV				
1+35	0.3759		3.82	QV				
1+40	0.4023		3.83	QV				
1+45	0.4287		3.83	QV				
1+50	0.4551		3.84	QV				
1+55	0.4816		3.84	Q V				
2+ 0	0.5083		3.88	Q V				
2+ 5	0.5358		4.00	Q V				
2+10	0.5635		4.02	Q V				
2+15	0.5917		4.09	Q V				
2+20	0.6206		4.20	Q V				
2+25	0.6498		4.24	Q V				
2+30	0.6792		4.27	Q V				
2+35	0.7087		4.28	Q V				
2+40	0.7383		4.30	Q V				
2+45	0.7682		4.34	Q V				
2+50	0.7992		4.50	Q V				
2+55	0.8311		4.64	Q V				
3+ 0	0.8634		4.69	Q V				
3+ 5	0.8960		4.73	Q V				
3+10	0.9290		4.79	Q V				
3+15	0.9630		4.95	Q V				
3+20	0.9981		5.10	Q V				
3+25	1.0339		5.19	Q V				
3+30	1.0712		5.41	Q V				
3+35	1.1109		5.76	Q V				
3+40	1.1529		6.11	Q V				
3+45	1.1969		6.38	Q V				
3+50	1.2426		6.64	Q V				
3+55	1.2901		6.89	Q V				
4+ 0	1.3393		7.14	Q V				
4+ 5	1.3901		7.38	Q V				
4+10	1.4429		7.67	Q V				
4+15	1.4984		8.05	Q V				

4+20	1.5568	8.48	Q	V			
4+25	1.6182	8.91	Q	V			
4+30	1.6824	9.33	Q	V			
4+35	1.7488	9.64	Q	V			
4+40	1.8175	9.97	Q	V			
4+45	1.8890	10.38	Q	V			
4+50	1.9633	10.79	Q	V			
4+55	2.0397	11.10	Q	V			
5+ 0	2.1184	11.42	Q	V			
5+ 5	2.2013	12.04	Q	V			
5+10	2.3012	14.52	Q	V			
5+15	2.4491	21.47		Q	V		
5+20	2.6591	30.49		Q	V		
5+25	2.9334	39.83			Q	V	
5+30	3.2946	52.44				VQ	
5+35	3.7255	62.58					V Q
5+40	4.0462	46.55				Q	V
5+45	4.2199	25.23		Q			V
5+50	4.3348	16.69					V
5+55	4.4193	12.26					V
6+ 0	4.4828	9.23					V
6+ 5	4.5303	6.90	Q				V
6+10	4.5657	5.13	Q				V
6+15	4.5923	3.86	Q				V
6+20	4.6123	2.90	Q				V
6+25	4.6271	2.16	Q				V
6+30	4.6379	1.56	Q				V
6+35	4.6457	1.13	Q				V
6+40	4.6505	0.70	Q				V
6+45	4.6515	0.14	Q				V
6+50	4.6520	0.08	Q				V
6+55	4.6523	0.05	Q				V
7+ 0	4.6525	0.03	Q				V
7+ 5	4.6526	0.01	Q				V
7+10	4.6526	0.01	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "A"

Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 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]
202.90	2.48	503.19

100 YEAR Area rainfall data:

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

202.90

6.90

1400.01

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 2.479(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000

Total Area Entered = 202.90 (Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436

Minimum soil loss rate ((In/Hr)) = 0.218

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.020	(0.772)	0.017	0.003
2	0.17	0.07	0.020	(0.769)	0.017	0.003
3	0.25	0.07	0.020	(0.766)	0.017	0.003
4	0.33	0.10	0.030	(0.763)	0.026	0.004
5	0.42	0.10	0.030	(0.760)	0.026	0.004
6	0.50	0.10	0.030	(0.757)	0.026	0.004
7	0.58	0.10	0.030	(0.755)	0.026	0.004
8	0.67	0.10	0.030	(0.752)	0.026	0.004
9	0.75	0.10	0.030	(0.749)	0.026	0.004
10	0.83	0.13	0.040	(0.746)	0.034	0.006
11	0.92	0.13	0.040	(0.743)	0.034	0.006
12	1.00	0.13	0.040	(0.740)	0.034	0.006
13	1.08	0.10	0.030	(0.737)	0.026	0.004
14	1.17	0.10	0.030	(0.734)	0.026	0.004
15	1.25	0.10	0.030	(0.731)	0.026	0.004
16	1.33	0.10	0.030	(0.728)	0.026	0.004
17	1.42	0.10	0.030	(0.725)	0.026	0.004
18	1.50	0.10	0.030	(0.722)	0.026	0.004
19	1.58	0.10	0.030	(0.719)	0.026	0.004
20	1.67	0.10	0.030	(0.717)	0.026	0.004
21	1.75	0.10	0.030	(0.714)	0.026	0.004
22	1.83	0.13	0.040	(0.711)	0.034	0.006
23	1.92	0.13	0.040	(0.708)	0.034	0.006
24	2.00	0.13	0.040	(0.705)	0.034	0.006
25	2.08	0.13	0.040	(0.702)	0.034	0.006
26	2.17	0.13	0.040	(0.699)	0.034	0.006
27	2.25	0.13	0.040	(0.697)	0.034	0.006
28	2.33	0.13	0.040	(0.694)	0.034	0.006
29	2.42	0.13	0.040	(0.691)	0.034	0.006
30	2.50	0.13	0.040	(0.688)	0.034	0.006
31	2.58	0.17	0.050	(0.685)	0.043	0.007
32	2.67	0.17	0.050	(0.682)	0.043	0.007
33	2.75	0.17	0.050	(0.680)	0.043	0.007
34	2.83	0.17	0.050	(0.677)	0.043	0.007
35	2.92	0.17	0.050	(0.674)	0.043	0.007
36	3.00	0.17	0.050	(0.671)	0.043	0.007

37	3.08	0.17	0.050	(0.669)	0.043	0.007
38	3.17	0.17	0.050	(0.666)	0.043	0.007
39	3.25	0.17	0.050	(0.663)	0.043	0.007
40	3.33	0.17	0.050	(0.660)	0.043	0.007
41	3.42	0.17	0.050	(0.657)	0.043	0.007
42	3.50	0.17	0.050	(0.655)	0.043	0.007
43	3.58	0.17	0.050	(0.652)	0.043	0.007
44	3.67	0.17	0.050	(0.649)	0.043	0.007
45	3.75	0.17	0.050	(0.647)	0.043	0.007
46	3.83	0.20	0.059	(0.644)	0.051	0.008
47	3.92	0.20	0.059	(0.641)	0.051	0.008
48	4.00	0.20	0.059	(0.638)	0.051	0.008
49	4.08	0.20	0.059	(0.636)	0.051	0.008
50	4.17	0.20	0.059	(0.633)	0.051	0.008
51	4.25	0.20	0.059	(0.630)	0.051	0.008
52	4.33	0.23	0.069	(0.628)	0.060	0.010
53	4.42	0.23	0.069	(0.625)	0.060	0.010
54	4.50	0.23	0.069	(0.622)	0.060	0.010
55	4.58	0.23	0.069	(0.620)	0.060	0.010
56	4.67	0.23	0.069	(0.617)	0.060	0.010
57	4.75	0.23	0.069	(0.614)	0.060	0.010
58	4.83	0.27	0.079	(0.612)	0.068	0.011
59	4.92	0.27	0.079	(0.609)	0.068	0.011
60	5.00	0.27	0.079	(0.606)	0.068	0.011
61	5.08	0.20	0.059	(0.604)	0.051	0.008
62	5.17	0.20	0.059	(0.601)	0.051	0.008
63	5.25	0.20	0.059	(0.598)	0.051	0.008
64	5.33	0.23	0.069	(0.596)	0.060	0.010
65	5.42	0.23	0.069	(0.593)	0.060	0.010
66	5.50	0.23	0.069	(0.591)	0.060	0.010
67	5.58	0.27	0.079	(0.588)	0.068	0.011
68	5.67	0.27	0.079	(0.585)	0.068	0.011
69	5.75	0.27	0.079	(0.583)	0.068	0.011
70	5.83	0.27	0.079	(0.580)	0.068	0.011
71	5.92	0.27	0.079	(0.578)	0.068	0.011
72	6.00	0.27	0.079	(0.575)	0.068	0.011
73	6.08	0.30	0.089	(0.573)	0.077	0.013
74	6.17	0.30	0.089	(0.570)	0.077	0.013
75	6.25	0.30	0.089	(0.567)	0.077	0.013
76	6.33	0.30	0.089	(0.565)	0.077	0.013
77	6.42	0.30	0.089	(0.562)	0.077	0.013
78	6.50	0.30	0.089	(0.560)	0.077	0.013
79	6.58	0.33	0.099	(0.557)	0.085	0.014
80	6.67	0.33	0.099	(0.555)	0.085	0.014
81	6.75	0.33	0.099	(0.552)	0.085	0.014
82	6.83	0.33	0.099	(0.550)	0.085	0.014
83	6.92	0.33	0.099	(0.547)	0.085	0.014
84	7.00	0.33	0.099	(0.545)	0.085	0.014
85	7.08	0.33	0.099	(0.542)	0.085	0.014
86	7.17	0.33	0.099	(0.540)	0.085	0.014
87	7.25	0.33	0.099	(0.537)	0.085	0.014
88	7.33	0.37	0.109	(0.535)	0.094	0.016
89	7.42	0.37	0.109	(0.533)	0.094	0.016
90	7.50	0.37	0.109	(0.530)	0.094	0.016

91	7.58	0.40	0.119	(0.528)	0.102	0.017
92	7.67	0.40	0.119	(0.525)	0.102	0.017
93	7.75	0.40	0.119	(0.523)	0.102	0.017
94	7.83	0.43	0.129	(0.520)	0.111	0.018
95	7.92	0.43	0.129	(0.518)	0.111	0.018
96	8.00	0.43	0.129	(0.516)	0.111	0.018
97	8.08	0.50	0.149	(0.513)	0.128	0.021
98	8.17	0.50	0.149	(0.511)	0.128	0.021
99	8.25	0.50	0.149	(0.508)	0.128	0.021
100	8.33	0.50	0.149	(0.506)	0.128	0.021
101	8.42	0.50	0.149	(0.504)	0.128	0.021
102	8.50	0.50	0.149	(0.501)	0.128	0.021
103	8.58	0.53	0.159	(0.499)	0.136	0.023
104	8.67	0.53	0.159	(0.497)	0.136	0.023
105	8.75	0.53	0.159	(0.494)	0.136	0.023
106	8.83	0.57	0.169	(0.492)	0.145	0.024
107	8.92	0.57	0.169	(0.490)	0.145	0.024
108	9.00	0.57	0.169	(0.487)	0.145	0.024
109	9.08	0.63	0.188	(0.485)	0.162	0.027
110	9.17	0.63	0.188	(0.483)	0.162	0.027
111	9.25	0.63	0.188	(0.480)	0.162	0.027
112	9.33	0.67	0.198	(0.478)	0.170	0.028
113	9.42	0.67	0.198	(0.476)	0.170	0.028
114	9.50	0.67	0.198	(0.474)	0.170	0.028
115	9.58	0.70	0.208	(0.471)	0.179	0.030
116	9.67	0.70	0.208	(0.469)	0.179	0.030
117	9.75	0.70	0.208	(0.467)	0.179	0.030
118	9.83	0.73	0.218	(0.465)	0.187	0.031
119	9.92	0.73	0.218	(0.462)	0.187	0.031
120	10.00	0.73	0.218	(0.460)	0.187	0.031
121	10.08	0.50	0.149	(0.458)	0.128	0.021
122	10.17	0.50	0.149	(0.456)	0.128	0.021
123	10.25	0.50	0.149	(0.453)	0.128	0.021
124	10.33	0.50	0.149	(0.451)	0.128	0.021
125	10.42	0.50	0.149	(0.449)	0.128	0.021
126	10.50	0.50	0.149	(0.447)	0.128	0.021
127	10.58	0.67	0.198	(0.445)	0.170	0.028
128	10.67	0.67	0.198	(0.443)	0.170	0.028
129	10.75	0.67	0.198	(0.440)	0.170	0.028
130	10.83	0.67	0.198	(0.438)	0.170	0.028
131	10.92	0.67	0.198	(0.436)	0.170	0.028
132	11.00	0.67	0.198	(0.434)	0.170	0.028
133	11.08	0.63	0.188	(0.432)	0.162	0.027
134	11.17	0.63	0.188	(0.430)	0.162	0.027
135	11.25	0.63	0.188	(0.428)	0.162	0.027
136	11.33	0.63	0.188	(0.425)	0.162	0.027
137	11.42	0.63	0.188	(0.423)	0.162	0.027
138	11.50	0.63	0.188	(0.421)	0.162	0.027
139	11.58	0.57	0.169	(0.419)	0.145	0.024
140	11.67	0.57	0.169	(0.417)	0.145	0.024
141	11.75	0.57	0.169	(0.415)	0.145	0.024
142	11.83	0.60	0.178	(0.413)	0.153	0.025
143	11.92	0.60	0.178	(0.411)	0.153	0.025
144	12.00	0.60	0.178	(0.409)	0.153	0.025

145	12.08	0.83	0.248	(0.407)	0.213	0.035
146	12.17	0.83	0.248	(0.405)	0.213	0.035
147	12.25	0.83	0.248	(0.403)	0.213	0.035
148	12.33	0.87	0.258	(0.401)	0.221	0.037
149	12.42	0.87	0.258	(0.399)	0.221	0.037
150	12.50	0.87	0.258	(0.397)	0.221	0.037
151	12.58	0.93	0.278	(0.395)	0.238	0.039
152	12.67	0.93	0.278	(0.393)	0.238	0.039
153	12.75	0.93	0.278	(0.391)	0.238	0.039
154	12.83	0.97	0.288	(0.389)	0.247	0.041
155	12.92	0.97	0.288	(0.387)	0.247	0.041
156	13.00	0.97	0.288	(0.385)	0.247	0.041
157	13.08	1.13	0.337	(0.383)	0.289	0.048
158	13.17	1.13	0.337	(0.381)	0.289	0.048
159	13.25	1.13	0.337	(0.379)	0.289	0.048
160	13.33	1.13	0.337	(0.377)	0.289	0.048
161	13.42	1.13	0.337	(0.375)	0.289	0.048
162	13.50	1.13	0.337	(0.373)	0.289	0.048
163	13.58	0.77	0.228	(0.371)	0.196	0.032
164	13.67	0.77	0.228	(0.369)	0.196	0.032
165	13.75	0.77	0.228	(0.368)	0.196	0.032
166	13.83	0.77	0.228	(0.366)	0.196	0.032
167	13.92	0.77	0.228	(0.364)	0.196	0.032
168	14.00	0.77	0.228	(0.362)	0.196	0.032
169	14.08	0.90	0.268	(0.360)	0.230	0.038
170	14.17	0.90	0.268	(0.358)	0.230	0.038
171	14.25	0.90	0.268	(0.356)	0.230	0.038
172	14.33	0.87	0.258	(0.355)	0.221	0.037
173	14.42	0.87	0.258	(0.353)	0.221	0.037
174	14.50	0.87	0.258	(0.351)	0.221	0.037
175	14.58	0.87	0.258	(0.349)	0.221	0.037
176	14.67	0.87	0.258	(0.347)	0.221	0.037
177	14.75	0.87	0.258	(0.346)	0.221	0.037
178	14.83	0.83	0.248	(0.344)	0.213	0.035
179	14.92	0.83	0.248	(0.342)	0.213	0.035
180	15.00	0.83	0.248	(0.340)	0.213	0.035
181	15.08	0.80	0.238	(0.339)	0.204	0.034
182	15.17	0.80	0.238	(0.337)	0.204	0.034
183	15.25	0.80	0.238	(0.335)	0.204	0.034
184	15.33	0.77	0.228	(0.333)	0.196	0.032
185	15.42	0.77	0.228	(0.332)	0.196	0.032
186	15.50	0.77	0.228	(0.330)	0.196	0.032
187	15.58	0.63	0.188	(0.328)	0.162	0.027
188	15.67	0.63	0.188	(0.327)	0.162	0.027
189	15.75	0.63	0.188	(0.325)	0.162	0.027
190	15.83	0.63	0.188	(0.323)	0.162	0.027
191	15.92	0.63	0.188	(0.322)	0.162	0.027
192	16.00	0.63	0.188	(0.320)	0.162	0.027
193	16.08	0.13	0.040	(0.318)	0.034	0.006
194	16.17	0.13	0.040	(0.317)	0.034	0.006
195	16.25	0.13	0.040	(0.315)	0.034	0.006
196	16.33	0.13	0.040	(0.313)	0.034	0.006
197	16.42	0.13	0.040	(0.312)	0.034	0.006
198	16.50	0.13	0.040	(0.310)	0.034	0.006

199	16.58	0.10	0.030	(0.309)	0.026	0.004
200	16.67	0.10	0.030	(0.307)	0.026	0.004
201	16.75	0.10	0.030	(0.306)	0.026	0.004
202	16.83	0.10	0.030	(0.304)	0.026	0.004
203	16.92	0.10	0.030	(0.302)	0.026	0.004
204	17.00	0.10	0.030	(0.301)	0.026	0.004
205	17.08	0.17	0.050	(0.299)	0.043	0.007
206	17.17	0.17	0.050	(0.298)	0.043	0.007
207	17.25	0.17	0.050	(0.296)	0.043	0.007
208	17.33	0.17	0.050	(0.295)	0.043	0.007
209	17.42	0.17	0.050	(0.293)	0.043	0.007
210	17.50	0.17	0.050	(0.292)	0.043	0.007
211	17.58	0.17	0.050	(0.291)	0.043	0.007
212	17.67	0.17	0.050	(0.289)	0.043	0.007
213	17.75	0.17	0.050	(0.288)	0.043	0.007
214	17.83	0.13	0.040	(0.286)	0.034	0.006
215	17.92	0.13	0.040	(0.285)	0.034	0.006
216	18.00	0.13	0.040	(0.283)	0.034	0.006
217	18.08	0.13	0.040	(0.282)	0.034	0.006
218	18.17	0.13	0.040	(0.281)	0.034	0.006
219	18.25	0.13	0.040	(0.279)	0.034	0.006
220	18.33	0.13	0.040	(0.278)	0.034	0.006
221	18.42	0.13	0.040	(0.277)	0.034	0.006
222	18.50	0.13	0.040	(0.275)	0.034	0.006
223	18.58	0.10	0.030	(0.274)	0.026	0.004
224	18.67	0.10	0.030	(0.273)	0.026	0.004
225	18.75	0.10	0.030	(0.271)	0.026	0.004
226	18.83	0.07	0.020	(0.270)	0.017	0.003
227	18.92	0.07	0.020	(0.269)	0.017	0.003
228	19.00	0.07	0.020	(0.267)	0.017	0.003
229	19.08	0.10	0.030	(0.266)	0.026	0.004
230	19.17	0.10	0.030	(0.265)	0.026	0.004
231	19.25	0.10	0.030	(0.264)	0.026	0.004
232	19.33	0.13	0.040	(0.262)	0.034	0.006
233	19.42	0.13	0.040	(0.261)	0.034	0.006
234	19.50	0.13	0.040	(0.260)	0.034	0.006
235	19.58	0.10	0.030	(0.259)	0.026	0.004
236	19.67	0.10	0.030	(0.258)	0.026	0.004
237	19.75	0.10	0.030	(0.256)	0.026	0.004
238	19.83	0.07	0.020	(0.255)	0.017	0.003
239	19.92	0.07	0.020	(0.254)	0.017	0.003
240	20.00	0.07	0.020	(0.253)	0.017	0.003
241	20.08	0.10	0.030	(0.252)	0.026	0.004
242	20.17	0.10	0.030	(0.251)	0.026	0.004
243	20.25	0.10	0.030	(0.250)	0.026	0.004
244	20.33	0.10	0.030	(0.249)	0.026	0.004
245	20.42	0.10	0.030	(0.248)	0.026	0.004
246	20.50	0.10	0.030	(0.246)	0.026	0.004
247	20.58	0.10	0.030	(0.245)	0.026	0.004
248	20.67	0.10	0.030	(0.244)	0.026	0.004
249	20.75	0.10	0.030	(0.243)	0.026	0.004
250	20.83	0.07	0.020	(0.242)	0.017	0.003
251	20.92	0.07	0.020	(0.241)	0.017	0.003
252	21.00	0.07	0.020	(0.240)	0.017	0.003

253	21.08	0.10	0.030	(0.240)	0.026	0.004
254	21.17	0.10	0.030	(0.239)	0.026	0.004
255	21.25	0.10	0.030	(0.238)	0.026	0.004
256	21.33	0.07	0.020	(0.237)	0.017	0.003
257	21.42	0.07	0.020	(0.236)	0.017	0.003
258	21.50	0.07	0.020	(0.235)	0.017	0.003
259	21.58	0.10	0.030	(0.234)	0.026	0.004
260	21.67	0.10	0.030	(0.233)	0.026	0.004
261	21.75	0.10	0.030	(0.232)	0.026	0.004
262	21.83	0.07	0.020	(0.232)	0.017	0.003
263	21.92	0.07	0.020	(0.231)	0.017	0.003
264	22.00	0.07	0.020	(0.230)	0.017	0.003
265	22.08	0.10	0.030	(0.229)	0.026	0.004
266	22.17	0.10	0.030	(0.229)	0.026	0.004
267	22.25	0.10	0.030	(0.228)	0.026	0.004
268	22.33	0.07	0.020	(0.227)	0.017	0.003
269	22.42	0.07	0.020	(0.226)	0.017	0.003
270	22.50	0.07	0.020	(0.226)	0.017	0.003
271	22.58	0.07	0.020	(0.225)	0.017	0.003
272	22.67	0.07	0.020	(0.224)	0.017	0.003
273	22.75	0.07	0.020	(0.224)	0.017	0.003
274	22.83	0.07	0.020	(0.223)	0.017	0.003
275	22.92	0.07	0.020	(0.223)	0.017	0.003
276	23.00	0.07	0.020	(0.222)	0.017	0.003
277	23.08	0.07	0.020	(0.222)	0.017	0.003
278	23.17	0.07	0.020	(0.221)	0.017	0.003
279	23.25	0.07	0.020	(0.221)	0.017	0.003
280	23.33	0.07	0.020	(0.220)	0.017	0.003
281	23.42	0.07	0.020	(0.220)	0.017	0.003
282	23.50	0.07	0.020	(0.219)	0.017	0.003
283	23.58	0.07	0.020	(0.219)	0.017	0.003
284	23.67	0.07	0.020	(0.219)	0.017	0.003
285	23.75	0.07	0.020	(0.218)	0.017	0.003
286	23.83	0.07	0.020	(0.218)	0.017	0.003
287	23.92	0.07	0.020	(0.218)	0.017	0.003
288	24.00	0.07	0.020	(0.218)	0.017	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.2

Flood volume = Effective rainfall 0.35(In)
 times area 202.9(Ac.)/[(In)/(Ft.)] = 6.0(Ac.Ft)
 Total soil loss = 2.13(In)
 Total soil loss = 35.956(Ac.Ft)
 Total rainfall = 2.48(In)
 Flood volume = 259637.7 Cubic Feet
 Total soil loss = 1566225.4 Cubic Feet

 Peak flow rate of this hydrograph = 9.607(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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0003		0.04	Q				
0+10	0.0018		0.22	Q				
0+15	0.0044		0.38	VQ				
0+20	0.0076		0.46	VQ				
0+25	0.0116		0.59	V Q				
0+30	0.0164		0.70	V Q				
0+35	0.0216		0.75	V Q				
0+40	0.0269		0.78	V Q				
0+45	0.0324		0.80	V Q				
0+50	0.0382		0.84	V Q				
0+55	0.0447		0.94	V Q				
1+ 0	0.0518		1.03	V Q				
1+ 5	0.0590		1.05	V Q				
1+10	0.0658		0.99	V Q				
1+15	0.0722		0.92	V Q				
1+20	0.0784		0.90	V Q				
1+25	0.0845		0.89	V Q				
1+30	0.0906		0.89	V Q				
1+35	0.0967		0.88	V Q				
1+40	0.1028		0.88	V Q				
1+45	0.1088		0.88	V Q				
1+50	0.1149		0.89	V Q				
1+55	0.1217		0.98	V Q				
2+ 0	0.1290		1.06	V Q				
2+ 5	0.1365		1.09	V Q				
2+10	0.1441		1.11	V Q				
2+15	0.1518		1.12	V Q				
2+20	0.1596		1.13	V Q				
2+25	0.1674		1.13	V Q				
2+30	0.1753		1.14	V Q				
2+35	0.1833		1.16	V Q				
2+40	0.1919		1.26	V Q				
2+45	0.2011		1.34	V Q				
2+50	0.2106		1.37	V Q				
2+55	0.2202		1.39	V Q				
3+ 0	0.2299		1.41	V Q				
3+ 5	0.2396		1.42	V Q				
3+10	0.2494		1.42	V Q				
3+15	0.2593		1.43	V Q				
3+20	0.2691		1.43	V Q				
3+25	0.2790		1.44	V Q				
3+30	0.2889		1.44	V Q				
3+35	0.2988		1.44	V Q				
3+40	0.3087		1.44	V Q				
3+45	0.3187		1.44	V Q				
3+50	0.3287		1.46	V Q				
3+55	0.3394		1.55	V Q				
4+ 0	0.3507		1.63	V Q				
4+ 5	0.3621		1.66	V Q				
4+10	0.3737		1.68	V Q				
4+15	0.3854		1.70	V Q				

4+20	0.3973	1.73	V	Q				
4+25	0.4098	1.82	V	Q				
4+30	0.4229	1.91	V	Q				
4+35	0.4363	1.94	V	Q				
4+40	0.4498	1.96	V	Q				
4+45	0.4635	1.98	V	Q				
4+50	0.4773	2.01	V	Q				
4+55	0.4918	2.11	V	Q				
5+ 0	0.5069	2.19	V	Q				
5+ 5	0.5220	2.19	V	Q				
5+10	0.5360	2.04	V	Q				
5+15	0.5490	1.89	V	Q				
5+20	0.5618	1.86	V	Q				
5+25	0.5750	1.91	V	Q				
5+30	0.5886	1.98	V	Q				
5+35	0.6025	2.02	V	Q				
5+40	0.6170	2.11	V	Q				
5+45	0.6322	2.20	V	Q				
5+50	0.6476	2.23	V	Q				
5+55	0.6631	2.25	V	Q				
6+ 0	0.6787	2.27	V	Q				
6+ 5	0.6945	2.30	V	Q				
6+10	0.7110	2.39	V	Q				
6+15	0.7281	2.48	V	Q				
6+20	0.7454	2.52	V	Q				
6+25	0.7629	2.54	V	Q				
6+30	0.7805	2.56	V	Q				
6+35	0.7983	2.59	V	Q				
6+40	0.8168	2.68	V	Q				
6+45	0.8359	2.77	V	Q				
6+50	0.8552	2.81	V	Q				
6+55	0.8747	2.83	V	Q				
7+ 0	0.8943	2.84	V	Q				
7+ 5	0.9139	2.86	V	Q				
7+10	0.9337	2.86	V	Q				
7+15	0.9534	2.87	V	Q				
7+20	0.9734	2.90	V	Q				
7+25	0.9939	2.99	V	Q				
7+30	1.0151	3.07	V	Q				
7+35	1.0366	3.12	V	Q				
7+40	1.0589	3.23	V	Q				
7+45	1.0818	3.33	V	Q				
7+50	1.1051	3.39	V	Q				
7+55	1.1292	3.50	V	Q				
8+ 0	1.1540	3.60	V	Q				
8+ 5	1.1794	3.69	V	Q				
8+10	1.2063	3.89	V	Q				
8+15	1.2343	4.07	V	Q				
8+20	1.2629	4.15	V	Q				
8+25	1.2919	4.20	V	Q				
8+30	1.3210	4.24	V	Q				
8+35	1.3505	4.28	V	Q				
8+40	1.3807	4.39	V	Q				
8+45	1.4116	4.48	V	Q				

8+50	1.4429	4.55	V	Q			
8+55	1.4750	4.66	V	Q			
9+ 0	1.5078	4.76	V	Q			
9+ 5	1.5412	4.85	V	Q			
9+10	1.5760	5.05	V	Q			
9+15	1.6120	5.23	V	Q			
9+20	1.6487	5.33	V	Q			
9+25	1.6864	5.47	V	Q			
9+30	1.7248	5.58	V	Q			
9+35	1.7638	5.66	V	Q			
9+40	1.8036	5.78	V	Q			
9+45	1.8441	5.89	V	Q			
9+50	1.8852	5.96	V	Q			
9+55	1.9271	6.08	V	Q			
10+ 0	1.9697	6.19	V	Q			
10+ 5	2.0117	6.09	V	Q			
10+10	2.0496	5.51	V	Q			
10+15	2.0838	4.97	V	Q			
10+20	2.1165	4.75	V	Q			
10+25	2.1485	4.64	V	Q			
10+30	2.1798	4.56	V	Q			
10+35	2.2115	4.60	V	Q			
10+40	2.2460	5.00	V	Q			
10+45	2.2830	5.37	V	Q			
10+50	2.3209	5.51	V	Q			
10+55	2.3593	5.58	V	Q			
11+ 0	2.3981	5.63	V	Q			
11+ 5	2.4369	5.64	V	Q			
11+10	2.4753	5.57	V	Q			
11+15	2.5132	5.51	V	Q			
11+20	2.5511	5.50	V	Q			
11+25	2.5889	5.49	V	Q			
11+30	2.6267	5.49	V	Q			
11+35	2.6642	5.45	V	Q			
11+40	2.7006	5.28	V	Q			
11+45	2.7358	5.12	V	Q			
11+50	2.7707	5.07	V	Q			
11+55	2.8060	5.12	V	Q			
12+ 0	2.8416	5.17	V	Q			
12+ 5	2.8783	5.33	V	Q			
12+10	2.9192	5.95	V	Q			
12+15	2.9641	6.51	V	Q			
12+20	3.0106	6.76	V	Q			
12+25	3.0587	6.98	V	Q			
12+30	3.1079	7.15	V	Q			
12+35	3.1581	7.29	V	Q			
12+40	3.2100	7.53	V	Q			
12+45	3.2632	7.74	V	Q			
12+50	3.3174	7.86	V	Q			
12+55	3.3726	8.02	V	Q			
13+ 0	3.4287	8.15	V	Q			
13+ 5	3.4860	8.32	V	Q			
13+10	3.5466	8.80	V	Q			
13+15	3.6103	9.24	V	Q			

13+20	3.6752	9.43				V			Q
13+25	3.7408	9.53				V			Q
13+30	3.8070	9.61				V			Q
13+35	3.8720	9.43				V			Q
13+40	3.9305	8.50				V		Q	
13+45	3.9832	7.65				V	Q		
13+50	4.0336	7.31				V	Q		
13+55	4.0826	7.13				VQ			
14+ 0	4.1308	7.00				VQ			
14+ 5	4.1790	6.99				QV			
14+10	4.2291	7.28				VQ			
14+15	4.2812	7.55				V	Q		
14+20	4.3336	7.62				VQ			
14+25	4.3858	7.57				VQ			
14+30	4.4375	7.51				VQ			
14+35	4.4891	7.50				QV			
14+40	4.5407	7.49				QV			
14+45	4.5922	7.48				QV			
14+50	4.6436	7.46				Q	V		
14+55	4.6944	7.38				Q	V		
15+ 0	4.7447	7.31				Q	V		
15+ 5	4.7947	7.26				Q	V		
15+10	4.8440	7.15				Q	V		
15+15	4.8926	7.06				Q	V		
15+20	4.9408	7.00				Q	V		
15+25	4.9882	6.88				Q	V		
15+30	5.0350	6.78				Q	V		
15+35	5.0808	6.66				Q	V		
15+40	5.1240	6.28				Q	V		
15+45	5.1649	5.93				Q	V		
15+50	5.2047	5.79				Q	V		
15+55	5.2440	5.70				Q	V		
16+ 0	5.2829	5.64				Q	V		
16+ 5	5.3193	5.29				Q	V		
16+10	5.3464	3.94				Q	V		
16+15	5.3651	2.71			Q		V		
16+20	5.3802	2.20			Q		V		
16+25	5.3933	1.91			Q		V		
16+30	5.4051	1.71			Q		V		
16+35	5.4157	1.54			Q		V		
16+40	5.4250	1.35			Q		V		
16+45	5.4331	1.19			Q		V		
16+50	5.4406	1.09			Q		V		
16+55	5.4477	1.02			Q		V		
17+ 0	5.4544	0.97	Q				V		
17+ 5	5.4611	0.98	Q				V		
17+10	5.4689	1.13	Q				V		
17+15	5.4776	1.26	Q				V		
17+20	5.4867	1.32	Q				V		
17+25	5.4960	1.35	Q				V		
17+30	5.5055	1.38	Q				V		
17+35	5.5150	1.39	Q				V		
17+40	5.5247	1.40	Q				V		
17+45	5.5345	1.41	Q				V		

17+50	5.5441	1.40	Q			V
17+55	5.5532	1.32	Q			V
18+ 0	5.5617	1.24	Q			V
18+ 5	5.5701	1.21	Q			V
18+10	5.5784	1.20	Q			V
18+15	5.5866	1.19	Q			V
18+20	5.5947	1.18	Q			V
18+25	5.6028	1.17	Q			V
18+30	5.6108	1.17	Q			V
18+35	5.6187	1.14	Q			V
18+40	5.6259	1.05	Q			V
18+45	5.6326	0.97	Q			V
18+50	5.6389	0.91	Q			V
18+55	5.6445	0.81	Q			V
19+ 0	5.6494	0.71	Q			V
19+ 5	5.6541	0.69	Q			V
19+10	5.6593	0.75	Q			V
19+15	5.6649	0.82	Q			V
19+20	5.6708	0.86	Q			V
19+25	5.6774	0.95	Q			V
19+30	5.6846	1.04	Q			V
19+35	5.6918	1.05	Q			V
19+40	5.6986	0.99	Q			V
19+45	5.7049	0.92	Q			V
19+50	5.7110	0.88	Q			V
19+55	5.7164	0.78	Q			V
20+ 0	5.7211	0.69	Q			V
20+ 5	5.7258	0.68	Q			V
20+10	5.7309	0.74	Q			V
20+15	5.7365	0.81	Q			V
20+20	5.7422	0.83	Q			V
20+25	5.7480	0.84	Q			V
20+30	5.7539	0.85	Q			V
20+35	5.7598	0.85	Q			V
20+40	5.7657	0.85	Q			V
20+45	5.7715	0.86	Q			V
20+50	5.7773	0.84	Q			V
20+55	5.7825	0.75	Q			V
21+ 0	5.7871	0.67	Q			V
21+ 5	5.7917	0.66	Q			V
21+10	5.7967	0.73	Q			V
21+15	5.8022	0.80	Q			V
21+20	5.8078	0.80	Q			V
21+25	5.8128	0.73	Q			V
21+30	5.8173	0.66	Q			V
21+35	5.8218	0.65	Q			V
21+40	5.8267	0.72	Q			V
21+45	5.8322	0.79	Q			V
21+50	5.8377	0.80	Q			V
21+55	5.8426	0.72	Q			V
22+ 0	5.8471	0.65	Q			V
22+ 5	5.8516	0.65	Q			V
22+10	5.8565	0.72	Q			V
22+15	5.8620	0.79	Q			V

22+20	5.8675	0.80	Q				V
22+25	5.8725	0.72	Q				V
22+30	5.8769	0.65	Q				V
22+35	5.8812	0.62	Q				V
22+40	5.8854	0.61	Q				V
22+45	5.8896	0.60	Q				V
22+50	5.8937	0.60	Q				V
22+55	5.8978	0.59	Q				V
23+ 0	5.9018	0.59	Q				V
23+ 5	5.9058	0.58	Q				V
23+10	5.9098	0.58	Q				V
23+15	5.9139	0.58	Q				V
23+20	5.9178	0.58	Q				V
23+25	5.9218	0.58	Q				V
23+30	5.9258	0.58	Q				V
23+35	5.9298	0.58	Q				V
23+40	5.9338	0.58	Q				V
23+45	5.9377	0.58	Q				V
23+50	5.9417	0.58	Q				V
23+55	5.9457	0.58	Q				V
24+ 0	5.9496	0.58	Q				V
24+ 5	5.9533	0.54	Q				V
24+10	5.9558	0.36	Q				V
24+15	5.9572	0.20	Q				V
24+20	5.9581	0.13	Q				V
24+25	5.9588	0.10	Q				V
24+30	5.9592	0.07	Q				V
24+35	5.9596	0.05	Q				V
24+40	5.9599	0.04	Q				V
24+45	5.9601	0.03	Q				V
24+50	5.9602	0.02	Q				V
24+55	5.9603	0.01	Q				V
25+ 0	5.9604	0.01	Q				V
25+ 5	5.9604	0.01	Q				V
25+10	5.9605	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "A"

Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
202.90	0.58	117.68

100 YEAR Area rainfall data:

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

202.90

1.45

294.20

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.784 (In)

Areal adjustment factor = 99.82 %

Adjusted average point rain = 0.782 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436

Minimum soil loss rate ((In/Hr)) = 0.218

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382

7	0.583	387.244	3.178	6.499
8	0.667	442.564	2.285	4.672
9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087
Sum = 100.000			Sum=	204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.413	(0.436)	0.354	0.059
2	0.17	4.50	0.422	(0.436)	0.362	0.060
3	0.25	5.40	0.507	(0.436)	0.435	0.072
4	0.33	5.40	0.507	(0.436)	0.435	0.072
5	0.42	5.70	0.535	0.436	(0.459)	0.099
6	0.50	6.40	0.601	0.436	(0.515)	0.165
7	0.58	7.90	0.742	0.436	(0.636)	0.306
8	0.67	9.10	0.854	0.436	(0.733)	0.419
9	0.75	12.80	1.202	0.436	(1.031)	0.766
10	0.83	25.60	2.403	0.436	(2.062)	1.968
11	0.92	7.90	0.742	0.436	(0.636)	0.306
12	1.00	4.90	0.460	(0.436)	0.395	0.065

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.4

Flood volume = Effective rainfall 0.36(In)

times area 202.9(Ac.)/[(In)/(Ft.)) = 6.1(Ac.Ft)

Total soil loss = 0.42(In)

Total soil loss = 7.089(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 267425.2 Cubic Feet

Total soil loss = 308784.9 Cubic Feet

Peak flow rate of this hydrograph = 187.729(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0059	0.86	Q				

0+10	0.0373	4.55	Q						
0+15	0.0935	8.17	VQ						
0+20	0.1648	10.35	VQ						
0+25	0.2491	12.24	VQ						
0+30	0.3574	15.73	VQ						
0+35	0.5228	24.01	VQ						
0+40	0.7930	39.23		V	Q				
0+45	1.2172	61.59			V				
0+50	1.9883	111.97			Q				
0+55	3.2812	187.73				V			Q
1+ 0	4.3880	160.71					V		
1+ 5	4.9702	84.53			Q			Q	
1+10	5.3068	48.87						V	
1+15	5.5288	32.24			Q				
1+20	5.6883	23.16				Q			
1+25	5.8055	17.01					Q		
1+30	5.8952	13.03			Q				
1+35	5.9667	10.37			Q				
1+40	6.0212	7.92			Q				
1+45	6.0629	6.06			Q				
1+50	6.0937	4.48	Q						
1+55	6.1183	3.56	Q						
2+ 0	6.1359	2.57	Q						
2+ 5	6.1387	0.41	Q						
2+10	6.1392	0.07	Q						

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "A"

Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 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]
202.90	0.98	198.84

100 YEAR Area rainfall data:

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

202.90

2.48

503.19

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 0.980 (In)
 Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.331 (In)
 Areal adjustment factor = 99.91 %
 Adjusted average point rain = 1.330 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436
 Minimum soil loss rate ((In/Hr)) = 0.218
 (for 24 hour storm duration)
 Soil loss rate (decimal) = 0.858

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.208	(0.436)	0.178	0.030
2	0.17	1.30	0.208	(0.436)	0.178	0.030
3	0.25	1.10	0.176	(0.436)	0.151	0.025
4	0.33	1.50	0.239	(0.436)	0.205	0.034
5	0.42	1.50	0.239	(0.436)	0.205	0.034
6	0.50	1.80	0.287	(0.436)	0.246	0.041
7	0.58	1.50	0.239	(0.436)	0.205	0.034
8	0.67	1.80	0.287	(0.436)	0.246	0.041
9	0.75	1.80	0.287	(0.436)	0.246	0.041
10	0.83	1.50	0.239	(0.436)	0.205	0.034
11	0.92	1.60	0.255	(0.436)	0.219	0.036
12	1.00	1.80	0.287	(0.436)	0.246	0.041
13	1.08	2.20	0.351	(0.436)	0.301	0.050
14	1.17	2.20	0.351	(0.436)	0.301	0.050
15	1.25	2.20	0.351	(0.436)	0.301	0.050
16	1.33	2.00	0.319	(0.436)	0.274	0.045
17	1.42	2.60	0.415	(0.436)	0.356	0.059
18	1.50	2.70	0.431	(0.436)	0.370	0.061
19	1.58	2.40	0.383	(0.436)	0.329	0.054
20	1.67	2.70	0.431	(0.436)	0.370	0.061
21	1.75	3.30	0.527	0.436	(0.452)	0.091
22	1.83	3.10	0.495	(0.436)	0.424	0.070
23	1.92	2.90	0.463	(0.436)	0.397	0.066
24	2.00	3.00	0.479	(0.436)	0.411	0.068
25	2.08	3.10	0.495	(0.436)	0.424	0.070
26	2.17	4.20	0.670	0.436	(0.575)	0.235
27	2.25	5.00	0.798	0.436	(0.685)	0.362
28	2.33	3.50	0.559	0.436	(0.479)	0.123
29	2.42	6.80	1.085	0.436	(0.931)	0.650
30	2.50	7.30	1.165	0.436	(1.000)	0.730
31	2.58	8.20	1.309	0.436	(1.123)	0.873
32	2.67	5.90	0.942	0.436	(0.808)	0.506
33	2.75	2.00	0.319	(0.436)	0.274	0.045
34	2.83	1.80	0.287	(0.436)	0.246	0.041
35	2.92	1.80	0.287	(0.436)	0.246	0.041
36	3.00	0.60	0.096	(0.436)	0.082	0.014

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.8

Flood volume = Effective rainfall 0.40 (In)

times area 202.9 (Ac.) / [(In) / (Ft.)] = 6.8 (Ac.Ft)

Total soil loss = 0.93 (In)

Total soil loss = 15.677 (Ac.Ft)

Total rainfall = 1.33 (In)

Flood volume = 296825.8 Cubic Feet

Total soil loss = 682868.9 Cubic Feet

Peak flow rate of this hydrograph = 126.311 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0030	0.43	Q				
0+10	0.0187	2.27	Q				
0+15	0.0455	3.89	Q				
0+20	0.0760	4.43	Q				
0+25	0.1112	5.12	VQ				
0+30	0.1519	5.90	VQ				
0+35	0.1971	6.57	Q				
0+40	0.2442	6.85	Q				
0+45	0.2938	7.20	Q				
0+50	0.3457	7.54	QV				
0+55	0.3965	7.37	QV				
1+ 0	0.4470	7.33	QV				
1+ 5	0.5009	7.83	QV				
1+10	0.5608	8.70	Q V				
1+15	0.6253	9.36	Q V				
1+20	0.6912	9.56	Q V				
1+25	0.7576	9.65	Q V				
1+30	0.8292	10.39	Q V				
1+35	0.9062	11.18	Q V				
1+40	0.9840	11.30	Q V				
1+45	1.0667	12.00	Q V				
1+50	1.1628	13.95	Q V				
1+55	1.2625	14.47	Q V				
2+ 0	1.3578	13.84	Q V				
2+ 5	1.4524	13.75	Q V				
2+10	1.5653	16.39	Q V				
2+15	1.7630	28.70	Q V				
2+20	2.0564	42.61	Q V				
2+25	2.3772	46.58	Q V				
2+30	2.8735	72.06	Q V				
2+35	3.6097	106.90	Q V				
2+40	4.4796	126.31	Q V				
2+45	5.2582	113.04	Q V				

2+50	5.7540	71.99		Q		V
2+55	6.0483	42.74		Q		V
3+ 0	6.2601	30.76		Q		V
3+ 5	6.4150	22.49	Q			V
3+10	6.5247	15.93	Q			V
3+15	6.6048	11.63	Q			V
3+20	6.6668	9.01	Q			V
3+25	6.7138	6.81	Q			V
3+30	6.7481	4.99	Q			V
3+35	6.7753	3.94	Q			V
3+40	6.7943	2.76	Q			V
3+45	6.8066	1.78	Q			V
3+50	6.8118	0.75	Q			V
3+55	6.8129	0.17	Q			V
4+ 0	6.8137	0.11	Q			V
4+ 5	6.8141	0.06	Q			V
4+10	6.8142	0.01	Q			V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "A" Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
202.90	1.38	280.00

100 YEAR Area rainfall data:

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

202.90

3.48

706.09

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.872 (In)

Areal adjustment factor = 99.93 %

Adjusted average point rain = 1.871 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436

Minimum soil loss rate ((In/Hr)) = 0.218

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.112	(0.436)	0.096	0.016
2	0.17	0.60	0.135	(0.436)	0.116	0.019
3	0.25	0.60	0.135	(0.436)	0.116	0.019
4	0.33	0.60	0.135	(0.436)	0.116	0.019
5	0.42	0.60	0.135	(0.436)	0.116	0.019
6	0.50	0.70	0.157	(0.436)	0.135	0.022
7	0.58	0.70	0.157	(0.436)	0.135	0.022
8	0.67	0.70	0.157	(0.436)	0.135	0.022
9	0.75	0.70	0.157	(0.436)	0.135	0.022
10	0.83	0.70	0.157	(0.436)	0.135	0.022
11	0.92	0.70	0.157	(0.436)	0.135	0.022
12	1.00	0.80	0.180	(0.436)	0.154	0.026
13	1.08	0.80	0.180	(0.436)	0.154	0.026
14	1.17	0.80	0.180	(0.436)	0.154	0.026
15	1.25	0.80	0.180	(0.436)	0.154	0.026
16	1.33	0.80	0.180	(0.436)	0.154	0.026
17	1.42	0.80	0.180	(0.436)	0.154	0.026
18	1.50	0.80	0.180	(0.436)	0.154	0.026
19	1.58	0.80	0.180	(0.436)	0.154	0.026
20	1.67	0.80	0.180	(0.436)	0.154	0.026
21	1.75	0.80	0.180	(0.436)	0.154	0.026
22	1.83	0.80	0.180	(0.436)	0.154	0.026
23	1.92	0.80	0.180	(0.436)	0.154	0.026
24	2.00	0.90	0.202	(0.436)	0.173	0.029
25	2.08	0.80	0.180	(0.436)	0.154	0.026
26	2.17	0.90	0.202	(0.436)	0.173	0.029
27	2.25	0.90	0.202	(0.436)	0.173	0.029
28	2.33	0.90	0.202	(0.436)	0.173	0.029
29	2.42	0.90	0.202	(0.436)	0.173	0.029
30	2.50	0.90	0.202	(0.436)	0.173	0.029
31	2.58	0.90	0.202	(0.436)	0.173	0.029
32	2.67	0.90	0.202	(0.436)	0.173	0.029
33	2.75	1.00	0.224	(0.436)	0.193	0.032
34	2.83	1.00	0.224	(0.436)	0.193	0.032
35	2.92	1.00	0.224	(0.436)	0.193	0.032
36	3.00	1.00	0.224	(0.436)	0.193	0.032

37	3.08	1.00	0.224	(0.436)	0.193	0.032
38	3.17	1.10	0.247	(0.436)	0.212	0.035
39	3.25	1.10	0.247	(0.436)	0.212	0.035
40	3.33	1.10	0.247	(0.436)	0.212	0.035
41	3.42	1.20	0.269	(0.436)	0.231	0.038
42	3.50	1.30	0.292	(0.436)	0.250	0.041
43	3.58	1.40	0.314	(0.436)	0.270	0.045
44	3.67	1.40	0.314	(0.436)	0.270	0.045
45	3.75	1.50	0.337	(0.436)	0.289	0.048
46	3.83	1.50	0.337	(0.436)	0.289	0.048
47	3.92	1.60	0.359	(0.436)	0.308	0.051
48	4.00	1.60	0.359	(0.436)	0.308	0.051
49	4.08	1.70	0.382	(0.436)	0.327	0.054
50	4.17	1.80	0.404	(0.436)	0.347	0.057
51	4.25	1.90	0.426	(0.436)	0.366	0.061
52	4.33	2.00	0.449	(0.436)	0.385	0.064
53	4.42	2.10	0.471	(0.436)	0.404	0.067
54	4.50	2.10	0.471	(0.436)	0.404	0.067
55	4.58	2.20	0.494	(0.436)	0.424	0.070
56	4.67	2.30	0.516	0.436 (0.443)		0.081
57	4.75	2.40	0.539	0.436 (0.462)		0.103
58	4.83	2.40	0.539	0.436 (0.462)		0.103
59	4.92	2.50	0.561	0.436 (0.481)		0.125
60	5.00	2.60	0.584	0.436 (0.501)		0.148
61	5.08	3.10	0.696	0.436 (0.597)		0.260
62	5.17	3.60	0.808	0.436 (0.693)		0.372
63	5.25	3.90	0.875	0.436 (0.751)		0.440
64	5.33	4.20	0.943	0.436 (0.809)		0.507
65	5.42	4.70	1.055	0.436 (0.905)		0.619
66	5.50	5.60	1.257	0.436 (1.078)		0.821
67	5.58	1.90	0.426	(0.436)	0.366	0.061
68	5.67	0.90	0.202	(0.436)	0.173	0.029
69	5.75	0.60	0.135	(0.436)	0.116	0.019
70	5.83	0.50	0.112	(0.436)	0.096	0.016
71	5.92	0.30	0.067	(0.436)	0.058	0.010
72	6.00	0.20	0.045	(0.436)	0.039	0.006

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.6

Flood volume = Effective rainfall 0.47(In)
times area 202.9(Ac.)/[(In)/(Ft.)) = 7.9(Ac.Ft)
Total soil loss = 1.41(In)
Total soil loss = 23.764(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 342565.6 Cubic Feet
Total soil loss = 1035156.3 Cubic Feet

Peak flow rate of this hydrograph = 112.086(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0016		0.23	Q				
0+10	0.0104		1.28	Q				
0+15	0.0269		2.39	Q				
0+20	0.0471		2.94	Q				
0+25	0.0693		3.22	Q				
0+30	0.0931		3.45	Q				
0+35	0.1192		3.79	Q				
0+40	0.1472		4.06	Q				
0+45	0.1762		4.21	Q				
0+50	0.2058		4.31	QV				
0+55	0.2360		4.38	QV				
1+ 0	0.2669		4.49	QV				
1+ 5	0.2995		4.73	QV				
1+10	0.3335		4.94	QV				
1+15	0.3683		5.05	Q				
1+20	0.4034		5.10	QV				
1+25	0.4387		5.13	QV				
1+30	0.4743		5.16	QV				
1+35	0.5099		5.18	QV				
1+40	0.5457		5.19	QV				
1+45	0.5815		5.20	QV				
1+50	0.6173		5.21	Q V				
1+55	0.6532		5.21	Q V				
2+ 0	0.6895		5.26	Q V				
2+ 5	0.7268		5.42	Q V				
2+10	0.7644		5.45	Q V				
2+15	0.8026		5.54	Q V				
2+20	0.8418		5.69	Q V				
2+25	0.8814		5.76	Q V				
2+30	0.9213		5.79	Q V				
2+35	0.9613		5.81	Q V				
2+40	1.0015		5.83	Q V				
2+45	1.0420		5.89	Q V				
2+50	1.0840		6.10	Q V				
2+55	1.1273		6.29	Q V				
3+ 0	1.1712		6.37	Q V				
3+ 5	1.2153		6.41	Q V				
3+10	1.2601		6.49	Q V				
3+15	1.3063		6.71	Q V				
3+20	1.3539		6.91	Q V				
3+25	1.4024		7.05	Q V				
3+30	1.4530		7.34	Q V				
3+35	1.5068		7.81	Q V				
3+40	1.5639		8.29	Q V				
3+45	1.6235		8.65	Q V				
3+50	1.6856		9.01	Q V				
3+55	1.7499		9.35	Q V				
4+ 0	1.8166		9.69	Q V				
4+ 5	1.8856		10.01	Q V				
4+10	1.9572		10.40	Q V				
4+15	2.0325		10.92	Q V				

4+20	2.1117	11.50	Q	V			
4+25	2.1949	12.09	Q	V			
4+30	2.2821	12.65	Q	V			
4+35	2.3721	13.08	Q	V			
4+40	2.4660	13.63	Q	V			
4+45	2.5687	14.92	Q	V			
4+50	2.6864	17.08	Q	V			
4+55	2.8175	19.05	Q	V			
5+ 0	2.9657	21.51	Q	V			
5+ 5	3.1468	26.29	Q	V			
5+10	3.4020	37.06	Q	V			
5+15	3.7636	52.51	Q	V			
5+20	4.2277	67.38	Q	V			
5+25	4.7898	81.62	Q	V			
5+30	5.4772	99.82	Q	V			
5+35	6.2492	112.09	Q	V			
5+40	6.8088	81.26	Q	V			
5+45	7.1112	43.91	Q	V			
5+50	7.3116	29.10	Q	V			
5+55	7.4587	21.35	Q	V			
6+ 0	7.5692	16.04	Q	V			
6+ 5	7.6521	12.04	Q	V			
6+10	7.7143	9.03	Q	V			
6+15	7.7615	6.86	Q	V			
6+20	7.7966	5.09	Q	V			
6+25	7.8224	3.74	Q	V			
6+30	7.8407	2.66	Q	V			
6+35	7.8536	1.88	Q	V			
6+40	7.8613	1.12	Q	V			
6+45	7.8627	0.19	Q	V			
6+50	7.8634	0.10	Q	V			
6+55	7.8638	0.06	Q	V			
7+ 0	7.8641	0.04	Q	V			
7+ 5	7.8642	0.02	Q	V			
7+10	7.8642	0.01	Q	V			

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "A" Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 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]
202.90	2.48	503.19

100 YEAR Area rainfall data:

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

202.90

6.90

1400.01

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 3.515 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 3.514 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	69.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	16.2	0.870	0.500	0.479	0.025	0.012
69.0	49.8	0.574	0.500	0.316	0.010	0.003
75.0	57.0	0.501	0.500	0.275	0.018	0.005
45.0	26.0	0.792	0.000	0.792	0.079	0.062
53.0	33.4	0.729	0.000	0.729	0.025	0.018
80.0	63.0	0.438	0.000	0.438	0.393	0.172
85.0	70.0	0.362	0.000	0.362	0.450	0.163
Sum (F) =						0.436

Area averaged mean soil loss (F) (In/Hr) = 0.436

Minimum soil loss rate ((In/Hr)) = 0.218

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

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	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.028	(0.772)	0.024	0.004
2	0.17	0.07	0.028	(0.769)	0.024	0.004
3	0.25	0.07	0.028	(0.766)	0.024	0.004
4	0.33	0.10	0.042	(0.763)	0.036	0.006
5	0.42	0.10	0.042	(0.760)	0.036	0.006
6	0.50	0.10	0.042	(0.757)	0.036	0.006
7	0.58	0.10	0.042	(0.755)	0.036	0.006
8	0.67	0.10	0.042	(0.752)	0.036	0.006
9	0.75	0.10	0.042	(0.749)	0.036	0.006
10	0.83	0.13	0.056	(0.746)	0.048	0.008
11	0.92	0.13	0.056	(0.743)	0.048	0.008
12	1.00	0.13	0.056	(0.740)	0.048	0.008
13	1.08	0.10	0.042	(0.737)	0.036	0.006
14	1.17	0.10	0.042	(0.734)	0.036	0.006
15	1.25	0.10	0.042	(0.731)	0.036	0.006
16	1.33	0.10	0.042	(0.728)	0.036	0.006
17	1.42	0.10	0.042	(0.725)	0.036	0.006
18	1.50	0.10	0.042	(0.722)	0.036	0.006
19	1.58	0.10	0.042	(0.719)	0.036	0.006
20	1.67	0.10	0.042	(0.717)	0.036	0.006
21	1.75	0.10	0.042	(0.714)	0.036	0.006
22	1.83	0.13	0.056	(0.711)	0.048	0.008
23	1.92	0.13	0.056	(0.708)	0.048	0.008
24	2.00	0.13	0.056	(0.705)	0.048	0.008
25	2.08	0.13	0.056	(0.702)	0.048	0.008
26	2.17	0.13	0.056	(0.699)	0.048	0.008
27	2.25	0.13	0.056	(0.697)	0.048	0.008
28	2.33	0.13	0.056	(0.694)	0.048	0.008
29	2.42	0.13	0.056	(0.691)	0.048	0.008
30	2.50	0.13	0.056	(0.688)	0.048	0.008
31	2.58	0.17	0.070	(0.685)	0.060	0.010
32	2.67	0.17	0.070	(0.682)	0.060	0.010
33	2.75	0.17	0.070	(0.680)	0.060	0.010
34	2.83	0.17	0.070	(0.677)	0.060	0.010
35	2.92	0.17	0.070	(0.674)	0.060	0.010
36	3.00	0.17	0.070	(0.671)	0.060	0.010

37	3.08	0.17	0.070	(0.669)	0.060	0.010
38	3.17	0.17	0.070	(0.666)	0.060	0.010
39	3.25	0.17	0.070	(0.663)	0.060	0.010
40	3.33	0.17	0.070	(0.660)	0.060	0.010
41	3.42	0.17	0.070	(0.657)	0.060	0.010
42	3.50	0.17	0.070	(0.655)	0.060	0.010
43	3.58	0.17	0.070	(0.652)	0.060	0.010
44	3.67	0.17	0.070	(0.649)	0.060	0.010
45	3.75	0.17	0.070	(0.647)	0.060	0.010
46	3.83	0.20	0.084	(0.644)	0.072	0.012
47	3.92	0.20	0.084	(0.641)	0.072	0.012
48	4.00	0.20	0.084	(0.638)	0.072	0.012
49	4.08	0.20	0.084	(0.636)	0.072	0.012
50	4.17	0.20	0.084	(0.633)	0.072	0.012
51	4.25	0.20	0.084	(0.630)	0.072	0.012
52	4.33	0.23	0.098	(0.628)	0.084	0.014
53	4.42	0.23	0.098	(0.625)	0.084	0.014
54	4.50	0.23	0.098	(0.622)	0.084	0.014
55	4.58	0.23	0.098	(0.620)	0.084	0.014
56	4.67	0.23	0.098	(0.617)	0.084	0.014
57	4.75	0.23	0.098	(0.614)	0.084	0.014
58	4.83	0.27	0.112	(0.612)	0.096	0.016
59	4.92	0.27	0.112	(0.609)	0.096	0.016
60	5.00	0.27	0.112	(0.606)	0.096	0.016
61	5.08	0.20	0.084	(0.604)	0.072	0.012
62	5.17	0.20	0.084	(0.601)	0.072	0.012
63	5.25	0.20	0.084	(0.598)	0.072	0.012
64	5.33	0.23	0.098	(0.596)	0.084	0.014
65	5.42	0.23	0.098	(0.593)	0.084	0.014
66	5.50	0.23	0.098	(0.591)	0.084	0.014
67	5.58	0.27	0.112	(0.588)	0.096	0.016
68	5.67	0.27	0.112	(0.585)	0.096	0.016
69	5.75	0.27	0.112	(0.583)	0.096	0.016
70	5.83	0.27	0.112	(0.580)	0.096	0.016
71	5.92	0.27	0.112	(0.578)	0.096	0.016
72	6.00	0.27	0.112	(0.575)	0.096	0.016
73	6.08	0.30	0.126	(0.573)	0.109	0.018
74	6.17	0.30	0.126	(0.570)	0.109	0.018
75	6.25	0.30	0.126	(0.567)	0.109	0.018
76	6.33	0.30	0.126	(0.565)	0.109	0.018
77	6.42	0.30	0.126	(0.562)	0.109	0.018
78	6.50	0.30	0.126	(0.560)	0.109	0.018
79	6.58	0.33	0.141	(0.557)	0.121	0.020
80	6.67	0.33	0.141	(0.555)	0.121	0.020
81	6.75	0.33	0.141	(0.552)	0.121	0.020
82	6.83	0.33	0.141	(0.550)	0.121	0.020
83	6.92	0.33	0.141	(0.547)	0.121	0.020
84	7.00	0.33	0.141	(0.545)	0.121	0.020
85	7.08	0.33	0.141	(0.542)	0.121	0.020
86	7.17	0.33	0.141	(0.540)	0.121	0.020
87	7.25	0.33	0.141	(0.537)	0.121	0.020
88	7.33	0.37	0.155	(0.535)	0.133	0.022
89	7.42	0.37	0.155	(0.533)	0.133	0.022
90	7.50	0.37	0.155	(0.530)	0.133	0.022

91	7.58	0.40	0.169	(0.528)	0.145	0.024
92	7.67	0.40	0.169	(0.525)	0.145	0.024
93	7.75	0.40	0.169	(0.523)	0.145	0.024
94	7.83	0.43	0.183	(0.520)	0.157	0.026
95	7.92	0.43	0.183	(0.518)	0.157	0.026
96	8.00	0.43	0.183	(0.516)	0.157	0.026
97	8.08	0.50	0.211	(0.513)	0.181	0.030
98	8.17	0.50	0.211	(0.511)	0.181	0.030
99	8.25	0.50	0.211	(0.508)	0.181	0.030
100	8.33	0.50	0.211	(0.506)	0.181	0.030
101	8.42	0.50	0.211	(0.504)	0.181	0.030
102	8.50	0.50	0.211	(0.501)	0.181	0.030
103	8.58	0.53	0.225	(0.499)	0.193	0.032
104	8.67	0.53	0.225	(0.497)	0.193	0.032
105	8.75	0.53	0.225	(0.494)	0.193	0.032
106	8.83	0.57	0.239	(0.492)	0.205	0.034
107	8.92	0.57	0.239	(0.490)	0.205	0.034
108	9.00	0.57	0.239	(0.487)	0.205	0.034
109	9.08	0.63	0.267	(0.485)	0.229	0.038
110	9.17	0.63	0.267	(0.483)	0.229	0.038
111	9.25	0.63	0.267	(0.480)	0.229	0.038
112	9.33	0.67	0.281	(0.478)	0.241	0.040
113	9.42	0.67	0.281	(0.476)	0.241	0.040
114	9.50	0.67	0.281	(0.474)	0.241	0.040
115	9.58	0.70	0.295	(0.471)	0.253	0.042
116	9.67	0.70	0.295	(0.469)	0.253	0.042
117	9.75	0.70	0.295	(0.467)	0.253	0.042
118	9.83	0.73	0.309	(0.465)	0.265	0.044
119	9.92	0.73	0.309	(0.462)	0.265	0.044
120	10.00	0.73	0.309	(0.460)	0.265	0.044
121	10.08	0.50	0.211	(0.458)	0.181	0.030
122	10.17	0.50	0.211	(0.456)	0.181	0.030
123	10.25	0.50	0.211	(0.453)	0.181	0.030
124	10.33	0.50	0.211	(0.451)	0.181	0.030
125	10.42	0.50	0.211	(0.449)	0.181	0.030
126	10.50	0.50	0.211	(0.447)	0.181	0.030
127	10.58	0.67	0.281	(0.445)	0.241	0.040
128	10.67	0.67	0.281	(0.443)	0.241	0.040
129	10.75	0.67	0.281	(0.440)	0.241	0.040
130	10.83	0.67	0.281	(0.438)	0.241	0.040
131	10.92	0.67	0.281	(0.436)	0.241	0.040
132	11.00	0.67	0.281	(0.434)	0.241	0.040
133	11.08	0.63	0.267	(0.432)	0.229	0.038
134	11.17	0.63	0.267	(0.430)	0.229	0.038
135	11.25	0.63	0.267	(0.428)	0.229	0.038
136	11.33	0.63	0.267	(0.425)	0.229	0.038
137	11.42	0.63	0.267	(0.423)	0.229	0.038
138	11.50	0.63	0.267	(0.421)	0.229	0.038
139	11.58	0.57	0.239	(0.419)	0.205	0.034
140	11.67	0.57	0.239	(0.417)	0.205	0.034
141	11.75	0.57	0.239	(0.415)	0.205	0.034
142	11.83	0.60	0.253	(0.413)	0.217	0.036
143	11.92	0.60	0.253	(0.411)	0.217	0.036
144	12.00	0.60	0.253	(0.409)	0.217	0.036

145	12.08	0.83	0.351	(0.407)	0.301	0.050
146	12.17	0.83	0.351	(0.405)	0.301	0.050
147	12.25	0.83	0.351	(0.403)	0.301	0.050
148	12.33	0.87	0.365	(0.401)	0.313	0.052
149	12.42	0.87	0.365	(0.399)	0.313	0.052
150	12.50	0.87	0.365	(0.397)	0.313	0.052
151	12.58	0.93	0.394	(0.395)	0.338	0.056
152	12.67	0.93	0.394	(0.393)	0.338	0.056
153	12.75	0.93	0.394	(0.391)	0.338	0.056
154	12.83	0.97	0.408	(0.389)	0.350	0.058
155	12.92	0.97	0.408	(0.387)	0.350	0.058
156	13.00	0.97	0.408	(0.385)	0.350	0.058
157	13.08	1.13	0.478	0.383	(0.410)	0.095
158	13.17	1.13	0.478	0.381	(0.410)	0.097
159	13.25	1.13	0.478	0.379	(0.410)	0.099
160	13.33	1.13	0.478	0.377	(0.410)	0.101
161	13.42	1.13	0.478	0.375	(0.410)	0.103
162	13.50	1.13	0.478	0.373	(0.410)	0.105
163	13.58	0.77	0.323	(0.371)	0.277	0.046
164	13.67	0.77	0.323	(0.369)	0.277	0.046
165	13.75	0.77	0.323	(0.368)	0.277	0.046
166	13.83	0.77	0.323	(0.366)	0.277	0.046
167	13.92	0.77	0.323	(0.364)	0.277	0.046
168	14.00	0.77	0.323	(0.362)	0.277	0.046
169	14.08	0.90	0.379	(0.360)	0.326	0.054
170	14.17	0.90	0.379	(0.358)	0.326	0.054
171	14.25	0.90	0.379	(0.356)	0.326	0.054
172	14.33	0.87	0.365	(0.355)	0.313	0.052
173	14.42	0.87	0.365	(0.353)	0.313	0.052
174	14.50	0.87	0.365	(0.351)	0.313	0.052
175	14.58	0.87	0.365	(0.349)	0.313	0.052
176	14.67	0.87	0.365	(0.347)	0.313	0.052
177	14.75	0.87	0.365	(0.346)	0.313	0.052
178	14.83	0.83	0.351	(0.344)	0.301	0.050
179	14.92	0.83	0.351	(0.342)	0.301	0.050
180	15.00	0.83	0.351	(0.340)	0.301	0.050
181	15.08	0.80	0.337	(0.339)	0.289	0.048
182	15.17	0.80	0.337	(0.337)	0.289	0.048
183	15.25	0.80	0.337	(0.335)	0.289	0.048
184	15.33	0.77	0.323	(0.333)	0.277	0.046
185	15.42	0.77	0.323	(0.332)	0.277	0.046
186	15.50	0.77	0.323	(0.330)	0.277	0.046
187	15.58	0.63	0.267	(0.328)	0.229	0.038
188	15.67	0.63	0.267	(0.327)	0.229	0.038
189	15.75	0.63	0.267	(0.325)	0.229	0.038
190	15.83	0.63	0.267	(0.323)	0.229	0.038
191	15.92	0.63	0.267	(0.322)	0.229	0.038
192	16.00	0.63	0.267	(0.320)	0.229	0.038
193	16.08	0.13	0.056	(0.318)	0.048	0.008
194	16.17	0.13	0.056	(0.317)	0.048	0.008
195	16.25	0.13	0.056	(0.315)	0.048	0.008
196	16.33	0.13	0.056	(0.313)	0.048	0.008
197	16.42	0.13	0.056	(0.312)	0.048	0.008
198	16.50	0.13	0.056	(0.310)	0.048	0.008

199	16.58	0.10	0.042	(0.309)	0.036	0.006
200	16.67	0.10	0.042	(0.307)	0.036	0.006
201	16.75	0.10	0.042	(0.306)	0.036	0.006
202	16.83	0.10	0.042	(0.304)	0.036	0.006
203	16.92	0.10	0.042	(0.302)	0.036	0.006
204	17.00	0.10	0.042	(0.301)	0.036	0.006
205	17.08	0.17	0.070	(0.299)	0.060	0.010
206	17.17	0.17	0.070	(0.298)	0.060	0.010
207	17.25	0.17	0.070	(0.296)	0.060	0.010
208	17.33	0.17	0.070	(0.295)	0.060	0.010
209	17.42	0.17	0.070	(0.293)	0.060	0.010
210	17.50	0.17	0.070	(0.292)	0.060	0.010
211	17.58	0.17	0.070	(0.291)	0.060	0.010
212	17.67	0.17	0.070	(0.289)	0.060	0.010
213	17.75	0.17	0.070	(0.288)	0.060	0.010
214	17.83	0.13	0.056	(0.286)	0.048	0.008
215	17.92	0.13	0.056	(0.285)	0.048	0.008
216	18.00	0.13	0.056	(0.283)	0.048	0.008
217	18.08	0.13	0.056	(0.282)	0.048	0.008
218	18.17	0.13	0.056	(0.281)	0.048	0.008
219	18.25	0.13	0.056	(0.279)	0.048	0.008
220	18.33	0.13	0.056	(0.278)	0.048	0.008
221	18.42	0.13	0.056	(0.277)	0.048	0.008
222	18.50	0.13	0.056	(0.275)	0.048	0.008
223	18.58	0.10	0.042	(0.274)	0.036	0.006
224	18.67	0.10	0.042	(0.273)	0.036	0.006
225	18.75	0.10	0.042	(0.271)	0.036	0.006
226	18.83	0.07	0.028	(0.270)	0.024	0.004
227	18.92	0.07	0.028	(0.269)	0.024	0.004
228	19.00	0.07	0.028	(0.267)	0.024	0.004
229	19.08	0.10	0.042	(0.266)	0.036	0.006
230	19.17	0.10	0.042	(0.265)	0.036	0.006
231	19.25	0.10	0.042	(0.264)	0.036	0.006
232	19.33	0.13	0.056	(0.262)	0.048	0.008
233	19.42	0.13	0.056	(0.261)	0.048	0.008
234	19.50	0.13	0.056	(0.260)	0.048	0.008
235	19.58	0.10	0.042	(0.259)	0.036	0.006
236	19.67	0.10	0.042	(0.258)	0.036	0.006
237	19.75	0.10	0.042	(0.256)	0.036	0.006
238	19.83	0.07	0.028	(0.255)	0.024	0.004
239	19.92	0.07	0.028	(0.254)	0.024	0.004
240	20.00	0.07	0.028	(0.253)	0.024	0.004
241	20.08	0.10	0.042	(0.252)	0.036	0.006
242	20.17	0.10	0.042	(0.251)	0.036	0.006
243	20.25	0.10	0.042	(0.250)	0.036	0.006
244	20.33	0.10	0.042	(0.249)	0.036	0.006
245	20.42	0.10	0.042	(0.248)	0.036	0.006
246	20.50	0.10	0.042	(0.246)	0.036	0.006
247	20.58	0.10	0.042	(0.245)	0.036	0.006
248	20.67	0.10	0.042	(0.244)	0.036	0.006
249	20.75	0.10	0.042	(0.243)	0.036	0.006
250	20.83	0.07	0.028	(0.242)	0.024	0.004
251	20.92	0.07	0.028	(0.241)	0.024	0.004
252	21.00	0.07	0.028	(0.240)	0.024	0.004

253	21.08	0.10	0.042	(0.240)	0.036	0.006
254	21.17	0.10	0.042	(0.239)	0.036	0.006
255	21.25	0.10	0.042	(0.238)	0.036	0.006
256	21.33	0.07	0.028	(0.237)	0.024	0.004
257	21.42	0.07	0.028	(0.236)	0.024	0.004
258	21.50	0.07	0.028	(0.235)	0.024	0.004
259	21.58	0.10	0.042	(0.234)	0.036	0.006
260	21.67	0.10	0.042	(0.233)	0.036	0.006
261	21.75	0.10	0.042	(0.232)	0.036	0.006
262	21.83	0.07	0.028	(0.232)	0.024	0.004
263	21.92	0.07	0.028	(0.231)	0.024	0.004
264	22.00	0.07	0.028	(0.230)	0.024	0.004
265	22.08	0.10	0.042	(0.229)	0.036	0.006
266	22.17	0.10	0.042	(0.229)	0.036	0.006
267	22.25	0.10	0.042	(0.228)	0.036	0.006
268	22.33	0.07	0.028	(0.227)	0.024	0.004
269	22.42	0.07	0.028	(0.226)	0.024	0.004
270	22.50	0.07	0.028	(0.226)	0.024	0.004
271	22.58	0.07	0.028	(0.225)	0.024	0.004
272	22.67	0.07	0.028	(0.224)	0.024	0.004
273	22.75	0.07	0.028	(0.224)	0.024	0.004
274	22.83	0.07	0.028	(0.223)	0.024	0.004
275	22.92	0.07	0.028	(0.223)	0.024	0.004
276	23.00	0.07	0.028	(0.222)	0.024	0.004
277	23.08	0.07	0.028	(0.222)	0.024	0.004
278	23.17	0.07	0.028	(0.221)	0.024	0.004
279	23.25	0.07	0.028	(0.221)	0.024	0.004
280	23.33	0.07	0.028	(0.220)	0.024	0.004
281	23.42	0.07	0.028	(0.220)	0.024	0.004
282	23.50	0.07	0.028	(0.219)	0.024	0.004
283	23.58	0.07	0.028	(0.219)	0.024	0.004
284	23.67	0.07	0.028	(0.219)	0.024	0.004
285	23.75	0.07	0.028	(0.218)	0.024	0.004
286	23.83	0.07	0.028	(0.218)	0.024	0.004
287	23.92	0.07	0.028	(0.218)	0.024	0.004
288	24.00	0.07	0.028	(0.218)	0.024	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.2

Flood volume = Effective rainfall 0.52(In)
times area 202.9(Ac.)/[(In)/(Ft.)] = 8.7(Ac.Ft)

Total soil loss = 3.00(In)

Total soil loss = 50.695(Ac.Ft)

Total rainfall = 3.51(In)

Flood volume = 379789.4 Cubic Feet

Total soil loss = 2208276.8 Cubic Feet

Peak flow rate of this hydrograph = 19.553(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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0004		0.06	Q				
0+10	0.0025		0.31	Q				
0+15	0.0062		0.54	VQ				
0+20	0.0108		0.66	VQ				
0+25	0.0165		0.84	VQ				
0+30	0.0233		0.99	VQ				
0+35	0.0306		1.06	V Q				
0+40	0.0382		1.10	V Q				
0+45	0.0460		1.13	V Q				
0+50	0.0542		1.19	V Q				
0+55	0.0634		1.33	V Q				
1+ 0	0.0734		1.46	V Q				
1+ 5	0.0837		1.49	V Q				
1+10	0.0933		1.40	V Q				
1+15	0.1023		1.31	V Q				
1+20	0.1111		1.28	V Q				
1+25	0.1198		1.26	V Q				
1+30	0.1285		1.26	V Q				
1+35	0.1371		1.25	V Q				
1+40	0.1457		1.24	V Q				
1+45	0.1542		1.24	V Q				
1+50	0.1629		1.27	V Q				
1+55	0.1725		1.39	V Q				
2+ 0	0.1828		1.50	V Q				
2+ 5	0.1935		1.55	V Q				
2+10	0.2043		1.57	V Q				
2+15	0.2152		1.59	V Q				
2+20	0.2262		1.60	V Q				
2+25	0.2373		1.61	V Q				
2+30	0.2484		1.61	V Q				
2+35	0.2598		1.65	V Q				
2+40	0.2720		1.78	V Q				
2+45	0.2851		1.90	V Q				
2+50	0.2985		1.95	V Q				
2+55	0.3121		1.97	V Q				
3+ 0	0.3258		1.99	V Q				
3+ 5	0.3397		2.01	V Q				
3+10	0.3535		2.02	V Q				
3+15	0.3675		2.02	V Q				
3+20	0.3815		2.03	V Q				
3+25	0.3955		2.03	V Q				
3+30	0.4095		2.04	V Q				
3+35	0.4236		2.04	V Q				
3+40	0.4376		2.04	V Q				
3+45	0.4517		2.04	V Q				
3+50	0.4660		2.07	V Q				
3+55	0.4811		2.20	V Q				
4+ 0	0.4971		2.31	V Q				
4+ 5	0.5133		2.36	V Q				
4+10	0.5297		2.39	V Q				
4+15	0.5463		2.40	V Q				

4+20	0.5631	2.45	V Q				
4+25	0.5809	2.58	V Q				
4+30	0.5995	2.70	V Q				
4+35	0.6185	2.75	V Q				
4+40	0.6376	2.78	V Q				
4+45	0.6569	2.81	V Q				
4+50	0.6766	2.85	V Q				
4+55	0.6971	2.99	V Q				
5+ 0	0.7186	3.11	V Q				
5+ 5	0.7399	3.10	V Q				
5+10	0.7598	2.88	V Q				
5+15	0.7782	2.68	V Q				
5+20	0.7963	2.63	V Q				
5+25	0.8150	2.71	V Q				
5+30	0.8343	2.80	V Q				
5+35	0.8540	2.86	V Q				
5+40	0.8746	2.99	VQ				
5+45	0.8961	3.12	V Q				
5+50	0.9179	3.16	V Q				
5+55	0.9399	3.19	V Q				
6+ 0	0.9620	3.21	V Q				
6+ 5	0.9844	3.26	V Q				
6+10	1.0078	3.39	V Q				
6+15	1.0320	3.51	V Q				
6+20	1.0565	3.57	V Q				
6+25	1.0813	3.60	V Q				
6+30	1.1063	3.62	V Q				
6+35	1.1316	3.67	V Q				
6+40	1.1578	3.80	V Q				
6+45	1.1848	3.93	V Q				
6+50	1.2122	3.98	V Q				
6+55	1.2398	4.01	V Q				
7+ 0	1.2676	4.03	V Q				
7+ 5	1.2955	4.05	V Q				
7+10	1.3234	4.06	V Q				
7+15	1.3514	4.07	V Q				
7+20	1.3797	4.10	V Q				
7+25	1.4089	4.23	V Q				
7+30	1.4388	4.35	V Q				
7+35	1.4693	4.43	V Q				
7+40	1.5009	4.58	V Q				
7+45	1.5334	4.72	V Q				
7+50	1.5664	4.80	V Q				
7+55	1.6006	4.96	V Q				
8+ 0	1.6358	5.10	V Q				
8+ 5	1.6718	5.23	V Q				
8+10	1.7098	5.52	V Q				
8+15	1.7496	5.77	V Q				
8+20	1.7901	5.89	V Q				
8+25	1.8311	5.96	V Q				
8+30	1.8725	6.01	V Q				
8+35	1.9143	6.07	V Q				
8+40	1.9571	6.22	V Q				
8+45	2.0009	6.35	V Q				

8+50	2.0453	6.44	V	Q			
8+55	2.0908	6.61	V	Q			
9+ 0	2.1372	6.75	V	Q			
9+ 5	2.1845	6.87	V	Q			
9+10	2.2338	7.16	V	Q			
9+15	2.2849	7.42	V	Q			
9+20	2.3370	7.56	V	Q			
9+25	2.3903	7.75	V	Q			
9+30	2.4448	7.91	V	Q			
9+35	2.5000	8.02	V	Q			
9+40	2.5565	8.20	V	Q			
9+45	2.6140	8.35	V	Q			
9+50	2.6722	8.45	V	Q			
9+55	2.7316	8.62	V	Q			
10+ 0	2.7920	8.77	V	Q			
10+ 5	2.8514	8.63	V	Q			
10+10	2.9052	7.81	V	Q			
10+15	2.9537	7.04	VQ				
10+20	3.0001	6.74	Q				
10+25	3.0453	6.57	Q				
10+30	3.0898	6.46	Q V				
10+35	3.1347	6.52	QV				
10+40	3.1835	7.09	Q				
10+45	3.2360	7.61	VQ				
10+50	3.2897	7.81	Q				
10+55	3.3442	7.91	Q				
11+ 0	3.3991	7.98	Q				
11+ 5	3.4542	7.99	Q				
11+10	3.5086	7.90	QV				
11+15	3.5623	7.81	QV				
11+20	3.6160	7.79	QV				
11+25	3.6696	7.79	QV				
11+30	3.7232	7.78	Q V				
11+35	3.7764	7.73	Q V				
11+40	3.8279	7.48	Q V				
11+45	3.8779	7.25	Q V				
11+50	3.9274	7.18	Q V				
11+55	3.9773	7.25	Q V				
12+ 0	4.0278	7.33	Q V				
12+ 5	4.0798	7.55	Q V				
12+10	4.1378	8.43	Q V				
12+15	4.2014	9.23	QV				
12+20	4.2674	9.58	Q				
12+25	4.3355	9.89	Q				
12+30	4.4053	10.13	Q				
12+35	4.4765	10.33	Q				
12+40	4.5499	10.67	VQ				
12+45	4.6255	10.97	Q				
12+50	4.7022	11.14	VQ				
12+55	4.7805	11.36	VQ				
13+ 0	4.8600	11.55	VQ				
13+ 5	4.9440	12.19	V Q				
13+10	5.0445	14.60	V		Q		
13+15	5.1610	16.92	V		V		Q

13+20	5.2855	18.07				V		Q
13+25	5.4155	18.88				V		Q
13+30	5.5501	19.55				V		Q
13+35	5.6827	19.26				V		Q
13+40	5.7928	15.98				V	Q	
13+45	5.8815	12.88				QV		
13+50	5.9621	11.70				V		
13+55	6.0383	11.07				V		
14+ 0	6.1117	10.65				Q	V	
14+ 5	6.1837	10.46				Q	V	
14+10	6.2577	10.75				Q	V	
14+15	6.3338	11.05				Q	V	
14+20	6.4099	11.05				Q	V	
14+25	6.4850	10.91				Q	V	
14+30	6.5592	10.77				Q	V	
14+35	6.6329	10.71				Q	V	
14+40	6.7063	10.65				Q	V	
14+45	6.7793	10.60				Q	V	
14+50	6.8521	10.58				Q	V	
14+55	6.9242	10.46				Q	V	
15+ 0	6.9955	10.36				Q	V	
15+ 5	7.0664	10.28				Q	V	
15+10	7.1362	10.14				Q	V	
15+15	7.2052	10.01				Q	V	
15+20	7.2735	9.92				Q	V	
15+25	7.3407	9.76				Q	V	
15+30	7.4069	9.62				Q	V	
15+35	7.4719	9.43				Q	V	
15+40	7.5331	8.90				Q	V	
15+45	7.5911	8.41				Q	V	
15+50	7.6476	8.20				Q	V	
15+55	7.7032	8.08				Q	V	
16+ 0	7.7583	8.00				Q	V	
16+ 5	7.8100	7.50				Q	V	
16+10	7.8484	5.58		Q			V	
16+15	7.8748	3.83			Q		V	
16+20	7.8963	3.11			Q		V	
16+25	7.9149	2.70			Q		V	
16+30	7.9315	2.42			Q		V	
16+35	7.9466	2.18			Q		V	
16+40	7.9597	1.91			Q		V	
16+45	7.9713	1.68			Q		V	
16+50	7.9819	1.54			Q		V	
16+55	7.9919	1.45	Q				V	
17+ 0	8.0014	1.38	Q				V	
17+ 5	8.0110	1.39	Q				V	
17+10	8.0220	1.60	Q				V	
17+15	8.0343	1.78	Q				V	
17+20	8.0472	1.87	Q				V	
17+25	8.0604	1.92	Q				V	
17+30	8.0738	1.95	Q				V	
17+35	8.0874	1.97	Q				V	
17+40	8.1011	1.99	Q				V	
17+45	8.1149	2.00	Q				V	

17+50	8.1286	1.99	Q				V
17+55	8.1415	1.87	Q				V
18+ 0	8.1536	1.76	Q				V
18+ 5	8.1655	1.72	Q				V
18+10	8.1772	1.70	Q				V
18+15	8.1888	1.69	Q				V
18+20	8.2003	1.67	Q				V
18+25	8.2118	1.66	Q				V
18+30	8.2232	1.66	Q				V
18+35	8.2343	1.62	Q				V
18+40	8.2446	1.49	Q				V
18+45	8.2541	1.37	Q				V
18+50	8.2630	1.30	Q				V
18+55	8.2709	1.14	Q				V
19+ 0	8.2778	1.01	Q				V
19+ 5	8.2846	0.98	Q				V
19+10	8.2919	1.07	Q				V
19+15	8.2999	1.16	Q				V
19+20	8.3082	1.21	Q				V
19+25	8.3175	1.35	Q				V
19+30	8.3277	1.47	Q				V
19+35	8.3380	1.49	Q				V
19+40	8.3476	1.40	Q				V
19+45	8.3566	1.30	Q				V
19+50	8.3651	1.24	Q				V
19+55	8.3728	1.10	Q				V
20+ 0	8.3795	0.98	Q				V
20+ 5	8.3861	0.96	Q				V
20+10	8.3934	1.06	Q				V
20+15	8.4013	1.15	Q				V
20+20	8.4094	1.18	Q				V
20+25	8.4177	1.19	Q				V
20+30	8.4260	1.20	Q				V
20+35	8.4343	1.21	Q				V
20+40	8.4426	1.21	Q				V
20+45	8.4510	1.21	Q				V
20+50	8.4592	1.19	Q				V
20+55	8.4665	1.06	Q				V
21+ 0	8.4730	0.95	Q				V
21+ 5	8.4795	0.94	Q				V
21+10	8.4866	1.04	Q				V
21+15	8.4945	1.14	Q				V
21+20	8.5023	1.14	Q				V
21+25	8.5094	1.03	Q				V
21+30	8.5158	0.93	Q				V
21+35	8.5222	0.92	Q				V
21+40	8.5292	1.02	Q				V
21+45	8.5369	1.12	Q				V
21+50	8.5447	1.13	Q				V
21+55	8.5518	1.02	Q				V
22+ 0	8.5581	0.92	Q				V
22+ 5	8.5644	0.91	Q				V
22+10	8.5714	1.02	Q				V
22+15	8.5792	1.12	Q				V

22+20	8.5870	1.13	Q				V
22+25	8.5940	1.02	Q				V
22+30	8.6004	0.92	Q				V
22+35	8.6065	0.89	Q				V
22+40	8.6124	0.87	Q				V
22+45	8.6183	0.85	Q				V
22+50	8.6241	0.84	Q				V
22+55	8.6299	0.84	Q				V
23+ 0	8.6356	0.83	Q				V
23+ 5	8.6413	0.83	Q				V
23+10	8.6470	0.83	Q				V
23+15	8.6527	0.82	Q				V
23+20	8.6584	0.82	Q				V
23+25	8.6640	0.82	Q				V
23+30	8.6696	0.82	Q				V
23+35	8.6753	0.82	Q				V
23+40	8.6809	0.82	Q				V
23+45	8.6865	0.82	Q				V
23+50	8.6922	0.82	Q				V
23+55	8.6978	0.82	Q				V
24+ 0	8.7034	0.82	Q				V
24+ 5	8.7087	0.76	Q				V
24+10	8.7122	0.51	Q				V
24+15	8.7141	0.28	Q				V
24+20	8.7154	0.19	Q				V
24+25	8.7163	0.14	Q				V
24+30	8.7170	0.10	Q				V
24+35	8.7176	0.07	Q				V
24+40	8.7179	0.06	Q				V
24+45	8.7182	0.04	Q				V
24+50	8.7184	0.03	Q				V
24+55	8.7186	0.02	Q				V
25+ 0	8.7187	0.01	Q				V
25+ 5	8.7187	0.01	Q				V
25+10	8.7188	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "A"

Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
202.90	0.58	117.68

100 YEAR Area rainfall data:

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

202.90

1.45

294.20

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.938 (In)

Areal adjustment factor = 99.82 %

Adjusted average point rain = 0.936 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	75.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.025	0.010
75.0	75.0	0.303	0.500	0.167	0.010	0.002
75.0	75.0	0.303	0.500	0.167	0.018	0.003
45.0	45.0	0.621	0.000	0.621	0.079	0.049
53.0	53.0	0.541	0.000	0.541	0.025	0.014
80.0	80.0	0.244	0.000	0.244	0.393	0.096
85.0	85.0	0.187	0.000	0.187	0.450	0.084
Sum (F) =						0.257

Area averaged mean soil loss (F) (In/Hr) = 0.257

Minimum soil loss rate ((In/Hr)) = 0.129

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

Slope of intensity-duration curve for a 1 hour storm = 0.4800

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	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382

7	0.583	387.244	3.178	6.499
8	0.667	442.564	2.285	4.672
9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087
Sum = 100.000			Sum=	204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.494	0.257	(0.424)	0.237
2	0.17	4.50	0.506	0.257	(0.434)	0.248
3	0.25	5.40	0.607	0.257	(0.520)	0.349
4	0.33	5.40	0.607	0.257	(0.520)	0.349
5	0.42	5.70	0.640	0.257	(0.549)	0.383
6	0.50	6.40	0.719	0.257	(0.617)	0.462
7	0.58	7.90	0.888	0.257	(0.761)	0.630
8	0.67	9.10	1.022	0.257	(0.877)	0.765
9	0.75	12.80	1.438	0.257	(1.234)	1.181
10	0.83	25.60	2.876	0.257	(2.467)	2.619
11	0.92	7.90	0.888	0.257	(0.761)	0.630
12	1.00	4.90	0.550	0.257	(0.472)	0.293

(Loss Rate Not Used)

Sum = 100.0 Sum = 8.1

Flood volume = Effective rainfall 0.68 (In)
times area 202.9 (Ac.) / [(In) / (Ft.)] = 11.5 (Ac.Ft)
Total soil loss = 0.26 (In)
Total soil loss = 4.352 (Ac.Ft)
Total rainfall = 0.94 (In)
Flood volume = 499956.0 Cubic Feet
Total soil loss = 189580.9 Cubic Feet

Peak flow rate of this hydrograph = 276.798 (CFS)

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1 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q (CFS)	0	75.0	150.0	225.0	300.0
0+ 5	0.0240	3.48	Q				

0+10	0.1509	18.43	V Q				
0+15	0.3862	34.16	V Q				
0+20	0.7070	46.59	V Q				
0+25	1.0942	56.22	V Q				
0+30	1.5356	64.09	V Q				
0+35	2.0615	76.36	V Q				
0+40	2.7242	96.22	V Q				
0+45	3.5795	124.19	V Q				
0+50	4.8565	185.42	V Q				
0+55	6.7628	276.80	V Q				
1+ 0	8.4454	244.32					
1+ 5	9.4602	147.34					
1+10	10.0719	88.82					
1+15	10.4563	55.81					
1+20	10.7279	39.43					
1+25	10.9271	28.93					
1+30	11.0780	21.92					
1+35	11.1959	17.11					
1+40	11.2854	13.00					
1+45	11.3533	9.85					
1+50	11.4029	7.21					
1+55	11.4411	5.55					
2+ 0	11.4682	3.93					
2+ 5	11.4752	1.02					
2+10	11.4774	0.32					

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "A" Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 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]
202.90	0.98	198.84

100 YEAR Area rainfall data:

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

202.90

2.48

503.19

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)

Areal adjustment factor = 99.91 %

Adjusted average point rain = 1.596(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	75.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.025	0.010
75.0	75.0	0.303	0.500	0.167	0.010	0.002
75.0	75.0	0.303	0.500	0.167	0.018	0.003
45.0	45.0	0.621	0.000	0.621	0.079	0.049
53.0	53.0	0.541	0.000	0.541	0.025	0.014
80.0	80.0	0.244	0.000	0.244	0.393	0.096
85.0	85.0	0.187	0.000	0.187	0.450	0.084
Sum (F) =						0.257

Area averaged mean soil loss (F) (In/Hr) = 0.257

Minimum soil loss rate ((In/Hr)) = 0.129

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.257)	0.214	0.035
2	0.17	1.30	0.249	(0.257)	0.214	0.035
3	0.25	1.10	0.211	(0.257)	0.181	0.030
4	0.33	1.50	0.287	(0.257)	0.246	0.041
5	0.42	1.50	0.287	(0.257)	0.246	0.041
6	0.50	1.80	0.345	0.257	(0.296)	0.087
7	0.58	1.50	0.287	(0.257)	0.246	0.041
8	0.67	1.80	0.345	0.257	(0.296)	0.087
9	0.75	1.80	0.345	0.257	(0.296)	0.087
10	0.83	1.50	0.287	(0.257)	0.246	0.041
11	0.92	1.60	0.306	0.257	(0.263)	0.049
12	1.00	1.80	0.345	0.257	(0.296)	0.087
13	1.08	2.20	0.421	0.257	(0.361)	0.164
14	1.17	2.20	0.421	0.257	(0.361)	0.164
15	1.25	2.20	0.421	0.257	(0.361)	0.164
16	1.33	2.00	0.383	0.257	(0.329)	0.126
17	1.42	2.60	0.498	0.257	(0.427)	0.240
18	1.50	2.70	0.517	0.257	(0.444)	0.260
19	1.58	2.40	0.460	0.257	(0.394)	0.202
20	1.67	2.70	0.517	0.257	(0.444)	0.260
21	1.75	3.30	0.632	0.257	(0.542)	0.374
22	1.83	3.10	0.594	0.257	(0.509)	0.336
23	1.92	2.90	0.555	0.257	(0.476)	0.298
24	2.00	3.00	0.574	0.257	(0.493)	0.317
25	2.08	3.10	0.594	0.257	(0.509)	0.336
26	2.17	4.20	0.804	0.257	(0.690)	0.547
27	2.25	5.00	0.957	0.257	(0.821)	0.700
28	2.33	3.50	0.670	0.257	(0.575)	0.413
29	2.42	6.80	1.302	0.257	(1.117)	1.045
30	2.50	7.30	1.398	0.257	(1.199)	1.140
31	2.58	8.20	1.570	0.257	(1.347)	1.313
32	2.67	5.90	1.130	0.257	(0.969)	0.872
33	2.75	2.00	0.383	0.257	(0.329)	0.126
34	2.83	1.80	0.345	0.257	(0.296)	0.087
35	2.92	1.80	0.345	0.257	(0.296)	0.087
36	3.00	0.60	0.115	(0.257)	0.099	0.016

(Loss Rate Not Used)

Sum =	100.0	Sum =	10.2
Flood volume =	Effective rainfall	0.85(In)	
times area	202.9(Ac.) / [(In) / (Ft.)]	=	14.4(Ac.Ft)
Total soil loss =	0.74(In)		
Total soil loss =	12.539(Ac.Ft)		
Total rainfall =	1.60(In)		
Flood volume =	629065.2 Cubic Feet		
Total soil loss =	546206.8 Cubic Feet		

Peak flow rate of this hydrograph = 205.131 (CFS)

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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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q(CFS)	0	75.0	150.0	225.0	300.0
0+ 5	0.0036	0.52	Q					
0+10	0.0224	2.73	Q					
0+15	0.0545	4.67	Q					
0+20	0.0911	5.31	Q					
0+25	0.1333	6.14	Q					
0+30	0.1859	7.63	VQ					
0+35	0.2566	10.26	VQ					
0+40	0.3321	10.96	VQ					
0+45	0.4179	12.46	Q					
0+50	0.5152	14.12	Q					
0+55	0.6001	12.34	Q					
1+ 0	0.6782	11.33	Q					
1+ 5	0.7789	14.63	QV					
1+10	0.9269	21.49	Q					
1+15	1.1107	26.68	Q					
1+20	1.3056	28.30	Q					
1+25	1.5047	28.91	QV					
1+30	1.7462	35.06	Q					
1+35	2.0336	41.74	Q					
1+40	2.3279	42.72	QV					
1+45	2.6491	46.64	QV					
1+50	3.0386	56.55	QV					
1+55	3.4634	61.68	QV					
2+ 0	3.8831	60.94	Q	V				
2+ 5	4.3068	61.52	Q	V				
2+10	4.7689	67.11	Q	V				
2+15	5.3498	84.33	Q	V				
2+20	6.0562	102.57	Q	V				
2+25	6.8011	108.16	Q	V				
2+30	7.7606	139.32	Q	V				
2+35	9.0113	181.59	Q	V				
2+40	10.4240	205.13	Q	V				
2+45	11.7087	186.53	Q	V				

2+50	12.5688	124.89			Q			V
2+55	13.0976	76.79			Q			V
3+ 0	13.4800	55.51			Q			V
3+ 5	13.7550	39.93		Q				V
3+10	13.9462	27.76	Q					V
3+15	14.0853	20.20	Q					V
3+20	14.1916	15.44	Q					V
3+25	14.2716	11.62	Q					V
3+30	14.3301	8.49	Q					V
3+35	14.3750	6.52	Q					V
3+40	14.4064	4.56	Q					V
3+45	14.4268	2.97	Q					V
3+50	14.4364	1.39	Q					V
3+55	14.4390	0.37	Q					V
4+ 0	14.4404	0.21	Q					V
4+ 5	14.4412	0.11	Q					V
4+10	14.4413	0.02	Q					V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "A"

Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq. Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
202.90	1.38	280.00

100 YEAR Area rainfall data:

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

202.90

3.48

706.09

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 2.244 (In)

Areal adjustment factor = 99.93 %

Adjusted average point rain = 2.242 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	75.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000

Total Area Entered = 202.90 (Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.025	0.010
75.0	75.0	0.303	0.500	0.167	0.010	0.002
75.0	75.0	0.303	0.500	0.167	0.018	0.003
45.0	45.0	0.621	0.000	0.621	0.079	0.049
53.0	53.0	0.541	0.000	0.541	0.025	0.014
80.0	80.0	0.244	0.000	0.244	0.393	0.096
85.0	85.0	0.187	0.000	0.187	0.450	0.084
Sum (F) =						0.257

Area averaged mean soil loss (F) (In/Hr) = 0.257

Minimum soil loss rate ((In/Hr)) = 0.129

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.858

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.135	(0.257)	0.115	0.019
2	0.17	0.60	0.161	(0.257)	0.139	0.023
3	0.25	0.60	0.161	(0.257)	0.139	0.023
4	0.33	0.60	0.161	(0.257)	0.139	0.023
5	0.42	0.60	0.161	(0.257)	0.139	0.023
6	0.50	0.70	0.188	(0.257)	0.162	0.027
7	0.58	0.70	0.188	(0.257)	0.162	0.027
8	0.67	0.70	0.188	(0.257)	0.162	0.027
9	0.75	0.70	0.188	(0.257)	0.162	0.027
10	0.83	0.70	0.188	(0.257)	0.162	0.027
11	0.92	0.70	0.188	(0.257)	0.162	0.027
12	1.00	0.80	0.215	(0.257)	0.185	0.031
13	1.08	0.80	0.215	(0.257)	0.185	0.031
14	1.17	0.80	0.215	(0.257)	0.185	0.031
15	1.25	0.80	0.215	(0.257)	0.185	0.031
16	1.33	0.80	0.215	(0.257)	0.185	0.031
17	1.42	0.80	0.215	(0.257)	0.185	0.031
18	1.50	0.80	0.215	(0.257)	0.185	0.031
19	1.58	0.80	0.215	(0.257)	0.185	0.031
20	1.67	0.80	0.215	(0.257)	0.185	0.031
21	1.75	0.80	0.215	(0.257)	0.185	0.031
22	1.83	0.80	0.215	(0.257)	0.185	0.031
23	1.92	0.80	0.215	(0.257)	0.185	0.031
24	2.00	0.90	0.242	(0.257)	0.208	0.034
25	2.08	0.80	0.215	(0.257)	0.185	0.031
26	2.17	0.90	0.242	(0.257)	0.208	0.034
27	2.25	0.90	0.242	(0.257)	0.208	0.034
28	2.33	0.90	0.242	(0.257)	0.208	0.034
29	2.42	0.90	0.242	(0.257)	0.208	0.034
30	2.50	0.90	0.242	(0.257)	0.208	0.034
31	2.58	0.90	0.242	(0.257)	0.208	0.034
32	2.67	0.90	0.242	(0.257)	0.208	0.034
33	2.75	1.00	0.269	(0.257)	0.231	0.038
34	2.83	1.00	0.269	(0.257)	0.231	0.038
35	2.92	1.00	0.269	(0.257)	0.231	0.038
36	3.00	1.00	0.269	(0.257)	0.231	0.038

37	3.08	1.00	0.269	(0.257)	0.231	0.038
38	3.17	1.10	0.296	(0.257)	0.254	0.042
39	3.25	1.10	0.296	(0.257)	0.254	0.042
40	3.33	1.10	0.296	(0.257)	0.254	0.042
41	3.42	1.20	0.323	0.257	(0.277)	0.066
42	3.50	1.30	0.350	0.257	(0.300)	0.092
43	3.58	1.40	0.377	0.257	(0.323)	0.119
44	3.67	1.40	0.377	0.257	(0.323)	0.119
45	3.75	1.50	0.404	0.257	(0.346)	0.146
46	3.83	1.50	0.404	0.257	(0.346)	0.146
47	3.92	1.60	0.431	0.257	(0.369)	0.173
48	4.00	1.60	0.431	0.257	(0.369)	0.173
49	4.08	1.70	0.457	0.257	(0.392)	0.200
50	4.17	1.80	0.484	0.257	(0.416)	0.227
51	4.25	1.90	0.511	0.257	(0.439)	0.254
52	4.33	2.00	0.538	0.257	(0.462)	0.281
53	4.42	2.10	0.565	0.257	(0.485)	0.308
54	4.50	2.10	0.565	0.257	(0.485)	0.308
55	4.58	2.20	0.592	0.257	(0.508)	0.335
56	4.67	2.30	0.619	0.257	(0.531)	0.362
57	4.75	2.40	0.646	0.257	(0.554)	0.388
58	4.83	2.40	0.646	0.257	(0.554)	0.388
59	4.92	2.50	0.673	0.257	(0.577)	0.415
60	5.00	2.60	0.700	0.257	(0.600)	0.442
61	5.08	3.10	0.834	0.257	(0.716)	0.577
62	5.17	3.60	0.969	0.257	(0.831)	0.711
63	5.25	3.90	1.049	0.257	(0.900)	0.792
64	5.33	4.20	1.130	0.257	(0.970)	0.873
65	5.42	4.70	1.265	0.257	(1.085)	1.007
66	5.50	5.60	1.507	0.257	(1.293)	1.249
67	5.58	1.90	0.511	0.257	(0.439)	0.254
68	5.67	0.90	0.242	(0.257)	0.208	0.034
69	5.75	0.60	0.161	(0.257)	0.139	0.023
70	5.83	0.50	0.135	(0.257)	0.115	0.019
71	5.92	0.30	0.081	(0.257)	0.069	0.011
72	6.00	0.20	0.054	(0.257)	0.046	0.008

(Loss Rate Not Used)

Sum = 100.0

Sum = 11.8

Flood volume = Effective rainfall 0.98(In)
 times area 202.9(Ac.)/[(In)/(Ft.)) = 16.6(Ac.Ft)
 Total soil loss = 1.26(In)
 Total soil loss = 21.340(Ac.Ft)
 Total rainfall = 2.24(In)
 Flood volume = 722028.4 Cubic Feet
 Total soil loss = 929553.8 Cubic Feet

 Peak flow rate of this hydrograph = 187.230(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0019		0.28	Q				
0+10	0.0125		1.53	Q				
0+15	0.0322		2.86	Q				
0+20	0.0564		3.52	Q				
0+25	0.0830		3.86	Q				
0+30	0.1115		4.14	Q				
0+35	0.1428		4.54	Q				
0+40	0.1763		4.87	Q				
0+45	0.2110		5.04	VQ				
0+50	0.2466		5.16	VQ				
0+55	0.2827		5.25	VQ				
1+ 0	0.3198		5.37	VQ				
1+ 5	0.3588		5.66	VQ				
1+10	0.3995		5.92	VQ				
1+15	0.4412		6.05	Q				
1+20	0.4832		6.11	Q				
1+25	0.5256		6.15	Q				
1+30	0.5681		6.18	Q				
1+35	0.6108		6.20	Q				
1+40	0.6537		6.22	Q				
1+45	0.6966		6.23	Q				
1+50	0.7395		6.24	Q				
1+55	0.7825		6.25	Q				
2+ 0	0.8260		6.31	Q				
2+ 5	0.8707		6.49	QV				
2+10	0.9157		6.53	QV				
2+15	0.9614		6.64	QV				
2+20	1.0084		6.82	QV				
2+25	1.0559		6.89	QV				
2+30	1.1036		6.94	QV				
2+35	1.1516		6.96	QV				
2+40	1.1997		6.98	QV				
2+45	1.2483		7.05	Q V				
2+50	1.2986		7.30	Q V				
2+55	1.3505		7.53	Q V				
3+ 0	1.4030		7.63	Q V				
3+ 5	1.4559		7.68	Q V				
3+10	1.5095		7.78	Q V				
3+15	1.5649		8.04	Q V				
3+20	1.6219		8.28	Q V				
3+25	1.6820		8.73	Q V				
3+30	1.7554	10.65		Q V				
3+35	1.8525	14.11		Q V				
3+40	1.9758	17.90		QV				
3+45	2.1189	20.78		QV				
3+50	2.2819	23.66		QV				
3+55	2.4634	26.36		Q				
4+ 0	2.6645	29.19		QV				
4+ 5	2.8840	31.87		Q				
4+10	3.1257	35.11		Q				
4+15	3.3976	39.48		QV				

4+20	3.7025	44.26		Q					
4+25	4.0417	49.26		Q					
4+30	4.4136	54.00		Q					
4+35	4.8102	57.57		Q					
4+40	5.2327	61.35		Q					
4+45	5.6878	66.08		Q					
4+50	6.1747	70.71		Q					
4+55	6.6859	74.22		Q	V				
5+ 0	7.2227	77.95		Q	V				
5+ 5	7.8030	84.26		Q	V				
5+10	8.4751	97.58			QV				
5+15	9.2769	116.42			VQ				
5+20	10.2031	134.49			V	Q			
5+25	11.2481	151.73				V	Q		
5+30	12.4442	173.68					V	Q	
5+35	13.7337	187.23						V	Q
5+40	14.7146	142.43				Q			
5+45	15.2767	81.61			Q				
5+50	15.6319	51.58		Q					
5+55	15.8868	37.01		Q					
6+ 0	16.0764	27.52		Q					
6+ 5	16.2179	20.55		Q					
6+10	16.3239	15.38		Q					
6+15	16.4039	11.63		Q					
6+20	16.4633	8.62	Q						
6+25	16.5065	6.27	Q						
6+30	16.5369	4.42	Q						
6+35	16.5581	3.07	Q						
6+40	16.5707	1.83	Q						
6+45	16.5736	0.43	Q						
6+50	16.5745	0.12	Q						
6+55	16.5750	0.07	Q						
7+ 0	16.5753	0.04	Q						
7+ 5	16.5754	0.02	Q						
7+10	16.5755	0.01	Q						

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Aex2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "A"

Existing Condition

Drainage Area = 202.90 (Ac.) = 0.317 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 202.90 (Ac.) = 0.317 Sq.Mi.
Length along longest watercourse = 4338.00 (Ft.)
Length along longest watercourse measured to centroid = 2099.00 (Ft.)
Length along longest watercourse = 0.822 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 330.00 (Ft.)
Slope along watercourse = 401.6598 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.151 Hr.
Lag time = 9.04 Min.
25% of lag time = 2.26 Min.
40% of lag time = 3.62 Min.
Unit time = 5.00 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]
202.90	2.48	503.19

100 YEAR Area rainfall data:

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

202.90

6.90

1400.01

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 4.298 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 4.297 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
5.000	32.00	0.500
2.100	75.00	0.500
3.600	75.00	0.500
16.000	45.00	0.000
5.100	53.00	0.000
79.700	80.00	0.000
91.400	85.00	0.000
Total Area Entered = 202.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
32.0	32.0	0.742	0.500	0.408	0.025	0.010
75.0	75.0	0.303	0.500	0.167	0.010	0.002
75.0	75.0	0.303	0.500	0.167	0.018	0.003
45.0	45.0	0.621	0.000	0.621	0.079	0.049
53.0	53.0	0.541	0.000	0.541	0.025	0.014
80.0	80.0	0.244	0.000	0.244	0.393	0.096
85.0	85.0	0.187	0.000	0.187	0.450	0.084
Sum (F) =						0.257

Area averaged mean soil loss (F) (In/Hr) = 0.257

Minimum soil loss rate ((In/Hr)) = 0.129

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.858

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	0.083	55.321	7.189
2	0.167	110.641	30.486
3	0.250	165.962	27.943
4	0.333	221.282	11.307
5	0.417	276.603	6.389
6	0.500	331.923	4.382
7	0.583	387.244	3.178
8	0.667	442.564	2.285

9	0.750	497.885	1.746	3.571
10	0.833	553.205	1.456	2.976
11	0.917	608.526	1.092	2.232
12	1.000	663.846	0.847	1.731
13	1.083	719.167	0.615	1.258
14	1.167	774.487	0.553	1.131
15	1.250	829.808	0.532	1.087

Sum = 100.000 Sum= 204.485

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.034	(0.456)	0.029	0.005
2	0.17	0.07	0.034	(0.455)	0.029	0.005
3	0.25	0.07	0.034	(0.453)	0.029	0.005
4	0.33	0.10	0.052	(0.451)	0.044	0.007
5	0.42	0.10	0.052	(0.449)	0.044	0.007
6	0.50	0.10	0.052	(0.448)	0.044	0.007
7	0.58	0.10	0.052	(0.446)	0.044	0.007
8	0.67	0.10	0.052	(0.444)	0.044	0.007
9	0.75	0.10	0.052	(0.442)	0.044	0.007
10	0.83	0.13	0.069	(0.441)	0.059	0.010
11	0.92	0.13	0.069	(0.439)	0.059	0.010
12	1.00	0.13	0.069	(0.437)	0.059	0.010
13	1.08	0.10	0.052	(0.435)	0.044	0.007
14	1.17	0.10	0.052	(0.434)	0.044	0.007
15	1.25	0.10	0.052	(0.432)	0.044	0.007
16	1.33	0.10	0.052	(0.430)	0.044	0.007
17	1.42	0.10	0.052	(0.428)	0.044	0.007
18	1.50	0.10	0.052	(0.427)	0.044	0.007
19	1.58	0.10	0.052	(0.425)	0.044	0.007
20	1.67	0.10	0.052	(0.423)	0.044	0.007
21	1.75	0.10	0.052	(0.422)	0.044	0.007
22	1.83	0.13	0.069	(0.420)	0.059	0.010
23	1.92	0.13	0.069	(0.418)	0.059	0.010
24	2.00	0.13	0.069	(0.417)	0.059	0.010
25	2.08	0.13	0.069	(0.415)	0.059	0.010
26	2.17	0.13	0.069	(0.413)	0.059	0.010
27	2.25	0.13	0.069	(0.412)	0.059	0.010
28	2.33	0.13	0.069	(0.410)	0.059	0.010
29	2.42	0.13	0.069	(0.408)	0.059	0.010
30	2.50	0.13	0.069	(0.407)	0.059	0.010
31	2.58	0.17	0.086	(0.405)	0.074	0.012
32	2.67	0.17	0.086	(0.403)	0.074	0.012
33	2.75	0.17	0.086	(0.402)	0.074	0.012
34	2.83	0.17	0.086	(0.400)	0.074	0.012
35	2.92	0.17	0.086	(0.398)	0.074	0.012
36	3.00	0.17	0.086	(0.397)	0.074	0.012

37	3.08	0.17	0.086	(0.395)	0.074	0.012
38	3.17	0.17	0.086	(0.393)	0.074	0.012
39	3.25	0.17	0.086	(0.392)	0.074	0.012
40	3.33	0.17	0.086	(0.390)	0.074	0.012
41	3.42	0.17	0.086	(0.388)	0.074	0.012
42	3.50	0.17	0.086	(0.387)	0.074	0.012
43	3.58	0.17	0.086	(0.385)	0.074	0.012
44	3.67	0.17	0.086	(0.384)	0.074	0.012
45	3.75	0.17	0.086	(0.382)	0.074	0.012
46	3.83	0.20	0.103	(0.380)	0.088	0.015
47	3.92	0.20	0.103	(0.379)	0.088	0.015
48	4.00	0.20	0.103	(0.377)	0.088	0.015
49	4.08	0.20	0.103	(0.376)	0.088	0.015
50	4.17	0.20	0.103	(0.374)	0.088	0.015
51	4.25	0.20	0.103	(0.372)	0.088	0.015
52	4.33	0.23	0.120	(0.371)	0.103	0.017
53	4.42	0.23	0.120	(0.369)	0.103	0.017
54	4.50	0.23	0.120	(0.368)	0.103	0.017
55	4.58	0.23	0.120	(0.366)	0.103	0.017
56	4.67	0.23	0.120	(0.364)	0.103	0.017
57	4.75	0.23	0.120	(0.363)	0.103	0.017
58	4.83	0.27	0.137	(0.361)	0.118	0.020
59	4.92	0.27	0.137	(0.360)	0.118	0.020
60	5.00	0.27	0.137	(0.358)	0.118	0.020
61	5.08	0.20	0.103	(0.357)	0.088	0.015
62	5.17	0.20	0.103	(0.355)	0.088	0.015
63	5.25	0.20	0.103	(0.354)	0.088	0.015
64	5.33	0.23	0.120	(0.352)	0.103	0.017
65	5.42	0.23	0.120	(0.350)	0.103	0.017
66	5.50	0.23	0.120	(0.349)	0.103	0.017
67	5.58	0.27	0.137	(0.347)	0.118	0.020
68	5.67	0.27	0.137	(0.346)	0.118	0.020
69	5.75	0.27	0.137	(0.344)	0.118	0.020
70	5.83	0.27	0.137	(0.343)	0.118	0.020
71	5.92	0.27	0.137	(0.341)	0.118	0.020
72	6.00	0.27	0.137	(0.340)	0.118	0.020
73	6.08	0.30	0.155	(0.338)	0.133	0.022
74	6.17	0.30	0.155	(0.337)	0.133	0.022
75	6.25	0.30	0.155	(0.335)	0.133	0.022
76	6.33	0.30	0.155	(0.334)	0.133	0.022
77	6.42	0.30	0.155	(0.332)	0.133	0.022
78	6.50	0.30	0.155	(0.331)	0.133	0.022
79	6.58	0.33	0.172	(0.329)	0.147	0.024
80	6.67	0.33	0.172	(0.328)	0.147	0.024
81	6.75	0.33	0.172	(0.326)	0.147	0.024
82	6.83	0.33	0.172	(0.325)	0.147	0.024
83	6.92	0.33	0.172	(0.323)	0.147	0.024
84	7.00	0.33	0.172	(0.322)	0.147	0.024
85	7.08	0.33	0.172	(0.320)	0.147	0.024
86	7.17	0.33	0.172	(0.319)	0.147	0.024
87	7.25	0.33	0.172	(0.318)	0.147	0.024
88	7.33	0.37	0.189	(0.316)	0.162	0.027
89	7.42	0.37	0.189	(0.315)	0.162	0.027
90	7.50	0.37	0.189	(0.313)	0.162	0.027

91	7.58	0.40	0.206	(0.312)	0.177	0.029
92	7.67	0.40	0.206	(0.310)	0.177	0.029
93	7.75	0.40	0.206	(0.309)	0.177	0.029
94	7.83	0.43	0.223	(0.307)	0.192	0.032
95	7.92	0.43	0.223	(0.306)	0.192	0.032
96	8.00	0.43	0.223	(0.305)	0.192	0.032
97	8.08	0.50	0.258	(0.303)	0.221	0.037
98	8.17	0.50	0.258	(0.302)	0.221	0.037
99	8.25	0.50	0.258	(0.300)	0.221	0.037
100	8.33	0.50	0.258	(0.299)	0.221	0.037
101	8.42	0.50	0.258	(0.298)	0.221	0.037
102	8.50	0.50	0.258	(0.296)	0.221	0.037
103	8.58	0.53	0.275	(0.295)	0.236	0.039
104	8.67	0.53	0.275	(0.293)	0.236	0.039
105	8.75	0.53	0.275	(0.292)	0.236	0.039
106	8.83	0.57	0.292	(0.291)	0.251	0.042
107	8.92	0.57	0.292	(0.289)	0.251	0.042
108	9.00	0.57	0.292	(0.288)	0.251	0.042
109	9.08	0.63	0.327	(0.287)	0.280	0.046
110	9.17	0.63	0.327	(0.285)	0.280	0.046
111	9.25	0.63	0.327	(0.284)	0.280	0.046
112	9.33	0.67	0.344	0.282	(0.295)	0.061
113	9.42	0.67	0.344	0.281	(0.295)	0.063
114	9.50	0.67	0.344	0.280	(0.295)	0.064
115	9.58	0.70	0.361	0.278	(0.310)	0.082
116	9.67	0.70	0.361	0.277	(0.310)	0.084
117	9.75	0.70	0.361	0.276	(0.310)	0.085
118	9.83	0.73	0.378	0.274	(0.324)	0.104
119	9.92	0.73	0.378	0.273	(0.324)	0.105
120	10.00	0.73	0.378	0.272	(0.324)	0.106
121	10.08	0.50	0.258	(0.270)	0.221	0.037
122	10.17	0.50	0.258	(0.269)	0.221	0.037
123	10.25	0.50	0.258	(0.268)	0.221	0.037
124	10.33	0.50	0.258	(0.267)	0.221	0.037
125	10.42	0.50	0.258	(0.265)	0.221	0.037
126	10.50	0.50	0.258	(0.264)	0.221	0.037
127	10.58	0.67	0.344	0.263	(0.295)	0.081
128	10.67	0.67	0.344	0.261	(0.295)	0.082
129	10.75	0.67	0.344	0.260	(0.295)	0.084
130	10.83	0.67	0.344	0.259	(0.295)	0.085
131	10.92	0.67	0.344	0.258	(0.295)	0.086
132	11.00	0.67	0.344	0.256	(0.295)	0.087
133	11.08	0.63	0.327	0.255	(0.280)	0.071
134	11.17	0.63	0.327	0.254	(0.280)	0.073
135	11.25	0.63	0.327	0.253	(0.280)	0.074
136	11.33	0.63	0.327	0.251	(0.280)	0.075
137	11.42	0.63	0.327	0.250	(0.280)	0.076
138	11.50	0.63	0.327	0.249	(0.280)	0.078
139	11.58	0.57	0.292	0.248	(0.251)	0.045
140	11.67	0.57	0.292	0.246	(0.251)	0.046
141	11.75	0.57	0.292	0.245	(0.251)	0.047
142	11.83	0.60	0.309	0.244	(0.265)	0.065
143	11.92	0.60	0.309	0.243	(0.265)	0.067
144	12.00	0.60	0.309	0.241	(0.265)	0.068

145	12.08	0.83	0.430	0.240	(0.369)	0.189
146	12.17	0.83	0.430	0.239	(0.369)	0.191
147	12.25	0.83	0.430	0.238	(0.369)	0.192
148	12.33	0.87	0.447	0.237	(0.383)	0.210
149	12.42	0.87	0.447	0.235	(0.383)	0.211
150	12.50	0.87	0.447	0.234	(0.383)	0.213
151	12.58	0.93	0.481	0.233	(0.413)	0.248
152	12.67	0.93	0.481	0.232	(0.413)	0.249
153	12.75	0.93	0.481	0.231	(0.413)	0.250
154	12.83	0.97	0.498	0.230	(0.428)	0.269
155	12.92	0.97	0.498	0.228	(0.428)	0.270
156	13.00	0.97	0.498	0.227	(0.428)	0.271
157	13.08	1.13	0.584	0.226	(0.501)	0.358
158	13.17	1.13	0.584	0.225	(0.501)	0.359
159	13.25	1.13	0.584	0.224	(0.501)	0.360
160	13.33	1.13	0.584	0.223	(0.501)	0.362
161	13.42	1.13	0.584	0.222	(0.501)	0.363
162	13.50	1.13	0.584	0.220	(0.501)	0.364
163	13.58	0.77	0.395	0.219	(0.339)	0.176
164	13.67	0.77	0.395	0.218	(0.339)	0.177
165	13.75	0.77	0.395	0.217	(0.339)	0.178
166	13.83	0.77	0.395	0.216	(0.339)	0.179
167	13.92	0.77	0.395	0.215	(0.339)	0.180
168	14.00	0.77	0.395	0.214	(0.339)	0.181
169	14.08	0.90	0.464	0.213	(0.398)	0.251
170	14.17	0.90	0.464	0.212	(0.398)	0.252
171	14.25	0.90	0.464	0.211	(0.398)	0.253
172	14.33	0.87	0.447	0.209	(0.383)	0.237
173	14.42	0.87	0.447	0.208	(0.383)	0.238
174	14.50	0.87	0.447	0.207	(0.383)	0.240
175	14.58	0.87	0.447	0.206	(0.383)	0.241
176	14.67	0.87	0.447	0.205	(0.383)	0.242
177	14.75	0.87	0.447	0.204	(0.383)	0.243
178	14.83	0.83	0.430	0.203	(0.369)	0.227
179	14.92	0.83	0.430	0.202	(0.369)	0.228
180	15.00	0.83	0.430	0.201	(0.369)	0.229
181	15.08	0.80	0.412	0.200	(0.354)	0.212
182	15.17	0.80	0.412	0.199	(0.354)	0.214
183	15.25	0.80	0.412	0.198	(0.354)	0.215
184	15.33	0.77	0.395	0.197	(0.339)	0.198
185	15.42	0.77	0.395	0.196	(0.339)	0.199
186	15.50	0.77	0.395	0.195	(0.339)	0.200
187	15.58	0.63	0.327	0.194	(0.280)	0.133
188	15.67	0.63	0.327	0.193	(0.280)	0.134
189	15.75	0.63	0.327	0.192	(0.280)	0.135
190	15.83	0.63	0.327	0.191	(0.280)	0.136
191	15.92	0.63	0.327	0.190	(0.280)	0.137
192	16.00	0.63	0.327	0.189	(0.280)	0.138
193	16.08	0.13	0.069	(0.188)	0.059	0.010
194	16.17	0.13	0.069	(0.187)	0.059	0.010
195	16.25	0.13	0.069	(0.186)	0.059	0.010
196	16.33	0.13	0.069	(0.185)	0.059	0.010
197	16.42	0.13	0.069	(0.184)	0.059	0.010
198	16.50	0.13	0.069	(0.183)	0.059	0.010

199	16.58	0.10	0.052	(0.182)	0.044	0.007
200	16.67	0.10	0.052	(0.181)	0.044	0.007
201	16.75	0.10	0.052	(0.181)	0.044	0.007
202	16.83	0.10	0.052	(0.180)	0.044	0.007
203	16.92	0.10	0.052	(0.179)	0.044	0.007
204	17.00	0.10	0.052	(0.178)	0.044	0.007
205	17.08	0.17	0.086	(0.177)	0.074	0.012
206	17.17	0.17	0.086	(0.176)	0.074	0.012
207	17.25	0.17	0.086	(0.175)	0.074	0.012
208	17.33	0.17	0.086	(0.174)	0.074	0.012
209	17.42	0.17	0.086	(0.173)	0.074	0.012
210	17.50	0.17	0.086	(0.173)	0.074	0.012
211	17.58	0.17	0.086	(0.172)	0.074	0.012
212	17.67	0.17	0.086	(0.171)	0.074	0.012
213	17.75	0.17	0.086	(0.170)	0.074	0.012
214	17.83	0.13	0.069	(0.169)	0.059	0.010
215	17.92	0.13	0.069	(0.168)	0.059	0.010
216	18.00	0.13	0.069	(0.167)	0.059	0.010
217	18.08	0.13	0.069	(0.167)	0.059	0.010
218	18.17	0.13	0.069	(0.166)	0.059	0.010
219	18.25	0.13	0.069	(0.165)	0.059	0.010
220	18.33	0.13	0.069	(0.164)	0.059	0.010
221	18.42	0.13	0.069	(0.163)	0.059	0.010
222	18.50	0.13	0.069	(0.163)	0.059	0.010
223	18.58	0.10	0.052	(0.162)	0.044	0.007
224	18.67	0.10	0.052	(0.161)	0.044	0.007
225	18.75	0.10	0.052	(0.160)	0.044	0.007
226	18.83	0.07	0.034	(0.159)	0.029	0.005
227	18.92	0.07	0.034	(0.159)	0.029	0.005
228	19.00	0.07	0.034	(0.158)	0.029	0.005
229	19.08	0.10	0.052	(0.157)	0.044	0.007
230	19.17	0.10	0.052	(0.156)	0.044	0.007
231	19.25	0.10	0.052	(0.156)	0.044	0.007
232	19.33	0.13	0.069	(0.155)	0.059	0.010
233	19.42	0.13	0.069	(0.154)	0.059	0.010
234	19.50	0.13	0.069	(0.154)	0.059	0.010
235	19.58	0.10	0.052	(0.153)	0.044	0.007
236	19.67	0.10	0.052	(0.152)	0.044	0.007
237	19.75	0.10	0.052	(0.151)	0.044	0.007
238	19.83	0.07	0.034	(0.151)	0.029	0.005
239	19.92	0.07	0.034	(0.150)	0.029	0.005
240	20.00	0.07	0.034	(0.149)	0.029	0.005
241	20.08	0.10	0.052	(0.149)	0.044	0.007
242	20.17	0.10	0.052	(0.148)	0.044	0.007
243	20.25	0.10	0.052	(0.148)	0.044	0.007
244	20.33	0.10	0.052	(0.147)	0.044	0.007
245	20.42	0.10	0.052	(0.146)	0.044	0.007
246	20.50	0.10	0.052	(0.146)	0.044	0.007
247	20.58	0.10	0.052	(0.145)	0.044	0.007
248	20.67	0.10	0.052	(0.144)	0.044	0.007
249	20.75	0.10	0.052	(0.144)	0.044	0.007
250	20.83	0.07	0.034	(0.143)	0.029	0.005
251	20.92	0.07	0.034	(0.143)	0.029	0.005
252	21.00	0.07	0.034	(0.142)	0.029	0.005

253	21.08	0.10	0.052	(0.142)	0.044	0.007
254	21.17	0.10	0.052	(0.141)	0.044	0.007
255	21.25	0.10	0.052	(0.140)	0.044	0.007
256	21.33	0.07	0.034	(0.140)	0.029	0.005
257	21.42	0.07	0.034	(0.139)	0.029	0.005
258	21.50	0.07	0.034	(0.139)	0.029	0.005
259	21.58	0.10	0.052	(0.138)	0.044	0.007
260	21.67	0.10	0.052	(0.138)	0.044	0.007
261	21.75	0.10	0.052	(0.137)	0.044	0.007
262	21.83	0.07	0.034	(0.137)	0.029	0.005
263	21.92	0.07	0.034	(0.136)	0.029	0.005
264	22.00	0.07	0.034	(0.136)	0.029	0.005
265	22.08	0.10	0.052	(0.135)	0.044	0.007
266	22.17	0.10	0.052	(0.135)	0.044	0.007
267	22.25	0.10	0.052	(0.135)	0.044	0.007
268	22.33	0.07	0.034	(0.134)	0.029	0.005
269	22.42	0.07	0.034	(0.134)	0.029	0.005
270	22.50	0.07	0.034	(0.133)	0.029	0.005
271	22.58	0.07	0.034	(0.133)	0.029	0.005
272	22.67	0.07	0.034	(0.133)	0.029	0.005
273	22.75	0.07	0.034	(0.132)	0.029	0.005
274	22.83	0.07	0.034	(0.132)	0.029	0.005
275	22.92	0.07	0.034	(0.132)	0.029	0.005
276	23.00	0.07	0.034	(0.131)	0.029	0.005
277	23.08	0.07	0.034	(0.131)	0.029	0.005
278	23.17	0.07	0.034	(0.131)	0.029	0.005
279	23.25	0.07	0.034	(0.130)	0.029	0.005
280	23.33	0.07	0.034	(0.130)	0.029	0.005
281	23.42	0.07	0.034	(0.130)	0.029	0.005
282	23.50	0.07	0.034	(0.130)	0.029	0.005
283	23.58	0.07	0.034	(0.129)	0.029	0.005
284	23.67	0.07	0.034	(0.129)	0.029	0.005
285	23.75	0.07	0.034	(0.129)	0.029	0.005
286	23.83	0.07	0.034	(0.129)	0.029	0.005
287	23.92	0.07	0.034	(0.129)	0.029	0.005
288	24.00	0.07	0.034	(0.129)	0.029	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 16.0

Flood volume = Effective rainfall 1.33(In)
times area 202.9(Ac.)/[(In)/(Ft.)] = 22.5(Ac.Ft)
Total soil loss = 2.96(In)
Total soil loss = 50.103(Ac.Ft)
Total rainfall = 4.30(In)
Flood volume = 982181.4 Cubic Feet
Total soil loss = 2182469.1 Cubic Feet

Peak flow rate of this hydrograph = 71.353(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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0005		0.07 Q					
0+10	0.0031		0.38 Q					
0+15	0.0076		0.66 Q					
0+20	0.0131		0.80 Q					
0+25	0.0202		1.02 Q					
0+30	0.0285		1.20 Q					
0+35	0.0374		1.29 Q					
0+40	0.0466		1.35 Q					
0+45	0.0562		1.39 Q					
0+50	0.0662		1.45 Q					
0+55	0.0774		1.63 Q					
1+ 0	0.0897		1.78 Q					
1+ 5	0.1022		1.82 Q					
1+10	0.1140		1.71 Q					
1+15	0.1250		1.60 Q					
1+20	0.1358		1.56 Q					
1+25	0.1464		1.55 Q					
1+30	0.1570		1.54 Q					
1+35	0.1675		1.53 Q					
1+40	0.1780		1.52 Q					
1+45	0.1884		1.52 Q					
1+50	0.1991		1.55 Q					
1+55	0.2108		1.70 Q					
2+ 0	0.2234		1.84 Q					
2+ 5	0.2364		1.89 Q					
2+10	0.2496		1.92 Q					
2+15	0.2630		1.94 Q					
2+20	0.2764		1.95 Q					
2+25	0.2900		1.96 Q					
2+30	0.3035		1.97 Q					
2+35	0.3174		2.02 VQ					
2+40	0.3324		2.17 VQ					
2+45	0.3484		2.32 VQ					
2+50	0.3647		2.38 VQ					
2+55	0.3814		2.41 VQ					
3+ 0	0.3981		2.44 VQ					
3+ 5	0.4150		2.45 VQ					
3+10	0.4320		2.46 VQ					
3+15	0.4490		2.47 VQ					
3+20	0.4661		2.48 VQ					
3+25	0.4832		2.49 VQ					
3+30	0.5004		2.49 VQ					
3+35	0.5176		2.49 VQ					
3+40	0.5347		2.50 VQ					
3+45	0.5519		2.50 VQ					
3+50	0.5694		2.53 Q					
3+55	0.5879		2.69 Q					
4+ 0	0.6074		2.83 Q					
4+ 5	0.6272		2.88 Q					
4+10	0.6473		2.91 Q					
4+15	0.6675		2.94 Q					

4+20	0.6881	2.99	Q				
4+25	0.7098	3.15	Q				
4+30	0.7325	3.30	Q				
4+35	0.7557	3.36	Q				
4+40	0.7791	3.40	Q				
4+45	0.8027	3.43	Q				
4+50	0.8267	3.48	Q				
4+55	0.8519	3.65	Q				
5+ 0	0.8780	3.80	Q				
5+ 5	0.9041	3.79	Q				
5+10	0.9284	3.52	Q				
5+15	0.9509	3.27	Q				
5+20	0.9731	3.21	Q				
5+25	0.9959	3.32	Q				
5+30	1.0195	3.42	Q				
5+35	1.0435	3.49	Q				
5+40	1.0687	3.66	Q				
5+45	1.0949	3.81	Q				
5+50	1.1216	3.87	Q				
5+55	1.1485	3.90	QV				
6+ 0	1.1755	3.93	QV				
6+ 5	1.2029	3.98	QV				
6+10	1.2315	4.14	Q				
6+15	1.2610	4.29	Q				
6+20	1.2910	4.36	Q				
6+25	1.3213	4.40	Q				
6+30	1.3518	4.43	Q				
6+35	1.3827	4.48	Q				
6+40	1.4147	4.65	Q				
6+45	1.4477	4.80	Q				
6+50	1.4812	4.86	Q				
6+55	1.5150	4.90	Q				
7+ 0	1.5489	4.93	Q				
7+ 5	1.5830	4.95	Q				
7+10	1.6171	4.96	Q				
7+15	1.6514	4.97	Q				
7+20	1.6859	5.01	Q				
7+25	1.7215	5.17	QV				
7+30	1.7581	5.32	QV				
7+35	1.7954	5.41	QV				
7+40	1.8340	5.60	QV				
7+45	1.8736	5.76	QV				
7+50	1.9141	5.87	QV				
7+55	1.9559	6.07	Q				
8+ 0	1.9988	6.24	Q				
8+ 5	2.0428	6.39	Q				
8+10	2.0892	6.74	Q				
8+15	2.1378	7.06	Q				
8+20	2.1874	7.20	Q				
8+25	2.2375	7.28	Q				
8+30	2.2881	7.34	QV				
8+35	2.3391	7.42	QV				
8+40	2.3915	7.60	QV				
8+45	2.4449	7.76	QV				

8+50	2.4992	7.87	QV						
8+55	2.5548	8.07	Q						
9+ 0	2.6115	8.24	Q						
9+ 5	2.6693	8.39	Q						
9+10	2.7296	8.75	Q						
9+15	2.7920	9.06	Q						
9+20	2.8569	9.42	QV						
9+25	2.9288	10.44	Q						
9+30	3.0077	11.45	Q						
9+35	3.0922	12.27	VQ						
9+40	3.1871	13.78	VQ						
9+45	3.2915	15.15	V Q						
9+50	3.4027	16.15	V Q						
9+55	3.5252	17.78	V Q						
10+ 0	3.6577	19.24	V Q						
10+ 5	3.7886	19.01	V Q						
10+10	3.8930	15.17	VQ						
10+15	3.9724	11.52	Q V						
10+20	4.0422	10.14	Q V						
10+25	4.1070	9.41	Q V						
10+30	4.1685	8.93	Q V						
10+35	4.2320	9.22	Q V						
10+40	4.3131	11.76	Q V						
10+45	4.4110	14.21	Q						
10+50	4.5159	15.24	QV						
10+55	4.6253	15.89	QV						
11+ 0	4.7383	16.41	Q						
11+ 5	4.8526	16.59	Q						
11+10	4.9619	15.88	QV						
11+15	5.0667	15.22	QV						
11+20	5.1714	15.20	Q V						
11+25	5.2769	15.32	Q V						
11+30	5.3837	15.49	Q V						
11+35	5.4882	15.18	Q V						
11+40	5.5795	13.26	Q V						
11+45	5.6590	11.53	Q V						
11+50	5.7361	11.19	Q V						
11+55	5.8189	12.03	Q V						
12+ 0	5.9079	12.92	Q V						
12+ 5	6.0119	15.10	Q V						
12+10	6.1695	22.89	VQ						
12+15	6.3764	30.03	V Q						
12+20	6.6058	33.32	V Q						
12+25	6.8553	36.22	V Q						
12+30	7.1206	38.52	V Q						
12+35	7.3993	40.46	V Q						
12+40	7.6998	43.64	V Q						
12+45	8.0195	46.42	V Q						
12+50	8.3514	48.20	V Q						
12+55	8.6980	50.33	V Q						
13+ 0	9.0572	52.15	V Q						
13+ 5	9.4323	54.47	V Q						
13+10	9.8499	60.63	V Q						
13+15	10.3059	66.22	V Q						

13+20	10.7789	68.68			V				Q
13+25	11.2624	70.21			V				Q
13+30	11.7538	71.35				V			Q
13+35	12.2322	69.46				V			Q
13+40	12.6342	58.38					V	Q	
13+45	12.9660	48.17					VQ		
13+50	13.2712	44.31					QV		
13+55	13.5623	42.27				Q	V		
14+ 0	13.8445	40.97			Q		V		
14+ 5	14.1275	41.09			Q		V		
14+10	14.4361	44.82				Q	V		
14+15	14.7694	48.39					Q V		
14+20	15.1095	49.39					Q V		
14+25	15.4471	49.01					Q V		
14+30	15.7814	48.54					Q V		
14+35	16.1159	48.57					Q V		
14+40	16.4512	48.67					Q V		
14+45	16.7871	48.78					Q V		
14+50	17.1234	48.84					Q V		
14+55	17.4544	48.05					Q V		
15+ 0	17.7804	47.34					Q V		
15+ 5	18.1037	46.94					Q V		
15+10	18.4198	45.90					Q V		
15+15	18.7298	45.02					Q V		
15+20	19.0359	44.44					Q V		
15+25	19.3338	43.26					Q V		
15+30	19.6248	42.25					Q V		
15+35	19.9064	40.88					Q V		
15+40	20.1575	36.46					Q V		
15+45	20.3812	32.49					Q V		
15+50	20.5942	30.92					Q V		
15+55	20.8013	30.08					Q V		
16+ 0	21.0049	29.56					Q V		
16+ 5	21.1933	27.35					Q V		
16+10	21.3250	19.12					Q V		
16+15	21.4048	11.60					Q V		
16+20	21.4631	8.46					Q V		
16+25	21.5089	6.65					Q V		
16+30	21.5460	5.39					Q V		
16+35	21.5767	4.46					Q V		
16+40	21.6018	3.64					Q V		
16+45	21.6224	2.98					Q V		
16+50	21.6400	2.55					Q V		
16+55	21.6554	2.24					Q V		
17+ 0	21.6692	2.00					Q V		
17+ 5	21.6823	1.90					Q V		
17+10	21.6964	2.05					Q V		
17+15	21.7114	2.18					Q V		
17+20	21.7271	2.29					Q V		
17+25	21.7433	2.34					Q V		
17+30	21.7597	2.38					Q V		
17+35	21.7763	2.41					Q V		
17+40	21.7931	2.43					Q V		
17+45	21.8099	2.45					Q V		

17+50	21.8266	2.43	Q				V
17+55	21.8424	2.28	Q				V
18+ 0	21.8572	2.15	Q				V
18+ 5	21.8717	2.10	Q				V
18+10	21.8860	2.08	Q				V
18+15	21.9002	2.06	Q				V
18+20	21.9143	2.04	Q				V
18+25	21.9283	2.03	Q				V
18+30	21.9422	2.02	Q				V
18+35	21.9558	1.98	Q				V
18+40	21.9684	1.82	Q				V
18+45	21.9800	1.68	Q				V
18+50	21.9909	1.58	Q				V
18+55	22.0005	1.40	Q				V
19+ 0	22.0090	1.23	Q				V
19+ 5	22.0172	1.20	Q				V
19+10	22.0262	1.31	Q				V
19+15	22.0359	1.41	Q				V
19+20	22.0462	1.48	Q				V
19+25	22.0575	1.65	Q				V
19+30	22.0699	1.80	Q				V
19+35	22.0825	1.83	Q				V
19+40	22.0943	1.71	Q				V
19+45	22.1052	1.59	Q				V
19+50	22.1157	1.52	Q				V
19+55	22.1250	1.35	Q				V
20+ 0	22.1332	1.20	Q				V
20+ 5	22.1413	1.17	Q				V
20+10	22.1502	1.29	Q				V
20+15	22.1599	1.41	Q				V
20+20	22.1698	1.44	Q				V
20+25	22.1799	1.46	Q				V
20+30	22.1900	1.47	Q				V
20+35	22.2002	1.48	Q				V
20+40	22.2104	1.48	Q				V
20+45	22.2206	1.48	Q				V
20+50	22.2306	1.45	Q				V
20+55	22.2395	1.30	Q				V
21+ 0	22.2475	1.16	Q				V
21+ 5	22.2554	1.15	Q				V
21+10	22.2641	1.27	Q				V
21+15	22.2737	1.39	Q				V
21+20	22.2833	1.39	Q				V
21+25	22.2920	1.26	Q				V
21+30	22.2998	1.14	Q				V
21+35	22.3075	1.12	Q				V
21+40	22.3162	1.25	Q				V
21+45	22.3256	1.37	Q				V
21+50	22.3351	1.38	Q				V
21+55	22.3437	1.25	Q				V
22+ 0	22.3515	1.13	Q				V
22+ 5	22.3592	1.12	Q				V
22+10	22.3678	1.25	Q				V
22+15	22.3772	1.37	Q				V

22+20	22.3867	1.38	Q				V
22+25	22.3953	1.25	Q				V
22+30	22.4031	1.13	Q				V
22+35	22.4106	1.08	Q				V
22+40	22.4178	1.06	Q				V
22+45	22.4250	1.04	Q				V
22+50	22.4321	1.03	Q				V
22+55	22.4392	1.02	Q				V
23+ 0	22.4462	1.02	Q				V
23+ 5	22.4532	1.01	Q				V
23+10	22.4601	1.01	Q				V
23+15	22.4671	1.01	Q				V
23+20	22.4740	1.00	Q				V
23+25	22.4809	1.00	Q				V
23+30	22.4878	1.00	Q				V
23+35	22.4946	1.00	Q				V
23+40	22.5015	1.00	Q				V
23+45	22.5084	1.00	Q				V
23+50	22.5153	1.00	Q				V
23+55	22.5222	1.00	Q				V
24+ 0	22.5291	1.00	Q				V
24+ 5	22.5354	0.93	Q				V
24+10	22.5397	0.62	Q				V
24+15	22.5421	0.34	Q				V
24+20	22.5437	0.23	Q				V
24+25	22.5448	0.17	Q				V
24+30	22.5457	0.12	Q				V
24+35	22.5463	0.09	Q				V
24+40	22.5468	0.07	Q				V
24+45	22.5471	0.05	Q				V
24+50	22.5474	0.04	Q				V
24+55	22.5476	0.03	Q				V
25+ 0	22.5477	0.02	Q				V
25+ 5	22.5477	0.01	Q				V
25+10	22.5478	0.01	Q				V



MAYERS & ASSOCIATES
Civil Engineering, Inc.
PLANNING • ENGINEERING • SURVEYING

Preliminary Hydrology Analysis
VTTM 36557, "TERRACINA"
City of Lake Elsinore / Riverside County

AREA "B" CALCULATION

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
94.30	0.58	54.69

100 YEAR Area rainfall data:

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

94.30

1.45

136.73

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)

Areal adjustment factor = 99.91 %

Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	9.795
2	0.167	137.488	37.478
3	0.250	206.232	22.414
4	0.333	274.976	8.676
5	0.417	343.720	5.276
6	0.500	412.464	3.527
7	0.583	481.208	2.344
8	0.667	549.952	1.841
9	0.750	618.696	1.317
10	0.833	687.440	0.945

11	0.917	756.184	0.716	0.680
12	1.000	824.928	0.782	0.743
Sum = 100.000			Sum=	95.037

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	0.08	4.40	0.306	(0.339)	0.202	0.104
2	0.17	4.50	0.313	(0.339)	0.207	0.106
3	0.25	5.40	0.376	(0.339)	0.248	0.127
4	0.33	5.40	0.376	(0.339)	0.248	0.127
5	0.42	5.70	0.396	(0.339)	0.262	0.135
6	0.50	6.40	0.445	(0.339)	0.294	0.151
7	0.58	7.90	0.549	0.339	(0.363)	0.210
8	0.67	9.10	0.633	0.339	(0.418)	0.294
9	0.75	12.80	0.890	0.339	(0.588)	0.551
10	0.83	25.60	1.780	0.339	(1.176)	1.441
11	0.92	7.90	0.549	0.339	(0.363)	0.210
12	1.00	4.90	0.341	(0.339)	0.225	0.116

(Loss Rate Not Used)

Sum = 100.0 Sum = 3.6

Flood volume = Effective rainfall 0.30(In)
times area 94.3(Ac.)/[(In)/(Ft.)) = 2.3(Ac.Ft)

Total soil loss = 0.28(In)

Total soil loss = 2.214(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 101913.4 Cubic Feet

Total soil loss = 96456.1 Cubic Feet

Peak flow rate of this hydrograph = 73.536(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0070	1.02	Q				
0+10	0.0410	4.94	V Q				
0+15	0.0931	7.56	V Q				
0+20	0.1572	9.31	V Q				
0+25	0.2291	10.43	V Q				
0+30	0.3077	11.42	Q				
0+35	0.3982	13.14	Q				
0+40	0.5145	16.88	Q				

0+45	0.6814	24.23			VQ				
0+50	0.9929	45.24				V			
0+55	1.4994	73.54					Q		
1+ 0	1.8399	49.45						V	Q
1+ 5	2.0241	26.74			Q		Q		
1+10	2.1312	15.55						V	
1+15	2.1976	9.64							V
1+20	2.2426	6.54							V
1+25	2.2758	4.82							V
1+30	2.2994	3.43							V
1+35	2.3163	2.45							V
1+40	2.3283	1.74							V
1+45	2.3374	1.32							V
1+50	2.3390	0.24							V
1+55	2.3396	0.09							V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 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]
94.30	0.98	92.41

100 YEAR Area rainfall data:

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

94.30

2.48

233.86

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 0.980 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 0.980 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.339)	0.101	0.052
2	0.17	1.30	0.153	(0.339)	0.101	0.052
3	0.25	1.10	0.129	(0.339)	0.085	0.044
4	0.33	1.50	0.176	(0.339)	0.116	0.060
5	0.42	1.50	0.176	(0.339)	0.116	0.060
6	0.50	1.80	0.212	(0.339)	0.140	0.072
7	0.58	1.50	0.176	(0.339)	0.116	0.060
8	0.67	1.80	0.212	(0.339)	0.140	0.072
9	0.75	1.80	0.212	(0.339)	0.140	0.072
10	0.83	1.50	0.176	(0.339)	0.116	0.060
11	0.92	1.60	0.188	(0.339)	0.124	0.064
12	1.00	1.80	0.212	(0.339)	0.140	0.072
13	1.08	2.20	0.259	(0.339)	0.171	0.088
14	1.17	2.20	0.259	(0.339)	0.171	0.088
15	1.25	2.20	0.259	(0.339)	0.171	0.088
16	1.33	2.00	0.235	(0.339)	0.155	0.080
17	1.42	2.60	0.306	(0.339)	0.202	0.104
18	1.50	2.70	0.317	(0.339)	0.210	0.108
19	1.58	2.40	0.282	(0.339)	0.186	0.096
20	1.67	2.70	0.317	(0.339)	0.210	0.108
21	1.75	3.30	0.388	(0.339)	0.256	0.132
22	1.83	3.10	0.364	(0.339)	0.241	0.124
23	1.92	2.90	0.341	(0.339)	0.225	0.116
24	2.00	3.00	0.353	(0.339)	0.233	0.120
25	2.08	3.10	0.364	(0.339)	0.241	0.124
26	2.17	4.20	0.494	(0.339)	0.326	0.168
27	2.25	5.00	0.588	0.339	(0.388)	0.249
28	2.33	3.50	0.411	(0.339)	0.272	0.140
29	2.42	6.80	0.799	0.339	(0.528)	0.460
30	2.50	7.30	0.858	0.339	(0.567)	0.519
31	2.58	8.20	0.964	0.339	(0.637)	0.625
32	2.67	5.90	0.694	0.339	(0.458)	0.354
33	2.75	2.00	0.235	(0.339)	0.155	0.080
34	2.83	1.80	0.212	(0.339)	0.140	0.072
35	2.92	1.80	0.212	(0.339)	0.140	0.072
36	3.00	0.60	0.071	(0.339)	0.047	0.024

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.9

Flood volume = Effective rainfall 0.41(In)
times area 94.3(Ac.)/[(In)/(Ft.)] = 3.2(Ac.Ft)
Total soil loss = 0.57(In)
Total soil loss = 4.507(Ac.Ft)
Total rainfall = 0.98(In)

Flood volume = 139004.0 Cubic Feet
 Total soil loss = 196320.5 Cubic Feet

 Peak flow rate of this hydrograph = 45.219 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0035	0.51	Q					
0+10	0.0204	2.45	VQ					
0+15	0.0448	3.54	V Q					
0+20	0.0713	3.85	V Q					
0+25	0.1025	4.54	V Q					
0+30	0.1379	5.13	V Q					
0+35	0.1770	5.68	V Q					
0+40	0.2167	5.77	V Q					
0+45	0.2591	6.16	VQ					
0+50	0.3028	6.34	V Q					
0+55	0.3446	6.07	Q					
1+ 0	0.3868	6.13	Q					
1+ 5	0.4323	6.62	Q					
1+10	0.4832	7.39	QV					
1+15	0.5371	7.83	Q					
1+20	0.5917	7.93	QV					
1+25	0.6466	7.97	Q V					
1+30	0.7072	8.80	QV					
1+35	0.7716	9.35	Q V					
1+40	0.8358	9.31	Q V					
1+45	0.9038	9.88	Q V					
1+50	0.9795	10.98	Q V					
1+55	1.0569	11.25	Q V					
2+ 0	1.1333	11.09	Q V					
2+ 5	1.2105	11.21	Q V					
2+10	1.2923	11.88	Q V					
2+15	1.3918	14.45	Q V					
2+20	1.5122	17.48	Q V					
2+25	1.6415	18.77	Q V					
2+30	1.8473	29.88	Q					
2+35	2.1226	39.97	Q					
2+40	2.4340	45.22	Q					
2+45	2.6878	36.85	Q					
2+50	2.8443	22.72	Q					
2+55	2.9503	15.39	Q					
3+ 0	3.0329	12.00	Q					
3+ 5	3.0898	8.26	Q					
3+10	3.1256	5.20	Q					
3+15	3.1491	3.41	Q					
3+20	3.1660	2.45	Q					

3+25	3.1773	1.64	Q				V
3+30	3.1846	1.06	Q				V
3+35	3.1882	0.52	Q				V
3+40	3.1896	0.21	Q				V
3+45	3.1905	0.12	Q				V
3+50	3.1910	0.07	Q				V
3+55	3.1911	0.02	Q				V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
94.30	1.38	130.13

100 YEAR Area rainfall data:

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

94.30

3.48

328.16

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.380 (In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 1.380 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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	0.08	0.50	0.083	(0.339)	0.055	0.028
2	0.17	0.60	0.099	(0.339)	0.066	0.034
3	0.25	0.60	0.099	(0.339)	0.066	0.034
4	0.33	0.60	0.099	(0.339)	0.066	0.034
5	0.42	0.60	0.099	(0.339)	0.066	0.034
6	0.50	0.70	0.116	(0.339)	0.077	0.039
7	0.58	0.70	0.116	(0.339)	0.077	0.039
8	0.67	0.70	0.116	(0.339)	0.077	0.039
9	0.75	0.70	0.116	(0.339)	0.077	0.039
10	0.83	0.70	0.116	(0.339)	0.077	0.039
11	0.92	0.70	0.116	(0.339)	0.077	0.039
12	1.00	0.80	0.132	(0.339)	0.087	0.045
13	1.08	0.80	0.132	(0.339)	0.087	0.045
14	1.17	0.80	0.132	(0.339)	0.087	0.045
15	1.25	0.80	0.132	(0.339)	0.087	0.045
16	1.33	0.80	0.132	(0.339)	0.087	0.045
17	1.42	0.80	0.132	(0.339)	0.087	0.045
18	1.50	0.80	0.132	(0.339)	0.087	0.045
19	1.58	0.80	0.132	(0.339)	0.087	0.045
20	1.67	0.80	0.132	(0.339)	0.087	0.045
21	1.75	0.80	0.132	(0.339)	0.087	0.045
22	1.83	0.80	0.132	(0.339)	0.087	0.045
23	1.92	0.80	0.132	(0.339)	0.087	0.045
24	2.00	0.90	0.149	(0.339)	0.098	0.051
25	2.08	0.80	0.132	(0.339)	0.087	0.045
26	2.17	0.90	0.149	(0.339)	0.098	0.051
27	2.25	0.90	0.149	(0.339)	0.098	0.051
28	2.33	0.90	0.149	(0.339)	0.098	0.051
29	2.42	0.90	0.149	(0.339)	0.098	0.051
30	2.50	0.90	0.149	(0.339)	0.098	0.051
31	2.58	0.90	0.149	(0.339)	0.098	0.051
32	2.67	0.90	0.149	(0.339)	0.098	0.051
33	2.75	1.00	0.166	(0.339)	0.109	0.056
34	2.83	1.00	0.166	(0.339)	0.109	0.056
35	2.92	1.00	0.166	(0.339)	0.109	0.056
36	3.00	1.00	0.166	(0.339)	0.109	0.056
37	3.08	1.00	0.166	(0.339)	0.109	0.056
38	3.17	1.10	0.182	(0.339)	0.120	0.062
39	3.25	1.10	0.182	(0.339)	0.120	0.062
40	3.33	1.10	0.182	(0.339)	0.120	0.062
41	3.42	1.20	0.199	(0.339)	0.131	0.067
42	3.50	1.30	0.215	(0.339)	0.142	0.073
43	3.58	1.40	0.232	(0.339)	0.153	0.079

44	3.67	1.40	0.232	(0.339)	0.153	0.079
45	3.75	1.50	0.248	(0.339)	0.164	0.084
46	3.83	1.50	0.248	(0.339)	0.164	0.084
47	3.92	1.60	0.265	(0.339)	0.175	0.090
48	4.00	1.60	0.265	(0.339)	0.175	0.090
49	4.08	1.70	0.281	(0.339)	0.186	0.096
50	4.17	1.80	0.298	(0.339)	0.197	0.101
51	4.25	1.90	0.315	(0.339)	0.208	0.107
52	4.33	2.00	0.331	(0.339)	0.219	0.112
53	4.42	2.10	0.348	(0.339)	0.230	0.118
54	4.50	2.10	0.348	(0.339)	0.230	0.118
55	4.58	2.20	0.364	(0.339)	0.241	0.124
56	4.67	2.30	0.381	(0.339)	0.251	0.129
57	4.75	2.40	0.397	(0.339)	0.262	0.135
58	4.83	2.40	0.397	(0.339)	0.262	0.135
59	4.92	2.50	0.414	(0.339)	0.273	0.141
60	5.00	2.60	0.430	(0.339)	0.284	0.146
61	5.08	3.10	0.513	(0.339)	0.339	0.174
62	5.17	3.60	0.596	0.339 (0.394)		0.257
63	5.25	3.90	0.646	0.339 (0.426)		0.306
64	5.33	4.20	0.695	0.339 (0.459)		0.356
65	5.42	4.70	0.778	0.339 (0.514)		0.439
66	5.50	5.60	0.927	0.339 (0.612)		0.588
67	5.58	1.90	0.315	(0.339)	0.208	0.107
68	5.67	0.90	0.149	(0.339)	0.098	0.051
69	5.75	0.60	0.099	(0.339)	0.066	0.034
70	5.83	0.50	0.083	(0.339)	0.055	0.028
71	5.92	0.30	0.050	(0.339)	0.033	0.017
72	6.00	0.20	0.033	(0.339)	0.022	0.011

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.3

Flood volume = Effective rainfall 0.53(In)
times area 94.3(Ac.)/[(In)/(Ft.)] = 4.1(Ac.Ft)
Total soil loss = 0.85(In)
Total soil loss = 6.696(Ac.Ft)
Total rainfall = 1.38(In)
Flood volume = 180572.8 Cubic Feet
Total soil loss = 291660.5 Cubic Feet

Peak flow rate of this hydrograph = 39.729(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0019	0.28	Q				
0+10	0.0114	1.38	VQ				
0+15	0.0268	2.23	V Q				
0+20	0.0446	2.60	V Q				

0+25	0.0639	2.79	V Q						
0+30	0.0844	2.98	V Q						
0+35	0.1069	3.27	V Q						
0+40	0.1307	3.46	V Q						
0+45	0.1553	3.56	V Q						
0+50	0.1802	3.62	V Q						
0+55	0.2055	3.67	V Q						
1+ 0	0.2314	3.76	VQ						
1+ 5	0.2588	3.99	VQ						
1+10	0.2872	4.12	V Q						
1+15	0.3159	4.17	VQ						
1+20	0.3449	4.21	VQ						
1+25	0.3741	4.23	VQ						
1+30	0.4033	4.24	VQ						
1+35	0.4326	4.25	Q						
1+40	0.4619	4.26	Q						
1+45	0.4913	4.27	Q						
1+50	0.5207	4.27	QV						
1+55	0.5502	4.28	QV						
2+ 0	0.5800	4.33	QV						
2+ 5	0.6109	4.49	QV						
2+10	0.6416	4.46	Q V						
2+15	0.6732	4.59	Q V						
2+20	0.7056	4.70	Q V						
2+25	0.7382	4.74	Q V						
2+30	0.7709	4.76	Q V						
2+35	0.8038	4.78	Q V						
2+40	0.8368	4.79	Q V						
2+45	0.8702	4.85	Q V						
2+50	0.9051	5.07	Q V						
2+55	0.9409	5.20	Q V						
3+ 0	0.9770	5.25	Q V						
3+ 5	1.0134	5.28	Q V						
3+10	1.0503	5.35	Q V						
3+15	1.0887	5.58	Q V						
3+20	1.1280	5.72	Q V						
3+25	1.1682	5.83	Q V						
3+30	1.2104	6.13	Q V						
3+35	1.2554	6.54	Q V						
3+40	1.3033	6.95	Q V						
3+45	1.3530	7.22	Q V						
3+50	1.4048	7.53	Q V						
3+55	1.4584	7.78	Q V						
4+ 0	1.5141	8.09	Q V						
4+ 5	1.5715	8.33	Q V						
4+10	1.6314	8.69	Q V						
4+15	1.6943	9.14	Q V						
4+20	1.7606	9.63	Q V						
4+25	1.8304	10.13	Q V						
4+30	1.9033	10.58	Q V						
4+35	1.9782	10.88	Q V						
4+40	2.0559	11.28	Q V						
4+45	2.1369	11.76	Q V						
4+50	2.2209	12.20	Q V						

4+55	2.3070	12.50			Q		V	
5+ 0	2.3959	12.90			Q		V	
5+ 5	2.4895	13.59			Q		V	
5+10	2.5975	15.69			Q		V	
5+15	2.7354	20.02				Q	V	
5+20	2.9045	24.54					Q	
5+25	3.1059	29.24					V	
5+30	3.3533	35.93					Q	
5+35	3.6269	39.73						V
5+40	3.8053	25.90						Q
5+45	3.9089	15.05			Q			V
5+50	3.9803	10.36						V
5+55	4.0327	7.61		Q				V
6+ 0	4.0710	5.56						V
6+ 5	4.0989	4.05		Q				V
6+10	4.1171	2.64	Q					V
6+15	4.1289	1.72	Q					V
6+20	4.1368	1.14	Q					V
6+25	4.1418	0.73	Q					V
6+30	4.1435	0.24	Q					V
6+35	4.1444	0.13	Q					V
6+40	4.1449	0.07	Q					V
6+45	4.1452	0.04	Q					V
6+50	4.1453	0.02	Q					V
6+55	4.1454	0.01	Q					V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 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]
94.30	2.48	233.86

100 YEAR Area rainfall data:

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

94.30

6.90

650.67

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 2.480(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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	0.08	0.07	0.020	(0.601) 0.013	0.007
2	0.17	0.07	0.020	(0.599) 0.013	0.007
3	0.25	0.07	0.020	(0.597) 0.013	0.007
4	0.33	0.10	0.030	(0.594) 0.020	0.010
5	0.42	0.10	0.030	(0.592) 0.020	0.010
6	0.50	0.10	0.030	(0.590) 0.020	0.010
7	0.58	0.10	0.030	(0.587) 0.020	0.010
8	0.67	0.10	0.030	(0.585) 0.020	0.010
9	0.75	0.10	0.030	(0.583) 0.020	0.010
10	0.83	0.13	0.040	(0.580) 0.026	0.013
11	0.92	0.13	0.040	(0.578) 0.026	0.013
12	1.00	0.13	0.040	(0.576) 0.026	0.013
13	1.08	0.10	0.030	(0.574) 0.020	0.010
14	1.17	0.10	0.030	(0.571) 0.020	0.010
15	1.25	0.10	0.030	(0.569) 0.020	0.010
16	1.33	0.10	0.030	(0.567) 0.020	0.010
17	1.42	0.10	0.030	(0.565) 0.020	0.010
18	1.50	0.10	0.030	(0.562) 0.020	0.010
19	1.58	0.10	0.030	(0.560) 0.020	0.010
20	1.67	0.10	0.030	(0.558) 0.020	0.010
21	1.75	0.10	0.030	(0.556) 0.020	0.010
22	1.83	0.13	0.040	(0.553) 0.026	0.013
23	1.92	0.13	0.040	(0.551) 0.026	0.013
24	2.00	0.13	0.040	(0.549) 0.026	0.013
25	2.08	0.13	0.040	(0.547) 0.026	0.013
26	2.17	0.13	0.040	(0.544) 0.026	0.013
27	2.25	0.13	0.040	(0.542) 0.026	0.013
28	2.33	0.13	0.040	(0.540) 0.026	0.013
29	2.42	0.13	0.040	(0.538) 0.026	0.013
30	2.50	0.13	0.040	(0.536) 0.026	0.013
31	2.58	0.17	0.050	(0.533) 0.033	0.017
32	2.67	0.17	0.050	(0.531) 0.033	0.017
33	2.75	0.17	0.050	(0.529) 0.033	0.017
34	2.83	0.17	0.050	(0.527) 0.033	0.017
35	2.92	0.17	0.050	(0.525) 0.033	0.017
36	3.00	0.17	0.050	(0.523) 0.033	0.017
37	3.08	0.17	0.050	(0.520) 0.033	0.017
38	3.17	0.17	0.050	(0.518) 0.033	0.017
39	3.25	0.17	0.050	(0.516) 0.033	0.017
40	3.33	0.17	0.050	(0.514) 0.033	0.017
41	3.42	0.17	0.050	(0.512) 0.033	0.017
42	3.50	0.17	0.050	(0.510) 0.033	0.017
43	3.58	0.17	0.050	(0.507) 0.033	0.017

44	3.67	0.17	0.050	(0.505)	0.033	0.017
45	3.75	0.17	0.050	(0.503)	0.033	0.017
46	3.83	0.20	0.060	(0.501)	0.039	0.020
47	3.92	0.20	0.060	(0.499)	0.039	0.020
48	4.00	0.20	0.060	(0.497)	0.039	0.020
49	4.08	0.20	0.060	(0.495)	0.039	0.020
50	4.17	0.20	0.060	(0.493)	0.039	0.020
51	4.25	0.20	0.060	(0.491)	0.039	0.020
52	4.33	0.23	0.069	(0.488)	0.046	0.024
53	4.42	0.23	0.069	(0.486)	0.046	0.024
54	4.50	0.23	0.069	(0.484)	0.046	0.024
55	4.58	0.23	0.069	(0.482)	0.046	0.024
56	4.67	0.23	0.069	(0.480)	0.046	0.024
57	4.75	0.23	0.069	(0.478)	0.046	0.024
58	4.83	0.27	0.079	(0.476)	0.052	0.027
59	4.92	0.27	0.079	(0.474)	0.052	0.027
60	5.00	0.27	0.079	(0.472)	0.052	0.027
61	5.08	0.20	0.060	(0.470)	0.039	0.020
62	5.17	0.20	0.060	(0.468)	0.039	0.020
63	5.25	0.20	0.060	(0.466)	0.039	0.020
64	5.33	0.23	0.069	(0.464)	0.046	0.024
65	5.42	0.23	0.069	(0.462)	0.046	0.024
66	5.50	0.23	0.069	(0.460)	0.046	0.024
67	5.58	0.27	0.079	(0.458)	0.052	0.027
68	5.67	0.27	0.079	(0.456)	0.052	0.027
69	5.75	0.27	0.079	(0.454)	0.052	0.027
70	5.83	0.27	0.079	(0.452)	0.052	0.027
71	5.92	0.27	0.079	(0.450)	0.052	0.027
72	6.00	0.27	0.079	(0.448)	0.052	0.027
73	6.08	0.30	0.089	(0.446)	0.059	0.030
74	6.17	0.30	0.089	(0.444)	0.059	0.030
75	6.25	0.30	0.089	(0.442)	0.059	0.030
76	6.33	0.30	0.089	(0.440)	0.059	0.030
77	6.42	0.30	0.089	(0.438)	0.059	0.030
78	6.50	0.30	0.089	(0.436)	0.059	0.030
79	6.58	0.33	0.099	(0.434)	0.066	0.034
80	6.67	0.33	0.099	(0.432)	0.066	0.034
81	6.75	0.33	0.099	(0.430)	0.066	0.034
82	6.83	0.33	0.099	(0.428)	0.066	0.034
83	6.92	0.33	0.099	(0.426)	0.066	0.034
84	7.00	0.33	0.099	(0.424)	0.066	0.034
85	7.08	0.33	0.099	(0.422)	0.066	0.034
86	7.17	0.33	0.099	(0.420)	0.066	0.034
87	7.25	0.33	0.099	(0.418)	0.066	0.034
88	7.33	0.37	0.109	(0.416)	0.072	0.037
89	7.42	0.37	0.109	(0.415)	0.072	0.037
90	7.50	0.37	0.109	(0.413)	0.072	0.037
91	7.58	0.40	0.119	(0.411)	0.079	0.040
92	7.67	0.40	0.119	(0.409)	0.079	0.040
93	7.75	0.40	0.119	(0.407)	0.079	0.040
94	7.83	0.43	0.129	(0.405)	0.085	0.044
95	7.92	0.43	0.129	(0.403)	0.085	0.044
96	8.00	0.43	0.129	(0.401)	0.085	0.044
97	8.08	0.50	0.149	(0.399)	0.098	0.051

98	8.17	0.50	0.149	(0.398)	0.098	0.051
99	8.25	0.50	0.149	(0.396)	0.098	0.051
100	8.33	0.50	0.149	(0.394)	0.098	0.051
101	8.42	0.50	0.149	(0.392)	0.098	0.051
102	8.50	0.50	0.149	(0.390)	0.098	0.051
103	8.58	0.53	0.159	(0.388)	0.105	0.054
104	8.67	0.53	0.159	(0.387)	0.105	0.054
105	8.75	0.53	0.159	(0.385)	0.105	0.054
106	8.83	0.57	0.169	(0.383)	0.111	0.057
107	8.92	0.57	0.169	(0.381)	0.111	0.057
108	9.00	0.57	0.169	(0.379)	0.111	0.057
109	9.08	0.63	0.188	(0.378)	0.124	0.064
110	9.17	0.63	0.188	(0.376)	0.124	0.064
111	9.25	0.63	0.188	(0.374)	0.124	0.064
112	9.33	0.67	0.198	(0.372)	0.131	0.067
113	9.42	0.67	0.198	(0.370)	0.131	0.067
114	9.50	0.67	0.198	(0.369)	0.131	0.067
115	9.58	0.70	0.208	(0.367)	0.138	0.071
116	9.67	0.70	0.208	(0.365)	0.138	0.071
117	9.75	0.70	0.208	(0.363)	0.138	0.071
118	9.83	0.73	0.218	(0.362)	0.144	0.074
119	9.92	0.73	0.218	(0.360)	0.144	0.074
120	10.00	0.73	0.218	(0.358)	0.144	0.074
121	10.08	0.50	0.149	(0.356)	0.098	0.051
122	10.17	0.50	0.149	(0.355)	0.098	0.051
123	10.25	0.50	0.149	(0.353)	0.098	0.051
124	10.33	0.50	0.149	(0.351)	0.098	0.051
125	10.42	0.50	0.149	(0.350)	0.098	0.051
126	10.50	0.50	0.149	(0.348)	0.098	0.051
127	10.58	0.67	0.198	(0.346)	0.131	0.067
128	10.67	0.67	0.198	(0.344)	0.131	0.067
129	10.75	0.67	0.198	(0.343)	0.131	0.067
130	10.83	0.67	0.198	(0.341)	0.131	0.067
131	10.92	0.67	0.198	(0.339)	0.131	0.067
132	11.00	0.67	0.198	(0.338)	0.131	0.067
133	11.08	0.63	0.188	(0.336)	0.124	0.064
134	11.17	0.63	0.188	(0.334)	0.124	0.064
135	11.25	0.63	0.188	(0.333)	0.124	0.064
136	11.33	0.63	0.188	(0.331)	0.124	0.064
137	11.42	0.63	0.188	(0.329)	0.124	0.064
138	11.50	0.63	0.188	(0.328)	0.124	0.064
139	11.58	0.57	0.169	(0.326)	0.111	0.057
140	11.67	0.57	0.169	(0.325)	0.111	0.057
141	11.75	0.57	0.169	(0.323)	0.111	0.057
142	11.83	0.60	0.179	(0.321)	0.118	0.061
143	11.92	0.60	0.179	(0.320)	0.118	0.061
144	12.00	0.60	0.179	(0.318)	0.118	0.061
145	12.08	0.83	0.248	(0.317)	0.164	0.084
146	12.17	0.83	0.248	(0.315)	0.164	0.084
147	12.25	0.83	0.248	(0.313)	0.164	0.084
148	12.33	0.87	0.258	(0.312)	0.170	0.088
149	12.42	0.87	0.258	(0.310)	0.170	0.088
150	12.50	0.87	0.258	(0.309)	0.170	0.088
151	12.58	0.93	0.278	(0.307)	0.183	0.094

152	12.67	0.93	0.278	(0.306)	0.183	0.094
153	12.75	0.93	0.278	(0.304)	0.183	0.094
154	12.83	0.97	0.288	(0.303)	0.190	0.098
155	12.92	0.97	0.288	(0.301)	0.190	0.098
156	13.00	0.97	0.288	(0.299)	0.190	0.098
157	13.08	1.13	0.337	(0.298)	0.223	0.114
158	13.17	1.13	0.337	(0.296)	0.223	0.114
159	13.25	1.13	0.337	(0.295)	0.223	0.114
160	13.33	1.13	0.337	(0.293)	0.223	0.114
161	13.42	1.13	0.337	(0.292)	0.223	0.114
162	13.50	1.13	0.337	(0.290)	0.223	0.114
163	13.58	0.77	0.228	(0.289)	0.151	0.077
164	13.67	0.77	0.228	(0.288)	0.151	0.077
165	13.75	0.77	0.228	(0.286)	0.151	0.077
166	13.83	0.77	0.228	(0.285)	0.151	0.077
167	13.92	0.77	0.228	(0.283)	0.151	0.077
168	14.00	0.77	0.228	(0.282)	0.151	0.077
169	14.08	0.90	0.268	(0.280)	0.177	0.091
170	14.17	0.90	0.268	(0.279)	0.177	0.091
171	14.25	0.90	0.268	(0.277)	0.177	0.091
172	14.33	0.87	0.258	(0.276)	0.170	0.088
173	14.42	0.87	0.258	(0.275)	0.170	0.088
174	14.50	0.87	0.258	(0.273)	0.170	0.088
175	14.58	0.87	0.258	(0.272)	0.170	0.088
176	14.67	0.87	0.258	(0.270)	0.170	0.088
177	14.75	0.87	0.258	(0.269)	0.170	0.088
178	14.83	0.83	0.248	(0.268)	0.164	0.084
179	14.92	0.83	0.248	(0.266)	0.164	0.084
180	15.00	0.83	0.248	(0.265)	0.164	0.084
181	15.08	0.80	0.238	(0.264)	0.157	0.081
182	15.17	0.80	0.238	(0.262)	0.157	0.081
183	15.25	0.80	0.238	(0.261)	0.157	0.081
184	15.33	0.77	0.228	(0.259)	0.151	0.077
185	15.42	0.77	0.228	(0.258)	0.151	0.077
186	15.50	0.77	0.228	(0.257)	0.151	0.077
187	15.58	0.63	0.188	(0.256)	0.124	0.064
188	15.67	0.63	0.188	(0.254)	0.124	0.064
189	15.75	0.63	0.188	(0.253)	0.124	0.064
190	15.83	0.63	0.188	(0.252)	0.124	0.064
191	15.92	0.63	0.188	(0.250)	0.124	0.064
192	16.00	0.63	0.188	(0.249)	0.124	0.064
193	16.08	0.13	0.040	(0.248)	0.026	0.013
194	16.17	0.13	0.040	(0.247)	0.026	0.013
195	16.25	0.13	0.040	(0.245)	0.026	0.013
196	16.33	0.13	0.040	(0.244)	0.026	0.013
197	16.42	0.13	0.040	(0.243)	0.026	0.013
198	16.50	0.13	0.040	(0.242)	0.026	0.013
199	16.58	0.10	0.030	(0.240)	0.020	0.010
200	16.67	0.10	0.030	(0.239)	0.020	0.010
201	16.75	0.10	0.030	(0.238)	0.020	0.010
202	16.83	0.10	0.030	(0.237)	0.020	0.010
203	16.92	0.10	0.030	(0.235)	0.020	0.010
204	17.00	0.10	0.030	(0.234)	0.020	0.010
205	17.08	0.17	0.050	(0.233)	0.033	0.017

206	17.17	0.17	0.050	(0.232)	0.033	0.017
207	17.25	0.17	0.050	(0.231)	0.033	0.017
208	17.33	0.17	0.050	(0.230)	0.033	0.017
209	17.42	0.17	0.050	(0.228)	0.033	0.017
210	17.50	0.17	0.050	(0.227)	0.033	0.017
211	17.58	0.17	0.050	(0.226)	0.033	0.017
212	17.67	0.17	0.050	(0.225)	0.033	0.017
213	17.75	0.17	0.050	(0.224)	0.033	0.017
214	17.83	0.13	0.040	(0.223)	0.026	0.013
215	17.92	0.13	0.040	(0.222)	0.026	0.013
216	18.00	0.13	0.040	(0.221)	0.026	0.013
217	18.08	0.13	0.040	(0.220)	0.026	0.013
218	18.17	0.13	0.040	(0.218)	0.026	0.013
219	18.25	0.13	0.040	(0.217)	0.026	0.013
220	18.33	0.13	0.040	(0.216)	0.026	0.013
221	18.42	0.13	0.040	(0.215)	0.026	0.013
222	18.50	0.13	0.040	(0.214)	0.026	0.013
223	18.58	0.10	0.030	(0.213)	0.020	0.010
224	18.67	0.10	0.030	(0.212)	0.020	0.010
225	18.75	0.10	0.030	(0.211)	0.020	0.010
226	18.83	0.07	0.020	(0.210)	0.013	0.007
227	18.92	0.07	0.020	(0.209)	0.013	0.007
228	19.00	0.07	0.020	(0.208)	0.013	0.007
229	19.08	0.10	0.030	(0.207)	0.020	0.010
230	19.17	0.10	0.030	(0.206)	0.020	0.010
231	19.25	0.10	0.030	(0.205)	0.020	0.010
232	19.33	0.13	0.040	(0.204)	0.026	0.013
233	19.42	0.13	0.040	(0.203)	0.026	0.013
234	19.50	0.13	0.040	(0.202)	0.026	0.013
235	19.58	0.10	0.030	(0.201)	0.020	0.010
236	19.67	0.10	0.030	(0.201)	0.020	0.010
237	19.75	0.10	0.030	(0.200)	0.020	0.010
238	19.83	0.07	0.020	(0.199)	0.013	0.007
239	19.92	0.07	0.020	(0.198)	0.013	0.007
240	20.00	0.07	0.020	(0.197)	0.013	0.007
241	20.08	0.10	0.030	(0.196)	0.020	0.010
242	20.17	0.10	0.030	(0.195)	0.020	0.010
243	20.25	0.10	0.030	(0.194)	0.020	0.010
244	20.33	0.10	0.030	(0.194)	0.020	0.010
245	20.42	0.10	0.030	(0.193)	0.020	0.010
246	20.50	0.10	0.030	(0.192)	0.020	0.010
247	20.58	0.10	0.030	(0.191)	0.020	0.010
248	20.67	0.10	0.030	(0.190)	0.020	0.010
249	20.75	0.10	0.030	(0.189)	0.020	0.010
250	20.83	0.07	0.020	(0.189)	0.013	0.007
251	20.92	0.07	0.020	(0.188)	0.013	0.007
252	21.00	0.07	0.020	(0.187)	0.013	0.007
253	21.08	0.10	0.030	(0.186)	0.020	0.010
254	21.17	0.10	0.030	(0.186)	0.020	0.010
255	21.25	0.10	0.030	(0.185)	0.020	0.010
256	21.33	0.07	0.020	(0.184)	0.013	0.007
257	21.42	0.07	0.020	(0.184)	0.013	0.007
258	21.50	0.07	0.020	(0.183)	0.013	0.007
259	21.58	0.10	0.030	(0.182)	0.020	0.010

260	21.67	0.10	0.030	(0.182)	0.020	0.010
261	21.75	0.10	0.030	(0.181)	0.020	0.010
262	21.83	0.07	0.020	(0.180)	0.013	0.007
263	21.92	0.07	0.020	(0.180)	0.013	0.007
264	22.00	0.07	0.020	(0.179)	0.013	0.007
265	22.08	0.10	0.030	(0.178)	0.020	0.010
266	22.17	0.10	0.030	(0.178)	0.020	0.010
267	22.25	0.10	0.030	(0.177)	0.020	0.010
268	22.33	0.07	0.020	(0.177)	0.013	0.007
269	22.42	0.07	0.020	(0.176)	0.013	0.007
270	22.50	0.07	0.020	(0.176)	0.013	0.007
271	22.58	0.07	0.020	(0.175)	0.013	0.007
272	22.67	0.07	0.020	(0.175)	0.013	0.007
273	22.75	0.07	0.020	(0.174)	0.013	0.007
274	22.83	0.07	0.020	(0.174)	0.013	0.007
275	22.92	0.07	0.020	(0.173)	0.013	0.007
276	23.00	0.07	0.020	(0.173)	0.013	0.007
277	23.08	0.07	0.020	(0.173)	0.013	0.007
278	23.17	0.07	0.020	(0.172)	0.013	0.007
279	23.25	0.07	0.020	(0.172)	0.013	0.007
280	23.33	0.07	0.020	(0.171)	0.013	0.007
281	23.42	0.07	0.020	(0.171)	0.013	0.007
282	23.50	0.07	0.020	(0.171)	0.013	0.007
283	23.58	0.07	0.020	(0.171)	0.013	0.007
284	23.67	0.07	0.020	(0.170)	0.013	0.007
285	23.75	0.07	0.020	(0.170)	0.013	0.007
286	23.83	0.07	0.020	(0.170)	0.013	0.007
287	23.92	0.07	0.020	(0.170)	0.013	0.007
288	24.00	0.07	0.020	(0.170)	0.013	0.007

(Loss Rate Not Used)

Sum = 100.0

Sum = 10.1

Flood volume = Effective rainfall 0.84(In)

times area 94.3(Ac.)/[(In)/(Ft.)] = 6.6(Ac.Ft)

Total soil loss = 1.64(In)

Total soil loss = 12.870(Ac.Ft)

Total rainfall = 2.48(In)

Flood volume = 288157.4 Cubic Feet

Total soil loss = 560612.6 Cubic Feet

Peak flow rate of this hydrograph = 10.745(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0005	0.07	Q				
0+10	0.0026	0.32	Q				
0+15	0.0059	0.47	Q				
0+20	0.0097	0.56	VQ				

0+25	0.0147	0.72	VQ
0+30	0.0204	0.82	VQ
0+35	0.0264	0.87	VQ
0+40	0.0325	0.90	VQ
0+45	0.0389	0.92	VQ
0+50	0.0455	0.97	VQ
0+55	0.0531	1.10	V Q
1+ 0	0.0613	1.19	V Q
1+ 5	0.0694	1.19	V Q
1+10	0.0769	1.08	V Q
1+15	0.0839	1.02	V Q
1+20	0.0908	1.00	VQ
1+25	0.0976	0.99	VQ
1+30	0.1043	0.98	VQ
1+35	0.1110	0.97	VQ
1+40	0.1177	0.97	VQ
1+45	0.1244	0.97	VQ
1+50	0.1313	1.00	VQ
1+55	0.1390	1.12	V Q
2+ 0	0.1472	1.20	V Q
2+ 5	0.1557	1.22	V Q
2+10	0.1642	1.24	V Q
2+15	0.1729	1.25	VQ
2+20	0.1815	1.26	VQ
2+25	0.1903	1.27	VQ
2+30	0.1990	1.27	VQ
2+35	0.2081	1.31	VQ
2+40	0.2180	1.44	VQ
2+45	0.2284	1.52	V Q
2+50	0.2390	1.54	V Q
2+55	0.2498	1.56	V Q
3+ 0	0.2606	1.57	V Q
3+ 5	0.2715	1.58	V Q
3+10	0.2825	1.59	V Q
3+15	0.2934	1.59	V Q
3+20	0.3044	1.60	V Q
3+25	0.3154	1.60	V Q
3+30	0.3265	1.60	V Q
3+35	0.3375	1.60	VQ
3+40	0.3485	1.60	VQ
3+45	0.3595	1.60	VQ
3+50	0.3708	1.63	VQ
3+55	0.3829	1.76	VQ
4+ 0	0.3956	1.84	VQ
4+ 5	0.4084	1.86	VQ
4+10	0.4214	1.88	VQ
4+15	0.4344	1.89	VQ
4+20	0.4477	1.94	VQ
4+25	0.4620	2.07	V Q
4+30	0.4768	2.15	V Q
4+35	0.4918	2.18	V Q
4+40	0.5070	2.20	VQ
4+45	0.5222	2.21	VQ
4+50	0.5377	2.26	VQ

4+55	0.5542	2.39	VQ			
5+ 0	0.5712	2.47	VQ			
5+ 5	0.5879	2.43	VQ			
5+10	0.6031	2.20	VQ			
5+15	0.6173	2.07	VQ			
5+20	0.6314	2.05	VQ			
5+25	0.6462	2.14	VQ			
5+30	0.6614	2.20	VQ			
5+35	0.6769	2.25	Q			
5+40	0.6933	2.38	Q			
5+45	0.7103	2.47	Q			
5+50	0.7275	2.50	Q			
5+55	0.7448	2.52	VQ			
6+ 0	0.7622	2.53	VQ			
6+ 5	0.7799	2.57	VQ			
6+10	0.7985	2.71	VQ			
6+15	0.8177	2.79	VQ			
6+20	0.8372	2.82	Q			
6+25	0.8567	2.84	Q			
6+30	0.8764	2.86	Q			
6+35	0.8963	2.90	Q			
6+40	0.9172	3.03	VQ			
6+45	0.9386	3.11	VQ			
6+50	0.9602	3.14	VQ			
6+55	0.9820	3.16	VQ			
7+ 0	1.0039	3.18	Q			
7+ 5	1.0258	3.18	Q			
7+10	1.0477	3.19	Q			
7+15	1.0697	3.19	Q			
7+20	1.0920	3.23	Q			
7+25	1.1151	3.36	Q			
7+30	1.1388	3.44	Q			
7+35	1.1629	3.50	QV			
7+40	1.1880	3.64	Q			
7+45	1.2137	3.73	Q			
7+50	1.2398	3.80	Q			
7+55	1.2670	3.95	Q			
8+ 0	1.2949	4.04	VQ			
8+ 5	1.3235	4.15	Q			
8+10	1.3539	4.43	Q			
8+15	1.3856	4.60	VQ			
8+20	1.4177	4.67	VQ			
8+25	1.4502	4.71	VQ			
8+30	1.4828	4.74	VQ			
8+35	1.5159	4.79	Q			
8+40	1.5498	4.93	Q			
8+45	1.5844	5.02	VQ			
8+50	1.6195	5.09	VQ			
8+55	1.6556	5.24	Q			
9+ 0	1.6923	5.33	Q			
9+ 5	1.7297	5.43	Q			
9+10	1.7690	5.71	VQ			
9+15	1.8095	5.88	VQ			
9+20	1.8507	5.98	Q			

9+25	1.8931	6.15	VQ						
9+30	1.9362	6.26	VQ						
9+35	1.9798	6.34	VQ						
9+40	2.0246	6.50	Q						
9+45	2.0700	6.60	VQ						
9+50	2.1159	6.67	VQ						
9+55	2.1630	6.83	Q						
10+ 0	2.2106	6.92	Q						
10+ 5	2.2570	6.73	Q						
10+10	2.2975	5.88	Q V						
10+15	2.3344	5.37	Q V						
10+20	2.3701	5.17	Q V						
10+25	2.4049	5.06	Q V						
10+30	2.4392	4.98	Q V						
10+35	2.4743	5.09	Q V						
10+40	2.5134	5.68	Q V						
10+45	2.5549	6.03	Q V						
10+50	2.5973	6.16	Q V						
10+55	2.6402	6.23	Q V						
11+ 0	2.6834	6.27	Q V						
11+ 5	2.7267	6.28	Q V						
11+10	2.7692	6.18	Q V						
11+15	2.8114	6.13	Q V						
11+20	2.8536	6.12	Q V						
11+25	2.8956	6.11	Q V						
11+30	2.9377	6.11	Q V						
11+35	2.9793	6.04	Q V						
11+40	3.0191	5.78	Q V						
11+45	3.0578	5.62	Q V						
11+50	3.0963	5.59	Q V						
11+55	3.1354	5.68	Q V						
12+ 0	3.1749	5.73	Q V						
12+ 5	3.2161	5.98	Q V						
12+10	3.2633	6.86	Q V						
12+15	3.3143	7.40	Q V						
12+20	3.3669	7.64	Q V						
12+25	3.4212	7.89	Q V						
12+30	3.4766	8.05	Q V						
12+35	3.5331	8.20	Q V						
12+40	3.5917	8.52	Q V						
12+45	3.6517	8.71	Q V						
12+50	3.7125	8.83	Q V						
12+55	3.7746	9.02	Q V						
13+ 0	3.8376	9.14	Q V						
13+ 5	3.9020	9.35	Q V						
13+10	3.9710	10.02	Q V						
13+15	4.0427	10.42	Q V						
13+20	4.1155	10.58	Q V						
13+25	4.1891	10.68	Q V						
13+30	4.2631	10.75	Q V						
13+35	4.3349	10.43	Q V						
13+40	4.3973	9.07	Q V						
13+45	4.4543	8.26	Q V						
13+50	4.5091	7.96	Q V						

13+55	4.5626	7.77			Q	V
14+ 0	4.6153	7.66			Q	V
14+ 5	4.6684	7.70			Q	V
14+10	4.7244	8.14			Q	V
14+15	4.7822	8.39			Q	V
14+20	4.8403	8.44			Q	V
14+25	4.8979	8.36			Q	V
14+30	4.9551	8.30			Q	V
14+35	5.0123	8.31			Q	V
14+40	5.0695	8.31			Q	V
14+45	5.1268	8.32			Q	V
14+50	5.1839	8.29			Q	V
14+55	5.2402	8.17			Q	V
15+ 0	5.2960	8.10			Q	V
15+ 5	5.3513	8.03			Q	V
15+10	5.4056	7.89			Q	V
15+15	5.4593	7.80			Q	V
15+20	5.5125	7.73			Q	V
15+25	5.5647	7.58			Q	V
15+30	5.6162	7.48			Q	V
15+35	5.6666	7.31			Q	V
15+40	5.7133	6.78			Q	V
15+45	5.7577	6.46			Q	V
15+50	5.8013	6.33			Q	V
15+55	5.8444	6.25			Q	V
16+ 0	5.8871	6.20			Q	V
16+ 5	5.9261	5.67			Q	V
16+10	5.9519	3.75		Q		V
16+15	5.9698	2.59		Q		V
16+20	5.9845	2.14		Q		V
16+25	5.9974	1.87		Q		V
16+30	6.0090	1.68		Q		V
16+35	6.0195	1.53		Q		V
16+40	6.0285	1.31	Q			V
16+45	6.0365	1.17	Q			V
16+50	6.0440	1.09	Q			V
16+55	6.0511	1.04	Q			V
17+ 0	6.0579	0.99	Q			V
17+ 5	6.0651	1.05	Q			V
17+10	6.0740	1.29	Q			V
17+15	6.0839	1.44	Q			V
17+20	6.0942	1.49	Q			V
17+25	6.1047	1.53	Q			V
17+30	6.1154	1.55	Q			V
17+35	6.1262	1.56	Q			V
17+40	6.1370	1.58	Q			V
17+45	6.1479	1.58	Q			V
17+50	6.1587	1.56	Q			V
17+55	6.1686	1.44	Q			V
18+ 0	6.1780	1.37	Q			V
18+ 5	6.1872	1.34	Q			V
18+10	6.1963	1.32	Q			V
18+15	6.2053	1.31	Q			V
18+20	6.2142	1.30	Q			V

18+25	6.2231	1.29	Q				V
18+30	6.2320	1.29	Q				V
18+35	6.2406	1.25	Q				V
18+40	6.2484	1.12	Q				V
18+45	6.2556	1.05	Q				V
18+50	6.2623	0.98	Q				V
18+55	6.2681	0.84	Q				V
19+ 0	6.2733	0.75	Q				V
19+ 5	6.2785	0.75	Q				V
19+10	6.2843	0.85	Q				V
19+15	6.2906	0.91	Q				V
19+20	6.2972	0.96	Q				V
19+25	6.3047	1.10	Q				V
19+30	6.3128	1.18	Q				V
19+35	6.3210	1.18	Q				V
19+40	6.3283	1.07	Q				V
19+45	6.3353	1.01	Q				V
19+50	6.3419	0.96	Q				V
19+55	6.3476	0.82	Q				V
20+ 0	6.3527	0.74	Q				V
20+ 5	6.3579	0.74	Q				V
20+10	6.3637	0.85	Q				V
20+15	6.3700	0.91	Q				V
20+20	6.3763	0.93	Q				V
20+25	6.3828	0.94	Q				V
20+30	6.3893	0.94	Q				V
20+35	6.3958	0.95	Q				V
20+40	6.4024	0.95	Q				V
20+45	6.4089	0.95	Q				V
20+50	6.4153	0.92	Q				V
20+55	6.4208	0.80	Q				V
21+ 0	6.4258	0.73	Q				V
21+ 5	6.4308	0.73	Q				V
21+10	6.4366	0.84	Q				V
21+15	6.4428	0.90	Q				V
21+20	6.4489	0.89	Q				V
21+25	6.4542	0.78	Q				V
21+30	6.4591	0.71	Q				V
21+35	6.4640	0.72	Q				V
21+40	6.4697	0.83	Q				V
21+45	6.4759	0.89	Q				V
21+50	6.4820	0.89	Q				V
21+55	6.4873	0.77	Q				V
22+ 0	6.4922	0.71	Q				V
22+ 5	6.4971	0.72	Q				V
22+10	6.5028	0.83	Q				V
22+15	6.5090	0.89	Q				V
22+20	6.5151	0.89	Q				V
22+25	6.5204	0.77	Q				V
22+30	6.5253	0.71	Q				V
22+35	6.5300	0.68	Q				V
22+40	6.5346	0.67	Q				V
22+45	6.5391	0.66	Q				V
22+50	6.5436	0.65	Q				V

22+55	6.5481	0.65	Q				V
23+ 0	6.5526	0.65	Q				V
23+ 5	6.5570	0.65	Q				V
23+10	6.5614	0.64	Q				V
23+15	6.5658	0.64	Q				V
23+20	6.5702	0.64	Q				V
23+25	6.5747	0.64	Q				V
23+30	6.5791	0.64	Q				V
23+35	6.5835	0.64	Q				V
23+40	6.5879	0.64	Q				V
23+45	6.5923	0.64	Q				V
23+50	6.5967	0.64	Q				V
23+55	6.6011	0.64	Q				V
24+ 0	6.6055	0.64	Q				V
24+ 5	6.6095	0.57	Q				V
24+10	6.6117	0.32	Q				V
24+15	6.6129	0.17	Q				V
24+20	6.6137	0.11	Q				V
24+25	6.6142	0.08	Q				V
24+30	6.6145	0.05	Q				V
24+35	6.6148	0.04	Q				V
24+40	6.6150	0.02	Q				V
24+45	6.6151	0.02	Q				V
24+50	6.6151	0.01	Q				V
24+55	6.6152	0.01	Q				V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
94.30	0.58	54.69

100 YEAR Area rainfall data:

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

94.30

1.45

136.73

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.784 (In)

Areal adjustment factor = 99.91 %

Adjusted average point rain = 0.783 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.660

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	9.795
2	0.167	137.488	37.478
3	0.250	206.232	22.414
4	0.333	274.976	8.676
5	0.417	343.720	5.276
6	0.500	412.464	3.527
7	0.583	481.208	2.344
8	0.667	549.952	1.841
9	0.750	618.696	1.317
10	0.833	687.440	0.945

11	0.917	756.184	0.716	0.680
12	1.000	824.928	0.782	0.743
Sum = 100.000			Sum=	95.037

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	0.08	4.40	0.413	(0.339)	0.273	0.140
2	0.17	4.50	0.423	(0.339)	0.279	0.144
3	0.25	5.40	0.507	(0.339)	0.335	0.172
4	0.33	5.40	0.507	(0.339)	0.335	0.172
5	0.42	5.70	0.536	0.339	(0.354)	0.197
6	0.50	6.40	0.601	0.339	(0.397)	0.262
7	0.58	7.90	0.742	0.339	(0.490)	0.403
8	0.67	9.10	0.855	0.339	(0.565)	0.516
9	0.75	12.80	1.203	0.339	(0.794)	0.864
10	0.83	25.60	2.406	0.339	(1.589)	2.067
11	0.92	7.90	0.742	0.339	(0.490)	0.403
12	1.00	4.90	0.460	(0.339)	0.304	0.156

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.5

Flood volume = Effective rainfall 0.46 (In)

times area 94.3 (Ac.) / [(In) / (Ft.)] = 3.6 (Ac. Ft)

Total soil loss = 0.33 (In)

Total soil loss = 2.555 (Ac. Ft)

Total rainfall = 0.78 (In)

Flood volume = 156789.3 Cubic Feet

Total soil loss = 111274.7 Cubic Feet

Peak flow rate of this hydrograph = 109.582 (CFS)

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1 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac. Ft	Q (CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0095	1.38	Q				
0+10	0.0554	6.67	VQ				
0+15	0.1258	10.22	VQ				
0+20	0.2125	12.59	Q				
0+25	0.3105	14.24	QV				
0+30	0.4245	16.55	QV				
0+35	0.5721	21.43	Q V				
0+40	0.7779	29.88	Q V				

0+45	1.0646	41.63		Q	V			
0+50	1.5525	70.83				Q	V	
0+55	2.3072	109.58					Q	V
1+ 0	2.8320	76.21						V
1+ 5	3.1164	41.30		Q				V
1+10	3.2796	23.69						V
1+15	3.3815	14.80	Q					V
1+20	3.4509	10.07	Q					V
1+25	3.5018	7.40	Q					V
1+30	3.5383	5.30	Q					V
1+35	3.5641	3.75	Q					V
1+40	3.5823	2.64	Q					V
1+45	3.5958	1.96	Q					V
1+50	3.5986	0.41	Q					V
1+55	3.5994	0.12	Q					V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 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]
94.30	0.98	92.41

100 YEAR Area rainfall data:

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

94.30

2.48

233.86

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.208	(0.339)	0.137	0.070
2	0.17	1.30	0.208	(0.339)	0.137	0.070
3	0.25	1.10	0.176	(0.339)	0.116	0.060
4	0.33	1.50	0.240	(0.339)	0.158	0.081
5	0.42	1.50	0.240	(0.339)	0.158	0.081
6	0.50	1.80	0.287	(0.339)	0.190	0.098
7	0.58	1.50	0.240	(0.339)	0.158	0.081
8	0.67	1.80	0.287	(0.339)	0.190	0.098
9	0.75	1.80	0.287	(0.339)	0.190	0.098
10	0.83	1.50	0.240	(0.339)	0.158	0.081
11	0.92	1.60	0.256	(0.339)	0.169	0.087
12	1.00	1.80	0.287	(0.339)	0.190	0.098
13	1.08	2.20	0.351	(0.339)	0.232	0.119
14	1.17	2.20	0.351	(0.339)	0.232	0.119
15	1.25	2.20	0.351	(0.339)	0.232	0.119
16	1.33	2.00	0.319	(0.339)	0.211	0.108
17	1.42	2.60	0.415	(0.339)	0.274	0.141
18	1.50	2.70	0.431	(0.339)	0.285	0.146
19	1.58	2.40	0.383	(0.339)	0.253	0.130
20	1.67	2.70	0.431	(0.339)	0.285	0.146
21	1.75	3.30	0.527	0.339	(0.348)	0.188
22	1.83	3.10	0.495	(0.339)	0.327	0.168
23	1.92	2.90	0.463	(0.339)	0.306	0.157
24	2.00	3.00	0.479	(0.339)	0.316	0.163
25	2.08	3.10	0.495	(0.339)	0.327	0.168
26	2.17	4.20	0.671	0.339	(0.443)	0.332
27	2.25	5.00	0.798	0.339	(0.527)	0.459
28	2.33	3.50	0.559	0.339	(0.369)	0.220
29	2.42	6.80	1.086	0.339	(0.717)	0.747
30	2.50	7.30	1.166	0.339	(0.770)	0.827
31	2.58	8.20	1.309	0.339	(0.865)	0.970
32	2.67	5.90	0.942	0.339	(0.622)	0.603
33	2.75	2.00	0.319	(0.339)	0.211	0.108
34	2.83	1.80	0.287	(0.339)	0.190	0.098
35	2.92	1.80	0.287	(0.339)	0.190	0.098
36	3.00	0.60	0.096	(0.339)	0.063	0.033

(Loss Rate Not Used)

Sum = 100.0

Sum = 7.4

Flood volume = Effective rainfall 0.61(In)

times area 94.3(Ac.)/[(In)/(Ft.)] = 4.8(Ac.Ft)

Total soil loss = 0.72(In)

Total soil loss = 5.631(Ac.Ft)

Total rainfall = 1.33(In)

Flood volume = 210253.9 Cubic Feet
 Total soil loss = 245286.5 Cubic Feet

 Peak flow rate of this hydrograph = 71.801(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0048		0.69	Q				
0+10	0.0277		3.33	VQ				
0+15	0.0608		4.81	V Q				
0+20	0.0968		5.23	V Q				
0+25	0.1393		6.17	V Q				
0+30	0.1873		6.97	V Q				
0+35	0.2404		7.71	V Q				
0+40	0.2944		7.84	VQ				
0+45	0.3520		8.37	V Q				
0+50	0.4113		8.61	VQ				
0+55	0.4681		8.24	VQ				
1+ 0	0.5254		8.32	Q				
1+ 5	0.5873		8.99	Q				
1+10	0.6564		10.04	Q				
1+15	0.7297		10.63	QV				
1+20	0.8038		10.77	QV				
1+25	0.8785		10.83	Q V				
1+30	0.9608		11.95	Q V				
1+35	1.0483		12.71	Q V				
1+40	1.1354		12.65	Q V				
1+45	1.2285		13.51	Q	V			
1+50	1.3335		15.25	Q	V			
1+55	1.4401		15.48	Q	V			
2+ 0	1.5445		15.15	Q	V			
2+ 5	1.6497		15.27	Q	V			
2+10	1.7680		17.19	Q	V			
2+15	1.9384		24.74		Q	V		
2+20	2.1515		30.95			Q V		
2+25	2.3682		31.46			Q	V	
2+30	2.7031		48.63				V Q	
2+35	3.1442		64.05				V	
2+40	3.6387		71.80					Q
2+45	4.0494		59.62				Q	V
2+50	4.2984		36.15			Q		V
2+55	4.4611		23.63		Q			V
3+ 0	4.5858		18.11		Q			V
3+ 5	4.6719		12.51		Q			V
3+10	4.7268		7.96	Q				V
3+15	4.7629		5.24	Q				V
3+20	4.7889		3.77	Q				V

3+25	4.8062	2.51	Q				V
3+30	4.8173	1.62	Q				V
3+35	4.8228	0.80	Q				V
3+40	4.8248	0.28	Q				V
3+45	4.8259	0.17	Q				V
3+50	4.8266	0.09	Q				V
3+55	4.8268	0.02	Q				V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
94.30	1.38	130.13

100 YEAR Area rainfall data:

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

94.30

3.48

328.16

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.872 (In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 1.871 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.112	(0.339)	0.074	0.038
2	0.17	0.60	0.135	(0.339)	0.089	0.046
3	0.25	0.60	0.135	(0.339)	0.089	0.046
4	0.33	0.60	0.135	(0.339)	0.089	0.046
5	0.42	0.60	0.135	(0.339)	0.089	0.046
6	0.50	0.70	0.157	(0.339)	0.104	0.053
7	0.58	0.70	0.157	(0.339)	0.104	0.053
8	0.67	0.70	0.157	(0.339)	0.104	0.053
9	0.75	0.70	0.157	(0.339)	0.104	0.053
10	0.83	0.70	0.157	(0.339)	0.104	0.053
11	0.92	0.70	0.157	(0.339)	0.104	0.053
12	1.00	0.80	0.180	(0.339)	0.119	0.061
13	1.08	0.80	0.180	(0.339)	0.119	0.061
14	1.17	0.80	0.180	(0.339)	0.119	0.061
15	1.25	0.80	0.180	(0.339)	0.119	0.061
16	1.33	0.80	0.180	(0.339)	0.119	0.061
17	1.42	0.80	0.180	(0.339)	0.119	0.061
18	1.50	0.80	0.180	(0.339)	0.119	0.061
19	1.58	0.80	0.180	(0.339)	0.119	0.061
20	1.67	0.80	0.180	(0.339)	0.119	0.061
21	1.75	0.80	0.180	(0.339)	0.119	0.061
22	1.83	0.80	0.180	(0.339)	0.119	0.061
23	1.92	0.80	0.180	(0.339)	0.119	0.061
24	2.00	0.90	0.202	(0.339)	0.133	0.069
25	2.08	0.80	0.180	(0.339)	0.119	0.061
26	2.17	0.90	0.202	(0.339)	0.133	0.069
27	2.25	0.90	0.202	(0.339)	0.133	0.069
28	2.33	0.90	0.202	(0.339)	0.133	0.069
29	2.42	0.90	0.202	(0.339)	0.133	0.069
30	2.50	0.90	0.202	(0.339)	0.133	0.069
31	2.58	0.90	0.202	(0.339)	0.133	0.069
32	2.67	0.90	0.202	(0.339)	0.133	0.069
33	2.75	1.00	0.225	(0.339)	0.148	0.076
34	2.83	1.00	0.225	(0.339)	0.148	0.076
35	2.92	1.00	0.225	(0.339)	0.148	0.076
36	3.00	1.00	0.225	(0.339)	0.148	0.076
37	3.08	1.00	0.225	(0.339)	0.148	0.076
38	3.17	1.10	0.247	(0.339)	0.163	0.084
39	3.25	1.10	0.247	(0.339)	0.163	0.084
40	3.33	1.10	0.247	(0.339)	0.163	0.084
41	3.42	1.20	0.269	(0.339)	0.178	0.091
42	3.50	1.30	0.292	(0.339)	0.193	0.099
43	3.58	1.40	0.314	(0.339)	0.208	0.107

44	3.67	1.40	0.314	(0.339)	0.208	0.107
45	3.75	1.50	0.337	(0.339)	0.222	0.114
46	3.83	1.50	0.337	(0.339)	0.222	0.114
47	3.92	1.60	0.359	(0.339)	0.237	0.122
48	4.00	1.60	0.359	(0.339)	0.237	0.122
49	4.08	1.70	0.382	(0.339)	0.252	0.130
50	4.17	1.80	0.404	(0.339)	0.267	0.137
51	4.25	1.90	0.427	(0.339)	0.282	0.145
52	4.33	2.00	0.449	(0.339)	0.297	0.152
53	4.42	2.10	0.472	(0.339)	0.311	0.160
54	4.50	2.10	0.472	(0.339)	0.311	0.160
55	4.58	2.20	0.494	(0.339)	0.326	0.168
56	4.67	2.30	0.516	0.339 (0.341)		0.177
57	4.75	2.40	0.539	0.339 (0.356)		0.200
58	4.83	2.40	0.539	0.339 (0.356)		0.200
59	4.92	2.50	0.561	0.339 (0.371)		0.222
60	5.00	2.60	0.584	0.339 (0.386)		0.245
61	5.08	3.10	0.696	0.339 (0.460)		0.357
62	5.17	3.60	0.808	0.339 (0.534)		0.469
63	5.25	3.90	0.876	0.339 (0.578)		0.537
64	5.33	4.20	0.943	0.339 (0.623)		0.604
65	5.42	4.70	1.055	0.339 (0.697)		0.716
66	5.50	5.60	1.257	0.339 (0.831)		0.918
67	5.58	1.90	0.427	(0.339)	0.282	0.145
68	5.67	0.90	0.202	(0.339)	0.133	0.069
69	5.75	0.60	0.135	(0.339)	0.089	0.046
70	5.83	0.50	0.112	(0.339)	0.074	0.038
71	5.92	0.30	0.067	(0.339)	0.044	0.023
72	6.00	0.20	0.045	(0.339)	0.030	0.015

(Loss Rate Not Used)

Sum = 100.0

Sum = 9.4

Flood volume = Effective rainfall 0.79(In)

times area 94.3(Ac.)/[(In)/(Ft.)] = 6.2(Ac.Ft)

Total soil loss = 1.09(In)

Total soil loss = 8.533(Ac.Ft)

Total rainfall = 1.87(In)

Flood volume = 268861.7 Cubic Feet

Total soil loss = 371688.8 Cubic Feet

Peak flow rate of this hydrograph = 63.687(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0026	0.37	Q				
0+10	0.0155	1.88	VQ				
0+15	0.0363	3.02	VQ				
0+20	0.0605	3.52	V Q				

0+25	0.0866	3.79	V Q						
0+30	0.1144	4.04	V Q						
0+35	0.1450	4.44	V Q						
0+40	0.1773	4.70	VQ						
0+45	0.2106	4.83	VQ						
0+50	0.2445	4.91	VQ						
0+55	0.2787	4.97	VQ						
1+ 0	0.3138	5.10	Q						
1+ 5	0.3511	5.41	VQ						
1+10	0.3896	5.59	VQ						
1+15	0.4286	5.66	VQ						
1+20	0.4679	5.71	Q						
1+25	0.5074	5.74	Q						
1+30	0.5470	5.76	Q						
1+35	0.5868	5.77	Q						
1+40	0.6266	5.78	QV						
1+45	0.6665	5.79	QV						
1+50	0.7064	5.79	QV						
1+55	0.7463	5.80	QV						
2+ 0	0.7867	5.87	Q V						
2+ 5	0.8287	6.08	Q V						
2+10	0.8703	6.04	Q V						
2+15	0.9132	6.23	Q V						
2+20	0.9570	6.37	Q V						
2+25	1.0013	6.42	Q V						
2+30	1.0457	6.45	Q V						
2+35	1.0903	6.48	Q V						
2+40	1.1351	6.49	Q V						
2+45	1.1804	6.58	Q V						
2+50	1.2277	6.87	Q V						
2+55	1.2762	7.05	Q V						
3+ 0	1.3253	7.12	Q V						
3+ 5	1.3746	7.16	Q V						
3+10	1.4246	7.26	Q V						
3+15	1.4767	7.57	Q V						
3+20	1.5301	7.75	Q V						
3+25	1.5845	7.90	Q V						
3+30	1.6418	8.31	Q V						
3+35	1.7029	8.87	Q V						
3+40	1.7678	9.42	Q V						
3+45	1.8352	9.79	Q V						
3+50	1.9056	10.22	Q V						
3+55	1.9782	10.55	Q V						
4+ 0	2.0538	10.97	Q V						
4+ 5	2.1317	11.30	Q V						
4+10	2.2129	11.79	Q V						
4+15	2.2983	12.40	Q V						
4+20	2.3882	13.06	Q V						
4+25	2.4828	13.73	Q V						
4+30	2.5816	14.35	Q V						
4+35	2.6833	14.76	Q V						
4+40	2.7888	15.32	Q V						
4+45	2.9003	16.19	Q V						
4+50	3.0201	17.39	Q V						

4+55	3.1461	18.30		Q	V	
5+ 0	3.2816	19.67		Q	V	
5+ 5	3.4353	22.32		Q	V	
5+10	3.6313	28.46		Q	V	
5+15	3.8810	36.25			V	
5+20	4.1784	43.20			Q	V
5+25	4.5233	50.08			QV	
5+30	4.9329	59.48				V Q
5+35	5.3716	63.69				V Q
5+40	5.6510	40.57		Q		V
5+45	5.8113	23.28				V
5+50	5.9212	15.95		Q		V
5+55	6.0014	11.65				V
6+ 0	6.0599	8.49				V
6+ 5	6.1023	6.16		Q		V
6+10	6.1301	4.03		Q		V
6+15	6.1481	2.62	Q			V
6+20	6.1599	1.72	Q			V
6+25	6.1674	1.08	Q			V
6+30	6.1696	0.33	Q			V
6+35	6.1708	0.18	Q			V
6+40	6.1715	0.10	Q			V
6+45	6.1719	0.06	Q			V
6+50	6.1721	0.03	Q			V
6+55	6.1722	0.01	Q			V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 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]
94.30	2.48	233.86

100 YEAR Area rainfall data:

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

94.30

6.90

650.67

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 3.515 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 3.515 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.008	0.003
69.0	49.8	0.574	0.500	0.316	0.022	0.007
75.0	57.0	0.501	0.500	0.275	0.211	0.058
75.0	57.0	0.501	0.500	0.275	0.337	0.093
81.0	64.4	0.422	0.000	0.422	0.421	0.178
Sum (F) =						0.339

Area averaged mean soil loss (F) (In/Hr) = 0.339

Minimum soil loss rate ((In/Hr)) = 0.170

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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	0.08	0.07	0.028	(0.601) 0.019	0.010
2	0.17	0.07	0.028	(0.599) 0.019	0.010
3	0.25	0.07	0.028	(0.597) 0.019	0.010
4	0.33	0.10	0.042	(0.594) 0.028	0.014
5	0.42	0.10	0.042	(0.592) 0.028	0.014
6	0.50	0.10	0.042	(0.590) 0.028	0.014
7	0.58	0.10	0.042	(0.587) 0.028	0.014
8	0.67	0.10	0.042	(0.585) 0.028	0.014
9	0.75	0.10	0.042	(0.583) 0.028	0.014
10	0.83	0.13	0.056	(0.580) 0.037	0.019
11	0.92	0.13	0.056	(0.578) 0.037	0.019
12	1.00	0.13	0.056	(0.576) 0.037	0.019
13	1.08	0.10	0.042	(0.574) 0.028	0.014
14	1.17	0.10	0.042	(0.571) 0.028	0.014
15	1.25	0.10	0.042	(0.569) 0.028	0.014
16	1.33	0.10	0.042	(0.567) 0.028	0.014
17	1.42	0.10	0.042	(0.565) 0.028	0.014
18	1.50	0.10	0.042	(0.562) 0.028	0.014
19	1.58	0.10	0.042	(0.560) 0.028	0.014
20	1.67	0.10	0.042	(0.558) 0.028	0.014
21	1.75	0.10	0.042	(0.556) 0.028	0.014
22	1.83	0.13	0.056	(0.553) 0.037	0.019
23	1.92	0.13	0.056	(0.551) 0.037	0.019
24	2.00	0.13	0.056	(0.549) 0.037	0.019
25	2.08	0.13	0.056	(0.547) 0.037	0.019
26	2.17	0.13	0.056	(0.544) 0.037	0.019
27	2.25	0.13	0.056	(0.542) 0.037	0.019
28	2.33	0.13	0.056	(0.540) 0.037	0.019
29	2.42	0.13	0.056	(0.538) 0.037	0.019
30	2.50	0.13	0.056	(0.536) 0.037	0.019
31	2.58	0.17	0.070	(0.533) 0.046	0.024
32	2.67	0.17	0.070	(0.531) 0.046	0.024
33	2.75	0.17	0.070	(0.529) 0.046	0.024
34	2.83	0.17	0.070	(0.527) 0.046	0.024
35	2.92	0.17	0.070	(0.525) 0.046	0.024
36	3.00	0.17	0.070	(0.523) 0.046	0.024
37	3.08	0.17	0.070	(0.520) 0.046	0.024
38	3.17	0.17	0.070	(0.518) 0.046	0.024
39	3.25	0.17	0.070	(0.516) 0.046	0.024
40	3.33	0.17	0.070	(0.514) 0.046	0.024
41	3.42	0.17	0.070	(0.512) 0.046	0.024
42	3.50	0.17	0.070	(0.510) 0.046	0.024
43	3.58	0.17	0.070	(0.507) 0.046	0.024

44	3.67	0.17	0.070	(0.505)	0.046	0.024
45	3.75	0.17	0.070	(0.503)	0.046	0.024
46	3.83	0.20	0.084	(0.501)	0.056	0.029
47	3.92	0.20	0.084	(0.499)	0.056	0.029
48	4.00	0.20	0.084	(0.497)	0.056	0.029
49	4.08	0.20	0.084	(0.495)	0.056	0.029
50	4.17	0.20	0.084	(0.493)	0.056	0.029
51	4.25	0.20	0.084	(0.491)	0.056	0.029
52	4.33	0.23	0.098	(0.488)	0.065	0.033
53	4.42	0.23	0.098	(0.486)	0.065	0.033
54	4.50	0.23	0.098	(0.484)	0.065	0.033
55	4.58	0.23	0.098	(0.482)	0.065	0.033
56	4.67	0.23	0.098	(0.480)	0.065	0.033
57	4.75	0.23	0.098	(0.478)	0.065	0.033
58	4.83	0.27	0.112	(0.476)	0.074	0.038
59	4.92	0.27	0.112	(0.474)	0.074	0.038
60	5.00	0.27	0.112	(0.472)	0.074	0.038
61	5.08	0.20	0.084	(0.470)	0.056	0.029
62	5.17	0.20	0.084	(0.468)	0.056	0.029
63	5.25	0.20	0.084	(0.466)	0.056	0.029
64	5.33	0.23	0.098	(0.464)	0.065	0.033
65	5.42	0.23	0.098	(0.462)	0.065	0.033
66	5.50	0.23	0.098	(0.460)	0.065	0.033
67	5.58	0.27	0.112	(0.458)	0.074	0.038
68	5.67	0.27	0.112	(0.456)	0.074	0.038
69	5.75	0.27	0.112	(0.454)	0.074	0.038
70	5.83	0.27	0.112	(0.452)	0.074	0.038
71	5.92	0.27	0.112	(0.450)	0.074	0.038
72	6.00	0.27	0.112	(0.448)	0.074	0.038
73	6.08	0.30	0.127	(0.446)	0.084	0.043
74	6.17	0.30	0.127	(0.444)	0.084	0.043
75	6.25	0.30	0.127	(0.442)	0.084	0.043
76	6.33	0.30	0.127	(0.440)	0.084	0.043
77	6.42	0.30	0.127	(0.438)	0.084	0.043
78	6.50	0.30	0.127	(0.436)	0.084	0.043
79	6.58	0.33	0.141	(0.434)	0.093	0.048
80	6.67	0.33	0.141	(0.432)	0.093	0.048
81	6.75	0.33	0.141	(0.430)	0.093	0.048
82	6.83	0.33	0.141	(0.428)	0.093	0.048
83	6.92	0.33	0.141	(0.426)	0.093	0.048
84	7.00	0.33	0.141	(0.424)	0.093	0.048
85	7.08	0.33	0.141	(0.422)	0.093	0.048
86	7.17	0.33	0.141	(0.420)	0.093	0.048
87	7.25	0.33	0.141	(0.418)	0.093	0.048
88	7.33	0.37	0.155	(0.416)	0.102	0.053
89	7.42	0.37	0.155	(0.415)	0.102	0.053
90	7.50	0.37	0.155	(0.413)	0.102	0.053
91	7.58	0.40	0.169	(0.411)	0.111	0.057
92	7.67	0.40	0.169	(0.409)	0.111	0.057
93	7.75	0.40	0.169	(0.407)	0.111	0.057
94	7.83	0.43	0.183	(0.405)	0.121	0.062
95	7.92	0.43	0.183	(0.403)	0.121	0.062
96	8.00	0.43	0.183	(0.401)	0.121	0.062
97	8.08	0.50	0.211	(0.399)	0.139	0.072

98	8.17	0.50	0.211	(0.398)	0.139	0.072
99	8.25	0.50	0.211	(0.396)	0.139	0.072
100	8.33	0.50	0.211	(0.394)	0.139	0.072
101	8.42	0.50	0.211	(0.392)	0.139	0.072
102	8.50	0.50	0.211	(0.390)	0.139	0.072
103	8.58	0.53	0.225	(0.388)	0.149	0.076
104	8.67	0.53	0.225	(0.387)	0.149	0.076
105	8.75	0.53	0.225	(0.385)	0.149	0.076
106	8.83	0.57	0.239	(0.383)	0.158	0.081
107	8.92	0.57	0.239	(0.381)	0.158	0.081
108	9.00	0.57	0.239	(0.379)	0.158	0.081
109	9.08	0.63	0.267	(0.378)	0.176	0.091
110	9.17	0.63	0.267	(0.376)	0.176	0.091
111	9.25	0.63	0.267	(0.374)	0.176	0.091
112	9.33	0.67	0.281	(0.372)	0.186	0.095
113	9.42	0.67	0.281	(0.370)	0.186	0.095
114	9.50	0.67	0.281	(0.369)	0.186	0.095
115	9.58	0.70	0.295	(0.367)	0.195	0.100
116	9.67	0.70	0.295	(0.365)	0.195	0.100
117	9.75	0.70	0.295	(0.363)	0.195	0.100
118	9.83	0.73	0.309	(0.362)	0.204	0.105
119	9.92	0.73	0.309	(0.360)	0.204	0.105
120	10.00	0.73	0.309	(0.358)	0.204	0.105
121	10.08	0.50	0.211	(0.356)	0.139	0.072
122	10.17	0.50	0.211	(0.355)	0.139	0.072
123	10.25	0.50	0.211	(0.353)	0.139	0.072
124	10.33	0.50	0.211	(0.351)	0.139	0.072
125	10.42	0.50	0.211	(0.350)	0.139	0.072
126	10.50	0.50	0.211	(0.348)	0.139	0.072
127	10.58	0.67	0.281	(0.346)	0.186	0.095
128	10.67	0.67	0.281	(0.344)	0.186	0.095
129	10.75	0.67	0.281	(0.343)	0.186	0.095
130	10.83	0.67	0.281	(0.341)	0.186	0.095
131	10.92	0.67	0.281	(0.339)	0.186	0.095
132	11.00	0.67	0.281	(0.338)	0.186	0.095
133	11.08	0.63	0.267	(0.336)	0.176	0.091
134	11.17	0.63	0.267	(0.334)	0.176	0.091
135	11.25	0.63	0.267	(0.333)	0.176	0.091
136	11.33	0.63	0.267	(0.331)	0.176	0.091
137	11.42	0.63	0.267	(0.329)	0.176	0.091
138	11.50	0.63	0.267	(0.328)	0.176	0.091
139	11.58	0.57	0.239	(0.326)	0.158	0.081
140	11.67	0.57	0.239	(0.325)	0.158	0.081
141	11.75	0.57	0.239	(0.323)	0.158	0.081
142	11.83	0.60	0.253	(0.321)	0.167	0.086
143	11.92	0.60	0.253	(0.320)	0.167	0.086
144	12.00	0.60	0.253	(0.318)	0.167	0.086
145	12.08	0.83	0.351	(0.317)	0.232	0.119
146	12.17	0.83	0.351	(0.315)	0.232	0.119
147	12.25	0.83	0.351	(0.313)	0.232	0.119
148	12.33	0.87	0.366	(0.312)	0.241	0.124
149	12.42	0.87	0.366	(0.310)	0.241	0.124
150	12.50	0.87	0.366	(0.309)	0.241	0.124
151	12.58	0.93	0.394	(0.307)	0.260	0.134

152	12.67	0.93	0.394	(0.306)	0.260	0.134
153	12.75	0.93	0.394	(0.304)	0.260	0.134
154	12.83	0.97	0.408	(0.303)	0.269	0.138
155	12.92	0.97	0.408	(0.301)	0.269	0.138
156	13.00	0.97	0.408	(0.299)	0.269	0.138
157	13.08	1.13	0.478	0.298 (0.316)		0.180
158	13.17	1.13	0.478	0.296 (0.316)		0.182
159	13.25	1.13	0.478	0.295 (0.316)		0.183
160	13.33	1.13	0.478	0.293 (0.316)		0.185
161	13.42	1.13	0.478	0.292 (0.316)		0.186
162	13.50	1.13	0.478	0.290 (0.316)		0.188
163	13.58	0.77	0.323	(0.289)	0.214	0.110
164	13.67	0.77	0.323	(0.288)	0.214	0.110
165	13.75	0.77	0.323	(0.286)	0.214	0.110
166	13.83	0.77	0.323	(0.285)	0.214	0.110
167	13.92	0.77	0.323	(0.283)	0.214	0.110
168	14.00	0.77	0.323	(0.282)	0.214	0.110
169	14.08	0.90	0.380	(0.280)	0.251	0.129
170	14.17	0.90	0.380	(0.279)	0.251	0.129
171	14.25	0.90	0.380	(0.277)	0.251	0.129
172	14.33	0.87	0.366	(0.276)	0.241	0.124
173	14.42	0.87	0.366	(0.275)	0.241	0.124
174	14.50	0.87	0.366	(0.273)	0.241	0.124
175	14.58	0.87	0.366	(0.272)	0.241	0.124
176	14.67	0.87	0.366	(0.270)	0.241	0.124
177	14.75	0.87	0.366	(0.269)	0.241	0.124
178	14.83	0.83	0.351	(0.268)	0.232	0.119
179	14.92	0.83	0.351	(0.266)	0.232	0.119
180	15.00	0.83	0.351	(0.265)	0.232	0.119
181	15.08	0.80	0.337	(0.264)	0.223	0.115
182	15.17	0.80	0.337	(0.262)	0.223	0.115
183	15.25	0.80	0.337	(0.261)	0.223	0.115
184	15.33	0.77	0.323	(0.259)	0.214	0.110
185	15.42	0.77	0.323	(0.258)	0.214	0.110
186	15.50	0.77	0.323	(0.257)	0.214	0.110
187	15.58	0.63	0.267	(0.256)	0.176	0.091
188	15.67	0.63	0.267	(0.254)	0.176	0.091
189	15.75	0.63	0.267	(0.253)	0.176	0.091
190	15.83	0.63	0.267	(0.252)	0.176	0.091
191	15.92	0.63	0.267	(0.250)	0.176	0.091
192	16.00	0.63	0.267	(0.249)	0.176	0.091
193	16.08	0.13	0.056	(0.248)	0.037	0.019
194	16.17	0.13	0.056	(0.247)	0.037	0.019
195	16.25	0.13	0.056	(0.245)	0.037	0.019
196	16.33	0.13	0.056	(0.244)	0.037	0.019
197	16.42	0.13	0.056	(0.243)	0.037	0.019
198	16.50	0.13	0.056	(0.242)	0.037	0.019
199	16.58	0.10	0.042	(0.240)	0.028	0.014
200	16.67	0.10	0.042	(0.239)	0.028	0.014
201	16.75	0.10	0.042	(0.238)	0.028	0.014
202	16.83	0.10	0.042	(0.237)	0.028	0.014
203	16.92	0.10	0.042	(0.235)	0.028	0.014
204	17.00	0.10	0.042	(0.234)	0.028	0.014
205	17.08	0.17	0.070	(0.233)	0.046	0.024

206	17.17	0.17	0.070	(0.232)	0.046	0.024
207	17.25	0.17	0.070	(0.231)	0.046	0.024
208	17.33	0.17	0.070	(0.230)	0.046	0.024
209	17.42	0.17	0.070	(0.228)	0.046	0.024
210	17.50	0.17	0.070	(0.227)	0.046	0.024
211	17.58	0.17	0.070	(0.226)	0.046	0.024
212	17.67	0.17	0.070	(0.225)	0.046	0.024
213	17.75	0.17	0.070	(0.224)	0.046	0.024
214	17.83	0.13	0.056	(0.223)	0.037	0.019
215	17.92	0.13	0.056	(0.222)	0.037	0.019
216	18.00	0.13	0.056	(0.221)	0.037	0.019
217	18.08	0.13	0.056	(0.220)	0.037	0.019
218	18.17	0.13	0.056	(0.218)	0.037	0.019
219	18.25	0.13	0.056	(0.217)	0.037	0.019
220	18.33	0.13	0.056	(0.216)	0.037	0.019
221	18.42	0.13	0.056	(0.215)	0.037	0.019
222	18.50	0.13	0.056	(0.214)	0.037	0.019
223	18.58	0.10	0.042	(0.213)	0.028	0.014
224	18.67	0.10	0.042	(0.212)	0.028	0.014
225	18.75	0.10	0.042	(0.211)	0.028	0.014
226	18.83	0.07	0.028	(0.210)	0.019	0.010
227	18.92	0.07	0.028	(0.209)	0.019	0.010
228	19.00	0.07	0.028	(0.208)	0.019	0.010
229	19.08	0.10	0.042	(0.207)	0.028	0.014
230	19.17	0.10	0.042	(0.206)	0.028	0.014
231	19.25	0.10	0.042	(0.205)	0.028	0.014
232	19.33	0.13	0.056	(0.204)	0.037	0.019
233	19.42	0.13	0.056	(0.203)	0.037	0.019
234	19.50	0.13	0.056	(0.202)	0.037	0.019
235	19.58	0.10	0.042	(0.201)	0.028	0.014
236	19.67	0.10	0.042	(0.201)	0.028	0.014
237	19.75	0.10	0.042	(0.200)	0.028	0.014
238	19.83	0.07	0.028	(0.199)	0.019	0.010
239	19.92	0.07	0.028	(0.198)	0.019	0.010
240	20.00	0.07	0.028	(0.197)	0.019	0.010
241	20.08	0.10	0.042	(0.196)	0.028	0.014
242	20.17	0.10	0.042	(0.195)	0.028	0.014
243	20.25	0.10	0.042	(0.194)	0.028	0.014
244	20.33	0.10	0.042	(0.194)	0.028	0.014
245	20.42	0.10	0.042	(0.193)	0.028	0.014
246	20.50	0.10	0.042	(0.192)	0.028	0.014
247	20.58	0.10	0.042	(0.191)	0.028	0.014
248	20.67	0.10	0.042	(0.190)	0.028	0.014
249	20.75	0.10	0.042	(0.189)	0.028	0.014
250	20.83	0.07	0.028	(0.189)	0.019	0.010
251	20.92	0.07	0.028	(0.188)	0.019	0.010
252	21.00	0.07	0.028	(0.187)	0.019	0.010
253	21.08	0.10	0.042	(0.186)	0.028	0.014
254	21.17	0.10	0.042	(0.186)	0.028	0.014
255	21.25	0.10	0.042	(0.185)	0.028	0.014
256	21.33	0.07	0.028	(0.184)	0.019	0.010
257	21.42	0.07	0.028	(0.184)	0.019	0.010
258	21.50	0.07	0.028	(0.183)	0.019	0.010
259	21.58	0.10	0.042	(0.182)	0.028	0.014

260	21.67	0.10	0.042	(0.182)	0.028	0.014
261	21.75	0.10	0.042	(0.181)	0.028	0.014
262	21.83	0.07	0.028	(0.180)	0.019	0.010
263	21.92	0.07	0.028	(0.180)	0.019	0.010
264	22.00	0.07	0.028	(0.179)	0.019	0.010
265	22.08	0.10	0.042	(0.178)	0.028	0.014
266	22.17	0.10	0.042	(0.178)	0.028	0.014
267	22.25	0.10	0.042	(0.177)	0.028	0.014
268	22.33	0.07	0.028	(0.177)	0.019	0.010
269	22.42	0.07	0.028	(0.176)	0.019	0.010
270	22.50	0.07	0.028	(0.176)	0.019	0.010
271	22.58	0.07	0.028	(0.175)	0.019	0.010
272	22.67	0.07	0.028	(0.175)	0.019	0.010
273	22.75	0.07	0.028	(0.174)	0.019	0.010
274	22.83	0.07	0.028	(0.174)	0.019	0.010
275	22.92	0.07	0.028	(0.173)	0.019	0.010
276	23.00	0.07	0.028	(0.173)	0.019	0.010
277	23.08	0.07	0.028	(0.173)	0.019	0.010
278	23.17	0.07	0.028	(0.172)	0.019	0.010
279	23.25	0.07	0.028	(0.172)	0.019	0.010
280	23.33	0.07	0.028	(0.171)	0.019	0.010
281	23.42	0.07	0.028	(0.171)	0.019	0.010
282	23.50	0.07	0.028	(0.171)	0.019	0.010
283	23.58	0.07	0.028	(0.171)	0.019	0.010
284	23.67	0.07	0.028	(0.170)	0.019	0.010
285	23.75	0.07	0.028	(0.170)	0.019	0.010
286	23.83	0.07	0.028	(0.170)	0.019	0.010
287	23.92	0.07	0.028	(0.170)	0.019	0.010
288	24.00	0.07	0.028	(0.170)	0.019	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 14.4

Flood volume = Effective rainfall 1.20(In)

times area 94.3(Ac.)/[(In)/(Ft.)] = 9.5(Ac.Ft)

Total soil loss = 2.31(In)

Total soil loss = 18.158(Ac.Ft)

Total rainfall = 3.51(In)

Flood volume = 412128.1 Cubic Feet

Total soil loss = 790959.3 Cubic Feet

Peak flow rate of this hydrograph = 17.212(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0006	0.09	Q				
0+10	0.0038	0.45	Q				
0+15	0.0083	0.67	VQ				
0+20	0.0138	0.80	VQ				

0+25	0.0209	1.02	V Q
0+30	0.0289	1.17	V Q
0+35	0.0374	1.23	V Q
0+40	0.0461	1.27	V Q
0+45	0.0551	1.30	V Q
0+50	0.0645	1.37	V Q
0+55	0.0753	1.56	V Q
1+ 0	0.0869	1.68	V Q
1+ 5	0.0984	1.68	V Q
1+10	0.1090	1.53	V Q
1+15	0.1189	1.44	V Q
1+20	0.1287	1.41	V Q
1+25	0.1383	1.40	V Q
1+30	0.1479	1.39	V Q
1+35	0.1574	1.38	V Q
1+40	0.1669	1.38	V Q
1+45	0.1763	1.37	V Q
1+50	0.1861	1.42	V Q
1+55	0.1970	1.59	V Q
2+ 0	0.2087	1.69	V Q
2+ 5	0.2206	1.74	V Q
2+10	0.2328	1.76	V Q
2+15	0.2450	1.78	V Q
2+20	0.2573	1.79	V Q
2+25	0.2697	1.80	V Q
2+30	0.2821	1.80	V Q
2+35	0.2949	1.86	V Q
2+40	0.3089	2.04	V Q
2+45	0.3237	2.15	V Q
2+50	0.3388	2.19	V Q
2+55	0.3541	2.21	V Q
3+ 0	0.3694	2.23	V Q
3+ 5	0.3849	2.24	V Q
3+10	0.4004	2.25	V Q
3+15	0.4159	2.26	V Q
3+20	0.4315	2.26	V Q
3+25	0.4471	2.27	V Q
3+30	0.4628	2.27	V Q
3+35	0.4784	2.27	V Q
3+40	0.4940	2.27	V Q
3+45	0.5096	2.27	V Q
3+50	0.5256	2.32	V Q
3+55	0.5428	2.49	V Q
4+ 0	0.5607	2.60	V Q
4+ 5	0.5789	2.64	V Q
4+10	0.5973	2.67	V Q
4+15	0.6158	2.69	V Q
4+20	0.6347	2.74	V Q
4+25	0.6548	2.93	V Q
4+30	0.6758	3.04	V Q
4+35	0.6971	3.09	V Q
4+40	0.7186	3.12	V Q
4+45	0.7402	3.14	V Q
4+50	0.7622	3.20	V Q

4+55	0.7855	3.38	V	Q			
5+ 0	0.8096	3.50	V	Q			
5+ 5	0.8334	3.45	V	Q			
5+10	0.8549	3.12	V	Q			
5+15	0.8750	2.93	V	Q			
5+20	0.8950	2.90	V	Q			
5+25	0.9160	3.04	V	Q			
5+30	0.9375	3.12	V	Q			
5+35	0.9594	3.19	V	Q			
5+40	0.9827	3.38	V	Q			
5+45	1.0068	3.49	V	Q			
5+50	1.0311	3.54	V	Q			
5+55	1.0557	3.57	V	Q			
6+ 0	1.0804	3.58	V	Q			
6+ 5	1.1055	3.64	V	Q			
6+10	1.1319	3.84	V	Q			
6+15	1.1591	3.95	V	Q			
6+20	1.1866	4.00	V	Q			
6+25	1.2144	4.03	V	Q			
6+30	1.2422	4.05	V	Q			
6+35	1.2705	4.10	V	Q			
6+40	1.3001	4.29	V	Q			
6+45	1.3304	4.41	V	Q			
6+50	1.3611	4.45	V	Q			
6+55	1.3919	4.48	V	Q			
7+ 0	1.4229	4.50	V	Q			
7+ 5	1.4540	4.51	V	Q			
7+10	1.4851	4.52	V	Q			
7+15	1.5163	4.53	V	Q			
7+20	1.5478	4.58	V	Q			
7+25	1.5806	4.76	V	Q			
7+30	1.6142	4.87	V	Q			
7+35	1.6483	4.96	V	Q			
7+40	1.6839	5.16	V	Q			
7+45	1.7203	5.29	V	Q			
7+50	1.7574	5.39	V	Q			
7+55	1.7960	5.60	V	Q			
8+ 0	1.8354	5.73	V	Q			
8+ 5	1.8759	5.88	V	Q			
8+10	1.9191	6.28	V	Q			
8+15	1.9640	6.52	V	Q			
8+20	2.0096	6.62	V	Q			
8+25	2.0556	6.68	V	Q			
8+30	2.1019	6.72	V	Q			
8+35	2.1487	6.79	V	Q			
8+40	2.1968	6.99	V	Q			
8+45	2.2458	7.12	V	Q			
8+50	2.2955	7.21	V	Q			
8+55	2.3467	7.43	V	Q			
9+ 0	2.3987	7.56	V	Q			
9+ 5	2.4518	7.70	V	Q			
9+10	2.5075	8.09	V	Q			
9+15	2.5649	8.33	V	Q			
9+20	2.6233	8.48	V	Q			

9+25	2.6833	8.72	V	Q			
9+30	2.7444	8.87	V	Q			
9+35	2.8063	8.98	V	Q			
9+40	2.8697	9.21	V	Q			
9+45	2.9341	9.35	V	Q			
9+50	2.9992	9.46	V	Q			
9+55	3.0659	9.68	V	Q			
10+ 0	3.1335	9.81	V	Q			
10+ 5	3.1992	9.54	V	Q			
10+10	3.2566	8.33	V	Q			
10+15	3.3089	7.61	V	Q			
10+20	3.3594	7.33	Q				
10+25	3.4088	7.17	Q				
10+30	3.4574	7.06	Q				
10+35	3.5071	7.22	Q				
10+40	3.5626	8.06	VQ				
10+45	3.6215	8.55	V Q				
10+50	3.6816	8.73	V Q				
10+55	3.7424	8.83	V Q				
11+ 0	3.8036	8.89	VQ				
11+ 5	3.8649	8.90	VQ				
11+10	3.9253	8.76	VQ				
11+15	3.9851	8.69	VQ				
11+20	4.0448	8.67	Q				
11+25	4.1044	8.66	Q				
11+30	4.1641	8.66	Q				
11+35	4.2230	8.56	Q				
11+40	4.2794	8.19	Q V				
11+45	4.3343	7.97	Q V				
11+50	4.3889	7.93	Q V				
11+55	4.4443	8.05	Q V				
12+ 0	4.5003	8.12	Q V				
12+ 5	4.5586	8.47	Q V				
12+10	4.6256	9.73	Q				
12+15	4.6978	10.48	VQ				
12+20	4.7723	10.82	VQ				
12+25	4.8493	11.18	V Q				
12+30	4.9279	11.40	V Q				
12+35	5.0079	11.62	V Q				
12+40	5.0911	12.07	V Q				
12+45	5.1761	12.35	V Q				
12+50	5.2623	12.52	V Q				
12+55	5.3504	12.78	V Q				
13+ 0	5.4396	12.95	V Q				
13+ 5	5.5321	13.43	V Q				
13+10	5.6357	15.05	V	Q			
13+15	5.7465	16.09	V		Q		
13+20	5.8607	16.57	V		Q		
13+25	5.9772	16.93	V		Q		
13+30	6.0958	17.21	V		Q		
13+35	6.2106	16.67	V		Q		
13+40	6.3063	13.90	VQ				
13+45	6.3906	12.24	Q V				
13+50	6.4707	11.63	Q V				

13+55	6.5483	11.26				Q	V	
14+ 0	6.6242	11.03				Q	V	
14+ 5	6.7003	11.04				Q	V	
14+10	6.7803	11.62				Q	V	
14+15	6.8626	11.95				Q	V	
14+20	6.9452	12.00				Q	V	
14+25	7.0270	11.87				Q	V	
14+30	7.1080	11.77				Q	V	
14+35	7.1891	11.77				Q	V	
14+40	7.2703	11.78				Q	V	
14+45	7.3515	11.79				Q	V	
14+50	7.4324	11.75				Q	V	
14+55	7.5122	11.58				Q	V	
15+ 0	7.5912	11.48				Q	V	
15+ 5	7.6696	11.39				Q	V	
15+10	7.7466	11.18				Q	V	
15+15	7.8227	11.05				Q	V	
15+20	7.8981	10.95				Q	V	
15+25	7.9721	10.74				Q	V	
15+30	8.0452	10.61				Q	V	
15+35	8.1165	10.36				Q	V	
15+40	8.1827	9.61				Q	V	
15+45	8.2458	9.16				Q	V	
15+50	8.3076	8.97				Q	V	
15+55	8.3686	8.86				Q	V	
16+ 0	8.4291	8.78				Q	V	
16+ 5	8.4844	8.03				Q	V	
16+10	8.5210	5.31				Q	V	
16+15	8.5463	3.68				Q	V	
16+20	8.5673	3.04				Q	V	
16+25	8.5855	2.65				Q	V	
16+30	8.6019	2.38				Q	V	
16+35	8.6168	2.16				Q	V	
16+40	8.6295	1.85				Q	V	
16+45	8.6409	1.65				Q	V	
16+50	8.6515	1.54				Q	V	
16+55	8.6617	1.47				Q	V	
17+ 0	8.6713	1.40				Q	V	
17+ 5	8.6815	1.48				Q	V	
17+10	8.6941	1.83				Q	V	
17+15	8.7081	2.04				Q	V	
17+20	8.7227	2.12				Q	V	
17+25	8.7376	2.16				Q	V	
17+30	8.7527	2.19				Q	V	
17+35	8.7680	2.22				Q	V	
17+40	8.7834	2.23				Q	V	
17+45	8.7989	2.25				Q	V	
17+50	8.8141	2.21				Q	V	
17+55	8.8281	2.04				Q	V	
18+ 0	8.8414	1.94				Q	V	
18+ 5	8.8545	1.89				Q	V	
18+10	8.8674	1.87				Q	V	
18+15	8.8801	1.85				Q	V	
18+20	8.8928	1.84				Q	V	

18+25	8.9054	1.83	Q				V
18+30	8.9180	1.83	Q				V
18+35	8.9302	1.78	Q				V
18+40	8.9412	1.59	Q				V
18+45	8.9514	1.48	Q				V
18+50	8.9610	1.39	Q				V
18+55	8.9692	1.19	Q				V
19+ 0	8.9766	1.07	Q				V
19+ 5	8.9839	1.06	Q				V
19+10	8.9922	1.21	Q				V
19+15	9.0010	1.29	Q				V
19+20	9.0104	1.36	Q				V
19+25	9.0211	1.55	Q				V
19+30	9.0326	1.67	Q				V
19+35	9.0441	1.67	Q				V
19+40	9.0546	1.52	Q				V
19+45	9.0645	1.43	Q				V
19+50	9.0738	1.36	Q				V
19+55	9.0819	1.17	Q				V
20+ 0	9.0891	1.05	Q				V
20+ 5	9.0964	1.05	Q				V
20+10	9.1047	1.20	Q				V
20+15	9.1136	1.29	Q				V
20+20	9.1226	1.32	Q				V
20+25	9.1318	1.33	Q				V
20+30	9.1410	1.34	Q				V
20+35	9.1502	1.34	Q				V
20+40	9.1595	1.35	Q				V
20+45	9.1688	1.35	Q				V
20+50	9.1778	1.31	Q				V
20+55	9.1856	1.13	Q				V
21+ 0	9.1927	1.03	Q				V
21+ 5	9.1998	1.03	Q				V
21+10	9.2080	1.19	Q				V
21+15	9.2168	1.28	Q				V
21+20	9.2255	1.26	Q				V
21+25	9.2330	1.10	Q				V
21+30	9.2399	1.00	Q				V
21+35	9.2469	1.01	Q				V
21+40	9.2550	1.17	Q				V
21+45	9.2637	1.27	Q				V
21+50	9.2724	1.25	Q				V
21+55	9.2799	1.10	Q				V
22+ 0	9.2868	1.00	Q				V
22+ 5	9.2938	1.01	Q				V
22+10	9.3019	1.17	Q				V
22+15	9.3106	1.27	Q				V
22+20	9.3193	1.25	Q				V
22+25	9.3268	1.10	Q				V
22+30	9.3337	1.00	Q				V
22+35	9.3404	0.97	Q				V
22+40	9.3469	0.95	Q				V
22+45	9.3533	0.93	Q				V
22+50	9.3597	0.93	Q				V

22+55	9.3661	0.92	Q				V
23+ 0	9.3724	0.92	Q				V
23+ 5	9.3787	0.91	Q				V
23+10	9.3850	0.91	Q				V
23+15	9.3912	0.91	Q				V
23+20	9.3975	0.91	Q				V
23+25	9.4037	0.91	Q				V
23+30	9.4100	0.91	Q				V
23+35	9.4162	0.91	Q				V
23+40	9.4225	0.91	Q				V
23+45	9.4287	0.91	Q				V
23+50	9.4350	0.91	Q				V
23+55	9.4412	0.91	Q				V
24+ 0	9.4475	0.91	Q				V
24+ 5	9.4531	0.81	Q				V
24+10	9.4562	0.46	Q				V
24+15	9.4579	0.24	Q				V
24+20	9.4590	0.16	Q				V
24+25	9.4597	0.11	Q				V
24+30	9.4603	0.08	Q				V
24+35	9.4606	0.05	Q				V
24+40	9.4609	0.04	Q				V
24+45	9.4610	0.02	Q				V
24+50	9.4611	0.01	Q				V
24+55	9.4612	0.01	Q				V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
94.30	0.58	54.69

100 YEAR Area rainfall data:

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

94.30

1.45

136.73

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)

Areal adjustment factor = 99.91 %

Adjusted average point rain = 0.937(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.008	0.002
69.0	69.0	0.373	0.500	0.205	0.022	0.005
75.0	75.0	0.303	0.500	0.167	0.211	0.035
75.0	75.0	0.303	0.500	0.167	0.337	0.056
81.0	81.0	0.233	0.000	0.233	0.421	0.098
Sum (F) =						0.196

Area averaged mean soil loss (F) (In/Hr) = 0.196

Minimum soil loss rate ((In/Hr)) = 0.098

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.660

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	9.795
2	0.167	137.488	37.478
3	0.250	206.232	22.414
4	0.333	274.976	8.676
5	0.417	343.720	5.276
6	0.500	412.464	3.527
7	0.583	481.208	2.344
8	0.667	549.952	1.841
9	0.750	618.696	1.317
10	0.833	687.440	0.945

11	0.917	756.184	0.716	0.680
12	1.000	824.928	0.782	0.743
Sum = 100.000			Sum=	95.037

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	0.08	4.40	0.495	0.196	(0.327)	0.299
2	0.17	4.50	0.506	0.196	(0.334)	0.310
3	0.25	5.40	0.607	0.196	(0.401)	0.411
4	0.33	5.40	0.607	0.196	(0.401)	0.411
5	0.42	5.70	0.641	0.196	(0.423)	0.445
6	0.50	6.40	0.720	0.196	(0.475)	0.523
7	0.58	7.90	0.888	0.196	(0.587)	0.692
8	0.67	9.10	1.023	0.196	(0.676)	0.827
9	0.75	12.80	1.439	0.196	(0.951)	1.243
10	0.83	25.60	2.879	0.196	(1.901)	2.683
11	0.92	7.90	0.888	0.196	(0.587)	0.692
12	1.00	4.90	0.551	0.196	(0.364)	0.355

(Loss Rate Not Used)

Sum = 100.0 Sum = 8.9

Flood volume = Effective rainfall 0.74 (In)
times area 94.3 (Ac.) / [(In)/(Ft.)] = 5.8 (Ac.Ft)

Total soil loss = 0.20 (In)

Total soil loss = 1.542 (Ac.Ft)

Total rainfall = 0.94 (In)

Flood volume = 253611.3 Cubic Feet

Total soil loss = 67174.5 Cubic Feet

Peak flow rate of this hydrograph = 150.771 (CFS)

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1 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q (CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0202	2.93	Q				
0+10	0.1182	14.23	V Q				
0+15	0.2720	22.34	V Q				
0+20	0.4716	28.98	V Q				
0+25	0.7006	33.25	V Q				
0+30	0.9574	37.28	V Q				
0+35	1.2598	43.92	Q				
0+40	1.6356	54.56	QV				

0+45	2.1107	68.99			QV				
0+50	2.8284	104.21				VQ			
0+55	3.8667	150.77					V	Q	
1+ 0	4.6284	110.60				Q		V	
1+ 5	5.0807	65.66			Q			V	
1+10	5.3384	37.42		Q				V	
1+15	5.4944	22.66		Q				V	
1+20	5.6000	15.33		Q				V	
1+25	5.6764	11.10		Q				V	
1+30	5.7308	7.89	Q					V	
1+35	5.7691	5.56	Q					V	
1+40	5.7958	3.87	Q					V	
1+45	5.8151	2.80	Q					V	
1+50	5.8203	0.76	Q					V	
1+55	5.8221	0.26	Q					V	

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 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]
94.30	0.98	92.41

100 YEAR Area rainfall data:

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

94.30

2.48

233.86

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 1.596(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.008	0.002
69.0	69.0	0.373	0.500	0.205	0.022	0.005
75.0	75.0	0.303	0.500	0.167	0.211	0.035
75.0	75.0	0.303	0.500	0.167	0.337	0.056
81.0	81.0	0.233	0.000	0.233	0.421	0.098
Sum (F) =						0.196

Area averaged mean soil loss (F) (In/Hr) = 0.196

Minimum soil loss rate ((In/Hr)) = 0.098

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.196)	0.164	0.085
2	0.17	1.30	0.249	(0.196)	0.164	0.085
3	0.25	1.10	0.211	(0.196)	0.139	0.072
4	0.33	1.50	0.287	(0.196)	0.190	0.098
5	0.42	1.50	0.287	(0.196)	0.190	0.098
6	0.50	1.80	0.345	0.196	(0.228)	0.149
7	0.58	1.50	0.287	(0.196)	0.190	0.098
8	0.67	1.80	0.345	0.196	(0.228)	0.149
9	0.75	1.80	0.345	0.196	(0.228)	0.149
10	0.83	1.50	0.287	(0.196)	0.190	0.098
11	0.92	1.60	0.307	0.196	(0.202)	0.110
12	1.00	1.80	0.345	0.196	(0.228)	0.149
13	1.08	2.20	0.421	0.196	(0.278)	0.225
14	1.17	2.20	0.421	0.196	(0.278)	0.225
15	1.25	2.20	0.421	0.196	(0.278)	0.225
16	1.33	2.00	0.383	0.196	(0.253)	0.187
17	1.42	2.60	0.498	0.196	(0.329)	0.302
18	1.50	2.70	0.517	0.196	(0.342)	0.321
19	1.58	2.40	0.460	0.196	(0.304)	0.264
20	1.67	2.70	0.517	0.196	(0.342)	0.321
21	1.75	3.30	0.632	0.196	(0.418)	0.436
22	1.83	3.10	0.594	0.196	(0.392)	0.398
23	1.92	2.90	0.556	0.196	(0.367)	0.359
24	2.00	3.00	0.575	0.196	(0.380)	0.378
25	2.08	3.10	0.594	0.196	(0.392)	0.398
26	2.17	4.20	0.805	0.196	(0.531)	0.608
27	2.25	5.00	0.958	0.196	(0.633)	0.762
28	2.33	3.50	0.671	0.196	(0.443)	0.474
29	2.42	6.80	1.303	0.196	(0.860)	1.106
30	2.50	7.30	1.398	0.196	(0.924)	1.202
31	2.58	8.20	1.571	0.196	(1.038)	1.375
32	2.67	5.90	1.130	0.196	(0.747)	0.934
33	2.75	2.00	0.383	0.196	(0.253)	0.187
34	2.83	1.80	0.345	0.196	(0.228)	0.149
35	2.92	1.80	0.345	0.196	(0.228)	0.149
36	3.00	0.60	0.115	(0.196)	0.076	0.039

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.4

Flood volume = Effective rainfall 1.03(In)
times area 94.3(Ac.)/[(In)/(Ft.)] =

8.1(Ac.Ft)

Total soil loss = 0.57(In)

Total soil loss = 4.452(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 352562.0 Cubic Feet
 Total soil loss = 193918.3 Cubic Feet

 Peak flow rate of this hydrograph = 106.050 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0057	0.83	Q					
0+10	0.0332	4.00	Q					
0+15	0.0730	5.77	VQ					
0+20	0.1161	6.27	VQ					
0+25	0.1671	7.40	VQ					
0+30	0.2268	8.67	Q					
0+35	0.2987	10.44	VQ					
0+40	0.3704	10.42	VQ					
0+45	0.4517	11.80	Q					
0+50	0.5370	12.39	Q					
0+55	0.6130	11.04	QV					
1+ 0	0.6891	11.04	QV					
1+ 5	0.7803	13.24	QV					
1+10	0.8968	16.92	QV					
1+15	1.0273	18.95	Q V					
1+20	1.1611	19.42	Q V					
1+25	1.2963	19.64	Q V					
1+30	1.4588	23.59	Q V					
1+35	1.6395	26.25	Q V					
1+40	1.8189	26.05	Q V					
1+45	2.0172	28.79	Q V					
1+50	2.2516	34.04	Q		V			
1+55	2.4950	35.34	Q		V			
2+ 0	2.7333	34.60	Q		V			
2+ 5	2.9753	35.14	Q		V			
2+10	3.2394	38.36	Q		V			
2+15	3.5727	48.39	Q		V			
2+20	3.9613	56.42	Q		V			
2+25	4.3558	57.29	Q		V			
2+30	4.8933	78.03	Q		V			
2+35	5.5590	96.66	Q		V			
2+40	6.2894	106.05	Q		V			
2+45	6.9090	89.96	Q		V			
2+50	7.2933	55.81	Q		V			
2+55	7.5442	36.43	Q		V			
3+ 0	7.7343	27.60	Q		V			
3+ 5	7.8630	18.68	Q		V			
3+10	7.9446	11.85	Q		V			
3+15	7.9988	7.86	Q		V			
3+20	8.0373	5.59	Q		V			

3+25	8.0629	3.72	Q				V
3+30	8.0794	2.40	Q				V
3+35	8.0879	1.23	Q				V
3+40	8.0909	0.43	Q				V
3+45	8.0926	0.25	Q				V
3+50	8.0935	0.14	Q				V
3+55	8.0937	0.03	Q				V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
94.30	1.38	130.13

100 YEAR Area rainfall data:

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

94.30

3.48

328.16

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 2.244 (In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 2.243 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.008	0.002
69.0	69.0	0.373	0.500	0.205	0.022	0.005
75.0	75.0	0.303	0.500	0.167	0.211	0.035
75.0	75.0	0.303	0.500	0.167	0.337	0.056
81.0	81.0	0.233	0.000	0.233	0.421	0.098
						Sum (F) = 0.196

Area averaged mean soil loss (F) (In/Hr) = 0.196

Minimum soil loss rate ((In/Hr)) = 0.098

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.135	(0.196)	0.089	0.046
2	0.17	0.60	0.162	(0.196)	0.107	0.055
3	0.25	0.60	0.162	(0.196)	0.107	0.055
4	0.33	0.60	0.162	(0.196)	0.107	0.055
5	0.42	0.60	0.162	(0.196)	0.107	0.055
6	0.50	0.70	0.188	(0.196)	0.124	0.064
7	0.58	0.70	0.188	(0.196)	0.124	0.064
8	0.67	0.70	0.188	(0.196)	0.124	0.064
9	0.75	0.70	0.188	(0.196)	0.124	0.064
10	0.83	0.70	0.188	(0.196)	0.124	0.064
11	0.92	0.70	0.188	(0.196)	0.124	0.064
12	1.00	0.80	0.215	(0.196)	0.142	0.073
13	1.08	0.80	0.215	(0.196)	0.142	0.073
14	1.17	0.80	0.215	(0.196)	0.142	0.073
15	1.25	0.80	0.215	(0.196)	0.142	0.073
16	1.33	0.80	0.215	(0.196)	0.142	0.073
17	1.42	0.80	0.215	(0.196)	0.142	0.073
18	1.50	0.80	0.215	(0.196)	0.142	0.073
19	1.58	0.80	0.215	(0.196)	0.142	0.073
20	1.67	0.80	0.215	(0.196)	0.142	0.073
21	1.75	0.80	0.215	(0.196)	0.142	0.073
22	1.83	0.80	0.215	(0.196)	0.142	0.073
23	1.92	0.80	0.215	(0.196)	0.142	0.073
24	2.00	0.90	0.242	(0.196)	0.160	0.082
25	2.08	0.80	0.215	(0.196)	0.142	0.073
26	2.17	0.90	0.242	(0.196)	0.160	0.082
27	2.25	0.90	0.242	(0.196)	0.160	0.082
28	2.33	0.90	0.242	(0.196)	0.160	0.082
29	2.42	0.90	0.242	(0.196)	0.160	0.082
30	2.50	0.90	0.242	(0.196)	0.160	0.082
31	2.58	0.90	0.242	(0.196)	0.160	0.082
32	2.67	0.90	0.242	(0.196)	0.160	0.082
33	2.75	1.00	0.269	(0.196)	0.178	0.091
34	2.83	1.00	0.269	(0.196)	0.178	0.091
35	2.92	1.00	0.269	(0.196)	0.178	0.091
36	3.00	1.00	0.269	(0.196)	0.178	0.091
37	3.08	1.00	0.269	(0.196)	0.178	0.091
38	3.17	1.10	0.296	(0.196)	0.196	0.101
39	3.25	1.10	0.296	(0.196)	0.196	0.101
40	3.33	1.10	0.296	(0.196)	0.196	0.101
41	3.42	1.20	0.323	0.196	(0.213)	0.127
42	3.50	1.30	0.350	0.196	(0.231)	0.154
43	3.58	1.40	0.377	0.196	(0.249)	0.181

44	3.67	1.40	0.377	0.196	(0.249)	0.181
45	3.75	1.50	0.404	0.196	(0.267)	0.208
46	3.83	1.50	0.404	0.196	(0.267)	0.208
47	3.92	1.60	0.431	0.196	(0.284)	0.234
48	4.00	1.60	0.431	0.196	(0.284)	0.234
49	4.08	1.70	0.458	0.196	(0.302)	0.261
50	4.17	1.80	0.485	0.196	(0.320)	0.288
51	4.25	1.90	0.511	0.196	(0.338)	0.315
52	4.33	2.00	0.538	0.196	(0.356)	0.342
53	4.42	2.10	0.565	0.196	(0.373)	0.369
54	4.50	2.10	0.565	0.196	(0.373)	0.369
55	4.58	2.20	0.592	0.196	(0.391)	0.396
56	4.67	2.30	0.619	0.196	(0.409)	0.423
57	4.75	2.40	0.646	0.196	(0.427)	0.450
58	4.83	2.40	0.646	0.196	(0.427)	0.450
59	4.92	2.50	0.673	0.196	(0.444)	0.477
60	5.00	2.60	0.700	0.196	(0.462)	0.504
61	5.08	3.10	0.834	0.196	(0.551)	0.638
62	5.17	3.60	0.969	0.196	(0.640)	0.773
63	5.25	3.90	1.050	0.196	(0.693)	0.854
64	5.33	4.20	1.131	0.196	(0.747)	0.934
65	5.42	4.70	1.265	0.196	(0.836)	1.069
66	5.50	5.60	1.507	0.196	(0.996)	1.311
67	5.58	1.90	0.511	0.196	(0.338)	0.315
68	5.67	0.90	0.242	(0.196)	0.160	0.082
69	5.75	0.60	0.162	(0.196)	0.107	0.055
70	5.83	0.50	0.135	(0.196)	0.089	0.046
71	5.92	0.30	0.081	(0.196)	0.053	0.027
72	6.00	0.20	0.054	(0.196)	0.036	0.018

(Loss Rate Not Used)

Sum = 100.0

Sum = 15.3

Flood volume = Effective rainfall 1.28(In)
times area 94.3(Ac.)/[(In)/(Ft.)] = 10.0(Ac.Ft)
Total soil loss = 0.97(In)
Total soil loss = 7.603(Ac.Ft)
Total rainfall = 2.24(In)
Flood volume = 436685.1 Cubic Feet
Total soil loss = 331192.6 Cubic Feet

Peak flow rate of this hydrograph = 95.670(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	25.0	50.0	75.0	100.0
0+ 5	0.0031	0.45	Q				
0+10	0.0186	2.25	Q				
0+15	0.0435	3.62	VQ				
0+20	0.0726	4.22	VQ				

0+25	0.1038	4.54	VQ						
0+30	0.1372	4.84	VQ						
0+35	0.1738	5.32	V Q						
0+40	0.2126	5.63	V Q						
0+45	0.2525	5.79	VQ						
0+50	0.2930	5.89	VQ						
0+55	0.3341	5.96	VQ						
1+ 0	0.3762	6.12	VQ						
1+ 5	0.4209	6.48	VQ						
1+10	0.4670	6.70	VQ						
1+15	0.5137	6.79	Q						
1+20	0.5609	6.84	Q						
1+25	0.6082	6.88	Q						
1+30	0.6558	6.90	Q						
1+35	0.7034	6.92	Q						
1+40	0.7511	6.93	Q						
1+45	0.7989	6.94	QV						
1+50	0.8468	6.95	QV						
1+55	0.8946	6.95	QV						
2+ 0	0.9431	7.04	QV						
2+ 5	0.9934	7.29	QV						
2+10	1.0433	7.25	Q V						
2+15	1.0947	7.46	Q V						
2+20	1.1473	7.64	QV						
2+25	1.2003	7.70	QV						
2+30	1.2536	7.74	Q V						
2+35	1.3071	7.77	Q V						
2+40	1.3607	7.78	Q V						
2+45	1.4150	7.89	Q V						
2+50	1.4717	8.24	Q V						
2+55	1.5299	8.45	Q V						
3+ 0	1.5887	8.53	Q V						
3+ 5	1.6478	8.59	Q V						
3+10	1.7078	8.71	Q V						
3+15	1.7703	9.07	Q V						
3+20	1.8343	9.29	Q V						
3+25	1.9007	9.64	Q V						
3+30	1.9761	10.95	Q V						
3+35	2.0645	12.85	Q V						
3+40	2.1659	14.72	Q V						
3+45	2.2759	15.97	Q V						
3+50	2.3962	17.46	Q V						
3+55	2.5245	18.64	Q V						
4+ 0	2.6629	20.09	Q V						
4+ 5	2.8093	21.26	Q V						
4+10	2.9675	22.97	Q V						
4+15	3.1406	25.13	Q V						
4+20	3.3296	27.45	Q V						
4+25	3.5351	29.84	Q V						
4+30	3.7556	32.02	Q V						
4+35	3.9862	33.47	Q V						
4+40	4.2298	35.37	Q V						
4+45	4.4891	37.65	Q V						
4+50	4.7632	39.79	Q V						

4+55	5.0471	41.23			Q	V		
5+ 0	5.3440	43.12			Q	V		
5+ 5	5.6639	46.45			Q	V		
5+10	6.0353	53.92				Q	V	
5+15	6.4716	63.34					Q	
5+20	6.9655	71.72					VQ	
5+25	7.5164	79.99					V	Q
5+30	8.1451	91.29						V
5+35	8.8040	95.67						Q
5+40	9.2447	64.00						V
5+45	9.4955	36.41						V
5+50	9.6598	23.86			Q			V
5+55	9.7777	17.11						V
6+ 0	9.8627	12.34		Q				V
6+ 5	9.9238	8.88		Q				V
6+10	9.9642	5.87		Q				V
6+15	9.9905	3.82	Q					V
6+20	10.0077	2.50	Q					V
6+25	10.0184	1.55	Q					V
6+30	10.0218	0.50	Q					V
6+35	10.0233	0.21	Q					V
6+40	10.0241	0.12	Q					V
6+45	10.0246	0.07	Q					V
6+50	10.0248	0.03	Q					V
6+55	10.0249	0.01	Q					V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786BDev2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 1 Proposed Developed Condition

Drainage Area = 94.30 (Ac.) = 0.147 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 94.30 (Ac.) = 0.147 Sq. Mi.
Length along longest watercourse = 6162.00 (Ft.)
Length along longest watercourse measured to centroid = 3095.00 (Ft.)
Length along longest watercourse = 1.167 Mi.
Length along longest watercourse measured to centroid = 0.586 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 143.9533 Ft./Mi.
Average Manning's 'N' = 0.015
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 = 5.00 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]
94.30	2.48	233.86

100 YEAR Area rainfall data:

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

94.30

6.90

650.67

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 4.298 (In)

Areal adjustment factor = 99.98 %

Adjusted average point rain = 4.298 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
31.800	75.00	0.500
39.700	81.00	0.000
Total Area Entered = 94.30 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.008	0.002
69.0	69.0	0.373	0.500	0.205	0.022	0.005
75.0	75.0	0.303	0.500	0.167	0.211	0.035
75.0	75.0	0.303	0.500	0.167	0.337	0.056
81.0	81.0	0.233	0.000	0.233	0.421	0.098
Sum (F) =						0.196

Area averaged mean soil loss (F) (In/Hr) = 0.196

Minimum soil loss rate ((In/Hr)) = 0.098

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.660

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	68.744	10.306
2	0.167	137.488	39.435
3	0.250	206.232	23.584
4	0.333	274.976	9.129
5	0.417	343.720	5.552
6	0.500	412.464	3.712
7	0.583	481.208	2.467
8	0.667	549.952	1.938
9	0.750	618.696	1.385
10	0.833	687.440	0.995
11	0.917	756.184	0.716
12	1.000	824.928	0.782

Sum = 100.000 Sum= 95.037

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	0.08	0.07	0.034	(0.348) 0.023	0.012
2	0.17	0.07	0.034	(0.347) 0.023	0.012
3	0.25	0.07	0.034	(0.345) 0.023	0.012
4	0.33	0.10	0.052	(0.344) 0.034	0.018
5	0.42	0.10	0.052	(0.343) 0.034	0.018
6	0.50	0.10	0.052	(0.341) 0.034	0.018
7	0.58	0.10	0.052	(0.340) 0.034	0.018
8	0.67	0.10	0.052	(0.339) 0.034	0.018
9	0.75	0.10	0.052	(0.337) 0.034	0.018
10	0.83	0.13	0.069	(0.336) 0.045	0.023
11	0.92	0.13	0.069	(0.335) 0.045	0.023
12	1.00	0.13	0.069	(0.333) 0.045	0.023
13	1.08	0.10	0.052	(0.332) 0.034	0.018
14	1.17	0.10	0.052	(0.331) 0.034	0.018
15	1.25	0.10	0.052	(0.329) 0.034	0.018
16	1.33	0.10	0.052	(0.328) 0.034	0.018
17	1.42	0.10	0.052	(0.327) 0.034	0.018
18	1.50	0.10	0.052	(0.325) 0.034	0.018
19	1.58	0.10	0.052	(0.324) 0.034	0.018
20	1.67	0.10	0.052	(0.323) 0.034	0.018
21	1.75	0.10	0.052	(0.321) 0.034	0.018
22	1.83	0.13	0.069	(0.320) 0.045	0.023
23	1.92	0.13	0.069	(0.319) 0.045	0.023
24	2.00	0.13	0.069	(0.318) 0.045	0.023
25	2.08	0.13	0.069	(0.316) 0.045	0.023
26	2.17	0.13	0.069	(0.315) 0.045	0.023
27	2.25	0.13	0.069	(0.314) 0.045	0.023
28	2.33	0.13	0.069	(0.312) 0.045	0.023
29	2.42	0.13	0.069	(0.311) 0.045	0.023
30	2.50	0.13	0.069	(0.310) 0.045	0.023
31	2.58	0.17	0.086	(0.309) 0.057	0.029
32	2.67	0.17	0.086	(0.307) 0.057	0.029
33	2.75	0.17	0.086	(0.306) 0.057	0.029
34	2.83	0.17	0.086	(0.305) 0.057	0.029
35	2.92	0.17	0.086	(0.304) 0.057	0.029
36	3.00	0.17	0.086	(0.302) 0.057	0.029
37	3.08	0.17	0.086	(0.301) 0.057	0.029
38	3.17	0.17	0.086	(0.300) 0.057	0.029
39	3.25	0.17	0.086	(0.299) 0.057	0.029
40	3.33	0.17	0.086	(0.297) 0.057	0.029
41	3.42	0.17	0.086	(0.296) 0.057	0.029
42	3.50	0.17	0.086	(0.295) 0.057	0.029
43	3.58	0.17	0.086	(0.294) 0.057	0.029

44	3.67	0.17	0.086	(0.292)	0.057	0.029
45	3.75	0.17	0.086	(0.291)	0.057	0.029
46	3.83	0.20	0.103	(0.290)	0.068	0.035
47	3.92	0.20	0.103	(0.289)	0.068	0.035
48	4.00	0.20	0.103	(0.288)	0.068	0.035
49	4.08	0.20	0.103	(0.286)	0.068	0.035
50	4.17	0.20	0.103	(0.285)	0.068	0.035
51	4.25	0.20	0.103	(0.284)	0.068	0.035
52	4.33	0.23	0.120	(0.283)	0.079	0.041
53	4.42	0.23	0.120	(0.281)	0.079	0.041
54	4.50	0.23	0.120	(0.280)	0.079	0.041
55	4.58	0.23	0.120	(0.279)	0.079	0.041
56	4.67	0.23	0.120	(0.278)	0.079	0.041
57	4.75	0.23	0.120	(0.277)	0.079	0.041
58	4.83	0.27	0.138	(0.275)	0.091	0.047
59	4.92	0.27	0.138	(0.274)	0.091	0.047
60	5.00	0.27	0.138	(0.273)	0.091	0.047
61	5.08	0.20	0.103	(0.272)	0.068	0.035
62	5.17	0.20	0.103	(0.271)	0.068	0.035
63	5.25	0.20	0.103	(0.270)	0.068	0.035
64	5.33	0.23	0.120	(0.268)	0.079	0.041
65	5.42	0.23	0.120	(0.267)	0.079	0.041
66	5.50	0.23	0.120	(0.266)	0.079	0.041
67	5.58	0.27	0.138	(0.265)	0.091	0.047
68	5.67	0.27	0.138	(0.264)	0.091	0.047
69	5.75	0.27	0.138	(0.263)	0.091	0.047
70	5.83	0.27	0.138	(0.261)	0.091	0.047
71	5.92	0.27	0.138	(0.260)	0.091	0.047
72	6.00	0.27	0.138	(0.259)	0.091	0.047
73	6.08	0.30	0.155	(0.258)	0.102	0.053
74	6.17	0.30	0.155	(0.257)	0.102	0.053
75	6.25	0.30	0.155	(0.256)	0.102	0.053
76	6.33	0.30	0.155	(0.254)	0.102	0.053
77	6.42	0.30	0.155	(0.253)	0.102	0.053
78	6.50	0.30	0.155	(0.252)	0.102	0.053
79	6.58	0.33	0.172	(0.251)	0.114	0.058
80	6.67	0.33	0.172	(0.250)	0.114	0.058
81	6.75	0.33	0.172	(0.249)	0.114	0.058
82	6.83	0.33	0.172	(0.248)	0.114	0.058
83	6.92	0.33	0.172	(0.247)	0.114	0.058
84	7.00	0.33	0.172	(0.245)	0.114	0.058
85	7.08	0.33	0.172	(0.244)	0.114	0.058
86	7.17	0.33	0.172	(0.243)	0.114	0.058
87	7.25	0.33	0.172	(0.242)	0.114	0.058
88	7.33	0.37	0.189	(0.241)	0.125	0.064
89	7.42	0.37	0.189	(0.240)	0.125	0.064
90	7.50	0.37	0.189	(0.239)	0.125	0.064
91	7.58	0.40	0.206	(0.238)	0.136	0.070
92	7.67	0.40	0.206	(0.237)	0.136	0.070
93	7.75	0.40	0.206	(0.235)	0.136	0.070
94	7.83	0.43	0.223	(0.234)	0.148	0.076
95	7.92	0.43	0.223	(0.233)	0.148	0.076
96	8.00	0.43	0.223	(0.232)	0.148	0.076
97	8.08	0.50	0.258	(0.231)	0.170	0.088

98	8.17	0.50	0.258	(0.230)	0.170	0.088
99	8.25	0.50	0.258	(0.229)	0.170	0.088
100	8.33	0.50	0.258	(0.228)	0.170	0.088
101	8.42	0.50	0.258	(0.227)	0.170	0.088
102	8.50	0.50	0.258	(0.226)	0.170	0.088
103	8.58	0.53	0.275	(0.225)	0.182	0.093
104	8.67	0.53	0.275	(0.224)	0.182	0.093
105	8.75	0.53	0.275	(0.223)	0.182	0.093
106	8.83	0.57	0.292	(0.222)	0.193	0.099
107	8.92	0.57	0.292	(0.221)	0.193	0.099
108	9.00	0.57	0.292	(0.220)	0.193	0.099
109	9.08	0.63	0.327	(0.218)	0.216	0.111
110	9.17	0.63	0.327	(0.217)	0.216	0.111
111	9.25	0.63	0.327	(0.216)	0.216	0.111
112	9.33	0.67	0.344	0.215	(0.227)	0.128
113	9.42	0.67	0.344	0.214	(0.227)	0.129
114	9.50	0.67	0.344	0.213	(0.227)	0.131
115	9.58	0.70	0.361	0.212	(0.238)	0.149
116	9.67	0.70	0.361	0.211	(0.238)	0.150
117	9.75	0.70	0.361	0.210	(0.238)	0.151
118	9.83	0.73	0.378	0.209	(0.250)	0.169
119	9.92	0.73	0.378	0.208	(0.250)	0.170
120	10.00	0.73	0.378	0.207	(0.250)	0.171
121	10.08	0.50	0.258	(0.206)	0.170	0.088
122	10.17	0.50	0.258	(0.205)	0.170	0.088
123	10.25	0.50	0.258	(0.204)	0.170	0.088
124	10.33	0.50	0.258	(0.203)	0.170	0.088
125	10.42	0.50	0.258	(0.202)	0.170	0.088
126	10.50	0.50	0.258	(0.201)	0.170	0.088
127	10.58	0.67	0.344	0.200	(0.227)	0.144
128	10.67	0.67	0.344	0.199	(0.227)	0.145
129	10.75	0.67	0.344	0.198	(0.227)	0.145
130	10.83	0.67	0.344	0.197	(0.227)	0.146
131	10.92	0.67	0.344	0.196	(0.227)	0.147
132	11.00	0.67	0.344	0.195	(0.227)	0.148
133	11.08	0.63	0.327	0.194	(0.216)	0.132
134	11.17	0.63	0.327	0.194	(0.216)	0.133
135	11.25	0.63	0.327	0.193	(0.216)	0.134
136	11.33	0.63	0.327	0.192	(0.216)	0.135
137	11.42	0.63	0.327	0.191	(0.216)	0.136
138	11.50	0.63	0.327	0.190	(0.216)	0.137
139	11.58	0.57	0.292	0.189	(0.193)	0.103
140	11.67	0.57	0.292	0.188	(0.193)	0.104
141	11.75	0.57	0.292	0.187	(0.193)	0.105
142	11.83	0.60	0.309	0.186	(0.204)	0.123
143	11.92	0.60	0.309	0.185	(0.204)	0.124
144	12.00	0.60	0.309	0.184	(0.204)	0.125
145	12.08	0.83	0.430	0.183	(0.284)	0.247
146	12.17	0.83	0.430	0.182	(0.284)	0.247
147	12.25	0.83	0.430	0.181	(0.284)	0.248
148	12.33	0.87	0.447	0.180	(0.295)	0.267
149	12.42	0.87	0.447	0.180	(0.295)	0.267
150	12.50	0.87	0.447	0.179	(0.295)	0.268
151	12.58	0.93	0.481	0.178	(0.318)	0.304

152	12.67	0.93	0.481	0.177	(0.318)	0.304
153	12.75	0.93	0.481	0.176	(0.318)	0.305
154	12.83	0.97	0.499	0.175	(0.329)	0.323
155	12.92	0.97	0.499	0.174	(0.329)	0.324
156	13.00	0.97	0.499	0.173	(0.329)	0.325
157	13.08	1.13	0.584	0.172	(0.386)	0.412
158	13.17	1.13	0.584	0.172	(0.386)	0.413
159	13.25	1.13	0.584	0.171	(0.386)	0.414
160	13.33	1.13	0.584	0.170	(0.386)	0.415
161	13.42	1.13	0.584	0.169	(0.386)	0.416
162	13.50	1.13	0.584	0.168	(0.386)	0.416
163	13.58	0.77	0.395	0.167	(0.261)	0.228
164	13.67	0.77	0.395	0.166	(0.261)	0.229
165	13.75	0.77	0.395	0.166	(0.261)	0.230
166	13.83	0.77	0.395	0.165	(0.261)	0.231
167	13.92	0.77	0.395	0.164	(0.261)	0.232
168	14.00	0.77	0.395	0.163	(0.261)	0.232
169	14.08	0.90	0.464	0.162	(0.307)	0.302
170	14.17	0.90	0.464	0.161	(0.307)	0.303
171	14.25	0.90	0.464	0.161	(0.307)	0.304
172	14.33	0.87	0.447	0.160	(0.295)	0.287
173	14.42	0.87	0.447	0.159	(0.295)	0.288
174	14.50	0.87	0.447	0.158	(0.295)	0.289
175	14.58	0.87	0.447	0.157	(0.295)	0.290
176	14.67	0.87	0.447	0.156	(0.295)	0.291
177	14.75	0.87	0.447	0.156	(0.295)	0.291
178	14.83	0.83	0.430	0.155	(0.284)	0.275
179	14.92	0.83	0.430	0.154	(0.284)	0.276
180	15.00	0.83	0.430	0.153	(0.284)	0.276
181	15.08	0.80	0.413	0.152	(0.273)	0.260
182	15.17	0.80	0.413	0.152	(0.273)	0.261
183	15.25	0.80	0.413	0.151	(0.273)	0.262
184	15.33	0.77	0.395	0.150	(0.261)	0.245
185	15.42	0.77	0.395	0.149	(0.261)	0.246
186	15.50	0.77	0.395	0.149	(0.261)	0.247
187	15.58	0.63	0.327	0.148	(0.216)	0.179
188	15.67	0.63	0.327	0.147	(0.216)	0.180
189	15.75	0.63	0.327	0.146	(0.216)	0.180
190	15.83	0.63	0.327	0.146	(0.216)	0.181
191	15.92	0.63	0.327	0.145	(0.216)	0.182
192	16.00	0.63	0.327	0.144	(0.216)	0.183
193	16.08	0.13	0.069	(0.143)	0.045	0.023
194	16.17	0.13	0.069	(0.143)	0.045	0.023
195	16.25	0.13	0.069	(0.142)	0.045	0.023
196	16.33	0.13	0.069	(0.141)	0.045	0.023
197	16.42	0.13	0.069	(0.140)	0.045	0.023
198	16.50	0.13	0.069	(0.140)	0.045	0.023
199	16.58	0.10	0.052	(0.139)	0.034	0.018
200	16.67	0.10	0.052	(0.138)	0.034	0.018
201	16.75	0.10	0.052	(0.138)	0.034	0.018
202	16.83	0.10	0.052	(0.137)	0.034	0.018
203	16.92	0.10	0.052	(0.136)	0.034	0.018
204	17.00	0.10	0.052	(0.136)	0.034	0.018
205	17.08	0.17	0.086	(0.135)	0.057	0.029

206	17.17	0.17	0.086	(0.134)	0.057	0.029
207	17.25	0.17	0.086	(0.134)	0.057	0.029
208	17.33	0.17	0.086	(0.133)	0.057	0.029
209	17.42	0.17	0.086	(0.132)	0.057	0.029
210	17.50	0.17	0.086	(0.132)	0.057	0.029
211	17.58	0.17	0.086	(0.131)	0.057	0.029
212	17.67	0.17	0.086	(0.130)	0.057	0.029
213	17.75	0.17	0.086	(0.130)	0.057	0.029
214	17.83	0.13	0.069	(0.129)	0.045	0.023
215	17.92	0.13	0.069	(0.128)	0.045	0.023
216	18.00	0.13	0.069	(0.128)	0.045	0.023
217	18.08	0.13	0.069	(0.127)	0.045	0.023
218	18.17	0.13	0.069	(0.126)	0.045	0.023
219	18.25	0.13	0.069	(0.126)	0.045	0.023
220	18.33	0.13	0.069	(0.125)	0.045	0.023
221	18.42	0.13	0.069	(0.125)	0.045	0.023
222	18.50	0.13	0.069	(0.124)	0.045	0.023
223	18.58	0.10	0.052	(0.123)	0.034	0.018
224	18.67	0.10	0.052	(0.123)	0.034	0.018
225	18.75	0.10	0.052	(0.122)	0.034	0.018
226	18.83	0.07	0.034	(0.122)	0.023	0.012
227	18.92	0.07	0.034	(0.121)	0.023	0.012
228	19.00	0.07	0.034	(0.120)	0.023	0.012
229	19.08	0.10	0.052	(0.120)	0.034	0.018
230	19.17	0.10	0.052	(0.119)	0.034	0.018
231	19.25	0.10	0.052	(0.119)	0.034	0.018
232	19.33	0.13	0.069	(0.118)	0.045	0.023
233	19.42	0.13	0.069	(0.118)	0.045	0.023
234	19.50	0.13	0.069	(0.117)	0.045	0.023
235	19.58	0.10	0.052	(0.117)	0.034	0.018
236	19.67	0.10	0.052	(0.116)	0.034	0.018
237	19.75	0.10	0.052	(0.115)	0.034	0.018
238	19.83	0.07	0.034	(0.115)	0.023	0.012
239	19.92	0.07	0.034	(0.114)	0.023	0.012
240	20.00	0.07	0.034	(0.114)	0.023	0.012
241	20.08	0.10	0.052	(0.113)	0.034	0.018
242	20.17	0.10	0.052	(0.113)	0.034	0.018
243	20.25	0.10	0.052	(0.112)	0.034	0.018
244	20.33	0.10	0.052	(0.112)	0.034	0.018
245	20.42	0.10	0.052	(0.111)	0.034	0.018
246	20.50	0.10	0.052	(0.111)	0.034	0.018
247	20.58	0.10	0.052	(0.111)	0.034	0.018
248	20.67	0.10	0.052	(0.110)	0.034	0.018
249	20.75	0.10	0.052	(0.110)	0.034	0.018
250	20.83	0.07	0.034	(0.109)	0.023	0.012
251	20.92	0.07	0.034	(0.109)	0.023	0.012
252	21.00	0.07	0.034	(0.108)	0.023	0.012
253	21.08	0.10	0.052	(0.108)	0.034	0.018
254	21.17	0.10	0.052	(0.107)	0.034	0.018
255	21.25	0.10	0.052	(0.107)	0.034	0.018
256	21.33	0.07	0.034	(0.107)	0.023	0.012
257	21.42	0.07	0.034	(0.106)	0.023	0.012
258	21.50	0.07	0.034	(0.106)	0.023	0.012
259	21.58	0.10	0.052	(0.105)	0.034	0.018

260	21.67	0.10	0.052	(0.105)	0.034	0.018
261	21.75	0.10	0.052	(0.105)	0.034	0.018
262	21.83	0.07	0.034	(0.104)	0.023	0.012
263	21.92	0.07	0.034	(0.104)	0.023	0.012
264	22.00	0.07	0.034	(0.104)	0.023	0.012
265	22.08	0.10	0.052	(0.103)	0.034	0.018
266	22.17	0.10	0.052	(0.103)	0.034	0.018
267	22.25	0.10	0.052	(0.103)	0.034	0.018
268	22.33	0.07	0.034	(0.102)	0.023	0.012
269	22.42	0.07	0.034	(0.102)	0.023	0.012
270	22.50	0.07	0.034	(0.102)	0.023	0.012
271	22.58	0.07	0.034	(0.101)	0.023	0.012
272	22.67	0.07	0.034	(0.101)	0.023	0.012
273	22.75	0.07	0.034	(0.101)	0.023	0.012
274	22.83	0.07	0.034	(0.101)	0.023	0.012
275	22.92	0.07	0.034	(0.100)	0.023	0.012
276	23.00	0.07	0.034	(0.100)	0.023	0.012
277	23.08	0.07	0.034	(0.100)	0.023	0.012
278	23.17	0.07	0.034	(0.100)	0.023	0.012
279	23.25	0.07	0.034	(0.099)	0.023	0.012
280	23.33	0.07	0.034	(0.099)	0.023	0.012
281	23.42	0.07	0.034	(0.099)	0.023	0.012
282	23.50	0.07	0.034	(0.099)	0.023	0.012
283	23.58	0.07	0.034	(0.099)	0.023	0.012
284	23.67	0.07	0.034	(0.099)	0.023	0.012
285	23.75	0.07	0.034	(0.098)	0.023	0.012
286	23.83	0.07	0.034	(0.098)	0.023	0.012
287	23.92	0.07	0.034	(0.098)	0.023	0.012
288	24.00	0.07	0.034	(0.098)	0.023	0.012

(Loss Rate Not Used)

Sum = 100.0

Sum = 24.3

Flood volume = Effective rainfall 2.03 (In)
 times area 94.3 (Ac.) / [(In) / (Ft.)] = 15.9 (Ac.Ft)
 Total soil loss = 2.27 (In)
 Total soil loss = 17.845 (Ac.Ft)
 Total rainfall = 4.30 (In)
 Flood volume = 693802.9 Cubic Feet
 Total soil loss = 777315.2 Cubic Feet

 Peak flow rate of this hydrograph = 38.696 (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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q (CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0008	0.11	Q				
0+10	0.0046	0.55	Q				
0+15	0.0102	0.81	Q				
0+20	0.0169	0.97	Q				

0+25	0.0255	1.25	VQ
0+30	0.0353	1.42	VQ
0+35	0.0457	1.50	VQ
0+40	0.0564	1.56	VQ
0+45	0.0674	1.59	VQ
0+50	0.0789	1.67	VQ
0+55	0.0920	1.91	VQ
1+ 0	0.1062	2.06	V Q
1+ 5	0.1204	2.06	V Q
1+10	0.1333	1.87	VQ
1+15	0.1454	1.77	VQ
1+20	0.1574	1.73	VQ
1+25	0.1691	1.71	VQ
1+30	0.1808	1.70	VQ
1+35	0.1924	1.69	VQ
1+40	0.2040	1.68	VQ
1+45	0.2156	1.68	VQ
1+50	0.2275	1.73	VQ
1+55	0.2409	1.95	VQ
2+ 0	0.2552	2.07	V Q
2+ 5	0.2698	2.12	V Q
2+10	0.2846	2.15	V Q
2+15	0.2996	2.17	V Q
2+20	0.3147	2.19	V Q
2+25	0.3298	2.20	V Q
2+30	0.3450	2.21	V Q
2+35	0.3606	2.27	V Q
2+40	0.3778	2.49	V Q
2+45	0.3959	2.63	V Q
2+50	0.4143	2.68	VQ
2+55	0.4330	2.71	VQ
3+ 0	0.4517	2.73	VQ
3+ 5	0.4706	2.74	VQ
3+10	0.4896	2.75	VQ
3+15	0.5086	2.76	VQ
3+20	0.5277	2.77	VQ
3+25	0.5467	2.77	VQ
3+30	0.5658	2.77	VQ
3+35	0.5850	2.77	VQ
3+40	0.6041	2.77	VQ
3+45	0.6232	2.77	VQ
3+50	0.6427	2.83	VQ
3+55	0.6637	3.05	V Q
4+ 0	0.6856	3.18	V Q
4+ 5	0.7079	3.23	V Q
4+10	0.7303	3.26	V Q
4+15	0.7530	3.28	V Q
4+20	0.7761	3.35	V Q
4+25	0.8007	3.58	VQ
4+30	0.8264	3.72	VQ
4+35	0.8524	3.78	VQ
4+40	0.8787	3.81	VQ
4+45	0.9051	3.84	VQ
4+50	0.9320	3.91	VQ

4+55	0.9605	4.14	V Q
5+ 0	0.9900	4.28	V Q
5+ 5	1.0191	4.22	V Q
5+10	1.0453	3.82	VQ
5+15	1.0700	3.58	VQ
5+20	1.0944	3.55	VQ
5+25	1.1200	3.72	VQ
5+30	1.1463	3.81	VQ
5+35	1.1732	3.90	VQ
5+40	1.2016	4.13	VQ
5+45	1.2311	4.27	VQ
5+50	1.2609	4.33	VQ
5+55	1.2909	4.36	VQ
6+ 0	1.3211	4.38	VQ
6+ 5	1.3517	4.46	VQ
6+10	1.3840	4.69	VQ
6+15	1.4173	4.83	VQ
6+20	1.4510	4.89	VQ
6+25	1.4849	4.92	VQ
6+30	1.5190	4.95	VQ
6+35	1.5536	5.02	V Q
6+40	1.5897	5.25	V Q
6+45	1.6268	5.39	VQ
6+50	1.6643	5.44	VQ
6+55	1.7020	5.48	VQ
7+ 0	1.7399	5.50	VQ
7+ 5	1.7779	5.52	VQ
7+10	1.8160	5.53	VQ
7+15	1.8541	5.54	VQ
7+20	1.8927	5.60	VQ
7+25	1.9328	5.82	VQ
7+30	1.9738	5.96	VQ
7+35	2.0156	6.06	VQ
7+40	2.0590	6.31	VQ
7+45	2.1036	6.47	VQ
7+50	2.1489	6.59	VQ
7+55	2.1961	6.85	VQ
8+ 0	2.2443	7.01	V Q
8+ 5	2.2939	7.19	V Q
8+10	2.3467	7.67	V Q
8+15	2.4016	7.97	VQ
8+20	2.4573	8.09	V Q
8+25	2.5135	8.17	V Q
8+30	2.5701	8.22	V Q
8+35	2.6273	8.31	V Q
8+40	2.6863	8.55	V Q
8+45	2.7462	8.70	V Q
8+50	2.8069	8.82	VQ
8+55	2.8695	9.08	V Q
9+ 0	2.9331	9.24	V Q
9+ 5	2.9980	9.42	V Q
9+10	3.0662	9.90	V Q
9+15	3.1363	10.19	V Q
9+20	3.2085	10.48	V Q

9+25	3.2858	11.23	V	Q				
9+30	3.3665	11.72	V	Q				
9+35	3.4502	12.15	V	Q				
9+40	3.5396	12.99	V	Q				
9+45	3.6329	13.54	V	Q				
9+50	3.7293	14.00	V	Q				
9+55	3.8317	14.87	V	Q				
10+ 0	3.9380	15.44	V	Q				
10+ 5	4.0407	14.91	V	Q				
10+10	4.1231	11.96	VQ					
10+15	4.1935	10.21	Q					
10+20	4.2593	9.56	QV					
10+25	4.3225	9.18	QV					
10+30	4.3840	8.93	Q	V				
10+35	4.4481	9.30	Q	V				
10+40	4.5257	11.27		Q				
10+45	4.6116	12.48		VQ				
10+50	4.7009	12.96		VQ				
10+55	4.7923	13.27		VQ				
11+ 0	4.8851	13.49		VQ				
11+ 5	4.9784	13.54		VQ				
11+10	5.0684	13.08		VQ				
11+15	5.1570	12.86		Q				
11+20	5.2455	12.85		QV				
11+25	5.3342	12.89		QV				
11+30	5.4235	12.96		QV				
11+35	5.5107	12.67		QV				
11+40	5.5895	11.44		Q	V			
11+45	5.6634	10.73	Q		V			
11+50	5.7370	10.68	Q		V			
11+55	5.8142	11.22	Q		V			
12+ 0	5.8938	11.56	Q		V			
12+ 5	5.9826	12.89		Q	V			
12+10	6.1033	17.52			V	Q		
12+15	6.2432	20.32			V		Q	
12+20	6.3922	21.63			V		Q	
12+25	6.5507	23.01			V		Q	
12+30	6.7153	23.90			V		Q	
12+35	6.8859	24.77			V		Q	
12+40	7.0682	26.47			V		Q	
12+45	7.2580	27.56			V		Q	
12+50	7.4526	28.26			V		Q	
12+55	7.6543	29.29			V		Q	
13+ 0	7.8609	29.99			V		Q	
13+ 5	8.0755	31.17			V		Q	
13+10	8.3141	34.64			V		Q	
13+15	8.5673	36.77			V		Q	
13+20	8.8267	37.67			V		Q	
13+25	9.0903	38.26			V		Q	
13+30	9.3568	38.70			V		Q	
13+35	9.6126	37.14			V		Q	
13+40	9.8213	30.30			V		Q	
13+45	10.0022	26.27			VQ			
13+50	10.1729	24.79			QV			

13+55	10.3377	23.93				Q	V		
14+ 0	10.4990	23.41				Q	V		
14+ 5	10.6623	23.72				Q	V		
14+10	10.8416	26.03					QV		
14+15	11.0303	27.40					Q		
14+20	11.2213	27.73					QV		
14+25	11.4100	27.40					QV		
14+30	11.5973	27.19					Q	V	
14+35	11.7852	27.28					Q	V	
14+40	11.9738	27.40					Q	V	
14+45	12.1632	27.50					Q	V	
14+50	12.3522	27.44					Q	V	
14+55	12.5373	26.88					Q	V	
15+ 0	12.7205	26.60					Q	V	
15+ 5	12.9020	26.34					Q	V	
15+10	13.0788	25.67					Q	V	
15+15	13.2529	25.29					Q	V	
15+20	13.4251	25.00					Q	V	
15+25	13.5926	24.31					Q	V	
15+30	13.7573	23.92					Q	V	
15+35	13.9164	23.11					Q	V	
15+40	14.0574	20.47				Q		V	
15+45	14.1876	18.90				Q		V	
15+50	14.3138	18.32				Q		V	
15+55	14.4377	17.99				Q		V	
16+ 0	14.5601	17.78				Q		V	
16+ 5	14.6710	16.11				Q		V	
16+10	14.7402	10.04		Q				V	
16+15	14.7841	6.38		Q				V	
16+20	14.8182	4.95		Q				V	
16+25	14.8462	4.07		Q				V	
16+30	14.8701	3.46		Q				V	
16+35	14.8910	3.04		Q				V	
16+40	14.9084	2.53		Q				V	
16+45	14.9235	2.19		Q				V	
16+50	14.9372	1.99	Q					V	
16+55	14.9499	1.85	Q					V	
17+ 0	14.9617	1.71	Q					V	
17+ 5	14.9742	1.81	Q					V	
17+10	14.9896	2.24	Q					V	
17+15	15.0067	2.49	Q					V	
17+20	15.0246	2.59	Q					V	
17+25	15.0428	2.65	Q					V	
17+30	15.0613	2.68	Q					V	
17+35	15.0799	2.71	Q					V	
17+40	15.0987	2.73	Q					V	
17+45	15.1177	2.75	Q					V	
17+50	15.1363	2.70	Q					V	
17+55	15.1534	2.49	Q					V	
18+ 0	15.1697	2.37	Q					V	
18+ 5	15.1857	2.32	Q					V	
18+10	15.2014	2.29	Q					V	
18+15	15.2170	2.27	Q					V	
18+20	15.2325	2.25	Q					V	

18+25	15.2480	2.24	Q				V
18+30	15.2634	2.23	Q				V
18+35	15.2783	2.17	Q				V
18+40	15.2917	1.95	Q				V
18+45	15.3042	1.81	Q				V
18+50	15.3160	1.70	Q				V
18+55	15.3260	1.46	Q				V
19+ 0	15.3350	1.30	Q				V
19+ 5	15.3439	1.30	Q				V
19+10	15.3540	1.47	Q				V
19+15	15.3649	1.58	Q				V
19+20	15.3764	1.67	Q				V
19+25	15.3895	1.90	Q				V
19+30	15.4035	2.04	Q				V
19+35	15.4176	2.04	Q				V
19+40	15.4304	1.86	Q				V
19+45	15.4424	1.75	Q				V
19+50	15.4539	1.66	Q				V
19+55	15.4637	1.43	Q				V
20+ 0	15.4726	1.29	Q				V
20+ 5	15.4815	1.29	Q				V
20+10	15.4916	1.47	Q				V
20+15	15.5025	1.58	Q				V
20+20	15.5136	1.61	Q				V
20+25	15.5247	1.62	Q				V
20+30	15.5360	1.63	Q				V
20+35	15.5473	1.64	Q				V
20+40	15.5586	1.65	Q				V
20+45	15.5700	1.65	Q				V
20+50	15.5810	1.60	Q				V
20+55	15.5906	1.38	Q				V
21+ 0	15.5992	1.26	Q				V
21+ 5	15.6079	1.26	Q				V
21+10	15.6179	1.45	Q				V
21+15	15.6287	1.56	Q				V
21+20	15.6393	1.54	Q				V
21+25	15.6486	1.34	Q				V
21+30	15.6570	1.23	Q				V
21+35	15.6656	1.24	Q				V
21+40	15.6754	1.44	Q				V
21+45	15.6861	1.55	Q				V
21+50	15.6967	1.53	Q				V
21+55	15.7059	1.34	Q				V
22+ 0	15.7143	1.23	Q				V
22+ 5	15.7229	1.24	Q				V
22+10	15.7328	1.44	Q				V
22+15	15.7434	1.55	Q				V
22+20	15.7540	1.53	Q				V
22+25	15.7632	1.34	Q				V
22+30	15.7717	1.23	Q				V
22+35	15.7798	1.18	Q				V
22+40	15.7878	1.16	Q				V
22+45	15.7957	1.14	Q				V
22+50	15.8035	1.13	Q				V

22+55	15.8112	1.13	Q				V
23+ 0	15.8190	1.12	Q				V
23+ 5	15.8267	1.12	Q				V
23+10	15.8344	1.11	Q				V
23+15	15.8420	1.11	Q				V
23+20	15.8496	1.11	Q				V
23+25	15.8573	1.11	Q				V
23+30	15.8649	1.11	Q				V
23+35	15.8726	1.11	Q				V
23+40	15.8802	1.11	Q				V
23+45	15.8879	1.11	Q				V
23+50	15.8955	1.11	Q				V
23+55	15.9031	1.11	Q				V
24+ 0	15.9108	1.11	Q				V
24+ 5	15.9176	1.00	Q				V
24+10	15.9215	0.56	Q				V
24+15	15.9235	0.30	Q				V
24+20	15.9249	0.19	Q				V
24+25	15.9258	0.13	Q				V
24+30	15.9264	0.09	Q				V
24+35	15.9269	0.06	Q				V
24+40	15.9272	0.04	Q				V
24+45	15.9273	0.03	Q				V
24+50	15.9275	0.02	Q				V
24+55	15.9275	0.01	Q				V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70(Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70(Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00(Ft.)
Length along longest watercourse measured to centroid = 2003.00(Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00(Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
32.70	0.58	18.97

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
32.70	1.45	47.41

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)
 Areal adjustment factor = 99.97 %
 Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

 Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
 VALLEY S-Curve

 Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
		Sum = 100.000	Sum= 32.955

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	0.08	4.40	0.306 (0.422)	0.276 0.031
2	0.17	4.50	0.313 (0.422)	0.282 0.031
3	0.25	5.40	0.376 (0.422)	0.338 0.038

4	0.33	5.40	0.376	(0.422)	0.338	0.038
5	0.42	5.70	0.397	(0.422)	0.357	0.040
6	0.50	6.40	0.445	(0.422)	0.401	0.045
7	0.58	7.90	0.550	0.422	(0.495)	0.127
8	0.67	9.10	0.633	0.422	(0.570)	0.211
9	0.75	12.80	0.891	0.422	(0.802)	0.468
10	0.83	25.60	1.781	0.422	(1.603)	1.359
11	0.92	7.90	0.550	0.422	(0.495)	0.127
12	1.00	4.90	0.341	(0.422)	0.307	0.034

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.5

Flood volume = Effective rainfall 0.21(In)
times area 32.7(Ac.)/[(In)/(Ft.)) = 0.6(Ac.Ft)

Total soil loss = 0.37(In)

Total soil loss = 1.002(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 25197.6 Cubic Feet

Total soil loss = 43628.6 Cubic Feet

Peak flow rate of this hydrograph = 23.262(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0008	0.11	Q				
0+10	0.0044	0.53	Q				
0+15	0.0098	0.79	VQ				
0+20	0.0165	0.97	Q				
0+25	0.0239	1.08	Q				
0+30	0.0320	1.18	QV				
0+35	0.0430	1.60	Q				
0+40	0.0642	3.08	Q				
0+45	0.1042	5.80		Q			
0+50	0.1965	13.40		V	Q		
0+55	0.3567	23.26			V	Q	
1+ 0	0.4528	13.96			Q	V	
1+ 5	0.4985	6.63		Q		V	
1+10	0.5252	3.88		Q		V	
1+15	0.5424	2.50	Q			V	
1+20	0.5542	1.72	Q			V	
1+25	0.5629	1.27	Q			V	
1+30	0.5691	0.90	Q			V	
1+35	0.5734	0.62	Q			V	
1+40	0.5765	0.45	Q			V	
1+45	0.5782	0.26	Q			V	
1+50	0.5784	0.03	Q			V	
1+55	0.5785	0.01	Q			V	V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70 (Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70 (Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00 (Ft.)
Length along longest watercourse measured to centroid = 2003.00 (Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00 (Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 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]
32.70	0.98	32.05

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	2.48	81.10

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 0.980(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 0.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
32.700	81.00	0.000
Total Area Entered = 32.70(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422
 Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)
 Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
Sum = 100.000			Sum= 32.955

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	0.08	1.30	0.153 (0.422)	0.138
2	0.17	1.30	0.153 (0.422)	0.138
3	0.25	1.10	0.129 (0.422)	0.116
4	0.33	1.50	0.176 (0.422)	0.159
5	0.42	1.50	0.176 (0.422)	0.159

6	0.50	1.80	0.212	(0.422)	0.190	0.021
7	0.58	1.50	0.176	(0.422)	0.159	0.018
8	0.67	1.80	0.212	(0.422)	0.190	0.021
9	0.75	1.80	0.212	(0.422)	0.190	0.021
10	0.83	1.50	0.176	(0.422)	0.159	0.018
11	0.92	1.60	0.188	(0.422)	0.169	0.019
12	1.00	1.80	0.212	(0.422)	0.190	0.021
13	1.08	2.20	0.259	(0.422)	0.233	0.026
14	1.17	2.20	0.259	(0.422)	0.233	0.026
15	1.25	2.20	0.259	(0.422)	0.233	0.026
16	1.33	2.00	0.235	(0.422)	0.212	0.024
17	1.42	2.60	0.306	(0.422)	0.275	0.031
18	1.50	2.70	0.317	(0.422)	0.286	0.032
19	1.58	2.40	0.282	(0.422)	0.254	0.028
20	1.67	2.70	0.317	(0.422)	0.286	0.032
21	1.75	3.30	0.388	(0.422)	0.349	0.039
22	1.83	3.10	0.365	(0.422)	0.328	0.036
23	1.92	2.90	0.341	(0.422)	0.307	0.034
24	2.00	3.00	0.353	(0.422)	0.317	0.035
25	2.08	3.10	0.365	(0.422)	0.328	0.036
26	2.17	4.20	0.494	0.422 (0.444)		0.071
27	2.25	5.00	0.588	0.422 (0.529)		0.165
28	2.33	3.50	0.412	(0.422)	0.370	0.041
29	2.42	6.80	0.800	0.422 (0.720)		0.377
30	2.50	7.30	0.858	0.422 (0.773)		0.436
31	2.58	8.20	0.964	0.422 (0.868)		0.542
32	2.67	5.90	0.694	0.422 (0.624)		0.271
33	2.75	2.00	0.235	(0.422)	0.212	0.024
34	2.83	1.80	0.212	(0.422)	0.190	0.021
35	2.92	1.80	0.212	(0.422)	0.190	0.021
36	3.00	0.60	0.071	(0.422)	0.063	0.007

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.6

Flood volume = Effective rainfall 0.22(In)

times area 32.7(Ac.)/[(In)/(Ft.)] = 0.6(Ac.Ft)

Total soil loss = 0.76(In)

Total soil loss = 2.080(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 25706.7 Cubic Feet

Total soil loss = 90603.6 Cubic Feet

Peak flow rate of this hydrograph = 13.031(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0004	0.06	Q				
0+10	0.0022	0.26	Q				
0+15	0.0047	0.37	Q				
0+20	0.0075	0.40	Q				
0+25	0.0107	0.47	Q				

0+30	0.0143	0.53	VQ						
0+35	0.0184	0.59	Q						
0+40	0.0224	0.59	Q						
0+45	0.0268	0.63	Q						
0+50	0.0313	0.65	QV						
0+55	0.0356	0.62	QV						
1+ 0	0.0399	0.63	QV						
1+ 5	0.0446	0.68	Q V						
1+10	0.0498	0.76	Q V						
1+15	0.0553	0.80	Q V						
1+20	0.0609	0.81	Q V						
1+25	0.0665	0.82	Q V						
1+30	0.0728	0.90	Q V						
1+35	0.0794	0.96	Q V						
1+40	0.0859	0.95	Q V						
1+45	0.0929	1.02	Q V						
1+50	0.1007	1.13	Q V						
1+55	0.1086	1.15	Q V						
2+ 0	0.1164	1.13	Q V						
2+ 5	0.1243	1.15	Q V						
2+10	0.1333	1.30	Q V						
2+15	0.1479	2.13	Q V						
2+20	0.1700	3.21	Q V						
2+25	0.1946	3.56	Q V						
2+30	0.2477	7.72	QV						
2+35	0.3252	11.25	Q						
2+40	0.4149	13.03	Q V						
2+45	0.4837	9.99	Q						
2+50	0.5209	5.40	Q						
2+55	0.5432	3.23	Q						
3+ 0	0.5592	2.32	Q						
3+ 5	0.5701	1.59	Q						
3+10	0.5774	1.06	Q						
3+15	0.5824	0.72	Q						
3+20	0.5859	0.51	Q						
3+25	0.5882	0.33	Q						
3+30	0.5894	0.18	Q						
3+35	0.5899	0.07	Q						
3+40	0.5900	0.02	Q						
3+45	0.5901	0.01	Q						
3+50	0.5901	0.01	Q						
3+55	0.5901	0.00	Q						

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Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70 (Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70 (Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00 (Ft.)
Length along longest watercourse measured to centroid = 2003.00 (Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00 (Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	1.38	45.13

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	3.48	113.80

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)
 Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
		Sum = 100.000	Sum= 32.955

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	0.08	0.083	(0.422)	0.075
2	0.17	0.099	(0.422)	0.089
3	0.25	0.099	(0.422)	0.089
4	0.33	0.099	(0.422)	0.089
5	0.42	0.099	(0.422)	0.089

6	0.50	0.70	0.116	(0.422)	0.104	0.012
7	0.58	0.70	0.116	(0.422)	0.104	0.012
8	0.67	0.70	0.116	(0.422)	0.104	0.012
9	0.75	0.70	0.116	(0.422)	0.104	0.012
10	0.83	0.70	0.116	(0.422)	0.104	0.012
11	0.92	0.70	0.116	(0.422)	0.104	0.012
12	1.00	0.80	0.132	(0.422)	0.119	0.013
13	1.08	0.80	0.132	(0.422)	0.119	0.013
14	1.17	0.80	0.132	(0.422)	0.119	0.013
15	1.25	0.80	0.132	(0.422)	0.119	0.013
16	1.33	0.80	0.132	(0.422)	0.119	0.013
17	1.42	0.80	0.132	(0.422)	0.119	0.013
18	1.50	0.80	0.132	(0.422)	0.119	0.013
19	1.58	0.80	0.132	(0.422)	0.119	0.013
20	1.67	0.80	0.132	(0.422)	0.119	0.013
21	1.75	0.80	0.132	(0.422)	0.119	0.013
22	1.83	0.80	0.132	(0.422)	0.119	0.013
23	1.92	0.80	0.132	(0.422)	0.119	0.013
24	2.00	0.90	0.149	(0.422)	0.134	0.015
25	2.08	0.80	0.132	(0.422)	0.119	0.013
26	2.17	0.90	0.149	(0.422)	0.134	0.015
27	2.25	0.90	0.149	(0.422)	0.134	0.015
28	2.33	0.90	0.149	(0.422)	0.134	0.015
29	2.42	0.90	0.149	(0.422)	0.134	0.015
30	2.50	0.90	0.149	(0.422)	0.134	0.015
31	2.58	0.90	0.149	(0.422)	0.134	0.015
32	2.67	0.90	0.149	(0.422)	0.134	0.015
33	2.75	1.00	0.166	(0.422)	0.149	0.017
34	2.83	1.00	0.166	(0.422)	0.149	0.017
35	2.92	1.00	0.166	(0.422)	0.149	0.017
36	3.00	1.00	0.166	(0.422)	0.149	0.017
37	3.08	1.00	0.166	(0.422)	0.149	0.017
38	3.17	1.10	0.182	(0.422)	0.164	0.018
39	3.25	1.10	0.182	(0.422)	0.164	0.018
40	3.33	1.10	0.182	(0.422)	0.164	0.018
41	3.42	1.20	0.199	(0.422)	0.179	0.020
42	3.50	1.30	0.215	(0.422)	0.194	0.022
43	3.58	1.40	0.232	(0.422)	0.209	0.023
44	3.67	1.40	0.232	(0.422)	0.209	0.023
45	3.75	1.50	0.248	(0.422)	0.224	0.025
46	3.83	1.50	0.248	(0.422)	0.224	0.025
47	3.92	1.60	0.265	(0.422)	0.238	0.026
48	4.00	1.60	0.265	(0.422)	0.238	0.026
49	4.08	1.70	0.281	(0.422)	0.253	0.028
50	4.17	1.80	0.298	(0.422)	0.268	0.030
51	4.25	1.90	0.315	(0.422)	0.283	0.031
52	4.33	2.00	0.331	(0.422)	0.298	0.033
53	4.42	2.10	0.348	(0.422)	0.313	0.035
54	4.50	2.10	0.348	(0.422)	0.313	0.035
55	4.58	2.20	0.364	(0.422)	0.328	0.036
56	4.67	2.30	0.381	(0.422)	0.343	0.038
57	4.75	2.40	0.397	(0.422)	0.358	0.040
58	4.83	2.40	0.397	(0.422)	0.358	0.040
59	4.92	2.50	0.414	(0.422)	0.373	0.041
60	5.00	2.60	0.431	(0.422)	0.387	0.043
61	5.08	3.10	0.513	0.422 (0.462)		0.091
62	5.17	3.60	0.596	0.422 (0.536)		0.174

63	5.25	3.90	0.646	0.422	(0.581)	0.223
64	5.33	4.20	0.695	0.422	(0.626)	0.273
65	5.42	4.70	0.778	0.422	(0.700)	0.356
66	5.50	5.60	0.927	0.422	(0.835)	0.505
67	5.58	1.90	0.315	(0.422)	0.283	0.031
68	5.67	0.90	0.149	(0.422)	0.134	0.015
69	5.75	0.60	0.099	(0.422)	0.089	0.010
70	5.83	0.50	0.083	(0.422)	0.075	0.008
71	5.92	0.30	0.050	(0.422)	0.045	0.005
72	6.00	0.20	0.033	(0.422)	0.030	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.9

Flood volume = Effective rainfall 0.24(In)
times area 32.7(Ac.)/[(In)/(Ft.)] = 0.6(Ac.Ft)
Total soil loss = 1.14(In)
Total soil loss = 3.110(Ac.Ft)
Total rainfall = 1.38(In)
Flood volume = 28304.4 Cubic Feet
Total soil loss = 135484.5 Cubic Feet

Peak flow rate of this hydrograph = 11.116(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0002	0.03	Q				
0+10	0.0012	0.15	Q				
0+15	0.0028	0.23	Q				
0+20	0.0047	0.27	Q				
0+25	0.0067	0.29	Q				
0+30	0.0088	0.31	Q				
0+35	0.0111	0.34	Q				
0+40	0.0135	0.36	Q				
0+45	0.0161	0.37	Q				
0+50	0.0186	0.37	QV				
0+55	0.0212	0.38	QV				
1+ 0	0.0239	0.39	QV				
1+ 5	0.0267	0.41	QV				
1+10	0.0296	0.42	QV				
1+15	0.0325	0.43	Q V				
1+20	0.0355	0.43	Q V				
1+25	0.0385	0.43	Q V				
1+30	0.0415	0.43	Q V				
1+35	0.0444	0.43	Q V				
1+40	0.0474	0.44	Q V				
1+45	0.0505	0.44	Q V				
1+50	0.0535	0.44	Q V				
1+55	0.0565	0.44	Q V				
2+ 0	0.0595	0.44	Q V				
2+ 5	0.0627	0.46	Q V				
2+10	0.0658	0.46	Q V				



Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70(Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70(Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00(Ft.)
Length along longest watercourse measured to centroid = 2003.00(Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00(Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 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]
32.70	2.48	81.10

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
32.70	6.90	225.63

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 2.480(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
		Sum = 100.000	Sum= 32.955

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	0.08	0.07	(0.749) 0.018	0.002
2	0.17	0.07	(0.746) 0.018	0.002
3	0.25	0.07	(0.743) 0.018	0.002
4	0.33	0.10	(0.740) 0.027	0.003
5	0.42	0.10	(0.737) 0.027	0.003

6	0.50	0.10	0.030	(0.735)	0.027	0.003
7	0.58	0.10	0.030	(0.732)	0.027	0.003
8	0.67	0.10	0.030	(0.729)	0.027	0.003
9	0.75	0.10	0.030	(0.726)	0.027	0.003
10	0.83	0.13	0.040	(0.723)	0.036	0.004
11	0.92	0.13	0.040	(0.720)	0.036	0.004
12	1.00	0.13	0.040	(0.717)	0.036	0.004
13	1.08	0.10	0.030	(0.715)	0.027	0.003
14	1.17	0.10	0.030	(0.712)	0.027	0.003
15	1.25	0.10	0.030	(0.709)	0.027	0.003
16	1.33	0.10	0.030	(0.706)	0.027	0.003
17	1.42	0.10	0.030	(0.703)	0.027	0.003
18	1.50	0.10	0.030	(0.700)	0.027	0.003
19	1.58	0.10	0.030	(0.698)	0.027	0.003
20	1.67	0.10	0.030	(0.695)	0.027	0.003
21	1.75	0.10	0.030	(0.692)	0.027	0.003
22	1.83	0.13	0.040	(0.689)	0.036	0.004
23	1.92	0.13	0.040	(0.687)	0.036	0.004
24	2.00	0.13	0.040	(0.684)	0.036	0.004
25	2.08	0.13	0.040	(0.681)	0.036	0.004
26	2.17	0.13	0.040	(0.678)	0.036	0.004
27	2.25	0.13	0.040	(0.675)	0.036	0.004
28	2.33	0.13	0.040	(0.673)	0.036	0.004
29	2.42	0.13	0.040	(0.670)	0.036	0.004
30	2.50	0.13	0.040	(0.667)	0.036	0.004
31	2.58	0.17	0.050	(0.665)	0.045	0.005
32	2.67	0.17	0.050	(0.662)	0.045	0.005
33	2.75	0.17	0.050	(0.659)	0.045	0.005
34	2.83	0.17	0.050	(0.656)	0.045	0.005
35	2.92	0.17	0.050	(0.654)	0.045	0.005
36	3.00	0.17	0.050	(0.651)	0.045	0.005
37	3.08	0.17	0.050	(0.648)	0.045	0.005
38	3.17	0.17	0.050	(0.646)	0.045	0.005
39	3.25	0.17	0.050	(0.643)	0.045	0.005
40	3.33	0.17	0.050	(0.640)	0.045	0.005
41	3.42	0.17	0.050	(0.638)	0.045	0.005
42	3.50	0.17	0.050	(0.635)	0.045	0.005
43	3.58	0.17	0.050	(0.632)	0.045	0.005
44	3.67	0.17	0.050	(0.630)	0.045	0.005
45	3.75	0.17	0.050	(0.627)	0.045	0.005
46	3.83	0.20	0.060	(0.624)	0.054	0.006
47	3.92	0.20	0.060	(0.622)	0.054	0.006
48	4.00	0.20	0.060	(0.619)	0.054	0.006
49	4.08	0.20	0.060	(0.616)	0.054	0.006
50	4.17	0.20	0.060	(0.614)	0.054	0.006
51	4.25	0.20	0.060	(0.611)	0.054	0.006
52	4.33	0.23	0.069	(0.609)	0.062	0.007
53	4.42	0.23	0.069	(0.606)	0.062	0.007
54	4.50	0.23	0.069	(0.603)	0.062	0.007
55	4.58	0.23	0.069	(0.601)	0.062	0.007
56	4.67	0.23	0.069	(0.598)	0.062	0.007
57	4.75	0.23	0.069	(0.596)	0.062	0.007
58	4.83	0.27	0.079	(0.593)	0.071	0.008
59	4.92	0.27	0.079	(0.590)	0.071	0.008
60	5.00	0.27	0.079	(0.588)	0.071	0.008
61	5.08	0.20	0.060	(0.585)	0.054	0.006
62	5.17	0.20	0.060	(0.583)	0.054	0.006

63	5.25	0.20	0.060	(0.580)	0.054	0.006
64	5.33	0.23	0.069	(0.578)	0.062	0.007
65	5.42	0.23	0.069	(0.575)	0.062	0.007
66	5.50	0.23	0.069	(0.573)	0.062	0.007
67	5.58	0.27	0.079	(0.570)	0.071	0.008
68	5.67	0.27	0.079	(0.568)	0.071	0.008
69	5.75	0.27	0.079	(0.565)	0.071	0.008
70	5.83	0.27	0.079	(0.563)	0.071	0.008
71	5.92	0.27	0.079	(0.560)	0.071	0.008
72	6.00	0.27	0.079	(0.558)	0.071	0.008
73	6.08	0.30	0.089	(0.555)	0.080	0.009
74	6.17	0.30	0.089	(0.553)	0.080	0.009
75	6.25	0.30	0.089	(0.550)	0.080	0.009
76	6.33	0.30	0.089	(0.548)	0.080	0.009
77	6.42	0.30	0.089	(0.545)	0.080	0.009
78	6.50	0.30	0.089	(0.543)	0.080	0.009
79	6.58	0.33	0.099	(0.540)	0.089	0.010
80	6.67	0.33	0.099	(0.538)	0.089	0.010
81	6.75	0.33	0.099	(0.536)	0.089	0.010
82	6.83	0.33	0.099	(0.533)	0.089	0.010
83	6.92	0.33	0.099	(0.531)	0.089	0.010
84	7.00	0.33	0.099	(0.528)	0.089	0.010
85	7.08	0.33	0.099	(0.526)	0.089	0.010
86	7.17	0.33	0.099	(0.524)	0.089	0.010
87	7.25	0.33	0.099	(0.521)	0.089	0.010
88	7.33	0.37	0.109	(0.519)	0.098	0.011
89	7.42	0.37	0.109	(0.516)	0.098	0.011
90	7.50	0.37	0.109	(0.514)	0.098	0.011
91	7.58	0.40	0.119	(0.512)	0.107	0.012
92	7.67	0.40	0.119	(0.509)	0.107	0.012
93	7.75	0.40	0.119	(0.507)	0.107	0.012
94	7.83	0.43	0.129	(0.505)	0.116	0.013
95	7.92	0.43	0.129	(0.502)	0.116	0.013
96	8.00	0.43	0.129	(0.500)	0.116	0.013
97	8.08	0.50	0.149	(0.498)	0.134	0.015
98	8.17	0.50	0.149	(0.495)	0.134	0.015
99	8.25	0.50	0.149	(0.493)	0.134	0.015
100	8.33	0.50	0.149	(0.491)	0.134	0.015
101	8.42	0.50	0.149	(0.488)	0.134	0.015
102	8.50	0.50	0.149	(0.486)	0.134	0.015
103	8.58	0.53	0.159	(0.484)	0.143	0.016
104	8.67	0.53	0.159	(0.482)	0.143	0.016
105	8.75	0.53	0.159	(0.479)	0.143	0.016
106	8.83	0.57	0.169	(0.477)	0.152	0.017
107	8.92	0.57	0.169	(0.475)	0.152	0.017
108	9.00	0.57	0.169	(0.473)	0.152	0.017
109	9.08	0.63	0.188	(0.470)	0.170	0.019
110	9.17	0.63	0.188	(0.468)	0.170	0.019
111	9.25	0.63	0.188	(0.466)	0.170	0.019
112	9.33	0.67	0.198	(0.464)	0.179	0.020
113	9.42	0.67	0.198	(0.461)	0.179	0.020
114	9.50	0.67	0.198	(0.459)	0.179	0.020
115	9.58	0.70	0.208	(0.457)	0.187	0.021
116	9.67	0.70	0.208	(0.455)	0.187	0.021
117	9.75	0.70	0.208	(0.453)	0.187	0.021
118	9.83	0.73	0.218	(0.450)	0.196	0.022
119	9.92	0.73	0.218	(0.448)	0.196	0.022

120	10.00	0.73	0.218	(0.446)	0.196	0.022
121	10.08	0.50	0.149	(0.444)	0.134	0.015
122	10.17	0.50	0.149	(0.442)	0.134	0.015
123	10.25	0.50	0.149	(0.440)	0.134	0.015
124	10.33	0.50	0.149	(0.438)	0.134	0.015
125	10.42	0.50	0.149	(0.435)	0.134	0.015
126	10.50	0.50	0.149	(0.433)	0.134	0.015
127	10.58	0.67	0.198	(0.431)	0.179	0.020
128	10.67	0.67	0.198	(0.429)	0.179	0.020
129	10.75	0.67	0.198	(0.427)	0.179	0.020
130	10.83	0.67	0.198	(0.425)	0.179	0.020
131	10.92	0.67	0.198	(0.423)	0.179	0.020
132	11.00	0.67	0.198	(0.421)	0.179	0.020
133	11.08	0.63	0.188	(0.419)	0.170	0.019
134	11.17	0.63	0.188	(0.417)	0.170	0.019
135	11.25	0.63	0.188	(0.415)	0.170	0.019
136	11.33	0.63	0.188	(0.412)	0.170	0.019
137	11.42	0.63	0.188	(0.410)	0.170	0.019
138	11.50	0.63	0.188	(0.408)	0.170	0.019
139	11.58	0.57	0.169	(0.406)	0.152	0.017
140	11.67	0.57	0.169	(0.404)	0.152	0.017
141	11.75	0.57	0.169	(0.402)	0.152	0.017
142	11.83	0.60	0.179	(0.400)	0.161	0.018
143	11.92	0.60	0.179	(0.398)	0.161	0.018
144	12.00	0.60	0.179	(0.396)	0.161	0.018
145	12.08	0.83	0.248	(0.394)	0.223	0.025
146	12.17	0.83	0.248	(0.392)	0.223	0.025
147	12.25	0.83	0.248	(0.390)	0.223	0.025
148	12.33	0.87	0.258	(0.388)	0.232	0.026
149	12.42	0.87	0.258	(0.387)	0.232	0.026
150	12.50	0.87	0.258	(0.385)	0.232	0.026
151	12.58	0.93	0.278	(0.383)	0.250	0.028
152	12.67	0.93	0.278	(0.381)	0.250	0.028
153	12.75	0.93	0.278	(0.379)	0.250	0.028
154	12.83	0.97	0.288	(0.377)	0.259	0.029
155	12.92	0.97	0.288	(0.375)	0.259	0.029
156	13.00	0.97	0.288	(0.373)	0.259	0.029
157	13.08	1.13	0.337	(0.371)	0.304	0.034
158	13.17	1.13	0.337	(0.369)	0.304	0.034
159	13.25	1.13	0.337	(0.367)	0.304	0.034
160	13.33	1.13	0.337	(0.366)	0.304	0.034
161	13.42	1.13	0.337	(0.364)	0.304	0.034
162	13.50	1.13	0.337	(0.362)	0.304	0.034
163	13.58	0.77	0.228	(0.360)	0.205	0.023
164	13.67	0.77	0.228	(0.358)	0.205	0.023
165	13.75	0.77	0.228	(0.356)	0.205	0.023
166	13.83	0.77	0.228	(0.355)	0.205	0.023
167	13.92	0.77	0.228	(0.353)	0.205	0.023
168	14.00	0.77	0.228	(0.351)	0.205	0.023
169	14.08	0.90	0.268	(0.349)	0.241	0.027
170	14.17	0.90	0.268	(0.347)	0.241	0.027
171	14.25	0.90	0.268	(0.346)	0.241	0.027
172	14.33	0.87	0.258	(0.344)	0.232	0.026
173	14.42	0.87	0.258	(0.342)	0.232	0.026
174	14.50	0.87	0.258	(0.340)	0.232	0.026
175	14.58	0.87	0.258	(0.339)	0.232	0.026
176	14.67	0.87	0.258	(0.337)	0.232	0.026

177	14.75	0.87	0.258	(0.335)	0.232	0.026
178	14.83	0.83	0.248	(0.333)	0.223	0.025
179	14.92	0.83	0.248	(0.332)	0.223	0.025
180	15.00	0.83	0.248	(0.330)	0.223	0.025
181	15.08	0.80	0.238	(0.328)	0.214	0.024
182	15.17	0.80	0.238	(0.327)	0.214	0.024
183	15.25	0.80	0.238	(0.325)	0.214	0.024
184	15.33	0.77	0.228	(0.323)	0.205	0.023
185	15.42	0.77	0.228	(0.322)	0.205	0.023
186	15.50	0.77	0.228	(0.320)	0.205	0.023
187	15.58	0.63	0.188	(0.318)	0.170	0.019
188	15.67	0.63	0.188	(0.317)	0.170	0.019
189	15.75	0.63	0.188	(0.315)	0.170	0.019
190	15.83	0.63	0.188	(0.313)	0.170	0.019
191	15.92	0.63	0.188	(0.312)	0.170	0.019
192	16.00	0.63	0.188	(0.310)	0.170	0.019
193	16.08	0.13	0.040	(0.309)	0.036	0.004
194	16.17	0.13	0.040	(0.307)	0.036	0.004
195	16.25	0.13	0.040	(0.306)	0.036	0.004
196	16.33	0.13	0.040	(0.304)	0.036	0.004
197	16.42	0.13	0.040	(0.302)	0.036	0.004
198	16.50	0.13	0.040	(0.301)	0.036	0.004
199	16.58	0.10	0.030	(0.299)	0.027	0.003
200	16.67	0.10	0.030	(0.298)	0.027	0.003
201	16.75	0.10	0.030	(0.296)	0.027	0.003
202	16.83	0.10	0.030	(0.295)	0.027	0.003
203	16.92	0.10	0.030	(0.293)	0.027	0.003
204	17.00	0.10	0.030	(0.292)	0.027	0.003
205	17.08	0.17	0.050	(0.290)	0.045	0.005
206	17.17	0.17	0.050	(0.289)	0.045	0.005
207	17.25	0.17	0.050	(0.287)	0.045	0.005
208	17.33	0.17	0.050	(0.286)	0.045	0.005
209	17.42	0.17	0.050	(0.285)	0.045	0.005
210	17.50	0.17	0.050	(0.283)	0.045	0.005
211	17.58	0.17	0.050	(0.282)	0.045	0.005
212	17.67	0.17	0.050	(0.280)	0.045	0.005
213	17.75	0.17	0.050	(0.279)	0.045	0.005
214	17.83	0.13	0.040	(0.278)	0.036	0.004
215	17.92	0.13	0.040	(0.276)	0.036	0.004
216	18.00	0.13	0.040	(0.275)	0.036	0.004
217	18.08	0.13	0.040	(0.273)	0.036	0.004
218	18.17	0.13	0.040	(0.272)	0.036	0.004
219	18.25	0.13	0.040	(0.271)	0.036	0.004
220	18.33	0.13	0.040	(0.269)	0.036	0.004
221	18.42	0.13	0.040	(0.268)	0.036	0.004
222	18.50	0.13	0.040	(0.267)	0.036	0.004
223	18.58	0.10	0.030	(0.266)	0.027	0.003
224	18.67	0.10	0.030	(0.264)	0.027	0.003
225	18.75	0.10	0.030	(0.263)	0.027	0.003
226	18.83	0.07	0.020	(0.262)	0.018	0.002
227	18.92	0.07	0.020	(0.260)	0.018	0.002
228	19.00	0.07	0.020	(0.259)	0.018	0.002
229	19.08	0.10	0.030	(0.258)	0.027	0.003
230	19.17	0.10	0.030	(0.257)	0.027	0.003
231	19.25	0.10	0.030	(0.256)	0.027	0.003
232	19.33	0.13	0.040	(0.254)	0.036	0.004
233	19.42	0.13	0.040	(0.253)	0.036	0.004

234	19.50	0.13	0.040	(0.252)	0.036	0.004
235	19.58	0.10	0.030	(0.251)	0.027	0.003
236	19.67	0.10	0.030	(0.250)	0.027	0.003
237	19.75	0.10	0.030	(0.249)	0.027	0.003
238	19.83	0.07	0.020	(0.248)	0.018	0.002
239	19.92	0.07	0.020	(0.246)	0.018	0.002
240	20.00	0.07	0.020	(0.245)	0.018	0.002
241	20.08	0.10	0.030	(0.244)	0.027	0.003
242	20.17	0.10	0.030	(0.243)	0.027	0.003
243	20.25	0.10	0.030	(0.242)	0.027	0.003
244	20.33	0.10	0.030	(0.241)	0.027	0.003
245	20.42	0.10	0.030	(0.240)	0.027	0.003
246	20.50	0.10	0.030	(0.239)	0.027	0.003
247	20.58	0.10	0.030	(0.238)	0.027	0.003
248	20.67	0.10	0.030	(0.237)	0.027	0.003
249	20.75	0.10	0.030	(0.236)	0.027	0.003
250	20.83	0.07	0.020	(0.235)	0.018	0.002
251	20.92	0.07	0.020	(0.234)	0.018	0.002
252	21.00	0.07	0.020	(0.233)	0.018	0.002
253	21.08	0.10	0.030	(0.232)	0.027	0.003
254	21.17	0.10	0.030	(0.231)	0.027	0.003
255	21.25	0.10	0.030	(0.230)	0.027	0.003
256	21.33	0.07	0.020	(0.230)	0.018	0.002
257	21.42	0.07	0.020	(0.229)	0.018	0.002
258	21.50	0.07	0.020	(0.228)	0.018	0.002
259	21.58	0.10	0.030	(0.227)	0.027	0.003
260	21.67	0.10	0.030	(0.226)	0.027	0.003
261	21.75	0.10	0.030	(0.225)	0.027	0.003
262	21.83	0.07	0.020	(0.225)	0.018	0.002
263	21.92	0.07	0.020	(0.224)	0.018	0.002
264	22.00	0.07	0.020	(0.223)	0.018	0.002
265	22.08	0.10	0.030	(0.222)	0.027	0.003
266	22.17	0.10	0.030	(0.222)	0.027	0.003
267	22.25	0.10	0.030	(0.221)	0.027	0.003
268	22.33	0.07	0.020	(0.220)	0.018	0.002
269	22.42	0.07	0.020	(0.220)	0.018	0.002
270	22.50	0.07	0.020	(0.219)	0.018	0.002
271	22.58	0.07	0.020	(0.218)	0.018	0.002
272	22.67	0.07	0.020	(0.218)	0.018	0.002
273	22.75	0.07	0.020	(0.217)	0.018	0.002
274	22.83	0.07	0.020	(0.216)	0.018	0.002
275	22.92	0.07	0.020	(0.216)	0.018	0.002
276	23.00	0.07	0.020	(0.215)	0.018	0.002
277	23.08	0.07	0.020	(0.215)	0.018	0.002
278	23.17	0.07	0.020	(0.214)	0.018	0.002
279	23.25	0.07	0.020	(0.214)	0.018	0.002
280	23.33	0.07	0.020	(0.214)	0.018	0.002
281	23.42	0.07	0.020	(0.213)	0.018	0.002
282	23.50	0.07	0.020	(0.213)	0.018	0.002
283	23.58	0.07	0.020	(0.212)	0.018	0.002
284	23.67	0.07	0.020	(0.212)	0.018	0.002
285	23.75	0.07	0.020	(0.212)	0.018	0.002
286	23.83	0.07	0.020	(0.212)	0.018	0.002
287	23.92	0.07	0.020	(0.211)	0.018	0.002
288	24.00	0.07	0.020	(0.211)	0.018	0.002

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.0

Flood volume = Effective rainfall 0.25 (In)
 times area 32.7 (Ac.) / [(In) / (Ft.)] = 0.7 (Ac.Ft)
 Total soil loss = 2.23 (In)
 Total soil loss = 6.082 (Ac.Ft)
 Total rainfall = 2.48 (In)
 Flood volume = 29436.0 Cubic Feet
 Total soil loss = 264923.7 Cubic Feet

 Peak flow rate of this hydrograph = 1.099 (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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q				
0+10	0.0003	0.03	Q				
0+15	0.0006	0.05	Q				
0+20	0.0010	0.06	Q				
0+25	0.0015	0.08	Q				
0+30	0.0021	0.08	Q				
0+35	0.0027	0.09	Q				
0+40	0.0034	0.09	Q				
0+45	0.0040	0.09	Q				
0+50	0.0047	0.10	Q				
0+55	0.0055	0.11	Q				
1+ 0	0.0063	0.12	Q				
1+ 5	0.0072	0.12	Q				
1+10	0.0079	0.11	Q				
1+15	0.0086	0.10	Q				
1+20	0.0093	0.10	Q				
1+25	0.0100	0.10	Q				
1+30	0.0107	0.10	Q				
1+35	0.0114	0.10	Q				
1+40	0.0121	0.10	Q				
1+45	0.0128	0.10	Q				
1+50	0.0135	0.10	Q				
1+55	0.0143	0.12	Q				
2+ 0	0.0151	0.12	Q				
2+ 5	0.0160	0.13	Q				
2+10	0.0168	0.13	Q				
2+15	0.0177	0.13	QV				
2+20	0.0186	0.13	QV				
2+25	0.0195	0.13	QV				
2+30	0.0204	0.13	QV				
2+35	0.0213	0.13	QV				
2+40	0.0223	0.15	QV				
2+45	0.0234	0.16	QV				
2+50	0.0245	0.16	QV				
2+55	0.0256	0.16	QV				
3+ 0	0.0267	0.16	QV				
3+ 5	0.0278	0.16	QV				
3+10	0.0289	0.16	QV				

3+15	0.0301	0.16	QV
3+20	0.0312	0.16	QV
3+25	0.0323	0.16	QV
3+30	0.0334	0.16	QV
3+35	0.0346	0.16	Q V
3+40	0.0357	0.16	Q V
3+45	0.0368	0.16	Q V
3+50	0.0380	0.17	Q V
3+55	0.0392	0.18	Q V
4+ 0	0.0405	0.19	Q V
4+ 5	0.0418	0.19	Q V
4+10	0.0432	0.19	Q V
4+15	0.0445	0.19	Q V
4+20	0.0459	0.20	Q V
4+25	0.0473	0.21	Q V
4+30	0.0488	0.22	Q V
4+35	0.0504	0.22	Q V
4+40	0.0519	0.23	Q V
4+45	0.0535	0.23	Q V
4+50	0.0551	0.23	Q V
4+55	0.0568	0.24	Q V
5+ 0	0.0585	0.25	Q V
5+ 5	0.0602	0.25	Q V
5+10	0.0617	0.22	Q V
5+15	0.0632	0.21	Q V
5+20	0.0646	0.21	Q V
5+25	0.0661	0.22	Q V
5+30	0.0677	0.22	Q V
5+35	0.0693	0.23	Q V
5+40	0.0710	0.24	Q V
5+45	0.0727	0.25	Q V
5+50	0.0745	0.26	Q V
5+55	0.0762	0.26	Q V
6+ 0	0.0780	0.26	Q V
6+ 5	0.0798	0.26	Q V
6+10	0.0817	0.28	Q V
6+15	0.0837	0.29	Q V
6+20	0.0857	0.29	Q V
6+25	0.0877	0.29	Q V
6+30	0.0897	0.29	Q V
6+35	0.0917	0.30	Q V
6+40	0.0939	0.31	Q V
6+45	0.0961	0.32	Q V
6+50	0.0983	0.32	Q V
6+55	0.1005	0.32	Q V
7+ 0	0.1027	0.32	Q V
7+ 5	0.1050	0.33	Q V
7+10	0.1072	0.33	Q V
7+15	0.1095	0.33	Q V
7+20	0.1117	0.33	Q V
7+25	0.1141	0.34	Q V
7+30	0.1165	0.35	Q V
7+35	0.1190	0.36	Q V
7+40	0.1216	0.37	Q V
7+45	0.1242	0.38	Q V
7+50	0.1269	0.39	Q V
7+55	0.1297	0.40	Q V

8+ 0	0.1325	0.41	Q	V				
8+ 5	0.1354	0.42	Q	V				
8+10	0.1386	0.45	Q	V				
8+15	0.1418	0.47	Q	V				
8+20	0.1451	0.48	Q	V				
8+25	0.1484	0.48	Q	V				
8+30	0.1518	0.48	Q	V				
8+35	0.1551	0.49	Q	V				
8+40	0.1586	0.51	Q	V				
8+45	0.1622	0.51	Q	V				
8+50	0.1657	0.52	Q	V				
8+55	0.1694	0.54	Q	V				
9+ 0	0.1732	0.55	Q	V				
9+ 5	0.1770	0.56	Q	V				
9+10	0.1810	0.59	Q	V				
9+15	0.1852	0.60	Q	V				
9+20	0.1894	0.61	Q	V				
9+25	0.1937	0.63	Q	V				
9+30	0.1982	0.64	Q	V				
9+35	0.2026	0.65	Q	V				
9+40	0.2072	0.67	Q	V				
9+45	0.2118	0.67	Q	V				
9+50	0.2165	0.68	Q	V				
9+55	0.2214	0.70	Q	V				
10+ 0	0.2262	0.71	Q	V				
10+ 5	0.2310	0.69	Q	V				
10+10	0.2351	0.60	Q	V				
10+15	0.2388	0.55	Q	V				
10+20	0.2424	0.53	Q	V				
10+25	0.2460	0.51	Q	V				
10+30	0.2495	0.51	Q	V				
10+35	0.2531	0.52	Q	V				
10+40	0.2571	0.58	Q	V				
10+45	0.2613	0.62	Q	V				
10+50	0.2657	0.63	Q	V				
10+55	0.2701	0.64	Q	V				
11+ 0	0.2745	0.64	Q	V				
11+ 5	0.2789	0.64	Q	V				
11+10	0.2833	0.63	Q	V				
11+15	0.2876	0.63	Q	V				
11+20	0.2919	0.62	Q	V				
11+25	0.2962	0.62	Q	V				
11+30	0.3005	0.62	Q	V				
11+35	0.3047	0.62	Q	V				
11+40	0.3088	0.59	Q	V				
11+45	0.3127	0.57	Q	V				
11+50	0.3166	0.57	Q	V				
11+55	0.3206	0.58	Q	V				
12+ 0	0.3247	0.59	Q	V				
12+ 5	0.3289	0.61	Q	V				
12+10	0.3338	0.71	Q	V				
12+15	0.3390	0.76	Q	V				
12+20	0.3444	0.78	Q	V				
12+25	0.3499	0.81	Q	V				
12+30	0.3556	0.82	Q	V				
12+35	0.3614	0.84	Q	V				
12+40	0.3674	0.87	Q	V				

12+45	0.3735	0.89	Q	V	
12+50	0.3798	0.90	Q	V	
12+55	0.3861	0.92	Q	V	
13+ 0	0.3926	0.93	Q	V	
13+ 5	0.3992	0.96	Q	V	
13+10	0.4062	1.03	Q	V	
13+15	0.4136	1.07	Q	V	
13+20	0.4210	1.08	Q	V	
13+25	0.4286	1.09	Q	V	
13+30	0.4361	1.10	Q	V	
13+35	0.4434	1.06	Q	V	
13+40	0.4498	0.92	Q	V	
13+45	0.4556	0.84	Q	V	
13+50	0.4611	0.81	Q	V	
13+55	0.4666	0.79	Q	V	
14+ 0	0.4720	0.78	Q	V	
14+ 5	0.4774	0.79	Q	V	
14+10	0.4831	0.83	Q	V	
14+15	0.4890	0.86	Q	V	
14+20	0.4949	0.86	Q	V	
14+25	0.5008	0.85	Q	V	
14+30	0.5067	0.85	Q	V	
14+35	0.5125	0.85	Q	V	
14+40	0.5184	0.85	Q	V	
14+45	0.5242	0.85	Q	V	
14+50	0.5301	0.85	Q	V	
14+55	0.5358	0.83	Q	V	
15+ 0	0.5415	0.83	Q	V	
15+ 5	0.5471	0.82	Q	V	
15+10	0.5527	0.80	Q	V	
15+15	0.5582	0.80	Q	V	
15+20	0.5636	0.79	Q	V	
15+25	0.5689	0.77	Q	V	
15+30	0.5742	0.76	Q	V	
15+35	0.5793	0.75	Q	V	
15+40	0.5840	0.69	Q	V	
15+45	0.5886	0.66	Q	V	
15+50	0.5930	0.65	Q	V	
15+55	0.5974	0.64	Q	V	
16+ 0	0.6018	0.63	Q	V	
16+ 5	0.6057	0.57	Q	V	
16+10	0.6083	0.37	Q	V	
16+15	0.6101	0.26	Q	V	
16+20	0.6115	0.21	Q	V	
16+25	0.6128	0.19	Q	V	
16+30	0.6140	0.17	Q	V	
16+35	0.6150	0.15	Q	V	
16+40	0.6159	0.13	Q	V	
16+45	0.6167	0.12	Q	V	
16+50	0.6175	0.11	Q	V	
16+55	0.6182	0.10	Q	V	
17+ 0	0.6189	0.10	Q	V	
17+ 5	0.6196	0.11	Q	V	
17+10	0.6206	0.13	Q	V	
17+15	0.6216	0.15	Q	V	
17+20	0.6226	0.15	Q	V	
17+25	0.6237	0.16	Q	V	

17+30	0.6248	0.16	Q				V
17+35	0.6259	0.16	Q				V
17+40	0.6270	0.16	Q				V
17+45	0.6281	0.16	Q				V
17+50	0.6292	0.16	Q				V
17+55	0.6302	0.15	Q				V
18+ 0	0.6312	0.14	Q				V
18+ 5	0.6321	0.14	Q				V
18+10	0.6330	0.13	Q				V
18+15	0.6340	0.13	Q				V
18+20	0.6349	0.13	Q				V
18+25	0.6358	0.13	Q				V
18+30	0.6367	0.13	Q				V
18+35	0.6376	0.13	Q				V
18+40	0.6384	0.11	Q				V
18+45	0.6391	0.11	Q				V
18+50	0.6398	0.10	Q				V
18+55	0.6404	0.08	Q				V
19+ 0	0.6409	0.08	Q				V
19+ 5	0.6414	0.08	Q				V
19+10	0.6420	0.09	Q				V
19+15	0.6427	0.09	Q				V
19+20	0.6433	0.10	Q				V
19+25	0.6441	0.11	Q				V
19+30	0.6449	0.12	Q				V
19+35	0.6458	0.12	Q				V
19+40	0.6465	0.11	Q				V
19+45	0.6472	0.10	Q				V
19+50	0.6479	0.10	Q				V
19+55	0.6485	0.08	Q				V
20+ 0	0.6490	0.08	Q				V
20+ 5	0.6495	0.08	Q				V
20+10	0.6501	0.09	Q				V
20+15	0.6508	0.09	Q				V
20+20	0.6514	0.09	Q				V
20+25	0.6521	0.10	Q				V
20+30	0.6527	0.10	Q				V
20+35	0.6534	0.10	Q				V
20+40	0.6541	0.10	Q				V
20+45	0.6547	0.10	Q				V
20+50	0.6554	0.09	Q				V
20+55	0.6559	0.08	Q				V
21+ 0	0.6565	0.07	Q				V
21+ 5	0.6570	0.07	Q				V
21+10	0.6576	0.09	Q				V
21+15	0.6582	0.09	Q				V
21+20	0.6588	0.09	Q				V
21+25	0.6594	0.08	Q				V
21+30	0.6599	0.07	Q				V
21+35	0.6604	0.07	Q				V
21+40	0.6609	0.09	Q				V
21+45	0.6616	0.09	Q				V
21+50	0.6622	0.09	Q				V
21+55	0.6627	0.08	Q				V
22+ 0	0.6632	0.07	Q				V
22+ 5	0.6637	0.07	Q				V
22+10	0.6643	0.09	Q				V

22+15	0.6650	0.09	Q				V
22+20	0.6656	0.09	Q				V
22+25	0.6661	0.08	Q				V
22+30	0.6666	0.07	Q				V
22+35	0.6671	0.07	Q				V
22+40	0.6676	0.07	Q				V
22+45	0.6680	0.07	Q				V
22+50	0.6685	0.07	Q				V
22+55	0.6689	0.07	Q				V
23+ 0	0.6694	0.07	Q				V
23+ 5	0.6699	0.07	Q				V
23+10	0.6703	0.07	Q				V
23+15	0.6708	0.07	Q				V
23+20	0.6712	0.07	Q				V
23+25	0.6717	0.07	Q				V
23+30	0.6721	0.07	Q				V
23+35	0.6726	0.07	Q				V
23+40	0.6730	0.07	Q				V
23+45	0.6735	0.07	Q				V
23+50	0.6739	0.07	Q				V
23+55	0.6744	0.07	Q				V
24+ 0	0.6748	0.07	Q				V
24+ 5	0.6752	0.06	Q				V
24+10	0.6754	0.03	Q				V
24+15	0.6755	0.02	Q				V
24+20	0.6756	0.01	Q				V
24+25	0.6757	0.01	Q				V
24+30	0.6757	0.01	Q				V
24+35	0.6757	0.00	Q				V
24+40	0.6757	0.00	Q				V
24+45	0.6757	0.00	Q				V
24+50	0.6758	0.00	Q				V
24+55	0.6758	0.00	Q				V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70 (Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70 (Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00 (Ft.)
Length along longest watercourse measured to centroid = 2003.00 (Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00 (Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	0.58	18.97

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	1.45	47.41

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)
 Areal adjustment factor = 99.97 %
 Adjusted average point rain = 0.784(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

 Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
 VALLEY S-Curve

 Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
Sum =		100.000	Sum= 32.955

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	0.08	4.40	(0.422) 0.372	0.041
2	0.17	4.50	(0.422) 0.381	0.042
3	0.25	5.40	0.422 (0.457)	0.085

4	0.33	5.40	0.508	0.422	(0.457)	0.085
5	0.42	5.70	0.536	0.422	(0.482)	0.113
6	0.50	6.40	0.602	0.422	(0.542)	0.179
7	0.58	7.90	0.743	0.422	(0.669)	0.320
8	0.67	9.10	0.856	0.422	(0.770)	0.433
9	0.75	12.80	1.204	0.422	(1.083)	0.781
10	0.83	25.60	2.407	0.422	(2.166)	1.985
11	0.92	7.90	0.743	0.422	(0.669)	0.320
12	1.00	4.90	0.461	(0.422)	0.415	0.046

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.4

Flood volume = Effective rainfall 0.37(In)

times area 32.7(Ac.)/[(In)/(Ft.)) = 1.0(Ac.Ft)

Total soil loss = 0.41(In)

Total soil loss = 1.129(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 43844.2 Cubic Feet

Total soil loss = 49163.1 Cubic Feet

Peak flow rate of this hydrograph = 36.003(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0010	0.15	Q				
0+10	0.0059	0.71	Q				
0+15	0.0141	1.19	VQ				
0+20	0.0272	1.90	Q				
0+25	0.0437	2.40	VQ				
0+30	0.0657	3.19	VQ				
0+35	0.0995	4.91	VQ				
0+40	0.1537	7.87	VQ				
0+45	0.2364	12.01	V	Q			
0+50	0.3916	22.52		V	Q		
0+55	0.6395	36.00			V	Q	
1+ 0	0.7979	23.00			Q	V	
1+ 5	0.8748	11.17		Q		V	
1+10	0.9189	6.40		Q		V	
1+15	0.9474	4.14		Q		V	
1+20	0.9670	2.84	Q			V	
1+25	0.9813	2.08	Q			V	
1+30	0.9914	1.47	Q			V	
1+35	0.9984	1.01	Q			V	
1+40	1.0033	0.71	Q			V	
1+45	1.0060	0.41	Q			V	
1+50	1.0065	0.06	Q			V	
1+55	1.0065	0.01	Q			V	

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70(Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70(Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00(Ft.)
Length along longest watercourse measured to centroid = 2003.00(Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00(Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 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]
32.70	0.98	32.05

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
32.70	2.48	81.10

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
		Sum = 100.000	Sum= 32.955

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	0.08	1.30	(0.422) 0.187	0.021
2	0.17	1.30	(0.422) 0.187	0.021
3	0.25	1.10	(0.422) 0.158	0.018
4	0.33	1.50	(0.422) 0.216	0.024
5	0.42	1.50	(0.422) 0.216	0.024

6	0.50	1.80	0.288	(0.422)	0.259	0.029
7	0.58	1.50	0.240	(0.422)	0.216	0.024
8	0.67	1.80	0.288	(0.422)	0.259	0.029
9	0.75	1.80	0.288	(0.422)	0.259	0.029
10	0.83	1.50	0.240	(0.422)	0.216	0.024
11	0.92	1.60	0.256	(0.422)	0.230	0.026
12	1.00	1.80	0.288	(0.422)	0.259	0.029
13	1.08	2.20	0.351	(0.422)	0.316	0.035
14	1.17	2.20	0.351	(0.422)	0.316	0.035
15	1.25	2.20	0.351	(0.422)	0.316	0.035
16	1.33	2.00	0.319	(0.422)	0.288	0.032
17	1.42	2.60	0.415	(0.422)	0.374	0.042
18	1.50	2.70	0.431	(0.422)	0.388	0.043
19	1.58	2.40	0.383	(0.422)	0.345	0.038
20	1.67	2.70	0.431	(0.422)	0.388	0.043
21	1.75	3.30	0.527	0.422 (0.474)		0.105
22	1.83	3.10	0.495	0.422 (0.446)		0.073
23	1.92	2.90	0.463	(0.422) 0.417		0.046
24	2.00	3.00	0.479	0.422 (0.431)		0.057
25	2.08	3.10	0.495	0.422 (0.446)		0.073
26	2.17	4.20	0.671	0.422 (0.604)		0.248
27	2.25	5.00	0.799	0.422 (0.719)		0.376
28	2.33	3.50	0.559	0.422 (0.503)		0.137
29	2.42	6.80	1.086	0.422 (0.978)		0.664
30	2.50	7.30	1.166	0.422 (1.049)		0.744
31	2.58	8.20	1.310	0.422 (1.179)		0.887
32	2.67	5.90	0.942	0.422 (0.848)		0.520
33	2.75	2.00	0.319	(0.422) 0.288		0.032
34	2.83	1.80	0.288	(0.422) 0.259		0.029
35	2.92	1.80	0.288	(0.422) 0.259		0.029
36	3.00	0.60	0.096	(0.422) 0.086		0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.39(In)

times area 32.7(Ac.)/[(In)/(Ft.)] = 1.1(Ac.Ft)

Total soil loss = 0.95(In)

Total soil loss = 2.577(Ac.Ft)

Total rainfall = 1.33(In)

Flood volume = 45769.9 Cubic Feet

Total soil loss = 112238.4 Cubic Feet

Peak flow rate of this hydrograph = 22.340(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0005	0.08	Q				
0+10	0.0030	0.36	Q				
0+15	0.0064	0.50	Q				
0+20	0.0101	0.54	Q				
0+25	0.0145	0.64	Q				

0+30	0.0195	0.72	Q						
0+35	0.0250	0.80	VQ						
0+40	0.0305	0.80	Q						
0+45	0.0364	0.86	Q						
0+50	0.0425	0.88	Q						
0+55	0.0483	0.84	Q						
1+ 0	0.0542	0.85	QV						
1+ 5	0.0605	0.92	QV						
1+10	0.0676	1.03	QV						
1+15	0.0752	1.09	QV						
1+20	0.0827	1.10	Q V						
1+25	0.0904	1.11	Q V						
1+30	0.0988	1.23	Q V						
1+35	0.1078	1.30	Q V						
1+40	0.1167	1.29	Q V						
1+45	0.1275	1.57	Q V						
1+50	0.1435	2.32	Q V						
1+55	0.1591	2.26	Q V						
2+ 0	0.1722	1.90	Q V						
2+ 5	0.1854	1.92	Q V						
2+10	0.2047	2.80	Q V						
2+15	0.2442	5.75	Q V						
2+20	0.2991	7.96	QV						
2+25	0.3551	8.14	Q V						
2+30	0.4547	14.46			V Q				
2+35	0.5905	19.73				V Q			
2+40	0.7444	22.34					VQ		
2+45	0.8668	17.78						V	
2+50	0.9329	9.59			Q				
2+55	0.9712	5.57						V	
3+ 0	0.9982	3.92							V
3+ 5	1.0168	2.70							V
3+10	1.0293	1.80							V
3+15	1.0378	1.23	Q						V
3+20	1.0437	0.86	Q						V
3+25	1.0475	0.55	Q						V
3+30	1.0496	0.31	Q						V
3+35	1.0504	0.12	Q						V
3+40	1.0506	0.02	Q						V
3+45	1.0507	0.01	Q						V
3+50	1.0507	0.01	Q						V
3+55	1.0507	0.00	Q						V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70 (Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70 (Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00 (Ft.)
Length along longest watercourse measured to centroid = 2003.00 (Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00 (Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	1.38	45.13

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	3.48	113.80

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380(In)
 Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.872(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 1.872(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
		Sum = 100.000	Sum= 32.955

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	0.08	0.112	(0.422) 0.101	0.011
2	0.17	0.135	(0.422) 0.121	0.013
3	0.25	0.135	(0.422) 0.121	0.013
4	0.33	0.135	(0.422) 0.121	0.013
5	0.42	0.135	(0.422) 0.121	0.013

6	0.50	0.70	0.157	(0.422)	0.141	0.016
7	0.58	0.70	0.157	(0.422)	0.141	0.016
8	0.67	0.70	0.157	(0.422)	0.141	0.016
9	0.75	0.70	0.157	(0.422)	0.141	0.016
10	0.83	0.70	0.157	(0.422)	0.141	0.016
11	0.92	0.70	0.157	(0.422)	0.141	0.016
12	1.00	0.80	0.180	(0.422)	0.162	0.018
13	1.08	0.80	0.180	(0.422)	0.162	0.018
14	1.17	0.80	0.180	(0.422)	0.162	0.018
15	1.25	0.80	0.180	(0.422)	0.162	0.018
16	1.33	0.80	0.180	(0.422)	0.162	0.018
17	1.42	0.80	0.180	(0.422)	0.162	0.018
18	1.50	0.80	0.180	(0.422)	0.162	0.018
19	1.58	0.80	0.180	(0.422)	0.162	0.018
20	1.67	0.80	0.180	(0.422)	0.162	0.018
21	1.75	0.80	0.180	(0.422)	0.162	0.018
22	1.83	0.80	0.180	(0.422)	0.162	0.018
23	1.92	0.80	0.180	(0.422)	0.162	0.018
24	2.00	0.90	0.202	(0.422)	0.182	0.020
25	2.08	0.80	0.180	(0.422)	0.162	0.018
26	2.17	0.90	0.202	(0.422)	0.182	0.020
27	2.25	0.90	0.202	(0.422)	0.182	0.020
28	2.33	0.90	0.202	(0.422)	0.182	0.020
29	2.42	0.90	0.202	(0.422)	0.182	0.020
30	2.50	0.90	0.202	(0.422)	0.182	0.020
31	2.58	0.90	0.202	(0.422)	0.182	0.020
32	2.67	0.90	0.202	(0.422)	0.182	0.020
33	2.75	1.00	0.225	(0.422)	0.202	0.022
34	2.83	1.00	0.225	(0.422)	0.202	0.022
35	2.92	1.00	0.225	(0.422)	0.202	0.022
36	3.00	1.00	0.225	(0.422)	0.202	0.022
37	3.08	1.00	0.225	(0.422)	0.202	0.022
38	3.17	1.10	0.247	(0.422)	0.222	0.025
39	3.25	1.10	0.247	(0.422)	0.222	0.025
40	3.33	1.10	0.247	(0.422)	0.222	0.025
41	3.42	1.20	0.270	(0.422)	0.243	0.027
42	3.50	1.30	0.292	(0.422)	0.263	0.029
43	3.58	1.40	0.314	(0.422)	0.283	0.031
44	3.67	1.40	0.314	(0.422)	0.283	0.031
45	3.75	1.50	0.337	(0.422)	0.303	0.034
46	3.83	1.50	0.337	(0.422)	0.303	0.034
47	3.92	1.60	0.359	(0.422)	0.323	0.036
48	4.00	1.60	0.359	(0.422)	0.323	0.036
49	4.08	1.70	0.382	(0.422)	0.344	0.038
50	4.17	1.80	0.404	(0.422)	0.364	0.040
51	4.25	1.90	0.427	(0.422)	0.384	0.043
52	4.33	2.00	0.449	(0.422)	0.404	0.045
53	4.42	2.10	0.472	0.422 (0.424)		0.049
54	4.50	2.10	0.472	0.422 (0.424)		0.049
55	4.58	2.20	0.494	0.422 (0.445)		0.072
56	4.67	2.30	0.517	0.422 (0.465)		0.094
57	4.75	2.40	0.539	0.422 (0.485)		0.117
58	4.83	2.40	0.539	0.422 (0.485)		0.117
59	4.92	2.50	0.561	0.422 (0.505)		0.139
60	5.00	2.60	0.584	0.422 (0.526)		0.161
61	5.08	3.10	0.696	0.422 (0.627)		0.274
62	5.17	3.60	0.809	0.422 (0.728)		0.386

63	5.25	3.90	0.876	0.422	(0.788)	0.453
64	5.33	4.20	0.943	0.422	(0.849)	0.521
65	5.42	4.70	1.056	0.422	(0.950)	0.633
66	5.50	5.60	1.258	0.422	(1.132)	0.835
67	5.58	1.90	0.427	(0.422)	0.384	0.043
68	5.67	0.90	0.202	(0.422)	0.182	0.020
69	5.75	0.60	0.135	(0.422)	0.121	0.013
70	5.83	0.50	0.112	(0.422)	0.101	0.011
71	5.92	0.30	0.067	(0.422)	0.061	0.007
72	6.00	0.20	0.045	(0.422)	0.040	0.004

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.2

Flood volume = Effective rainfall 0.43(In)
times area 32.7(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)

Total soil loss = 1.44(In)

Total soil loss = 3.927(Ac.Ft)

Total rainfall = 1.87(In)

Flood volume = 51088.5 Cubic Feet

Total soil loss = 171079.4 Cubic Feet

Peak flow rate of this hydrograph = 19.373(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0003	0.04	Q				
0+10	0.0017	0.20	Q				
0+15	0.0038	0.31	Q				
0+20	0.0063	0.36	Q				
0+25	0.0090	0.39	Q				
0+30	0.0119	0.42	Q				
0+35	0.0150	0.46	Q				
0+40	0.0184	0.48	Q				
0+45	0.0218	0.50	Q				
0+50	0.0253	0.50	VQ				
0+55	0.0288	0.51	VQ				
1+ 0	0.0324	0.52	Q				
1+ 5	0.0362	0.55	Q				
1+10	0.0401	0.57	Q				
1+15	0.0441	0.58	Q				
1+20	0.0481	0.58	Q				
1+25	0.0522	0.59	Q				
1+30	0.0562	0.59	Q				
1+35	0.0603	0.59	QV				
1+40	0.0644	0.59	QV				
1+45	0.0684	0.59	QV				
1+50	0.0725	0.59	QV				
1+55	0.0766	0.59	QV				
2+ 0	0.0807	0.60	QV				
2+ 5	0.0850	0.62	QV				
2+10	0.0893	0.62	Q V				

2+15	0.0937	0.64	Q V						
2+20	0.0981	0.65	Q V						
2+25	0.1027	0.66	Q V						
2+30	0.1072	0.66	Q V						
2+35	0.1118	0.66	Q V						
2+40	0.1163	0.66	Q V						
2+45	0.1210	0.67	Q V						
2+50	0.1258	0.70	Q V						
2+55	0.1308	0.72	Q V						
3+ 0	0.1358	0.73	Q V						
3+ 5	0.1409	0.73	Q V						
3+10	0.1460	0.74	Q V						
3+15	0.1513	0.78	Q V						
3+20	0.1568	0.79	Q V						
3+25	0.1623	0.81	Q V						
3+30	0.1682	0.85	Q V						
3+35	0.1745	0.91	Q V						
3+40	0.1811	0.97	Q V						
3+45	0.1880	1.00	Q V						
3+50	0.1953	1.05	Q V						
3+55	0.2027	1.08	Q V						
4+ 0	0.2105	1.12	Q V						
4+ 5	0.2184	1.16	Q V						
4+10	0.2268	1.21	Q V						
4+15	0.2355	1.27	Q V						
4+20	0.2447	1.34	Q V						
4+25	0.2545	1.42	Q V						
4+30	0.2649	1.51	Q V						
4+35	0.2761	1.64	Q V						
4+40	0.2902	2.04	Q V						
4+45	0.3082	2.61	Q V						
4+50	0.3299	3.16	Q V						
4+55	0.3541	3.52	Q V						
5+ 0	0.3820	4.04	Q V						
5+ 5	0.4164	5.01	Q V						
5+10	0.4662	7.22	Q V						
5+15	0.5348	9.97	Q V						
5+20	0.6201	12.38	Q V						
5+25	0.7220	14.80	Q V						
5+30	0.8468	18.12	Q V						
5+35	0.9803	19.37	Q V						
5+40	1.0547	10.81	Q V						
5+45	1.0935	5.63	Q V						
5+50	1.1191	3.72	Q V						
5+55	1.1370	2.61	Q V						
6+ 0	1.1498	1.86	Q V						
6+ 5	1.1589	1.33	Q V						
6+10	1.1649	0.87	Q V						
6+15	1.1688	0.56	Q V						
6+20	1.1712	0.35	Q V						
6+25	1.1724	0.17	Q V						
6+30	1.1726	0.03	Q V						
6+35	1.1727	0.02	Q V						
6+40	1.1728	0.01	Q V						
6+45	1.1728	0.00	Q V						
6+50	1.1728	0.00	Q V						
6+55	1.1728	0.00	Q V						

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Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70(Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70(Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00(Ft.)
Length along longest watercourse measured to centroid = 2003.00(Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00(Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 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]
32.70	2.48	81.10

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
32.70	6.90	225.63

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70 (Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
		Sum = 100.000	Sum= 32.955

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	0.08	0.07	(0.749) 0.025	0.003
2	0.17	0.07	(0.746) 0.025	0.003
3	0.25	0.07	(0.743) 0.025	0.003
4	0.33	0.10	(0.740) 0.038	0.004
5	0.42	0.10	(0.737) 0.038	0.004

6	0.50	0.10	0.042	(0.735)	0.038	0.004
7	0.58	0.10	0.042	(0.732)	0.038	0.004
8	0.67	0.10	0.042	(0.729)	0.038	0.004
9	0.75	0.10	0.042	(0.726)	0.038	0.004
10	0.83	0.13	0.056	(0.723)	0.051	0.006
11	0.92	0.13	0.056	(0.720)	0.051	0.006
12	1.00	0.13	0.056	(0.717)	0.051	0.006
13	1.08	0.10	0.042	(0.715)	0.038	0.004
14	1.17	0.10	0.042	(0.712)	0.038	0.004
15	1.25	0.10	0.042	(0.709)	0.038	0.004
16	1.33	0.10	0.042	(0.706)	0.038	0.004
17	1.42	0.10	0.042	(0.703)	0.038	0.004
18	1.50	0.10	0.042	(0.700)	0.038	0.004
19	1.58	0.10	0.042	(0.698)	0.038	0.004
20	1.67	0.10	0.042	(0.695)	0.038	0.004
21	1.75	0.10	0.042	(0.692)	0.038	0.004
22	1.83	0.13	0.056	(0.689)	0.051	0.006
23	1.92	0.13	0.056	(0.687)	0.051	0.006
24	2.00	0.13	0.056	(0.684)	0.051	0.006
25	2.08	0.13	0.056	(0.681)	0.051	0.006
26	2.17	0.13	0.056	(0.678)	0.051	0.006
27	2.25	0.13	0.056	(0.675)	0.051	0.006
28	2.33	0.13	0.056	(0.673)	0.051	0.006
29	2.42	0.13	0.056	(0.670)	0.051	0.006
30	2.50	0.13	0.056	(0.667)	0.051	0.006
31	2.58	0.17	0.070	(0.665)	0.063	0.007
32	2.67	0.17	0.070	(0.662)	0.063	0.007
33	2.75	0.17	0.070	(0.659)	0.063	0.007
34	2.83	0.17	0.070	(0.656)	0.063	0.007
35	2.92	0.17	0.070	(0.654)	0.063	0.007
36	3.00	0.17	0.070	(0.651)	0.063	0.007
37	3.08	0.17	0.070	(0.648)	0.063	0.007
38	3.17	0.17	0.070	(0.646)	0.063	0.007
39	3.25	0.17	0.070	(0.643)	0.063	0.007
40	3.33	0.17	0.070	(0.640)	0.063	0.007
41	3.42	0.17	0.070	(0.638)	0.063	0.007
42	3.50	0.17	0.070	(0.635)	0.063	0.007
43	3.58	0.17	0.070	(0.632)	0.063	0.007
44	3.67	0.17	0.070	(0.630)	0.063	0.007
45	3.75	0.17	0.070	(0.627)	0.063	0.007
46	3.83	0.20	0.084	(0.624)	0.076	0.008
47	3.92	0.20	0.084	(0.622)	0.076	0.008
48	4.00	0.20	0.084	(0.619)	0.076	0.008
49	4.08	0.20	0.084	(0.616)	0.076	0.008
50	4.17	0.20	0.084	(0.614)	0.076	0.008
51	4.25	0.20	0.084	(0.611)	0.076	0.008
52	4.33	0.23	0.098	(0.609)	0.089	0.010
53	4.42	0.23	0.098	(0.606)	0.089	0.010
54	4.50	0.23	0.098	(0.603)	0.089	0.010
55	4.58	0.23	0.098	(0.601)	0.089	0.010
56	4.67	0.23	0.098	(0.598)	0.089	0.010
57	4.75	0.23	0.098	(0.596)	0.089	0.010
58	4.83	0.27	0.112	(0.593)	0.101	0.011
59	4.92	0.27	0.112	(0.590)	0.101	0.011
60	5.00	0.27	0.112	(0.588)	0.101	0.011
61	5.08	0.20	0.084	(0.585)	0.076	0.008
62	5.17	0.20	0.084	(0.583)	0.076	0.008

63	5.25	0.20	0.084	(0.580)	0.076	0.008
64	5.33	0.23	0.098	(0.578)	0.089	0.010
65	5.42	0.23	0.098	(0.575)	0.089	0.010
66	5.50	0.23	0.098	(0.573)	0.089	0.010
67	5.58	0.27	0.112	(0.570)	0.101	0.011
68	5.67	0.27	0.112	(0.568)	0.101	0.011
69	5.75	0.27	0.112	(0.565)	0.101	0.011
70	5.83	0.27	0.112	(0.563)	0.101	0.011
71	5.92	0.27	0.112	(0.560)	0.101	0.011
72	6.00	0.27	0.112	(0.558)	0.101	0.011
73	6.08	0.30	0.127	(0.555)	0.114	0.013
74	6.17	0.30	0.127	(0.553)	0.114	0.013
75	6.25	0.30	0.127	(0.550)	0.114	0.013
76	6.33	0.30	0.127	(0.548)	0.114	0.013
77	6.42	0.30	0.127	(0.545)	0.114	0.013
78	6.50	0.30	0.127	(0.543)	0.114	0.013
79	6.58	0.33	0.141	(0.540)	0.127	0.014
80	6.67	0.33	0.141	(0.538)	0.127	0.014
81	6.75	0.33	0.141	(0.536)	0.127	0.014
82	6.83	0.33	0.141	(0.533)	0.127	0.014
83	6.92	0.33	0.141	(0.531)	0.127	0.014
84	7.00	0.33	0.141	(0.528)	0.127	0.014
85	7.08	0.33	0.141	(0.526)	0.127	0.014
86	7.17	0.33	0.141	(0.524)	0.127	0.014
87	7.25	0.33	0.141	(0.521)	0.127	0.014
88	7.33	0.37	0.155	(0.519)	0.139	0.015
89	7.42	0.37	0.155	(0.516)	0.139	0.015
90	7.50	0.37	0.155	(0.514)	0.139	0.015
91	7.58	0.40	0.169	(0.512)	0.152	0.017
92	7.67	0.40	0.169	(0.509)	0.152	0.017
93	7.75	0.40	0.169	(0.507)	0.152	0.017
94	7.83	0.43	0.183	(0.505)	0.165	0.018
95	7.92	0.43	0.183	(0.502)	0.165	0.018
96	8.00	0.43	0.183	(0.500)	0.165	0.018
97	8.08	0.50	0.211	(0.498)	0.190	0.021
98	8.17	0.50	0.211	(0.495)	0.190	0.021
99	8.25	0.50	0.211	(0.493)	0.190	0.021
100	8.33	0.50	0.211	(0.491)	0.190	0.021
101	8.42	0.50	0.211	(0.488)	0.190	0.021
102	8.50	0.50	0.211	(0.486)	0.190	0.021
103	8.58	0.53	0.225	(0.484)	0.202	0.022
104	8.67	0.53	0.225	(0.482)	0.202	0.022
105	8.75	0.53	0.225	(0.479)	0.202	0.022
106	8.83	0.57	0.239	(0.477)	0.215	0.024
107	8.92	0.57	0.239	(0.475)	0.215	0.024
108	9.00	0.57	0.239	(0.473)	0.215	0.024
109	9.08	0.63	0.267	(0.470)	0.240	0.027
110	9.17	0.63	0.267	(0.468)	0.240	0.027
111	9.25	0.63	0.267	(0.466)	0.240	0.027
112	9.33	0.67	0.281	(0.464)	0.253	0.028
113	9.42	0.67	0.281	(0.461)	0.253	0.028
114	9.50	0.67	0.281	(0.459)	0.253	0.028
115	9.58	0.70	0.295	(0.457)	0.266	0.030
116	9.67	0.70	0.295	(0.455)	0.266	0.030
117	9.75	0.70	0.295	(0.453)	0.266	0.030
118	9.83	0.73	0.309	(0.450)	0.278	0.031
119	9.92	0.73	0.309	(0.448)	0.278	0.031

120	10.00	0.73	0.309	(0.446)	0.278	0.031
121	10.08	0.50	0.211	(0.444)	0.190	0.021
122	10.17	0.50	0.211	(0.442)	0.190	0.021
123	10.25	0.50	0.211	(0.440)	0.190	0.021
124	10.33	0.50	0.211	(0.438)	0.190	0.021
125	10.42	0.50	0.211	(0.435)	0.190	0.021
126	10.50	0.50	0.211	(0.433)	0.190	0.021
127	10.58	0.67	0.281	(0.431)	0.253	0.028
128	10.67	0.67	0.281	(0.429)	0.253	0.028
129	10.75	0.67	0.281	(0.427)	0.253	0.028
130	10.83	0.67	0.281	(0.425)	0.253	0.028
131	10.92	0.67	0.281	(0.423)	0.253	0.028
132	11.00	0.67	0.281	(0.421)	0.253	0.028
133	11.08	0.63	0.267	(0.419)	0.240	0.027
134	11.17	0.63	0.267	(0.417)	0.240	0.027
135	11.25	0.63	0.267	(0.415)	0.240	0.027
136	11.33	0.63	0.267	(0.412)	0.240	0.027
137	11.42	0.63	0.267	(0.410)	0.240	0.027
138	11.50	0.63	0.267	(0.408)	0.240	0.027
139	11.58	0.57	0.239	(0.406)	0.215	0.024
140	11.67	0.57	0.239	(0.404)	0.215	0.024
141	11.75	0.57	0.239	(0.402)	0.215	0.024
142	11.83	0.60	0.253	(0.400)	0.228	0.025
143	11.92	0.60	0.253	(0.398)	0.228	0.025
144	12.00	0.60	0.253	(0.396)	0.228	0.025
145	12.08	0.83	0.352	(0.394)	0.316	0.035
146	12.17	0.83	0.352	(0.392)	0.316	0.035
147	12.25	0.83	0.352	(0.390)	0.316	0.035
148	12.33	0.87	0.366	(0.388)	0.329	0.037
149	12.42	0.87	0.366	(0.387)	0.329	0.037
150	12.50	0.87	0.366	(0.385)	0.329	0.037
151	12.58	0.93	0.394	(0.383)	0.354	0.039
152	12.67	0.93	0.394	(0.381)	0.354	0.039
153	12.75	0.93	0.394	(0.379)	0.354	0.039
154	12.83	0.97	0.408	(0.377)	0.367	0.041
155	12.92	0.97	0.408	(0.375)	0.367	0.041
156	13.00	0.97	0.408	(0.373)	0.367	0.041
157	13.08	1.13	0.478	0.371	(0.430)	0.107
158	13.17	1.13	0.478	0.369	(0.430)	0.109
159	13.25	1.13	0.478	0.367	(0.430)	0.111
160	13.33	1.13	0.478	0.366	(0.430)	0.112
161	13.42	1.13	0.478	0.364	(0.430)	0.114
162	13.50	1.13	0.478	0.362	(0.430)	0.116
163	13.58	0.77	0.323	(0.360)	0.291	0.032
164	13.67	0.77	0.323	(0.358)	0.291	0.032
165	13.75	0.77	0.323	(0.356)	0.291	0.032
166	13.83	0.77	0.323	(0.355)	0.291	0.032
167	13.92	0.77	0.323	(0.353)	0.291	0.032
168	14.00	0.77	0.323	(0.351)	0.291	0.032
169	14.08	0.90	0.380	(0.349)	0.342	0.038
170	14.17	0.90	0.380	(0.347)	0.342	0.038
171	14.25	0.90	0.380	(0.346)	0.342	0.038
172	14.33	0.87	0.366	(0.344)	0.329	0.037
173	14.42	0.87	0.366	(0.342)	0.329	0.037
174	14.50	0.87	0.366	(0.340)	0.329	0.037
175	14.58	0.87	0.366	(0.339)	0.329	0.037
176	14.67	0.87	0.366	(0.337)	0.329	0.037

177	14.75	0.87	0.366	(0.335)	0.329	0.037
178	14.83	0.83	0.352	(0.333)	0.316	0.035
179	14.92	0.83	0.352	(0.332)	0.316	0.035
180	15.00	0.83	0.352	(0.330)	0.316	0.035
181	15.08	0.80	0.337	(0.328)	0.304	0.034
182	15.17	0.80	0.337	(0.327)	0.304	0.034
183	15.25	0.80	0.337	(0.325)	0.304	0.034
184	15.33	0.77	0.323	(0.323)	0.291	0.032
185	15.42	0.77	0.323	(0.322)	0.291	0.032
186	15.50	0.77	0.323	(0.320)	0.291	0.032
187	15.58	0.63	0.267	(0.318)	0.240	0.027
188	15.67	0.63	0.267	(0.317)	0.240	0.027
189	15.75	0.63	0.267	(0.315)	0.240	0.027
190	15.83	0.63	0.267	(0.313)	0.240	0.027
191	15.92	0.63	0.267	(0.312)	0.240	0.027
192	16.00	0.63	0.267	(0.310)	0.240	0.027
193	16.08	0.13	0.056	(0.309)	0.051	0.006
194	16.17	0.13	0.056	(0.307)	0.051	0.006
195	16.25	0.13	0.056	(0.306)	0.051	0.006
196	16.33	0.13	0.056	(0.304)	0.051	0.006
197	16.42	0.13	0.056	(0.302)	0.051	0.006
198	16.50	0.13	0.056	(0.301)	0.051	0.006
199	16.58	0.10	0.042	(0.299)	0.038	0.004
200	16.67	0.10	0.042	(0.298)	0.038	0.004
201	16.75	0.10	0.042	(0.296)	0.038	0.004
202	16.83	0.10	0.042	(0.295)	0.038	0.004
203	16.92	0.10	0.042	(0.293)	0.038	0.004
204	17.00	0.10	0.042	(0.292)	0.038	0.004
205	17.08	0.17	0.070	(0.290)	0.063	0.007
206	17.17	0.17	0.070	(0.289)	0.063	0.007
207	17.25	0.17	0.070	(0.287)	0.063	0.007
208	17.33	0.17	0.070	(0.286)	0.063	0.007
209	17.42	0.17	0.070	(0.285)	0.063	0.007
210	17.50	0.17	0.070	(0.283)	0.063	0.007
211	17.58	0.17	0.070	(0.282)	0.063	0.007
212	17.67	0.17	0.070	(0.280)	0.063	0.007
213	17.75	0.17	0.070	(0.279)	0.063	0.007
214	17.83	0.13	0.056	(0.278)	0.051	0.006
215	17.92	0.13	0.056	(0.276)	0.051	0.006
216	18.00	0.13	0.056	(0.275)	0.051	0.006
217	18.08	0.13	0.056	(0.273)	0.051	0.006
218	18.17	0.13	0.056	(0.272)	0.051	0.006
219	18.25	0.13	0.056	(0.271)	0.051	0.006
220	18.33	0.13	0.056	(0.269)	0.051	0.006
221	18.42	0.13	0.056	(0.268)	0.051	0.006
222	18.50	0.13	0.056	(0.267)	0.051	0.006
223	18.58	0.10	0.042	(0.266)	0.038	0.004
224	18.67	0.10	0.042	(0.264)	0.038	0.004
225	18.75	0.10	0.042	(0.263)	0.038	0.004
226	18.83	0.07	0.028	(0.262)	0.025	0.003
227	18.92	0.07	0.028	(0.260)	0.025	0.003
228	19.00	0.07	0.028	(0.259)	0.025	0.003
229	19.08	0.10	0.042	(0.258)	0.038	0.004
230	19.17	0.10	0.042	(0.257)	0.038	0.004
231	19.25	0.10	0.042	(0.256)	0.038	0.004
232	19.33	0.13	0.056	(0.254)	0.051	0.006
233	19.42	0.13	0.056	(0.253)	0.051	0.006

234	19.50	0.13	0.056	(0.252)	0.051	0.006
235	19.58	0.10	0.042	(0.251)	0.038	0.004
236	19.67	0.10	0.042	(0.250)	0.038	0.004
237	19.75	0.10	0.042	(0.249)	0.038	0.004
238	19.83	0.07	0.028	(0.248)	0.025	0.003
239	19.92	0.07	0.028	(0.246)	0.025	0.003
240	20.00	0.07	0.028	(0.245)	0.025	0.003
241	20.08	0.10	0.042	(0.244)	0.038	0.004
242	20.17	0.10	0.042	(0.243)	0.038	0.004
243	20.25	0.10	0.042	(0.242)	0.038	0.004
244	20.33	0.10	0.042	(0.241)	0.038	0.004
245	20.42	0.10	0.042	(0.240)	0.038	0.004
246	20.50	0.10	0.042	(0.239)	0.038	0.004
247	20.58	0.10	0.042	(0.238)	0.038	0.004
248	20.67	0.10	0.042	(0.237)	0.038	0.004
249	20.75	0.10	0.042	(0.236)	0.038	0.004
250	20.83	0.07	0.028	(0.235)	0.025	0.003
251	20.92	0.07	0.028	(0.234)	0.025	0.003
252	21.00	0.07	0.028	(0.233)	0.025	0.003
253	21.08	0.10	0.042	(0.232)	0.038	0.004
254	21.17	0.10	0.042	(0.231)	0.038	0.004
255	21.25	0.10	0.042	(0.230)	0.038	0.004
256	21.33	0.07	0.028	(0.230)	0.025	0.003
257	21.42	0.07	0.028	(0.229)	0.025	0.003
258	21.50	0.07	0.028	(0.228)	0.025	0.003
259	21.58	0.10	0.042	(0.227)	0.038	0.004
260	21.67	0.10	0.042	(0.226)	0.038	0.004
261	21.75	0.10	0.042	(0.225)	0.038	0.004
262	21.83	0.07	0.028	(0.225)	0.025	0.003
263	21.92	0.07	0.028	(0.224)	0.025	0.003
264	22.00	0.07	0.028	(0.223)	0.025	0.003
265	22.08	0.10	0.042	(0.222)	0.038	0.004
266	22.17	0.10	0.042	(0.222)	0.038	0.004
267	22.25	0.10	0.042	(0.221)	0.038	0.004
268	22.33	0.07	0.028	(0.220)	0.025	0.003
269	22.42	0.07	0.028	(0.220)	0.025	0.003
270	22.50	0.07	0.028	(0.219)	0.025	0.003
271	22.58	0.07	0.028	(0.218)	0.025	0.003
272	22.67	0.07	0.028	(0.218)	0.025	0.003
273	22.75	0.07	0.028	(0.217)	0.025	0.003
274	22.83	0.07	0.028	(0.216)	0.025	0.003
275	22.92	0.07	0.028	(0.216)	0.025	0.003
276	23.00	0.07	0.028	(0.215)	0.025	0.003
277	23.08	0.07	0.028	(0.215)	0.025	0.003
278	23.17	0.07	0.028	(0.214)	0.025	0.003
279	23.25	0.07	0.028	(0.214)	0.025	0.003
280	23.33	0.07	0.028	(0.214)	0.025	0.003
281	23.42	0.07	0.028	(0.213)	0.025	0.003
282	23.50	0.07	0.028	(0.213)	0.025	0.003
283	23.58	0.07	0.028	(0.212)	0.025	0.003
284	23.67	0.07	0.028	(0.212)	0.025	0.003
285	23.75	0.07	0.028	(0.212)	0.025	0.003
286	23.83	0.07	0.028	(0.212)	0.025	0.003
287	23.92	0.07	0.028	(0.211)	0.025	0.003
288	24.00	0.07	0.028	(0.211)	0.025	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.38(In)
 times area 32.7(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
 Total soil loss = 3.13(In)
 Total soil loss = 8.534(Ac.Ft)
 Total rainfall = 3.52(In)
 Flood volume = 45506.2 Cubic Feet
 Total soil loss = 371733.3 Cubic Feet

 Peak flow rate of this hydrograph = 3.547(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.01	Q				
0+10	0.0004	0.05	Q				
0+15	0.0009	0.07	Q				
0+20	0.0014	0.08	Q				
0+25	0.0022	0.11	Q				
0+30	0.0030	0.12	Q				
0+35	0.0039	0.13	Q				
0+40	0.0048	0.13	Q				
0+45	0.0057	0.13	Q				
0+50	0.0067	0.14	Q				
0+55	0.0078	0.16	Q				
1+ 0	0.0090	0.17	Q				
1+ 5	0.0102	0.17	Q				
1+10	0.0112	0.16	Q				
1+15	0.0122	0.15	Q				
1+20	0.0132	0.14	Q				
1+25	0.0142	0.14	Q				
1+30	0.0152	0.14	Q				
1+35	0.0162	0.14	Q				
1+40	0.0171	0.14	Q				
1+45	0.0181	0.14	Q				
1+50	0.0191	0.14	Q				
1+55	0.0202	0.16	Q				
2+ 0	0.0214	0.17	Q				
2+ 5	0.0226	0.18	Q				
2+10	0.0239	0.18	Q				
2+15	0.0251	0.18	Q				
2+20	0.0264	0.18	QV				
2+25	0.0277	0.18	QV				
2+30	0.0289	0.18	QV				
2+35	0.0302	0.19	QV				
2+40	0.0317	0.21	QV				
2+45	0.0332	0.22	QV				
2+50	0.0347	0.22	QV				
2+55	0.0363	0.23	QV				
3+ 0	0.0379	0.23	QV				
3+ 5	0.0394	0.23	QV				
3+10	0.0410	0.23	QV				

3+15	0.0426	0.23	QV				
3+20	0.0442	0.23	QV				
3+25	0.0458	0.23	QV				
3+30	0.0474	0.23	QV				
3+35	0.0490	0.23	QV				
3+40	0.0506	0.23	QV				
3+45	0.0522	0.23	QV				
3+50	0.0538	0.24	Q V				
3+55	0.0556	0.26	QV				
4+ 0	0.0574	0.27	QV				
4+ 5	0.0593	0.27	QV				
4+10	0.0612	0.27	QV				
4+15	0.0631	0.27	QV				
4+20	0.0650	0.28	QV				
4+25	0.0671	0.30	QV				
4+30	0.0692	0.31	QV				
4+35	0.0714	0.32	QV				
4+40	0.0736	0.32	QV				
4+45	0.0758	0.32	QV				
4+50	0.0781	0.33	QV				
4+55	0.0804	0.35	Q V				
5+ 0	0.0829	0.36	Q V				
5+ 5	0.0853	0.35	Q V				
5+10	0.0875	0.32	Q V				
5+15	0.0896	0.30	Q V				
5+20	0.0916	0.30	Q V				
5+25	0.0938	0.31	Q V				
5+30	0.0960	0.32	Q V				
5+35	0.0982	0.33	Q V				
5+40	0.1006	0.35	Q V				
5+45	0.1030	0.36	Q V				
5+50	0.1055	0.36	Q V				
5+55	0.1080	0.36	Q V				
6+ 0	0.1106	0.37	Q V				
6+ 5	0.1131	0.37	Q V				
6+10	0.1158	0.39	Q V				
6+15	0.1186	0.40	Q V				
6+20	0.1215	0.41	Q V				
6+25	0.1243	0.41	Q V				
6+30	0.1271	0.41	Q V				
6+35	0.1300	0.42	Q V				
6+40	0.1331	0.44	Q V				
6+45	0.1362	0.45	Q V				
6+50	0.1393	0.46	Q V				
6+55	0.1425	0.46	Q V				
7+ 0	0.1456	0.46	Q V				
7+ 5	0.1488	0.46	Q V				
7+10	0.1520	0.46	Q V				
7+15	0.1552	0.46	Q V				
7+20	0.1584	0.47	Q V				
7+25	0.1617	0.49	Q V				
7+30	0.1652	0.50	Q V				
7+35	0.1687	0.51	Q V				
7+40	0.1723	0.53	Q V				
7+45	0.1760	0.54	Q V				
7+50	0.1798	0.55	Q V				
7+55	0.1838	0.57	Q V				

8+ 0	0.1878	0.59	Q	V				
8+ 5	0.1920	0.60	Q	V				
8+10	0.1964	0.64	Q	V				
8+15	0.2010	0.67	Q	V				
8+20	0.2057	0.68	Q	V				
8+25	0.2104	0.68	Q	V				
8+30	0.2151	0.69	Q	V				
8+35	0.2199	0.70	Q	V				
8+40	0.2248	0.72	Q	V				
8+45	0.2298	0.73	Q	V				
8+50	0.2349	0.74	Q	V				
8+55	0.2402	0.76	Q	V				
9+ 0	0.2455	0.77	Q	V				
9+ 5	0.2509	0.79	Q	V				
9+10	0.2566	0.83	Q	V				
9+15	0.2625	0.85	Q	V				
9+20	0.2685	0.87	Q	V				
9+25	0.2746	0.89	Q	V				
9+30	0.2809	0.91	Q	V				
9+35	0.2872	0.92	Q	V				
9+40	0.2937	0.94	Q	V				
9+45	0.3003	0.96	Q	V				
9+50	0.3069	0.97	Q	V				
9+55	0.3138	0.99	Q	V				
10+ 0	0.3207	1.00	Q	V				
10+ 5	0.3274	0.97	Q	V				
10+10	0.3332	0.84	Q	V				
10+15	0.3385	0.77	Q	V				
10+20	0.3437	0.75	Q	V				
10+25	0.3487	0.73	Q	V				
10+30	0.3536	0.72	Q	V				
10+35	0.3587	0.74	Q	V				
10+40	0.3644	0.83	Q	V				
10+45	0.3704	0.88	Q	V				
10+50	0.3766	0.89	Q	V				
10+55	0.3828	0.90	Q	V				
11+ 0	0.3891	0.91	Q	V				
11+ 5	0.3953	0.91	Q	V				
11+10	0.4015	0.90	Q	V				
11+15	0.4076	0.89	Q	V				
11+20	0.4137	0.89	Q	V				
11+25	0.4198	0.88	Q	V				
11+30	0.4259	0.88	Q	V				
11+35	0.4319	0.87	Q	V				
11+40	0.4377	0.83	Q	V				
11+45	0.4433	0.81	Q	V				
11+50	0.4488	0.81	Q	V				
11+55	0.4545	0.82	Q	V				
12+ 0	0.4602	0.83	Q	V				
12+ 5	0.4662	0.87	Q	V				
12+10	0.4731	1.00	Q	V				
12+15	0.4805	1.07	Q	V				
12+20	0.4881	1.11	Q	V				
12+25	0.4960	1.15	Q	V				
12+30	0.5040	1.17	Q	V				
12+35	0.5122	1.19	Q	V				
12+40	0.5208	1.24	Q	V				

12+45	0.5295	1.26	Q		V	
12+50	0.5383	1.28	Q		V	
12+55	0.5473	1.31	Q		V	
13+ 0	0.5564	1.32	Q		V	
13+ 5	0.5673	1.57	Q		V	
13+10	0.5843	2.47		Q	V	
13+15	0.6050	3.00			V	
13+20	0.6273	3.24		Q	V	
13+25	0.6508	3.41		Q	V	
13+30	0.6753	3.55		Q	V	
13+35	0.6983	3.34		Q	V	
13+40	0.7140	2.28		Q	V	
13+45	0.7257	1.70	Q		V	
13+50	0.7359	1.48	Q		V	
13+55	0.7452	1.35	Q		V	
14+ 0	0.7539	1.27	Q		V	
14+ 5	0.7624	1.23	Q		V	
14+10	0.7710	1.25	Q		V	
14+15	0.7797	1.26	Q		V	
14+20	0.7883	1.25	Q		V	
14+25	0.7967	1.22	Q		V	
14+30	0.8050	1.20	Q		V	
14+35	0.8133	1.20	Q		V	
14+40	0.8216	1.20	Q		V	
14+45	0.8299	1.21	Q		V	
14+50	0.8382	1.20	Q		V	
14+55	0.8463	1.18	Q		V	
15+ 0	0.8544	1.17	Q		V	
15+ 5	0.8624	1.16	Q		V	
15+10	0.8702	1.14	Q		V	
15+15	0.8780	1.13	Q		V	
15+20	0.8857	1.12	Q		V	
15+25	0.8932	1.10	Q		V	
15+30	0.9007	1.08	Q		V	
15+35	0.9080	1.06	Q		V	
15+40	0.9147	0.98	Q		V	
15+45	0.9211	0.93	Q		V	
15+50	0.9274	0.91	Q		V	
15+55	0.9336	0.90	Q		V	
16+ 0	0.9398	0.90	Q		V	
16+ 5	0.9454	0.81	Q		V	
16+10	0.9490	0.53	Q		V	
16+15	0.9516	0.37	Q		V	
16+20	0.9536	0.30	Q		V	
16+25	0.9555	0.26	Q		V	
16+30	0.9571	0.24	Q		V	
16+35	0.9586	0.22	Q		V	
16+40	0.9599	0.19	Q		V	
16+45	0.9610	0.17	Q		V	
16+50	0.9621	0.16	Q		V	
16+55	0.9631	0.15	Q		V	
17+ 0	0.9641	0.14	Q		V	
17+ 5	0.9651	0.15	Q		V	
17+10	0.9664	0.19	Q		V	
17+15	0.9679	0.21	Q		V	
17+20	0.9694	0.22	Q		V	
17+25	0.9709	0.22	Q		V	

17+30	0.9724	0.22	Q				V
17+35	0.9740	0.23	Q				V
17+40	0.9756	0.23	Q				V
17+45	0.9772	0.23	Q				V
17+50	0.9787	0.23	Q				V
17+55	0.9801	0.21	Q				V
18+ 0	0.9815	0.20	Q				V
18+ 5	0.9828	0.19	Q				V
18+10	0.9841	0.19	Q				V
18+15	0.9854	0.19	Q				V
18+20	0.9867	0.19	Q				V
18+25	0.9880	0.19	Q				V
18+30	0.9893	0.19	Q				V
18+35	0.9906	0.18	Q				V
18+40	0.9917	0.16	Q				V
18+45	0.9927	0.15	Q				V
18+50	0.9937	0.14	Q				V
18+55	0.9945	0.12	Q				V
19+ 0	0.9953	0.11	Q				V
19+ 5	0.9960	0.11	Q				V
19+10	0.9968	0.12	Q				V
19+15	0.9978	0.13	Q				V
19+20	0.9987	0.14	Q				V
19+25	0.9998	0.16	Q				V
19+30	1.0010	0.17	Q				V
19+35	1.0022	0.17	Q				V
19+40	1.0032	0.15	Q				V
19+45	1.0042	0.15	Q				V
19+50	1.0052	0.14	Q				V
19+55	1.0060	0.12	Q				V
20+ 0	1.0068	0.11	Q				V
20+ 5	1.0075	0.11	Q				V
20+10	1.0083	0.12	Q				V
20+15	1.0092	0.13	Q				V
20+20	1.0102	0.13	Q				V
20+25	1.0111	0.14	Q				V
20+30	1.0120	0.14	Q				V
20+35	1.0130	0.14	Q				V
20+40	1.0139	0.14	Q				V
20+45	1.0149	0.14	Q				V
20+50	1.0158	0.13	Q				V
20+55	1.0166	0.11	Q				V
21+ 0	1.0173	0.10	Q				V
21+ 5	1.0180	0.11	Q				V
21+10	1.0189	0.12	Q				V
21+15	1.0198	0.13	Q				V
21+20	1.0207	0.13	Q				V
21+25	1.0214	0.11	Q				V
21+30	1.0221	0.10	Q				V
21+35	1.0229	0.10	Q				V
21+40	1.0237	0.12	Q				V
21+45	1.0246	0.13	Q				V
21+50	1.0255	0.13	Q				V
21+55	1.0262	0.11	Q				V
22+ 0	1.0269	0.10	Q				V
22+ 5	1.0276	0.10	Q				V
22+10	1.0285	0.12	Q				V

22+15	1.0294	0.13	Q				V
22+20	1.0303	0.13	Q				V
22+25	1.0310	0.11	Q				V
22+30	1.0317	0.10	Q				V
22+35	1.0324	0.10	Q				V
22+40	1.0331	0.10	Q				V
22+45	1.0337	0.10	Q				V
22+50	1.0344	0.09	Q				V
22+55	1.0350	0.09	Q				V
23+ 0	1.0357	0.09	Q				V
23+ 5	1.0363	0.09	Q				V
23+10	1.0370	0.09	Q				V
23+15	1.0376	0.09	Q				V
23+20	1.0382	0.09	Q				V
23+25	1.0389	0.09	Q				V
23+30	1.0395	0.09	Q				V
23+35	1.0401	0.09	Q				V
23+40	1.0408	0.09	Q				V
23+45	1.0414	0.09	Q				V
23+50	1.0421	0.09	Q				V
23+55	1.0427	0.09	Q				V
24+ 0	1.0433	0.09	Q				V
24+ 5	1.0439	0.08	Q				V
24+10	1.0442	0.04	Q				V
24+15	1.0444	0.02	Q				V
24+20	1.0445	0.02	Q				V
24+25	1.0446	0.01	Q				V
24+30	1.0446	0.01	Q				V
24+35	1.0446	0.00	Q				V
24+40	1.0447	0.00	Q				V
24+45	1.0447	0.00	Q				V
24+50	1.0447	0.00	Q				V
24+55	1.0447	0.00	Q				V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70 (Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70 (Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00 (Ft.)
Length along longest watercourse measured to centroid = 2003.00 (Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00 (Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	0.58	18.97

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	1.45	47.41

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)
 Areal adjustment factor = 99.97 %
 Adjusted average point rain = 0.938(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
Sum (F) =						0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233

Minimum soil loss rate ((In/Hr)) = 0.116
 (for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

 Slope of intensity-duration curve for a 1 hour storm =0.4800

Unit Hydrograph
 VALLEY S-Curve

 Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
Sum = 100.000		Sum=	32.955

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	0.08	4.40	0.495 (0.446)	0.262
2	0.17	4.50	0.506 (0.456)	0.274
3	0.25	5.40	0.608 (0.547)	0.375

4	0.33	5.40	0.608	0.233	(0.547)	0.375
5	0.42	5.70	0.641	0.233	(0.577)	0.409
6	0.50	6.40	0.720	0.233	(0.648)	0.488
7	0.58	7.90	0.889	0.233	(0.800)	0.656
8	0.67	9.10	1.024	0.233	(0.922)	0.791
9	0.75	12.80	1.440	0.233	(1.296)	1.208
10	0.83	25.60	2.880	0.233	(2.592)	2.648
11	0.92	7.90	0.889	0.233	(0.800)	0.656
12	1.00	4.90	0.551	0.233	(0.496)	0.319

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.5

Flood volume = Effective rainfall 0.71(In)

times area 32.7(Ac.)/[(In)/(Ft.)] = 1.9(Ac.Ft)

Total soil loss = 0.23(In)

Total soil loss = 0.634(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 83689.8 Cubic Feet

Total soil loss = 27609.9 Cubic Feet

Peak flow rate of this hydrograph = 52.013(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0066	0.96	Q					
0+10	0.0378	4.54	V Q					
0+15	0.0861	7.01	V Q					
0+20	0.1497	9.23	V Q					
0+25	0.2228	10.61	V Q					
0+30	0.3052	11.97	VQ					
0+35	0.4037	14.30	VQ					
0+40	0.5280	18.04	V Q					
0+45	0.6872	23.13	VQ					
0+50	0.9338	35.81			V	Q		
0+55	1.2920	52.01				V	Q	
1+ 0	1.5432	36.46			Q	Q	V	
1+ 5	1.6895	21.24					V	V
1+10	1.7715	11.92		Q			V	V
1+15	1.8212	7.21		Q			V	V
1+20	1.8548	4.88		Q			V	V
1+25	1.8788	3.49	Q				V	V
1+30	1.8956	2.44	Q				V	V
1+35	1.9071	1.67	Q				V	V
1+40	1.9150	1.15	Q				V	V
1+45	1.9197	0.67	Q				V	V
1+50	1.9209	0.18	Q				V	V
1+55	1.9213	0.05	Q					V

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Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557
10-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 2
Existing Natural Condition

Drainage Area = 32.70(Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70(Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00(Ft.)
Length along longest watercourse measured to centroid = 2003.00(Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00(Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 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]
32.70	0.98	32.05

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
32.70	2.48	81.10

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980 (In)
 Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.597 (In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 1.597 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
32.700	81.00	0.000
Total Area Entered = 32.70 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
Sum (F) =						0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233
 Minimum soil loss rate ((In/Hr)) = 0.116
 (for 24 hour storm duration)
 Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
Sum =		100.000	Sum= 32.955

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	0.08	1.30	0.249 (0.233)	0.025
2	0.17	1.30	0.249 (0.233)	0.025
3	0.25	1.10	0.211 (0.233)	0.021
4	0.33	1.50	0.287 0.233 (0.259)	0.055
5	0.42	1.50	0.287 0.233 (0.259)	0.055

6	0.50	1.80	0.345	0.233	(0.310)	0.112
7	0.58	1.50	0.287	0.233	(0.259)	0.055
8	0.67	1.80	0.345	0.233	(0.310)	0.112
9	0.75	1.80	0.345	0.233	(0.310)	0.112
10	0.83	1.50	0.287	0.233	(0.259)	0.055
11	0.92	1.60	0.307	0.233	(0.276)	0.074
12	1.00	1.80	0.345	0.233	(0.310)	0.112
13	1.08	2.20	0.422	0.233	(0.379)	0.189
14	1.17	2.20	0.422	0.233	(0.379)	0.189
15	1.25	2.20	0.422	0.233	(0.379)	0.189
16	1.33	2.00	0.383	0.233	(0.345)	0.151
17	1.42	2.60	0.498	0.233	(0.448)	0.266
18	1.50	2.70	0.517	0.233	(0.466)	0.285
19	1.58	2.40	0.460	0.233	(0.414)	0.227
20	1.67	2.70	0.517	0.233	(0.466)	0.285
21	1.75	3.30	0.632	0.233	(0.569)	0.400
22	1.83	3.10	0.594	0.233	(0.535)	0.361
23	1.92	2.90	0.556	0.233	(0.500)	0.323
24	2.00	3.00	0.575	0.233	(0.517)	0.342
25	2.08	3.10	0.594	0.233	(0.535)	0.361
26	2.17	4.20	0.805	0.233	(0.724)	0.572
27	2.25	5.00	0.958	0.233	(0.862)	0.726
28	2.33	3.50	0.671	0.233	(0.604)	0.438
29	2.42	6.80	1.303	0.233	(1.173)	1.070
30	2.50	7.30	1.399	0.233	(1.259)	1.166
31	2.58	8.20	1.571	0.233	(1.414)	1.339
32	2.67	5.90	1.131	0.233	(1.018)	0.898
33	2.75	2.00	0.383	0.233	(0.345)	0.151
34	2.83	1.80	0.345	0.233	(0.310)	0.112
35	2.92	1.80	0.345	0.233	(0.310)	0.112
36	3.00	0.60	0.115	(0.233)	0.103	0.011

(Loss Rate Not Used)

Sum = 100.0

Sum = 11.0

Flood volume = Effective rainfall 0.91(In)

times area 32.7(Ac.) / [(In)/(Ft.)] = 2.5(Ac.Ft)

Total soil loss = 0.68(In)

Total soil loss = 1.859(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 108589.8 Cubic Feet

Total soil loss = 80961.9 Cubic Feet

Peak flow rate of this hydrograph = 35.840(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0006	0.09	Q				
0+10	0.0036	0.43	Q				
0+15	0.0077	0.60	Q				
0+20	0.0128	0.74	Q				
0+25	0.0212	1.21	VQ				

0+30	0.0328	1.69	VQ						
0+35	0.0491	2.37	V Q						
0+40	0.0650	2.30	VQ						
0+45	0.0847	2.87	VQ						
0+50	0.1057	3.05	V Q						
0+55	0.1230	2.50	VQ						
1+ 0	0.1407	2.57	Q						
1+ 5	0.1641	3.41	VQ						
1+10	0.1966	4.72	VQ						
1+15	0.2339	5.41	V Q						
1+20	0.2721	5.56	VQ						
1+25	0.3109	5.63	VQ						
1+30	0.3597	7.08	V Q						
1+35	0.4145	7.96	VQ						
1+40	0.4686	7.86	Q						
1+45	0.5297	8.88	Q						
1+50	0.6035	10.72	VQ						
1+55	0.6800	11.10	VQ						
2+ 0	0.7545	10.82	Q V						
2+ 5	0.8305	11.03	Q V						
2+10	0.9144	12.19	Q V						
2+15	1.0233	15.81	QV						
2+20	1.1509	18.52	Q						
2+25	1.2800	18.76	Q V						
2+30	1.4615	26.35				V	Q		
2+35	1.6868	32.70				V			
2+40	1.9336	35.84							
2+45	2.1387	29.78							
2+50	2.2602	17.64			Q				
2+55	2.3370	11.15		Q					
3+ 0	2.3932	8.17		Q					
3+ 5	2.4294	5.26		Q					
3+10	2.4525	3.35		Q					
3+15	2.4682	2.27		Q					
3+20	2.4789	1.56		Q					
3+25	2.4858	1.00		Q					
3+30	2.4899	0.60	Q						
3+35	2.4918	0.27	Q						
3+40	2.4924	0.09	Q						
3+45	2.4927	0.05	Q						
3+50	2.4929	0.02	Q						
3+55	2.4929	0.00	Q						



Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70 (Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70 (Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00 (Ft.)
Length along longest watercourse measured to centroid = 2003.00 (Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00 (Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	1.38	45.13

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	3.48	113.80

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380(In)
 Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 2.244(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 2.244(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
Sum (F) =						0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233

Minimum soil loss rate ((In/Hr)) = 0.116

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
Sum =		100.000	Sum= 32.955

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	0.08	0.50	(0.233)	0.121
2	0.17	0.60	(0.233)	0.145
3	0.25	0.60	(0.233)	0.145
4	0.33	0.60	(0.233)	0.145
5	0.42	0.60	(0.233)	0.145

6	0.50	0.70	0.188	(0.233)	0.170	0.019
7	0.58	0.70	0.188	(0.233)	0.170	0.019
8	0.67	0.70	0.188	(0.233)	0.170	0.019
9	0.75	0.70	0.188	(0.233)	0.170	0.019
10	0.83	0.70	0.188	(0.233)	0.170	0.019
11	0.92	0.70	0.188	(0.233)	0.170	0.019
12	1.00	0.80	0.215	(0.233)	0.194	0.022
13	1.08	0.80	0.215	(0.233)	0.194	0.022
14	1.17	0.80	0.215	(0.233)	0.194	0.022
15	1.25	0.80	0.215	(0.233)	0.194	0.022
16	1.33	0.80	0.215	(0.233)	0.194	0.022
17	1.42	0.80	0.215	(0.233)	0.194	0.022
18	1.50	0.80	0.215	(0.233)	0.194	0.022
19	1.58	0.80	0.215	(0.233)	0.194	0.022
20	1.67	0.80	0.215	(0.233)	0.194	0.022
21	1.75	0.80	0.215	(0.233)	0.194	0.022
22	1.83	0.80	0.215	(0.233)	0.194	0.022
23	1.92	0.80	0.215	(0.233)	0.194	0.022
24	2.00	0.90	0.242	(0.233)	0.218	0.024
25	2.08	0.80	0.215	(0.233)	0.194	0.022
26	2.17	0.90	0.242	(0.233)	0.218	0.024
27	2.25	0.90	0.242	(0.233)	0.218	0.024
28	2.33	0.90	0.242	(0.233)	0.218	0.024
29	2.42	0.90	0.242	(0.233)	0.218	0.024
30	2.50	0.90	0.242	(0.233)	0.218	0.024
31	2.58	0.90	0.242	(0.233)	0.218	0.024
32	2.67	0.90	0.242	(0.233)	0.218	0.024
33	2.75	1.00	0.269	0.233 (0.242)		0.037
34	2.83	1.00	0.269	0.233 (0.242)		0.037
35	2.92	1.00	0.269	0.233 (0.242)		0.037
36	3.00	1.00	0.269	0.233 (0.242)		0.037
37	3.08	1.00	0.269	0.233 (0.242)		0.037
38	3.17	1.10	0.296	0.233 (0.267)		0.064
39	3.25	1.10	0.296	0.233 (0.267)		0.064
40	3.33	1.10	0.296	0.233 (0.267)		0.064
41	3.42	1.20	0.323	0.233 (0.291)		0.090
42	3.50	1.30	0.350	0.233 (0.315)		0.117
43	3.58	1.40	0.377	0.233 (0.339)		0.144
44	3.67	1.40	0.377	0.233 (0.339)		0.144
45	3.75	1.50	0.404	0.233 (0.363)		0.171
46	3.83	1.50	0.404	0.233 (0.363)		0.171
47	3.92	1.60	0.431	0.233 (0.388)		0.198
48	4.00	1.60	0.431	0.233 (0.388)		0.198
49	4.08	1.70	0.458	0.233 (0.412)		0.225
50	4.17	1.80	0.485	0.233 (0.436)		0.252
51	4.25	1.90	0.512	0.233 (0.460)		0.279
52	4.33	2.00	0.538	0.233 (0.485)		0.306
53	4.42	2.10	0.565	0.233 (0.509)		0.333
54	4.50	2.10	0.565	0.233 (0.509)		0.333
55	4.58	2.20	0.592	0.233 (0.533)		0.360
56	4.67	2.30	0.619	0.233 (0.557)		0.387
57	4.75	2.40	0.646	0.233 (0.582)		0.414
58	4.83	2.40	0.646	0.233 (0.582)		0.414
59	4.92	2.50	0.673	0.233 (0.606)		0.441
60	5.00	2.60	0.700	0.233 (0.630)		0.467
61	5.08	3.10	0.835	0.233 (0.751)		0.602
62	5.17	3.60	0.969	0.233 (0.872)		0.737

63	5.25	3.90	1.050	0.233	(0.945)	0.817
64	5.33	4.20	1.131	0.233	(1.018)	0.898
65	5.42	4.70	1.265	0.233	(1.139)	1.033
66	5.50	5.60	1.508	0.233	(1.357)	1.275
67	5.58	1.90	0.512	0.233	(0.460)	0.279
68	5.67	0.90	0.242	(0.233)	0.218	0.024
69	5.75	0.60	0.162	(0.233)	0.145	0.016
70	5.83	0.50	0.135	(0.233)	0.121	0.013
71	5.92	0.30	0.081	(0.233)	0.073	0.008
72	6.00	0.20	0.054	(0.233)	0.048	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.2

Flood volume = Effective rainfall 1.02 (In)
times area 32.7 (Ac.) / [(In) / (Ft.)] = 2.8 (Ac.Ft)

Total soil loss = 1.23 (In)

Total soil loss = 3.345 (Ac.Ft)

Total rainfall = 2.24 (In)

Flood volume = 120603.7 Cubic Feet

Total soil loss = 145726.3 Cubic Feet

Peak flow rate of this hydrograph = 32.086 (CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0003	0.05	Q				
0+10	0.0020	0.24	Q				
0+15	0.0046	0.38	Q				
0+20	0.0076	0.44	Q				
0+25	0.0108	0.47	Q				
0+30	0.0143	0.50	Q				
0+35	0.0180	0.55	Q				
0+40	0.0220	0.58	Q				
0+45	0.0261	0.59	Q				
0+50	0.0303	0.60	Q				
0+55	0.0345	0.61	Q				
1+ 0	0.0388	0.63	Q				
1+ 5	0.0434	0.66	Q				
1+10	0.0481	0.69	Q				
1+15	0.0529	0.69	Q				
1+20	0.0577	0.70	Q				
1+25	0.0625	0.70	Q				
1+30	0.0674	0.71	Q				
1+35	0.0723	0.71	QV				
1+40	0.0772	0.71	QV				
1+45	0.0820	0.71	QV				
1+50	0.0869	0.71	QV				
1+55	0.0918	0.71	QV				
2+ 0	0.0968	0.72	QV				
2+ 5	0.1019	0.75	QV				
2+10	0.1070	0.74	QV				

2+15	0.1123	0.76	QV						
2+20	0.1177	0.78	QV						
2+25	0.1231	0.79	QV						
2+30	0.1285	0.79	QV						
2+35	0.1340	0.79	QV						
2+40	0.1395	0.80	Q V						
2+45	0.1453	0.84	Q V						
2+50	0.1522	1.01	QV						
2+55	0.1598	1.10	QV						
3+ 0	0.1677	1.14	QV						
3+ 5	0.1757	1.16	QV						
3+10	0.1845	1.27	QV						
3+15	0.1958	1.65	QV						
3+20	0.2086	1.86	Q V						
3+25	0.2226	2.04	QV						
3+30	0.2402	2.55	QV						
3+35	0.2626	3.25	Q						
3+40	0.2895	3.91	QV						
3+45	0.3195	4.35	Q						
3+50	0.3532	4.89	QV						
3+55	0.3896	5.29	Q						
4+ 0	0.4297	5.81	QV						
4+ 5	0.4724	6.21	Q						
4+10	0.5194	6.82	QV						
4+15	0.5716	7.58	QV						
4+20	0.6293	8.38	QV						
4+25	0.6928	9.22	QV						
4+30	0.7614	9.97	Q V						
4+35	0.8335	10.46	Q V						
4+40	0.9101	11.13	Q V						
4+45	0.9923	11.93	Q V						
4+50	1.0795	12.66	Q V						
4+55	1.1701	13.15	Q V						
5+ 0	1.2652	13.82	Q V						
5+ 5	1.3686	15.00	Q V						
5+10	1.4903	17.68	Q V						
5+15	1.6348	20.98	Q V						
5+20	1.7992	23.88	Q V						
5+25	1.9835	26.77	Q V						
5+30	2.1954	30.76	QV						
5+35	2.4164	32.09	Q V						
5+40	2.5566	20.37	Q						
5+45	2.6306	10.74	Q						
5+50	2.6762	6.62	Q						
5+55	2.7075	4.54	Q						
6+ 0	2.7294	3.18	Q						
6+ 5	2.7448	2.25	Q						
6+10	2.7551	1.49	Q						
6+15	2.7617	0.96	Q						
6+20	2.7658	0.60	Q						
6+25	2.7679	0.30	Q						
6+30	2.7684	0.07	Q						
6+35	2.7685	0.02	Q						
6+40	2.7686	0.01	Q						
6+45	2.7687	0.01	Q						
6+50	2.7687	0.00	Q						
6+55	2.7687	0.00	Q						





Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B2Nat2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 2 Existing Natural Condition

Drainage Area = 32.70 (Ac.) = 0.051 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 32.70 (Ac.) = 0.051 Sq. Mi.
Length along longest watercourse = 3306.00 (Ft.)
Length along longest watercourse measured to centroid = 2003.00 (Ft.)
Length along longest watercourse = 0.626 Mi.
Length along longest watercourse measured to centroid = 0.379 Mi.
Difference in elevation = 198.00 (Ft.)
Slope along watercourse = 316.2250 Ft./Mi.
Average Manning's 'N' = 0.025
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 = 5.00 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]
32.70	2.48	81.10

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
32.70	6.90	225.63

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 4.298(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 4.298(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 32.700 81.00 0.000
 Total Area Entered = 32.70(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
						Sum (F) = 0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233

Minimum soil loss rate ((In/Hr)) = 0.116
 (for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	71.597	11.036
2	0.167	143.194	40.912
3	0.250	214.791	22.602
4	0.333	286.388	8.868
5	0.417	357.985	5.390
6	0.500	429.582	3.545
7	0.583	501.179	2.402
8	0.667	572.776	1.844
9	0.750	644.373	1.300
10	0.833	715.970	0.901
11	0.917	787.567	0.717
12	1.000	859.164	0.482
		Sum = 100.000	Sum= 32.955

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	0.08	0.034	(0.412)	0.031
2	0.17	0.034	(0.411)	0.031
3	0.25	0.034	(0.409)	0.031
4	0.33	0.052	(0.408)	0.046
5	0.42	0.052	(0.406)	0.046

6	0.50	0.10	0.052	(0.404)	0.046	0.005
7	0.58	0.10	0.052	(0.403)	0.046	0.005
8	0.67	0.10	0.052	(0.401)	0.046	0.005
9	0.75	0.10	0.052	(0.400)	0.046	0.005
10	0.83	0.13	0.069	(0.398)	0.062	0.007
11	0.92	0.13	0.069	(0.397)	0.062	0.007
12	1.00	0.13	0.069	(0.395)	0.062	0.007
13	1.08	0.10	0.052	(0.393)	0.046	0.005
14	1.17	0.10	0.052	(0.392)	0.046	0.005
15	1.25	0.10	0.052	(0.390)	0.046	0.005
16	1.33	0.10	0.052	(0.389)	0.046	0.005
17	1.42	0.10	0.052	(0.387)	0.046	0.005
18	1.50	0.10	0.052	(0.386)	0.046	0.005
19	1.58	0.10	0.052	(0.384)	0.046	0.005
20	1.67	0.10	0.052	(0.383)	0.046	0.005
21	1.75	0.10	0.052	(0.381)	0.046	0.005
22	1.83	0.13	0.069	(0.379)	0.062	0.007
23	1.92	0.13	0.069	(0.378)	0.062	0.007
24	2.00	0.13	0.069	(0.376)	0.062	0.007
25	2.08	0.13	0.069	(0.375)	0.062	0.007
26	2.17	0.13	0.069	(0.373)	0.062	0.007
27	2.25	0.13	0.069	(0.372)	0.062	0.007
28	2.33	0.13	0.069	(0.370)	0.062	0.007
29	2.42	0.13	0.069	(0.369)	0.062	0.007
30	2.50	0.13	0.069	(0.367)	0.062	0.007
31	2.58	0.17	0.086	(0.366)	0.077	0.009
32	2.67	0.17	0.086	(0.364)	0.077	0.009
33	2.75	0.17	0.086	(0.363)	0.077	0.009
34	2.83	0.17	0.086	(0.361)	0.077	0.009
35	2.92	0.17	0.086	(0.360)	0.077	0.009
36	3.00	0.17	0.086	(0.358)	0.077	0.009
37	3.08	0.17	0.086	(0.357)	0.077	0.009
38	3.17	0.17	0.086	(0.355)	0.077	0.009
39	3.25	0.17	0.086	(0.354)	0.077	0.009
40	3.33	0.17	0.086	(0.352)	0.077	0.009
41	3.42	0.17	0.086	(0.351)	0.077	0.009
42	3.50	0.17	0.086	(0.350)	0.077	0.009
43	3.58	0.17	0.086	(0.348)	0.077	0.009
44	3.67	0.17	0.086	(0.347)	0.077	0.009
45	3.75	0.17	0.086	(0.345)	0.077	0.009
46	3.83	0.20	0.103	(0.344)	0.093	0.010
47	3.92	0.20	0.103	(0.342)	0.093	0.010
48	4.00	0.20	0.103	(0.341)	0.093	0.010
49	4.08	0.20	0.103	(0.339)	0.093	0.010
50	4.17	0.20	0.103	(0.338)	0.093	0.010
51	4.25	0.20	0.103	(0.336)	0.093	0.010
52	4.33	0.23	0.120	(0.335)	0.108	0.012
53	4.42	0.23	0.120	(0.334)	0.108	0.012
54	4.50	0.23	0.120	(0.332)	0.108	0.012
55	4.58	0.23	0.120	(0.331)	0.108	0.012
56	4.67	0.23	0.120	(0.329)	0.108	0.012
57	4.75	0.23	0.120	(0.328)	0.108	0.012
58	4.83	0.27	0.138	(0.326)	0.124	0.014
59	4.92	0.27	0.138	(0.325)	0.124	0.014
60	5.00	0.27	0.138	(0.324)	0.124	0.014
61	5.08	0.20	0.103	(0.322)	0.093	0.010
62	5.17	0.20	0.103	(0.321)	0.093	0.010

63	5.25	0.20	0.103	(0.319)	0.093	0.010
64	5.33	0.23	0.120	(0.318)	0.108	0.012
65	5.42	0.23	0.120	(0.317)	0.108	0.012
66	5.50	0.23	0.120	(0.315)	0.108	0.012
67	5.58	0.27	0.138	(0.314)	0.124	0.014
68	5.67	0.27	0.138	(0.313)	0.124	0.014
69	5.75	0.27	0.138	(0.311)	0.124	0.014
70	5.83	0.27	0.138	(0.310)	0.124	0.014
71	5.92	0.27	0.138	(0.308)	0.124	0.014
72	6.00	0.27	0.138	(0.307)	0.124	0.014
73	6.08	0.30	0.155	(0.306)	0.139	0.015
74	6.17	0.30	0.155	(0.304)	0.139	0.015
75	6.25	0.30	0.155	(0.303)	0.139	0.015
76	6.33	0.30	0.155	(0.302)	0.139	0.015
77	6.42	0.30	0.155	(0.300)	0.139	0.015
78	6.50	0.30	0.155	(0.299)	0.139	0.015
79	6.58	0.33	0.172	(0.298)	0.155	0.017
80	6.67	0.33	0.172	(0.296)	0.155	0.017
81	6.75	0.33	0.172	(0.295)	0.155	0.017
82	6.83	0.33	0.172	(0.294)	0.155	0.017
83	6.92	0.33	0.172	(0.292)	0.155	0.017
84	7.00	0.33	0.172	(0.291)	0.155	0.017
85	7.08	0.33	0.172	(0.290)	0.155	0.017
86	7.17	0.33	0.172	(0.288)	0.155	0.017
87	7.25	0.33	0.172	(0.287)	0.155	0.017
88	7.33	0.37	0.189	(0.286)	0.170	0.019
89	7.42	0.37	0.189	(0.284)	0.170	0.019
90	7.50	0.37	0.189	(0.283)	0.170	0.019
91	7.58	0.40	0.206	(0.282)	0.186	0.021
92	7.67	0.40	0.206	(0.280)	0.186	0.021
93	7.75	0.40	0.206	(0.279)	0.186	0.021
94	7.83	0.43	0.224	(0.278)	0.201	0.022
95	7.92	0.43	0.224	(0.277)	0.201	0.022
96	8.00	0.43	0.224	(0.275)	0.201	0.022
97	8.08	0.50	0.258	(0.274)	0.232	0.026
98	8.17	0.50	0.258	(0.273)	0.232	0.026
99	8.25	0.50	0.258	(0.271)	0.232	0.026
100	8.33	0.50	0.258	(0.270)	0.232	0.026
101	8.42	0.50	0.258	(0.269)	0.232	0.026
102	8.50	0.50	0.258	(0.268)	0.232	0.026
103	8.58	0.53	0.275	(0.266)	0.248	0.028
104	8.67	0.53	0.275	(0.265)	0.248	0.028
105	8.75	0.53	0.275	(0.264)	0.248	0.028
106	8.83	0.57	0.292	0.263	(0.263)	0.030
107	8.92	0.57	0.292	0.261	(0.263)	0.031
108	9.00	0.57	0.292	0.260	(0.263)	0.032
109	9.08	0.63	0.327	0.259	(0.294)	0.068
110	9.17	0.63	0.327	0.258	(0.294)	0.069
111	9.25	0.63	0.327	0.256	(0.294)	0.070
112	9.33	0.67	0.344	0.255	(0.309)	0.089
113	9.42	0.67	0.344	0.254	(0.309)	0.090
114	9.50	0.67	0.344	0.253	(0.309)	0.091
115	9.58	0.70	0.361	0.252	(0.325)	0.109
116	9.67	0.70	0.361	0.250	(0.325)	0.111
117	9.75	0.70	0.361	0.249	(0.325)	0.112
118	9.83	0.73	0.378	0.248	(0.340)	0.130
119	9.92	0.73	0.378	0.247	(0.340)	0.131

120	10.00	0.73	0.378	0.246	(0.340)	0.133
121	10.08	0.50	0.258	(0.244)	0.232	0.026
122	10.17	0.50	0.258	(0.243)	0.232	0.026
123	10.25	0.50	0.258	(0.242)	0.232	0.026
124	10.33	0.50	0.258	(0.241)	0.232	0.026
125	10.42	0.50	0.258	(0.240)	0.232	0.026
126	10.50	0.50	0.258	(0.239)	0.232	0.026
127	10.58	0.67	0.344	0.237	(0.309)	0.106
128	10.67	0.67	0.344	0.236	(0.309)	0.108
129	10.75	0.67	0.344	0.235	(0.309)	0.109
130	10.83	0.67	0.344	0.234	(0.309)	0.110
131	10.92	0.67	0.344	0.233	(0.309)	0.111
132	11.00	0.67	0.344	0.232	(0.309)	0.112
133	11.08	0.63	0.327	0.230	(0.294)	0.096
134	11.17	0.63	0.327	0.229	(0.294)	0.097
135	11.25	0.63	0.327	0.228	(0.294)	0.098
136	11.33	0.63	0.327	0.227	(0.294)	0.100
137	11.42	0.63	0.327	0.226	(0.294)	0.101
138	11.50	0.63	0.327	0.225	(0.294)	0.102
139	11.58	0.57	0.292	0.224	(0.263)	0.069
140	11.67	0.57	0.292	0.223	(0.263)	0.070
141	11.75	0.57	0.292	0.222	(0.263)	0.071
142	11.83	0.60	0.309	0.220	(0.279)	0.089
143	11.92	0.60	0.309	0.219	(0.279)	0.090
144	12.00	0.60	0.309	0.218	(0.279)	0.091
145	12.08	0.83	0.430	0.217	(0.387)	0.213
146	12.17	0.83	0.430	0.216	(0.387)	0.214
147	12.25	0.83	0.430	0.215	(0.387)	0.215
148	12.33	0.87	0.447	0.214	(0.402)	0.233
149	12.42	0.87	0.447	0.213	(0.402)	0.234
150	12.50	0.87	0.447	0.212	(0.402)	0.235
151	12.58	0.93	0.481	0.211	(0.433)	0.271
152	12.67	0.93	0.481	0.210	(0.433)	0.272
153	12.75	0.93	0.481	0.209	(0.433)	0.273
154	12.83	0.97	0.499	0.207	(0.449)	0.291
155	12.92	0.97	0.499	0.206	(0.449)	0.292
156	13.00	0.97	0.499	0.205	(0.449)	0.293
157	13.08	1.13	0.585	0.204	(0.526)	0.380
158	13.17	1.13	0.585	0.203	(0.526)	0.381
159	13.25	1.13	0.585	0.202	(0.526)	0.382
160	13.33	1.13	0.585	0.201	(0.526)	0.383
161	13.42	1.13	0.585	0.200	(0.526)	0.384
162	13.50	1.13	0.585	0.199	(0.526)	0.385
163	13.58	0.77	0.395	0.198	(0.356)	0.197
164	13.67	0.77	0.395	0.197	(0.356)	0.198
165	13.75	0.77	0.395	0.196	(0.356)	0.199
166	13.83	0.77	0.395	0.195	(0.356)	0.200
167	13.92	0.77	0.395	0.194	(0.356)	0.201
168	14.00	0.77	0.395	0.193	(0.356)	0.202
169	14.08	0.90	0.464	0.192	(0.418)	0.272
170	14.17	0.90	0.464	0.191	(0.418)	0.273
171	14.25	0.90	0.464	0.190	(0.418)	0.274
172	14.33	0.87	0.447	0.189	(0.402)	0.258
173	14.42	0.87	0.447	0.188	(0.402)	0.259
174	14.50	0.87	0.447	0.187	(0.402)	0.260
175	14.58	0.87	0.447	0.186	(0.402)	0.261
176	14.67	0.87	0.447	0.185	(0.402)	0.262

177	14.75	0.87	0.447	0.184	(0.402)	0.263
178	14.83	0.83	0.430	0.184	(0.387)	0.246
179	14.92	0.83	0.430	0.183	(0.387)	0.247
180	15.00	0.83	0.430	0.182	(0.387)	0.248
181	15.08	0.80	0.413	0.181	(0.371)	0.232
182	15.17	0.80	0.413	0.180	(0.371)	0.233
183	15.25	0.80	0.413	0.179	(0.371)	0.234
184	15.33	0.77	0.395	0.178	(0.356)	0.217
185	15.42	0.77	0.395	0.177	(0.356)	0.218
186	15.50	0.77	0.395	0.176	(0.356)	0.219
187	15.58	0.63	0.327	0.175	(0.294)	0.151
188	15.67	0.63	0.327	0.174	(0.294)	0.152
189	15.75	0.63	0.327	0.173	(0.294)	0.153
190	15.83	0.63	0.327	0.173	(0.294)	0.154
191	15.92	0.63	0.327	0.172	(0.294)	0.155
192	16.00	0.63	0.327	0.171	(0.294)	0.156
193	16.08	0.13	0.069	(0.170)	0.062	0.007
194	16.17	0.13	0.069	(0.169)	0.062	0.007
195	16.25	0.13	0.069	(0.168)	0.062	0.007
196	16.33	0.13	0.069	(0.167)	0.062	0.007
197	16.42	0.13	0.069	(0.166)	0.062	0.007
198	16.50	0.13	0.069	(0.166)	0.062	0.007
199	16.58	0.10	0.052	(0.165)	0.046	0.005
200	16.67	0.10	0.052	(0.164)	0.046	0.005
201	16.75	0.10	0.052	(0.163)	0.046	0.005
202	16.83	0.10	0.052	(0.162)	0.046	0.005
203	16.92	0.10	0.052	(0.161)	0.046	0.005
204	17.00	0.10	0.052	(0.161)	0.046	0.005
205	17.08	0.17	0.086	(0.160)	0.077	0.009
206	17.17	0.17	0.086	(0.159)	0.077	0.009
207	17.25	0.17	0.086	(0.158)	0.077	0.009
208	17.33	0.17	0.086	(0.157)	0.077	0.009
209	17.42	0.17	0.086	(0.157)	0.077	0.009
210	17.50	0.17	0.086	(0.156)	0.077	0.009
211	17.58	0.17	0.086	(0.155)	0.077	0.009
212	17.67	0.17	0.086	(0.154)	0.077	0.009
213	17.75	0.17	0.086	(0.154)	0.077	0.009
214	17.83	0.13	0.069	(0.153)	0.062	0.007
215	17.92	0.13	0.069	(0.152)	0.062	0.007
216	18.00	0.13	0.069	(0.151)	0.062	0.007
217	18.08	0.13	0.069	(0.151)	0.062	0.007
218	18.17	0.13	0.069	(0.150)	0.062	0.007
219	18.25	0.13	0.069	(0.149)	0.062	0.007
220	18.33	0.13	0.069	(0.148)	0.062	0.007
221	18.42	0.13	0.069	(0.148)	0.062	0.007
222	18.50	0.13	0.069	(0.147)	0.062	0.007
223	18.58	0.10	0.052	(0.146)	0.046	0.005
224	18.67	0.10	0.052	(0.145)	0.046	0.005
225	18.75	0.10	0.052	(0.145)	0.046	0.005
226	18.83	0.07	0.034	(0.144)	0.031	0.003
227	18.92	0.07	0.034	(0.143)	0.031	0.003
228	19.00	0.07	0.034	(0.143)	0.031	0.003
229	19.08	0.10	0.052	(0.142)	0.046	0.005
230	19.17	0.10	0.052	(0.141)	0.046	0.005
231	19.25	0.10	0.052	(0.141)	0.046	0.005
232	19.33	0.13	0.069	(0.140)	0.062	0.007
233	19.42	0.13	0.069	(0.139)	0.062	0.007

234	19.50	0.13	0.069	(0.139)	0.062	0.007
235	19.58	0.10	0.052	(0.138)	0.046	0.005
236	19.67	0.10	0.052	(0.138)	0.046	0.005
237	19.75	0.10	0.052	(0.137)	0.046	0.005
238	19.83	0.07	0.034	(0.136)	0.031	0.003
239	19.92	0.07	0.034	(0.136)	0.031	0.003
240	20.00	0.07	0.034	(0.135)	0.031	0.003
241	20.08	0.10	0.052	(0.134)	0.046	0.005
242	20.17	0.10	0.052	(0.134)	0.046	0.005
243	20.25	0.10	0.052	(0.133)	0.046	0.005
244	20.33	0.10	0.052	(0.133)	0.046	0.005
245	20.42	0.10	0.052	(0.132)	0.046	0.005
246	20.50	0.10	0.052	(0.132)	0.046	0.005
247	20.58	0.10	0.052	(0.131)	0.046	0.005
248	20.67	0.10	0.052	(0.130)	0.046	0.005
249	20.75	0.10	0.052	(0.130)	0.046	0.005
250	20.83	0.07	0.034	(0.129)	0.031	0.003
251	20.92	0.07	0.034	(0.129)	0.031	0.003
252	21.00	0.07	0.034	(0.128)	0.031	0.003
253	21.08	0.10	0.052	(0.128)	0.046	0.005
254	21.17	0.10	0.052	(0.127)	0.046	0.005
255	21.25	0.10	0.052	(0.127)	0.046	0.005
256	21.33	0.07	0.034	(0.126)	0.031	0.003
257	21.42	0.07	0.034	(0.126)	0.031	0.003
258	21.50	0.07	0.034	(0.125)	0.031	0.003
259	21.58	0.10	0.052	(0.125)	0.046	0.005
260	21.67	0.10	0.052	(0.125)	0.046	0.005
261	21.75	0.10	0.052	(0.124)	0.046	0.005
262	21.83	0.07	0.034	(0.124)	0.031	0.003
263	21.92	0.07	0.034	(0.123)	0.031	0.003
264	22.00	0.07	0.034	(0.123)	0.031	0.003
265	22.08	0.10	0.052	(0.122)	0.046	0.005
266	22.17	0.10	0.052	(0.122)	0.046	0.005
267	22.25	0.10	0.052	(0.122)	0.046	0.005
268	22.33	0.07	0.034	(0.121)	0.031	0.003
269	22.42	0.07	0.034	(0.121)	0.031	0.003
270	22.50	0.07	0.034	(0.121)	0.031	0.003
271	22.58	0.07	0.034	(0.120)	0.031	0.003
272	22.67	0.07	0.034	(0.120)	0.031	0.003
273	22.75	0.07	0.034	(0.120)	0.031	0.003
274	22.83	0.07	0.034	(0.119)	0.031	0.003
275	22.92	0.07	0.034	(0.119)	0.031	0.003
276	23.00	0.07	0.034	(0.119)	0.031	0.003
277	23.08	0.07	0.034	(0.118)	0.031	0.003
278	23.17	0.07	0.034	(0.118)	0.031	0.003
279	23.25	0.07	0.034	(0.118)	0.031	0.003
280	23.33	0.07	0.034	(0.118)	0.031	0.003
281	23.42	0.07	0.034	(0.117)	0.031	0.003
282	23.50	0.07	0.034	(0.117)	0.031	0.003
283	23.58	0.07	0.034	(0.117)	0.031	0.003
284	23.67	0.07	0.034	(0.117)	0.031	0.003
285	23.75	0.07	0.034	(0.117)	0.031	0.003
286	23.83	0.07	0.034	(0.116)	0.031	0.003
287	23.92	0.07	0.034	(0.116)	0.031	0.003
288	24.00	0.07	0.034	(0.116)	0.031	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 16.9

Flood volume = Effective rainfall 1.41(In)
 times area 32.7(Ac.)/[(In)/(Ft.)] = 3.8(Ac.Ft)
 Total soil loss = 2.89(In)
 Total soil loss = 7.876(Ac.Ft)
 Total rainfall = 4.30(In)
 Flood volume = 167132.0 Cubic Feet
 Total soil loss = 343062.6 Cubic Feet

 Peak flow rate of this hydrograph = 12.405(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0001	0.01	Q				
0+10	0.0005	0.06	Q				
0+15	0.0011	0.08	Q				
0+20	0.0018	0.10	Q				
0+25	0.0027	0.13	Q				
0+30	0.0037	0.15	Q				
0+35	0.0047	0.15	Q				
0+40	0.0058	0.16	Q				
0+45	0.0070	0.16	Q				
0+50	0.0082	0.17	Q				
0+55	0.0095	0.20	Q				
1+ 0	0.0110	0.21	Q				
1+ 5	0.0124	0.21	Q				
1+10	0.0137	0.19	Q				
1+15	0.0150	0.18	Q				
1+20	0.0162	0.18	Q				
1+25	0.0174	0.17	Q				
1+30	0.0186	0.17	Q				
1+35	0.0198	0.17	Q				
1+40	0.0209	0.17	Q				
1+45	0.0221	0.17	Q				
1+50	0.0233	0.18	Q				
1+55	0.0247	0.20	Q				
2+ 0	0.0262	0.21	Q				
2+ 5	0.0277	0.22	Q				
2+10	0.0292	0.22	Q				
2+15	0.0307	0.22	Q				
2+20	0.0323	0.22	Q				
2+25	0.0338	0.22	Q				
2+30	0.0354	0.23	Q				
2+35	0.0370	0.23	Q				
2+40	0.0387	0.26	Q				
2+45	0.0406	0.27	Q				
2+50	0.0425	0.27	Q				
2+55	0.0444	0.28	Q				
3+ 0	0.0463	0.28	Q				
3+ 5	0.0482	0.28	Q				
3+10	0.0502	0.28	Q				

3+15	0.0521	0.28	Q
3+20	0.0541	0.28	Q
3+25	0.0560	0.28	Q
3+30	0.0580	0.28	Q
3+35	0.0599	0.28	Q
3+40	0.0619	0.28	Q
3+45	0.0638	0.28	Q
3+50	0.0658	0.29	Q
3+55	0.0680	0.31	Q
4+ 0	0.0702	0.33	Q
4+ 5	0.0725	0.33	Q
4+10	0.0748	0.33	Q
4+15	0.0771	0.34	Q
4+20	0.0795	0.34	Q
4+25	0.0820	0.37	Q
4+30	0.0846	0.38	Q
4+35	0.0873	0.39	Q
4+40	0.0900	0.39	Q
4+45	0.0927	0.39	Q
4+50	0.0954	0.40	Q
4+55	0.0984	0.42	QV
5+ 0	0.1014	0.44	QV
5+ 5	0.1043	0.43	QV
5+10	0.1070	0.39	QV
5+15	0.1095	0.36	QV
5+20	0.1120	0.36	QV
5+25	0.1146	0.38	QV
5+30	0.1173	0.39	QV
5+35	0.1201	0.40	QV
5+40	0.1230	0.42	QV
5+45	0.1260	0.44	QV
5+50	0.1291	0.44	QV
5+55	0.1321	0.45	QV
6+ 0	0.1352	0.45	QV
6+ 5	0.1383	0.46	QV
6+10	0.1417	0.48	QV
6+15	0.1451	0.49	QV
6+20	0.1485	0.50	Q
6+25	0.1520	0.50	Q
6+30	0.1555	0.51	Q
6+35	0.1590	0.51	Q
6+40	0.1627	0.54	Q
6+45	0.1665	0.55	Q
6+50	0.1703	0.56	Q
6+55	0.1742	0.56	Q
7+ 0	0.1781	0.56	Q
7+ 5	0.1819	0.56	Q
7+10	0.1858	0.56	Q
7+15	0.1897	0.57	Q
7+20	0.1937	0.57	QV
7+25	0.1978	0.60	QV
7+30	0.2020	0.61	QV
7+35	0.2063	0.62	QV
7+40	0.2107	0.65	QV
7+45	0.2153	0.66	QV
7+50	0.2199	0.67	QV
7+55	0.2247	0.70	QV

8+ 0	0.2297	0.72	QV				
8+ 5	0.2347	0.74	QV				
8+10	0.2402	0.79	QV				
8+15	0.2458	0.82	QV				
8+20	0.2515	0.83	QV				
8+25	0.2572	0.84	QV				
8+30	0.2630	0.84	QV				
8+35	0.2689	0.85	QV				
8+40	0.2749	0.88	QV				
8+45	0.2810	0.89	QV				
8+50	0.2873	0.90	QV				
8+55	0.2937	0.94	Q V				
9+ 0	0.3005	0.98	Q V				
9+ 5	0.3084	1.14	QV				
9+10	0.3197	1.65	Q				
9+15	0.3331	1.94	Q				
9+20	0.3479	2.14	VQ				
9+25	0.3649	2.48	VQ				
9+30	0.3834	2.69	V Q				
9+35	0.4031	2.87	VQ				
9+40	0.4251	3.19	V Q				
9+45	0.4485	3.39	V Q				
9+50	0.4730	3.57	V Q				
9+55	0.4998	3.89	V Q				
10+ 0	0.5280	4.09	V Q				
10+ 5	0.5542	3.81	V Q				
10+10	0.5709	2.43	QV				
10+15	0.5824	1.67	Q V				
10+20	0.5920	1.39	Q V				
10+25	0.6004	1.21	Q V				
10+30	0.6080	1.10	Q V				
10+35	0.6170	1.32	Q V				
10+40	0.6332	2.35	Q V				
10+45	0.6534	2.93	QV				
10+50	0.6752	3.16	QV				
10+55	0.6980	3.31	QV				
11+ 0	0.7216	3.42	QV				
11+ 5	0.7454	3.46	QV				
11+10	0.7683	3.31	Q V				
11+15	0.7907	3.26	Q V				
11+20	0.8132	3.27	Q V				
11+25	0.8359	3.29	Q V				
11+30	0.8588	3.32	Q V				
11+35	0.8809	3.22	Q V				
11+40	0.9001	2.78	Q V				
11+45	0.9177	2.56	Q V				
11+50	0.9353	2.55	Q V				
11+55	0.9542	2.75	Q V				
12+ 0	0.9740	2.87	Q V				
12+ 5	0.9972	3.37	Q V				
12+10	1.0320	5.04	Q				
12+15	1.0731	5.98	Q				
12+20	1.1175	6.43	VQ				
12+25	1.1651	6.92	VQ				
12+30	1.2148	7.22	V Q				
12+35	1.2667	7.53	V Q				
12+40	1.3228	8.14	V Q				

12+45	1.3814	8.51				V	Q				
12+50	1.4417	8.75				V	Q				
12+55	1.5045	9.12				V	Q				
13+ 0	1.5689	9.35				V	Q				
13+ 5	1.6363	9.78				V	Q				
13+10	1.7122	11.03				V		Q			
13+15	1.7931	11.74				V		Q			
13+20	1.8761	12.05				V		Q			
13+25	1.9606	12.26				V		Q			
13+30	2.0460	12.41				V		Q			
13+35	2.1274	11.82				V	Q				
13+40	2.1919	9.36					V				
13+45	2.2472	8.03					V				
13+50	2.2991	7.53					V				
13+55	2.3490	7.25					V				
14+ 0	2.3977	7.08					V				
14+ 5	2.4474	7.21					V				
14+10	2.5028	8.05					V				
14+15	2.5615	8.52					V				
14+20	2.6209	8.63					V				
14+25	2.6796	8.51					V				
14+30	2.7379	8.46					V				
14+35	2.7964	8.50					V				
14+40	2.8552	8.54					V				
14+45	2.9144	8.59					V				
14+50	2.9733	8.56					V				
14+55	3.0310	8.37					V				
15+ 0	3.0879	8.27					V				
15+ 5	3.1443	8.19					V				
15+10	3.1991	7.95					V				
15+15	3.2530	7.83					V				
15+20	3.3062	7.73					V				
15+25	3.3578	7.49					V				
15+30	3.4086	7.37					V				
15+35	3.4573	7.08					V				
15+40	3.4996	6.13					V				
15+45	3.5383	5.62					V				
15+50	3.5757	5.43					V				
15+55	3.6123	5.32					V				
16+ 0	3.6486	5.26					V				
16+ 5	3.6809	4.69					V				
16+10	3.6991	2.65					V				
16+15	3.7095	1.51					V				
16+20	3.7168	1.06					V				
16+25	3.7222	0.78					V				
16+30	3.7263	0.60					V				
16+35	3.7296	0.48					V				
16+40	3.7321	0.36					V				
16+45	3.7340	0.29					V				
16+50	3.7357	0.24					V				
16+55	3.7371	0.20					V				
17+ 0	3.7383	0.17					V				
17+ 5	3.7395	0.19					V				
17+10	3.7411	0.23					V				
17+15	3.7429	0.26					V				
17+20	3.7447	0.27					V				
17+25	3.7466	0.27					V				

17+30	3.7485	0.27	Q				V
17+35	3.7504	0.28	Q				V
17+40	3.7523	0.28	Q				V
17+45	3.7543	0.28	Q				V
17+50	3.7562	0.28	Q				V
17+55	3.7579	0.25	Q				V
18+ 0	3.7596	0.24	Q				V
18+ 5	3.7612	0.24	Q				V
18+10	3.7628	0.23	Q				V
18+15	3.7644	0.23	Q				V
18+20	3.7660	0.23	Q				V
18+25	3.7675	0.23	Q				V
18+30	3.7691	0.23	Q				V
18+35	3.7706	0.22	Q				V
18+40	3.7720	0.20	Q				V
18+45	3.7733	0.18	Q				V
18+50	3.7745	0.17	Q				V
18+55	3.7755	0.15	Q				V
19+ 0	3.7764	0.13	Q				V
19+ 5	3.7773	0.13	Q				V
19+10	3.7783	0.15	Q				V
19+15	3.7794	0.16	Q				V
19+20	3.7806	0.17	Q				V
19+25	3.7820	0.20	Q				V
19+30	3.7834	0.21	Q				V
19+35	3.7848	0.21	Q				V
19+40	3.7861	0.19	Q				V
19+45	3.7874	0.18	Q				V
19+50	3.7885	0.17	Q				V
19+55	3.7895	0.14	Q				V
20+ 0	3.7904	0.13	Q				V
20+ 5	3.7913	0.13	Q				V
20+10	3.7924	0.15	Q				V
20+15	3.7935	0.16	Q				V
20+20	3.7946	0.16	Q				V
20+25	3.7958	0.17	Q				V
20+30	3.7969	0.17	Q				V
20+35	3.7981	0.17	Q				V
20+40	3.7992	0.17	Q				V
20+45	3.8004	0.17	Q				V
20+50	3.8015	0.16	Q				V
20+55	3.8025	0.14	Q				V
21+ 0	3.8034	0.13	Q				V
21+ 5	3.8043	0.13	Q				V
21+10	3.8053	0.15	Q				V
21+15	3.8064	0.16	Q				V
21+20	3.8075	0.16	Q				V
21+25	3.8084	0.14	Q				V
21+30	3.8093	0.12	Q				V
21+35	3.8101	0.13	Q				V
21+40	3.8112	0.15	Q				V
21+45	3.8123	0.16	Q				V
21+50	3.8133	0.16	Q				V
21+55	3.8143	0.14	Q				V
22+ 0	3.8151	0.12	Q				V
22+ 5	3.8160	0.13	Q				V
22+10	3.8170	0.15	Q				V

22+15	3.8181	0.16	Q				V
22+20	3.8192	0.16	Q				V
22+25	3.8201	0.14	Q				V
22+30	3.8210	0.12	Q				V
22+35	3.8218	0.12	Q				V
22+40	3.8226	0.12	Q				V
22+45	3.8234	0.12	Q				V
22+50	3.8242	0.12	Q				V
22+55	3.8250	0.12	Q				V
23+ 0	3.8258	0.11	Q				V
23+ 5	3.8266	0.11	Q				V
23+10	3.8274	0.11	Q				V
23+15	3.8282	0.11	Q				V
23+20	3.8289	0.11	Q				V
23+25	3.8297	0.11	Q				V
23+30	3.8305	0.11	Q				V
23+35	3.8313	0.11	Q				V
23+40	3.8321	0.11	Q				V
23+45	3.8328	0.11	Q				V
23+50	3.8336	0.11	Q				V
23+55	3.8344	0.11	Q				V
24+ 0	3.8352	0.11	Q				V
24+ 5	3.8359	0.10	Q				V
24+10	3.8363	0.05	Q				V
24+15	3.8364	0.03	Q				V
24+20	3.8366	0.02	Q				V
24+25	3.8367	0.01	Q				V
24+30	3.8367	0.01	Q				V
24+35	3.8368	0.01	Q				V
24+40	3.8368	0.00	Q				V
24+45	3.8368	0.00	Q				V
24+50	3.8368	0.00	Q				V
24+55	3.8368	0.00	Q				V

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00(Ft.)
Length along longest watercourse measured to centroid = 661.00(Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50(Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
3.90	0.58	2.26

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
3.90	1.45	5.65

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 3.900 81.00 0.000
 Total Area Entered = 3.90(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

 Slope of intensity-duration curve for a 1 hour storm =0.4800

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 0.083	135.459	29.490	1.159
2 0.167	270.918	47.989	1.886
3 0.250	406.377	12.112	0.476
4 0.333	541.836	5.367	0.211
5 0.417	677.295	2.915	0.115
6 0.500	812.755	2.128	0.084
		Sum = 100.000	Sum= 3.930

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 0.08	4.40	0.306	(0.422)	0.276	0.031
2 0.17	4.50	0.313	(0.422)	0.282	0.031
3 0.25	5.40	0.376	(0.422)	0.338	0.038
4 0.33	5.40	0.376	(0.422)	0.338	0.038
5 0.42	5.70	0.397	(0.422)	0.357	0.040
6 0.50	6.40	0.445	(0.422)	0.401	0.045
7 0.58	7.90	0.550	0.422	(0.495)	0.127
8 0.67	9.10	0.633	0.422	(0.570)	0.211
9 0.75	12.80	0.891	0.422	(0.802)	0.468

10	0.83	25.60	1.782	0.422	(1.604)	1.359
11	0.92	7.90	0.550	0.422	(0.495)	0.127
12	1.00	4.90	0.341	(0.422)	0.307	0.034

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.5

Flood volume = Effective rainfall 0.21(In)

times area 3.9(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)

Total soil loss = 0.37(In)

Total soil loss = 0.119(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 3006.6 Cubic Feet

Total soil loss = 5204.1 Cubic Feet

Peak flow rate of this hydrograph = 2.999(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002		0.04	Q				
0+10	0.0009		0.09	Q				
0+15	0.0017		0.12	Q				
0+20	0.0026		0.14	QV				
0+25	0.0036		0.14	Q V				
0+30	0.0047		0.16	Q V				
0+35	0.0066		0.27	Q V				
0+40	0.0101		0.52	Q V				
0+45	0.0172		1.02	Q	V			
0+50	0.0350		2.60		Q	V		
0+55	0.0557		3.00		Q		V	
1+ 0	0.0630		1.06	Q			V	V
1+ 5	0.0663		0.48	Q				V
1+10	0.0680		0.24	Q				V
1+15	0.0689		0.14	Q				V
1+20	0.0690		0.01	Q				V
1+25	0.0690		0.00	Q				V



Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 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]
3.90	0.98	3.82

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	2.48	9.67

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 0.980(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 0.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.900	81.00	0.000
Total Area Entered = 3.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum =		100.000	Sum= 3.930

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)		Effective (In/Hr)
			Max	Low	
1	0.08	1.30	0.153	(0.422)	0.138
2	0.17	1.30	0.153	(0.422)	0.138
3	0.25	1.10	0.129	(0.422)	0.116
4	0.33	1.50	0.176	(0.422)	0.159
5	0.42	1.50	0.176	(0.422)	0.159
6	0.50	1.80	0.212	(0.422)	0.191
7	0.58	1.50	0.176	(0.422)	0.159
8	0.67	1.80	0.212	(0.422)	0.191
9	0.75	1.80	0.212	(0.422)	0.191
10	0.83	1.50	0.176	(0.422)	0.159
11	0.92	1.60	0.188	(0.422)	0.169

12	1.00	1.80	0.212	(0.422)	0.191	0.021
13	1.08	2.20	0.259	(0.422)	0.233	0.026
14	1.17	2.20	0.259	(0.422)	0.233	0.026
15	1.25	2.20	0.259	(0.422)	0.233	0.026
16	1.33	2.00	0.235	(0.422)	0.212	0.024
17	1.42	2.60	0.306	(0.422)	0.275	0.031
18	1.50	2.70	0.318	(0.422)	0.286	0.032
19	1.58	2.40	0.282	(0.422)	0.254	0.028
20	1.67	2.70	0.318	(0.422)	0.286	0.032
21	1.75	3.30	0.388	(0.422)	0.349	0.039
22	1.83	3.10	0.365	(0.422)	0.328	0.036
23	1.92	2.90	0.341	(0.422)	0.307	0.034
24	2.00	3.00	0.353	(0.422)	0.318	0.035
25	2.08	3.10	0.365	(0.422)	0.328	0.036
26	2.17	4.20	0.494	0.422 (0.445)	0.071	0.071
27	2.25	5.00	0.588	0.422 (0.529)	0.166	0.166
28	2.33	3.50	0.412	(0.422)	0.370	0.041
29	2.42	6.80	0.800	0.422 (0.720)	0.377	0.377
30	2.50	7.30	0.858	0.422 (0.773)	0.436	0.436
31	2.58	8.20	0.964	0.422 (0.868)	0.542	0.542
32	2.67	5.90	0.694	0.422 (0.624)	0.271	0.271
33	2.75	2.00	0.235	(0.422)	0.212	0.024
34	2.83	1.80	0.212	(0.422)	0.191	0.021
35	2.92	1.80	0.212	(0.422)	0.191	0.021
36	3.00	0.60	0.071	(0.422)	0.064	0.007

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.6

Flood volume = Effective rainfall 0.22(In)

times area 3.9(Ac.)/[(In)/(Ft.)) = 0.1(Ac.Ft)

Total soil loss = 0.76(In)

Total soil loss = 0.248(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 3066.7 Cubic Feet

Total soil loss = 10806.9 Cubic Feet

Peak flow rate of this hydrograph = 1.664(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001	0.02	Q				
0+10	0.0004	0.05	Q				
0+15	0.0008	0.05	Q				
0+20	0.0012	0.06	Q				
0+25	0.0016	0.06	Q				
0+30	0.0021	0.07	QV				
0+35	0.0026	0.08	QV				
0+40	0.0032	0.07	QV				
0+45	0.0037	0.08	Q V				
0+50	0.0042	0.08	Q V				
0+55	0.0048	0.07	Q V				

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B3Nat62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	1.38	5.38

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	3.48	13.57

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)
 Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.900	81.00	0.000
Total Area Entered = 3.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)

Soil loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum =		100.000	Sum= 3.930

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)		Effective (In/Hr)
			Max	Low	
1	0.08	0.50	0.083	(0.422)	0.075
2	0.17	0.60	0.099	(0.422)	0.089
3	0.25	0.60	0.099	(0.422)	0.089
4	0.33	0.60	0.099	(0.422)	0.089
5	0.42	0.60	0.099	(0.422)	0.089
6	0.50	0.70	0.116	(0.422)	0.104
7	0.58	0.70	0.116	(0.422)	0.104
8	0.67	0.70	0.116	(0.422)	0.104
9	0.75	0.70	0.116	(0.422)	0.104
10	0.83	0.70	0.116	(0.422)	0.104
11	0.92	0.70	0.116	(0.422)	0.104

12	1.00	0.80	0.132	(0.422)	0.119	0.013
13	1.08	0.80	0.132	(0.422)	0.119	0.013
14	1.17	0.80	0.132	(0.422)	0.119	0.013
15	1.25	0.80	0.132	(0.422)	0.119	0.013
16	1.33	0.80	0.132	(0.422)	0.119	0.013
17	1.42	0.80	0.132	(0.422)	0.119	0.013
18	1.50	0.80	0.132	(0.422)	0.119	0.013
19	1.58	0.80	0.132	(0.422)	0.119	0.013
20	1.67	0.80	0.132	(0.422)	0.119	0.013
21	1.75	0.80	0.132	(0.422)	0.119	0.013
22	1.83	0.80	0.132	(0.422)	0.119	0.013
23	1.92	0.80	0.132	(0.422)	0.119	0.013
24	2.00	0.90	0.149	(0.422)	0.134	0.015
25	2.08	0.80	0.132	(0.422)	0.119	0.013
26	2.17	0.90	0.149	(0.422)	0.134	0.015
27	2.25	0.90	0.149	(0.422)	0.134	0.015
28	2.33	0.90	0.149	(0.422)	0.134	0.015
29	2.42	0.90	0.149	(0.422)	0.134	0.015
30	2.50	0.90	0.149	(0.422)	0.134	0.015
31	2.58	0.90	0.149	(0.422)	0.134	0.015
32	2.67	0.90	0.149	(0.422)	0.134	0.015
33	2.75	1.00	0.166	(0.422)	0.149	0.017
34	2.83	1.00	0.166	(0.422)	0.149	0.017
35	2.92	1.00	0.166	(0.422)	0.149	0.017
36	3.00	1.00	0.166	(0.422)	0.149	0.017
37	3.08	1.00	0.166	(0.422)	0.149	0.017
38	3.17	1.10	0.182	(0.422)	0.164	0.018
39	3.25	1.10	0.182	(0.422)	0.164	0.018
40	3.33	1.10	0.182	(0.422)	0.164	0.018
41	3.42	1.20	0.199	(0.422)	0.179	0.020
42	3.50	1.30	0.215	(0.422)	0.194	0.022
43	3.58	1.40	0.232	(0.422)	0.209	0.023
44	3.67	1.40	0.232	(0.422)	0.209	0.023
45	3.75	1.50	0.248	(0.422)	0.224	0.025
46	3.83	1.50	0.248	(0.422)	0.224	0.025
47	3.92	1.60	0.265	(0.422)	0.238	0.026
48	4.00	1.60	0.265	(0.422)	0.238	0.026
49	4.08	1.70	0.282	(0.422)	0.253	0.028
50	4.17	1.80	0.298	(0.422)	0.268	0.030
51	4.25	1.90	0.315	(0.422)	0.283	0.031
52	4.33	2.00	0.331	(0.422)	0.298	0.033
53	4.42	2.10	0.348	(0.422)	0.313	0.035
54	4.50	2.10	0.348	(0.422)	0.313	0.035
55	4.58	2.20	0.364	(0.422)	0.328	0.036
56	4.67	2.30	0.381	(0.422)	0.343	0.038
57	4.75	2.40	0.397	(0.422)	0.358	0.040
58	4.83	2.40	0.397	(0.422)	0.358	0.040
59	4.92	2.50	0.414	(0.422)	0.373	0.041
60	5.00	2.60	0.431	(0.422)	0.387	0.043
61	5.08	3.10	0.513	0.422 (0.462)		0.091
62	5.17	3.60	0.596	0.422 (0.537)		0.174
63	5.25	3.90	0.646	0.422 (0.581)		0.223
64	5.33	4.20	0.696	0.422 (0.626)		0.273
65	5.42	4.70	0.778	0.422 (0.700)		0.356
66	5.50	5.60	0.927	0.422 (0.835)		0.505
67	5.58	1.90	0.315	(0.422)	0.283	0.031
68	5.67	0.90	0.149	(0.422)	0.134	0.015

69	5.75	0.60	0.099	(0.422)	0.089	0.010
70	5.83	0.50	0.083	(0.422)	0.075	0.008
71	5.92	0.30	0.050	(0.422)	0.045	0.005
72	6.00	0.20	0.033	(0.422)	0.030	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.9

Flood volume = Effective rainfall 0.24(In)

times area 3.9(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)

Total soil loss = 1.14(In)

Total soil loss = 0.371(Ac.Ft)

Total rainfall = 1.38(In)

Flood volume = 3376.4 Cubic Feet

Total soil loss = 16160.0 Cubic Feet

Peak flow rate of this hydrograph = 1.462(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0001		0.01	Q				
0+10	0.0003		0.03	Q				
0+15	0.0005		0.03	Q				
0+20	0.0007		0.04	Q				
0+25	0.0010		0.04	Q				
0+30	0.0013		0.04	Q				
0+35	0.0016		0.04	Q				
0+40	0.0019		0.04	Q				
0+45	0.0022		0.05	QV				
0+50	0.0025		0.05	QV				
0+55	0.0028		0.05	QV				
1+ 0	0.0032		0.05	QV				
1+ 5	0.0035		0.05	QV				
1+10	0.0039		0.05	QV				
1+15	0.0042		0.05	Q V				
1+20	0.0046		0.05	Q V				
1+25	0.0049		0.05	Q V				
1+30	0.0053		0.05	Q V				
1+35	0.0057		0.05	Q V				
1+40	0.0060		0.05	Q V				
1+45	0.0064		0.05	Q V				
1+50	0.0067		0.05	Q V				
1+55	0.0071		0.05	Q V				
2+ 0	0.0075		0.05	Q V				
2+ 5	0.0078		0.06	Q V				
2+10	0.0082		0.05	Q V				
2+15	0.0086		0.06	Q V				
2+20	0.0090		0.06	Q V				
2+25	0.0094		0.06	Q V				
2+30	0.0098		0.06	Q V				
2+35	0.0102		0.06	Q V				
2+40	0.0106		0.06	Q V				

Unit Hydrograph Analysis

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 08/22/13 File: 32786B3Nat242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00(Ft.)
Length along longest watercourse measured to centroid = 661.00(Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50(Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 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]
3.90	2.48	9.67

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
3.90	6.90	26.91

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 2.480(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 3.900 81.00 0.000
 Total Area Entered = 3.90(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422
 Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum =		100.000	Sum= 3.930

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	0.08	0.07	(0.749) 0.018	0.002
2	0.17	0.07	(0.746) 0.018	0.002
3	0.25	0.07	(0.743) 0.018	0.002
4	0.33	0.10	(0.740) 0.027	0.003
5	0.42	0.10	(0.737) 0.027	0.003
6	0.50	0.10	(0.735) 0.027	0.003
7	0.58	0.10	(0.732) 0.027	0.003
8	0.67	0.10	(0.729) 0.027	0.003
9	0.75	0.10	(0.726) 0.027	0.003
10	0.83	0.13	(0.723) 0.036	0.004
11	0.92	0.13	(0.720) 0.036	0.004

12	1.00	0.13	0.040	(0.717)	0.036	0.004
13	1.08	0.10	0.030	(0.715)	0.027	0.003
14	1.17	0.10	0.030	(0.712)	0.027	0.003
15	1.25	0.10	0.030	(0.709)	0.027	0.003
16	1.33	0.10	0.030	(0.706)	0.027	0.003
17	1.42	0.10	0.030	(0.703)	0.027	0.003
18	1.50	0.10	0.030	(0.700)	0.027	0.003
19	1.58	0.10	0.030	(0.698)	0.027	0.003
20	1.67	0.10	0.030	(0.695)	0.027	0.003
21	1.75	0.10	0.030	(0.692)	0.027	0.003
22	1.83	0.13	0.040	(0.689)	0.036	0.004
23	1.92	0.13	0.040	(0.687)	0.036	0.004
24	2.00	0.13	0.040	(0.684)	0.036	0.004
25	2.08	0.13	0.040	(0.681)	0.036	0.004
26	2.17	0.13	0.040	(0.678)	0.036	0.004
27	2.25	0.13	0.040	(0.675)	0.036	0.004
28	2.33	0.13	0.040	(0.673)	0.036	0.004
29	2.42	0.13	0.040	(0.670)	0.036	0.004
30	2.50	0.13	0.040	(0.667)	0.036	0.004
31	2.58	0.17	0.050	(0.665)	0.045	0.005
32	2.67	0.17	0.050	(0.662)	0.045	0.005
33	2.75	0.17	0.050	(0.659)	0.045	0.005
34	2.83	0.17	0.050	(0.656)	0.045	0.005
35	2.92	0.17	0.050	(0.654)	0.045	0.005
36	3.00	0.17	0.050	(0.651)	0.045	0.005
37	3.08	0.17	0.050	(0.648)	0.045	0.005
38	3.17	0.17	0.050	(0.646)	0.045	0.005
39	3.25	0.17	0.050	(0.643)	0.045	0.005
40	3.33	0.17	0.050	(0.640)	0.045	0.005
41	3.42	0.17	0.050	(0.638)	0.045	0.005
42	3.50	0.17	0.050	(0.635)	0.045	0.005
43	3.58	0.17	0.050	(0.632)	0.045	0.005
44	3.67	0.17	0.050	(0.630)	0.045	0.005
45	3.75	0.17	0.050	(0.627)	0.045	0.005
46	3.83	0.20	0.060	(0.624)	0.054	0.006
47	3.92	0.20	0.060	(0.622)	0.054	0.006
48	4.00	0.20	0.060	(0.619)	0.054	0.006
49	4.08	0.20	0.060	(0.616)	0.054	0.006
50	4.17	0.20	0.060	(0.614)	0.054	0.006
51	4.25	0.20	0.060	(0.611)	0.054	0.006
52	4.33	0.23	0.069	(0.609)	0.062	0.007
53	4.42	0.23	0.069	(0.606)	0.062	0.007
54	4.50	0.23	0.069	(0.603)	0.062	0.007
55	4.58	0.23	0.069	(0.601)	0.062	0.007
56	4.67	0.23	0.069	(0.598)	0.062	0.007
57	4.75	0.23	0.069	(0.596)	0.062	0.007
58	4.83	0.27	0.079	(0.593)	0.071	0.008
59	4.92	0.27	0.079	(0.590)	0.071	0.008
60	5.00	0.27	0.079	(0.588)	0.071	0.008
61	5.08	0.20	0.060	(0.585)	0.054	0.006
62	5.17	0.20	0.060	(0.583)	0.054	0.006
63	5.25	0.20	0.060	(0.580)	0.054	0.006
64	5.33	0.23	0.069	(0.578)	0.062	0.007
65	5.42	0.23	0.069	(0.575)	0.062	0.007
66	5.50	0.23	0.069	(0.573)	0.062	0.007
67	5.58	0.27	0.079	(0.570)	0.071	0.008
68	5.67	0.27	0.079	(0.568)	0.071	0.008

69	5.75	0.27	0.079	(0.565)	0.071	0.008
70	5.83	0.27	0.079	(0.563)	0.071	0.008
71	5.92	0.27	0.079	(0.560)	0.071	0.008
72	6.00	0.27	0.079	(0.558)	0.071	0.008
73	6.08	0.30	0.089	(0.555)	0.080	0.009
74	6.17	0.30	0.089	(0.553)	0.080	0.009
75	6.25	0.30	0.089	(0.550)	0.080	0.009
76	6.33	0.30	0.089	(0.548)	0.080	0.009
77	6.42	0.30	0.089	(0.545)	0.080	0.009
78	6.50	0.30	0.089	(0.543)	0.080	0.009
79	6.58	0.33	0.099	(0.540)	0.089	0.010
80	6.67	0.33	0.099	(0.538)	0.089	0.010
81	6.75	0.33	0.099	(0.536)	0.089	0.010
82	6.83	0.33	0.099	(0.533)	0.089	0.010
83	6.92	0.33	0.099	(0.531)	0.089	0.010
84	7.00	0.33	0.099	(0.528)	0.089	0.010
85	7.08	0.33	0.099	(0.526)	0.089	0.010
86	7.17	0.33	0.099	(0.524)	0.089	0.010
87	7.25	0.33	0.099	(0.521)	0.089	0.010
88	7.33	0.37	0.109	(0.519)	0.098	0.011
89	7.42	0.37	0.109	(0.516)	0.098	0.011
90	7.50	0.37	0.109	(0.514)	0.098	0.011
91	7.58	0.40	0.119	(0.512)	0.107	0.012
92	7.67	0.40	0.119	(0.509)	0.107	0.012
93	7.75	0.40	0.119	(0.507)	0.107	0.012
94	7.83	0.43	0.129	(0.505)	0.116	0.013
95	7.92	0.43	0.129	(0.502)	0.116	0.013
96	8.00	0.43	0.129	(0.500)	0.116	0.013
97	8.08	0.50	0.149	(0.498)	0.134	0.015
98	8.17	0.50	0.149	(0.495)	0.134	0.015
99	8.25	0.50	0.149	(0.493)	0.134	0.015
100	8.33	0.50	0.149	(0.491)	0.134	0.015
101	8.42	0.50	0.149	(0.488)	0.134	0.015
102	8.50	0.50	0.149	(0.486)	0.134	0.015
103	8.58	0.53	0.159	(0.484)	0.143	0.016
104	8.67	0.53	0.159	(0.482)	0.143	0.016
105	8.75	0.53	0.159	(0.479)	0.143	0.016
106	8.83	0.57	0.169	(0.477)	0.152	0.017
107	8.92	0.57	0.169	(0.475)	0.152	0.017
108	9.00	0.57	0.169	(0.473)	0.152	0.017
109	9.08	0.63	0.188	(0.470)	0.170	0.019
110	9.17	0.63	0.188	(0.468)	0.170	0.019
111	9.25	0.63	0.188	(0.466)	0.170	0.019
112	9.33	0.67	0.198	(0.464)	0.179	0.020
113	9.42	0.67	0.198	(0.461)	0.179	0.020
114	9.50	0.67	0.198	(0.459)	0.179	0.020
115	9.58	0.70	0.208	(0.457)	0.187	0.021
116	9.67	0.70	0.208	(0.455)	0.187	0.021
117	9.75	0.70	0.208	(0.453)	0.187	0.021
118	9.83	0.73	0.218	(0.450)	0.196	0.022
119	9.92	0.73	0.218	(0.448)	0.196	0.022
120	10.00	0.73	0.218	(0.446)	0.196	0.022
121	10.08	0.50	0.149	(0.444)	0.134	0.015
122	10.17	0.50	0.149	(0.442)	0.134	0.015
123	10.25	0.50	0.149	(0.440)	0.134	0.015
124	10.33	0.50	0.149	(0.438)	0.134	0.015
125	10.42	0.50	0.149	(0.435)	0.134	0.015

126	10.50	0.50	0.149	(0.433)	0.134	0.015
127	10.58	0.67	0.198	(0.431)	0.179	0.020
128	10.67	0.67	0.198	(0.429)	0.179	0.020
129	10.75	0.67	0.198	(0.427)	0.179	0.020
130	10.83	0.67	0.198	(0.425)	0.179	0.020
131	10.92	0.67	0.198	(0.423)	0.179	0.020
132	11.00	0.67	0.198	(0.421)	0.179	0.020
133	11.08	0.63	0.188	(0.419)	0.170	0.019
134	11.17	0.63	0.188	(0.417)	0.170	0.019
135	11.25	0.63	0.188	(0.415)	0.170	0.019
136	11.33	0.63	0.188	(0.412)	0.170	0.019
137	11.42	0.63	0.188	(0.410)	0.170	0.019
138	11.50	0.63	0.188	(0.408)	0.170	0.019
139	11.58	0.57	0.169	(0.406)	0.152	0.017
140	11.67	0.57	0.169	(0.404)	0.152	0.017
141	11.75	0.57	0.169	(0.402)	0.152	0.017
142	11.83	0.60	0.179	(0.400)	0.161	0.018
143	11.92	0.60	0.179	(0.398)	0.161	0.018
144	12.00	0.60	0.179	(0.396)	0.161	0.018
145	12.08	0.83	0.248	(0.394)	0.223	0.025
146	12.17	0.83	0.248	(0.392)	0.223	0.025
147	12.25	0.83	0.248	(0.390)	0.223	0.025
148	12.33	0.87	0.258	(0.388)	0.232	0.026
149	12.42	0.87	0.258	(0.387)	0.232	0.026
150	12.50	0.87	0.258	(0.385)	0.232	0.026
151	12.58	0.93	0.278	(0.383)	0.250	0.028
152	12.67	0.93	0.278	(0.381)	0.250	0.028
153	12.75	0.93	0.278	(0.379)	0.250	0.028
154	12.83	0.97	0.288	(0.377)	0.259	0.029
155	12.92	0.97	0.288	(0.375)	0.259	0.029
156	13.00	0.97	0.288	(0.373)	0.259	0.029
157	13.08	1.13	0.337	(0.371)	0.304	0.034
158	13.17	1.13	0.337	(0.369)	0.304	0.034
159	13.25	1.13	0.337	(0.367)	0.304	0.034
160	13.33	1.13	0.337	(0.366)	0.304	0.034
161	13.42	1.13	0.337	(0.364)	0.304	0.034
162	13.50	1.13	0.337	(0.362)	0.304	0.034
163	13.58	0.77	0.228	(0.360)	0.205	0.023
164	13.67	0.77	0.228	(0.358)	0.205	0.023
165	13.75	0.77	0.228	(0.356)	0.205	0.023
166	13.83	0.77	0.228	(0.355)	0.205	0.023
167	13.92	0.77	0.228	(0.353)	0.205	0.023
168	14.00	0.77	0.228	(0.351)	0.205	0.023
169	14.08	0.90	0.268	(0.349)	0.241	0.027
170	14.17	0.90	0.268	(0.347)	0.241	0.027
171	14.25	0.90	0.268	(0.346)	0.241	0.027
172	14.33	0.87	0.258	(0.344)	0.232	0.026
173	14.42	0.87	0.258	(0.342)	0.232	0.026
174	14.50	0.87	0.258	(0.340)	0.232	0.026
175	14.58	0.87	0.258	(0.339)	0.232	0.026
176	14.67	0.87	0.258	(0.337)	0.232	0.026
177	14.75	0.87	0.258	(0.335)	0.232	0.026
178	14.83	0.83	0.248	(0.333)	0.223	0.025
179	14.92	0.83	0.248	(0.332)	0.223	0.025
180	15.00	0.83	0.248	(0.330)	0.223	0.025
181	15.08	0.80	0.238	(0.328)	0.214	0.024
182	15.17	0.80	0.238	(0.327)	0.214	0.024

183	15.25	0.80	0.238	(0.325)	0.214	0.024
184	15.33	0.77	0.228	(0.323)	0.205	0.023
185	15.42	0.77	0.228	(0.322)	0.205	0.023
186	15.50	0.77	0.228	(0.320)	0.205	0.023
187	15.58	0.63	0.188	(0.318)	0.170	0.019
188	15.67	0.63	0.188	(0.317)	0.170	0.019
189	15.75	0.63	0.188	(0.315)	0.170	0.019
190	15.83	0.63	0.188	(0.313)	0.170	0.019
191	15.92	0.63	0.188	(0.312)	0.170	0.019
192	16.00	0.63	0.188	(0.310)	0.170	0.019
193	16.08	0.13	0.040	(0.309)	0.036	0.004
194	16.17	0.13	0.040	(0.307)	0.036	0.004
195	16.25	0.13	0.040	(0.306)	0.036	0.004
196	16.33	0.13	0.040	(0.304)	0.036	0.004
197	16.42	0.13	0.040	(0.302)	0.036	0.004
198	16.50	0.13	0.040	(0.301)	0.036	0.004
199	16.58	0.10	0.030	(0.299)	0.027	0.003
200	16.67	0.10	0.030	(0.298)	0.027	0.003
201	16.75	0.10	0.030	(0.296)	0.027	0.003
202	16.83	0.10	0.030	(0.295)	0.027	0.003
203	16.92	0.10	0.030	(0.293)	0.027	0.003
204	17.00	0.10	0.030	(0.292)	0.027	0.003
205	17.08	0.17	0.050	(0.290)	0.045	0.005
206	17.17	0.17	0.050	(0.289)	0.045	0.005
207	17.25	0.17	0.050	(0.287)	0.045	0.005
208	17.33	0.17	0.050	(0.286)	0.045	0.005
209	17.42	0.17	0.050	(0.285)	0.045	0.005
210	17.50	0.17	0.050	(0.283)	0.045	0.005
211	17.58	0.17	0.050	(0.282)	0.045	0.005
212	17.67	0.17	0.050	(0.280)	0.045	0.005
213	17.75	0.17	0.050	(0.279)	0.045	0.005
214	17.83	0.13	0.040	(0.278)	0.036	0.004
215	17.92	0.13	0.040	(0.276)	0.036	0.004
216	18.00	0.13	0.040	(0.275)	0.036	0.004
217	18.08	0.13	0.040	(0.273)	0.036	0.004
218	18.17	0.13	0.040	(0.272)	0.036	0.004
219	18.25	0.13	0.040	(0.271)	0.036	0.004
220	18.33	0.13	0.040	(0.269)	0.036	0.004
221	18.42	0.13	0.040	(0.268)	0.036	0.004
222	18.50	0.13	0.040	(0.267)	0.036	0.004
223	18.58	0.10	0.030	(0.266)	0.027	0.003
224	18.67	0.10	0.030	(0.264)	0.027	0.003
225	18.75	0.10	0.030	(0.263)	0.027	0.003
226	18.83	0.07	0.020	(0.262)	0.018	0.002
227	18.92	0.07	0.020	(0.260)	0.018	0.002
228	19.00	0.07	0.020	(0.259)	0.018	0.002
229	19.08	0.10	0.030	(0.258)	0.027	0.003
230	19.17	0.10	0.030	(0.257)	0.027	0.003
231	19.25	0.10	0.030	(0.256)	0.027	0.003
232	19.33	0.13	0.040	(0.254)	0.036	0.004
233	19.42	0.13	0.040	(0.253)	0.036	0.004
234	19.50	0.13	0.040	(0.252)	0.036	0.004
235	19.58	0.10	0.030	(0.251)	0.027	0.003
236	19.67	0.10	0.030	(0.250)	0.027	0.003
237	19.75	0.10	0.030	(0.249)	0.027	0.003
238	19.83	0.07	0.020	(0.248)	0.018	0.002
239	19.92	0.07	0.020	(0.246)	0.018	0.002

240	20.00	0.07	0.020	(0.245)	0.018	0.002
241	20.08	0.10	0.030	(0.244)	0.027	0.003
242	20.17	0.10	0.030	(0.243)	0.027	0.003
243	20.25	0.10	0.030	(0.242)	0.027	0.003
244	20.33	0.10	0.030	(0.241)	0.027	0.003
245	20.42	0.10	0.030	(0.240)	0.027	0.003
246	20.50	0.10	0.030	(0.239)	0.027	0.003
247	20.58	0.10	0.030	(0.238)	0.027	0.003
248	20.67	0.10	0.030	(0.237)	0.027	0.003
249	20.75	0.10	0.030	(0.236)	0.027	0.003
250	20.83	0.07	0.020	(0.235)	0.018	0.002
251	20.92	0.07	0.020	(0.234)	0.018	0.002
252	21.00	0.07	0.020	(0.233)	0.018	0.002
253	21.08	0.10	0.030	(0.232)	0.027	0.003
254	21.17	0.10	0.030	(0.231)	0.027	0.003
255	21.25	0.10	0.030	(0.230)	0.027	0.003
256	21.33	0.07	0.020	(0.230)	0.018	0.002
257	21.42	0.07	0.020	(0.229)	0.018	0.002
258	21.50	0.07	0.020	(0.228)	0.018	0.002
259	21.58	0.10	0.030	(0.227)	0.027	0.003
260	21.67	0.10	0.030	(0.226)	0.027	0.003
261	21.75	0.10	0.030	(0.225)	0.027	0.003
262	21.83	0.07	0.020	(0.225)	0.018	0.002
263	21.92	0.07	0.020	(0.224)	0.018	0.002
264	22.00	0.07	0.020	(0.223)	0.018	0.002
265	22.08	0.10	0.030	(0.222)	0.027	0.003
266	22.17	0.10	0.030	(0.222)	0.027	0.003
267	22.25	0.10	0.030	(0.221)	0.027	0.003
268	22.33	0.07	0.020	(0.220)	0.018	0.002
269	22.42	0.07	0.020	(0.220)	0.018	0.002
270	22.50	0.07	0.020	(0.219)	0.018	0.002
271	22.58	0.07	0.020	(0.218)	0.018	0.002
272	22.67	0.07	0.020	(0.218)	0.018	0.002
273	22.75	0.07	0.020	(0.217)	0.018	0.002
274	22.83	0.07	0.020	(0.216)	0.018	0.002
275	22.92	0.07	0.020	(0.216)	0.018	0.002
276	23.00	0.07	0.020	(0.215)	0.018	0.002
277	23.08	0.07	0.020	(0.215)	0.018	0.002
278	23.17	0.07	0.020	(0.214)	0.018	0.002
279	23.25	0.07	0.020	(0.214)	0.018	0.002
280	23.33	0.07	0.020	(0.214)	0.018	0.002
281	23.42	0.07	0.020	(0.213)	0.018	0.002
282	23.50	0.07	0.020	(0.213)	0.018	0.002
283	23.58	0.07	0.020	(0.212)	0.018	0.002
284	23.67	0.07	0.020	(0.212)	0.018	0.002
285	23.75	0.07	0.020	(0.212)	0.018	0.002
286	23.83	0.07	0.020	(0.212)	0.018	0.002
287	23.92	0.07	0.020	(0.211)	0.018	0.002
288	24.00	0.07	0.020	(0.211)	0.018	0.002

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.0

Flood volume = Effective rainfall 0.25(In)

times area 3.9(Ac.) / [(In) / (Ft.)] = 0.1(Ac.Ft)

Total soil loss = 2.23(In)

Total soil loss = 0.725(Ac.Ft)

Total rainfall = 2.48(In)

Flood volume = 3510.9 Cubic Feet

Total soil loss = 31598.2 Cubic Feet

Peak flow rate of this hydrograph = 0.133(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0002	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.01	Q				
0+40	0.0005	0.01	Q				
0+45	0.0006	0.01	Q				
0+50	0.0006	0.01	Q				
0+55	0.0007	0.01	Q				
1+ 0	0.0009	0.02	Q				
1+ 5	0.0009	0.01	Q				
1+10	0.0010	0.01	Q				
1+15	0.0011	0.01	Q				
1+20	0.0012	0.01	Q				
1+25	0.0013	0.01	Q				
1+30	0.0014	0.01	Q				
1+35	0.0014	0.01	Q				
1+40	0.0015	0.01	Q				
1+45	0.0016	0.01	Q				
1+50	0.0017	0.01	Q				
1+55	0.0018	0.01	Q				
2+ 0	0.0019	0.02	Q				
2+ 5	0.0020	0.02	Q				
2+10	0.0021	0.02	QV				
2+15	0.0022	0.02	QV				
2+20	0.0023	0.02	QV				
2+25	0.0024	0.02	QV				
2+30	0.0025	0.02	QV				
2+35	0.0027	0.02	QV				
2+40	0.0028	0.02	QV				
2+45	0.0029	0.02	QV				
2+50	0.0030	0.02	QV				
2+55	0.0032	0.02	QV				
3+ 0	0.0033	0.02	QV				
3+ 5	0.0035	0.02	QV				
3+10	0.0036	0.02	QV				
3+15	0.0037	0.02	QV				
3+20	0.0039	0.02	QV				
3+25	0.0040	0.02	QV				
3+30	0.0041	0.02	Q V				
3+35	0.0043	0.02	Q V				
3+40	0.0044	0.02	Q V				

3+45	0.0045	0.02	Q	V				
3+50	0.0047	0.02	Q	V				
3+55	0.0048	0.02	Q	V				
4+ 0	0.0050	0.02	Q	V				
4+ 5	0.0051	0.02	Q	V				
4+10	0.0053	0.02	Q	V				
4+15	0.0055	0.02	Q	V				
4+20	0.0056	0.02	Q	V				
4+25	0.0058	0.03	Q	V				
4+30	0.0060	0.03	Q	V				
4+35	0.0062	0.03	Q	V				
4+40	0.0064	0.03	Q	V				
4+45	0.0066	0.03	Q	V				
4+50	0.0068	0.03	Q	V				
4+55	0.0070	0.03	Q	V				
5+ 0	0.0072	0.03	Q	V				
5+ 5	0.0074	0.03	Q	V				
5+10	0.0075	0.03	Q	V				
5+15	0.0077	0.02	Q	V				
5+20	0.0079	0.02	Q	V				
5+25	0.0081	0.03	Q	V				
5+30	0.0083	0.03	Q	V				
5+35	0.0085	0.03	Q	V				
5+40	0.0087	0.03	Q	V				
5+45	0.0089	0.03	Q	V				
5+50	0.0091	0.03	Q	V				
5+55	0.0093	0.03	Q	V				
6+ 0	0.0095	0.03	Q	V				
6+ 5	0.0097	0.03	Q	V				
6+10	0.0100	0.03	Q	V				
6+15	0.0102	0.03	Q	V				
6+20	0.0105	0.03	Q	V				
6+25	0.0107	0.04	Q	V				
6+30	0.0109	0.04	Q	V				
6+35	0.0112	0.04	Q	V				
6+40	0.0114	0.04	Q	V				
6+45	0.0117	0.04	Q	V				
6+50	0.0120	0.04	Q	V				
6+55	0.0122	0.04	Q	V				
7+ 0	0.0125	0.04	Q	V				
7+ 5	0.0128	0.04	Q	V				
7+10	0.0131	0.04	Q	V				
7+15	0.0133	0.04	Q	V				
7+20	0.0136	0.04	Q	V				
7+25	0.0139	0.04	Q	V				
7+30	0.0142	0.04	Q	V				
7+35	0.0145	0.04	Q	V				
7+40	0.0148	0.05	Q	V				
7+45	0.0151	0.05	Q	V				
7+50	0.0154	0.05	Q	V				
7+55	0.0158	0.05	Q	V				
8+ 0	0.0161	0.05	Q	V				
8+ 5	0.0165	0.05	Q	V				
8+10	0.0169	0.06	Q	V				
8+15	0.0173	0.06	Q	V				
8+20	0.0177	0.06	Q	V				
8+25	0.0181	0.06	Q	V				

8+30	0.0185	0.06	Q	V				
8+35	0.0189	0.06	Q	V				
8+40	0.0193	0.06	Q	V				
8+45	0.0198	0.06	Q	V				
8+50	0.0202	0.06	Q	V				
8+55	0.0206	0.07	Q	V				
9+ 0	0.0211	0.07	Q	V				
9+ 5	0.0216	0.07	Q	V				
9+10	0.0221	0.07	Q	V				
9+15	0.0226	0.07	Q	V				
9+20	0.0231	0.07	Q	V				
9+25	0.0236	0.08	Q	V				
9+30	0.0242	0.08	Q	V				
9+35	0.0247	0.08	Q	V				
9+40	0.0253	0.08	Q	V				
9+45	0.0258	0.08	Q	V				
9+50	0.0264	0.08	Q	V				
9+55	0.0270	0.08	Q	V				
10+ 0	0.0276	0.09	Q	V				
10+ 5	0.0281	0.08	Q	V				
10+10	0.0285	0.06	Q	V				
10+15	0.0290	0.06	Q	V				
10+20	0.0294	0.06	Q	V				
10+25	0.0298	0.06	Q	V				
10+30	0.0302	0.06	Q	V				
10+35	0.0306	0.06	Q	V				
10+40	0.0311	0.07	Q	V				
10+45	0.0317	0.08	Q	V				
10+50	0.0322	0.08	Q	V				
10+55	0.0327	0.08	Q	V				
11+ 0	0.0333	0.08	Q	V				
11+ 5	0.0338	0.08	Q	V				
11+10	0.0343	0.07	Q	V				
11+15	0.0348	0.07	Q	V				
11+20	0.0353	0.07	Q	V				
11+25	0.0358	0.07	Q	V				
11+30	0.0363	0.07	Q	V				
11+35	0.0368	0.07	Q	V				
11+40	0.0373	0.07	Q	V				
11+45	0.0378	0.07	Q	V				
11+50	0.0382	0.07	Q	V				
11+55	0.0387	0.07	Q	V				
12+ 0	0.0392	0.07	Q	V				
12+ 5	0.0397	0.08	Q	V				
12+10	0.0404	0.09	Q	V				
12+15	0.0410	0.09	Q	V				
12+20	0.0417	0.10	Q	V				
12+25	0.0424	0.10	Q	V				
12+30	0.0431	0.10	Q	V				
12+35	0.0438	0.10	Q	V				
12+40	0.0445	0.11	Q	V				
12+45	0.0453	0.11	Q	V				
12+50	0.0460	0.11	Q	V				
12+55	0.0468	0.11	Q	V				
13+ 0	0.0476	0.11	Q	V				
13+ 5	0.0484	0.12	Q	V				
13+10	0.0493	0.13	Q	V				

13+15	0.0502	0.13	Q		V	
13+20	0.0511	0.13	Q		V	
13+25	0.0520	0.13	Q		V	
13+30	0.0529	0.13	Q		V	
13+35	0.0537	0.12	Q		V	
13+40	0.0544	0.10	Q		V	
13+45	0.0551	0.09	Q		V	
13+50	0.0557	0.09	Q		V	
13+55	0.0563	0.09	Q		V	
14+ 0	0.0569	0.09	Q		V	
14+ 5	0.0576	0.09	Q		V	
14+10	0.0583	0.10	Q		V	
14+15	0.0590	0.10	Q		V	
14+20	0.0597	0.10	Q		V	
14+25	0.0604	0.10	Q		V	
14+30	0.0611	0.10	Q		V	
14+35	0.0618	0.10	Q		V	
14+40	0.0625	0.10	Q		V	
14+45	0.0632	0.10	Q		V	
14+50	0.0639	0.10	Q		V	
14+55	0.0646	0.10	Q		V	
15+ 0	0.0653	0.10	Q		V	
15+ 5	0.0659	0.10	Q		V	
15+10	0.0666	0.09	Q		V	
15+15	0.0672	0.09	Q		V	
15+20	0.0679	0.09	Q		V	
15+25	0.0685	0.09	Q		V	
15+30	0.0691	0.09	Q		V	
15+35	0.0697	0.09	Q		V	
15+40	0.0702	0.08	Q		V	
15+45	0.0708	0.08	Q		V	
15+50	0.0713	0.07	Q		V	
15+55	0.0718	0.07	Q		V	
16+ 0	0.0723	0.07	Q		V	
16+ 5	0.0727	0.06	Q		V	
16+10	0.0729	0.03	Q		V	
16+15	0.0730	0.02	Q		V	
16+20	0.0732	0.02	Q		V	
16+25	0.0733	0.02	Q		V	
16+30	0.0734	0.02	Q		V	
16+35	0.0735	0.01	Q		V	
16+40	0.0736	0.01	Q		V	
16+45	0.0737	0.01	Q		V	
16+50	0.0737	0.01	Q		V	
16+55	0.0738	0.01	Q		V	
17+ 0	0.0739	0.01	Q		V	
17+ 5	0.0740	0.01	Q		V	
17+10	0.0741	0.02	Q		V	
17+15	0.0742	0.02	Q		V	
17+20	0.0744	0.02	Q		V	
17+25	0.0745	0.02	Q		V	
17+30	0.0746	0.02	Q		V	
17+35	0.0748	0.02	Q		V	
17+40	0.0749	0.02	Q		V	
17+45	0.0751	0.02	Q		V	
17+50	0.0752	0.02	Q		V	
17+55	0.0753	0.02	Q		V	

18+ 0	0.0754	0.02	Q				V
18+ 5	0.0755	0.02	Q				V
18+10	0.0756	0.02	Q				V
18+15	0.0757	0.02	Q				V
18+20	0.0758	0.02	Q				V
18+25	0.0759	0.02	Q				V
18+30	0.0760	0.02	Q				V
18+35	0.0761	0.01	Q				V
18+40	0.0762	0.01	Q				V
18+45	0.0763	0.01	Q				V
18+50	0.0764	0.01	Q				V
18+55	0.0765	0.01	Q				V
19+ 0	0.0765	0.01	Q				V
19+ 5	0.0766	0.01	Q				V
19+10	0.0766	0.01	Q				V
19+15	0.0767	0.01	Q				V
19+20	0.0768	0.01	Q				V
19+25	0.0769	0.01	Q				V
19+30	0.0770	0.02	Q				V
19+35	0.0771	0.01	Q				V
19+40	0.0772	0.01	Q				V
19+45	0.0773	0.01	Q				V
19+50	0.0774	0.01	Q				V
19+55	0.0774	0.01	Q				V
20+ 0	0.0775	0.01	Q				V
20+ 5	0.0775	0.01	Q				V
20+10	0.0776	0.01	Q				V
20+15	0.0777	0.01	Q				V
20+20	0.0778	0.01	Q				V
20+25	0.0779	0.01	Q				V
20+30	0.0779	0.01	Q				V
20+35	0.0780	0.01	Q				V
20+40	0.0781	0.01	Q				V
20+45	0.0782	0.01	Q				V
20+50	0.0782	0.01	Q				V
20+55	0.0783	0.01	Q				V
21+ 0	0.0784	0.01	Q				V
21+ 5	0.0784	0.01	Q				V
21+10	0.0785	0.01	Q				V
21+15	0.0786	0.01	Q				V
21+20	0.0786	0.01	Q				V
21+25	0.0787	0.01	Q				V
21+30	0.0788	0.01	Q				V
21+35	0.0788	0.01	Q				V
21+40	0.0789	0.01	Q				V
21+45	0.0790	0.01	Q				V
21+50	0.0791	0.01	Q				V
21+55	0.0791	0.01	Q				V
22+ 0	0.0792	0.01	Q				V
22+ 5	0.0792	0.01	Q				V
22+10	0.0793	0.01	Q				V
22+15	0.0794	0.01	Q				V
22+20	0.0795	0.01	Q				V
22+25	0.0795	0.01	Q				V
22+30	0.0796	0.01	Q				V
22+35	0.0796	0.01	Q				V
22+40	0.0797	0.01	Q				V

22+45	0.0797	0.01	Q				V
22+50	0.0798	0.01	Q				V
22+55	0.0798	0.01	Q				V
23+ 0	0.0799	0.01	Q				V
23+ 5	0.0799	0.01	Q				V
23+10	0.0800	0.01	Q				V
23+15	0.0801	0.01	Q				V
23+20	0.0801	0.01	Q				V
23+25	0.0802	0.01	Q				V
23+30	0.0802	0.01	Q				V
23+35	0.0803	0.01	Q				V
23+40	0.0803	0.01	Q				V
23+45	0.0804	0.01	Q				V
23+50	0.0804	0.01	Q				V
23+55	0.0805	0.01	Q				V
24+ 0	0.0805	0.01	Q				V
24+ 5	0.0806	0.01	Q				V
24+10	0.0806	0.00	Q				V
24+15	0.0806	0.00	Q				V
24+20	0.0806	0.00	Q				V
24+25	0.0806	0.00	Q				V

7

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	0.58	2.26

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	1.45	5.65

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 0.784(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.900	81.00	0.000
Total Area Entered = 3.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

 Slope of intensity-duration curve for a 1 hour storm = 0.4800

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	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum = 100.000			Sum= 3.930

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)		Effective (In/Hr)
			Max	Low	
1	0.08	4.40	0.414	(0.422)	0.372
2	0.17	4.50	0.423	(0.422)	0.381
3	0.25	5.40	0.508	0.422 (0.457)	0.085
4	0.33	5.40	0.508	0.422 (0.457)	0.085
5	0.42	5.70	0.536	0.422 (0.482)	0.114
6	0.50	6.40	0.602	0.422 (0.542)	0.179
7	0.58	7.90	0.743	0.422 (0.669)	0.321
8	0.67	9.10	0.856	0.422 (0.770)	0.433
9	0.75	12.80	1.204	0.422 (1.083)	0.781

10	0.83	25.60	2.408	0.422	(2.167)	1.985
11	0.92	7.90	0.743	0.422	(0.669)	0.321
12	1.00	4.90	0.461	(0.422)	0.415	0.046

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.4

Flood volume = Effective rainfall 0.37(In)

times area 3.9(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)

Total soil loss = 0.41(In)

Total soil loss = 0.135(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 5231.7 Cubic Feet

Total soil loss = 5863.8 Cubic Feet

Peak flow rate of this hydrograph = 4.633(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0003	0.05	Q				
0+10	0.0012	0.13	Q				
0+15	0.0026	0.20	Q				
0+20	0.0046	0.29	Q				
0+25	0.0070	0.35	QV				
0+30	0.0103	0.49	Q V				
0+35	0.0158	0.80	Q V				
0+40	0.0243	1.23	Q V				
0+45	0.0376	1.93	Q	V			
0+50	0.0657	4.08	Q		Q	V	
0+55	0.0976	4.63	Q		Q	V	V
1+ 0	0.1104	1.85	Q				V
1+ 5	0.1158	0.78	Q				V
1+10	0.1184	0.38	Q				V
1+15	0.1199	0.21	Q				V
1+20	0.1201	0.03	Q				V
1+25	0.1201	0.00	Q				V

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 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]
3.90	0.98	3.82

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	2.48	9.67

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 3.900 81.00 0.000
 Total Area Entered = 3.90(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
						Sum (F) = 0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	135.459	29.490	1.159
2 0.167	270.918	47.989	1.886
3 0.250	406.377	12.112	0.476
4 0.333	541.836	5.367	0.211
5 0.417	677.295	2.915	0.115
6 0.500	812.755	2.128	0.084
Sum = 100.000		Sum=	3.930

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 0.08	1.30	0.208	(0.422) 0.187	0.021
2 0.17	1.30	0.208	(0.422) 0.187	0.021
3 0.25	1.10	0.176	(0.422) 0.158	0.018
4 0.33	1.50	0.240	(0.422) 0.216	0.024
5 0.42	1.50	0.240	(0.422) 0.216	0.024
6 0.50	1.80	0.288	(0.422) 0.259	0.029
7 0.58	1.50	0.240	(0.422) 0.216	0.024
8 0.67	1.80	0.288	(0.422) 0.259	0.029
9 0.75	1.80	0.288	(0.422) 0.259	0.029
10 0.83	1.50	0.240	(0.422) 0.216	0.024
11 0.92	1.60	0.256	(0.422) 0.230	0.026

12	1.00	1.80	0.288	(0.422)	0.259	0.029
13	1.08	2.20	0.351	(0.422)	0.316	0.035
14	1.17	2.20	0.351	(0.422)	0.316	0.035
15	1.25	2.20	0.351	(0.422)	0.316	0.035
16	1.33	2.00	0.320	(0.422)	0.288	0.032
17	1.42	2.60	0.415	(0.422)	0.374	0.042
18	1.50	2.70	0.431	(0.422)	0.388	0.043
19	1.58	2.40	0.383	(0.422)	0.345	0.038
20	1.67	2.70	0.431	(0.422)	0.388	0.043
21	1.75	3.30	0.527	0.422 (0.474)		0.105
22	1.83	3.10	0.495	0.422 (0.446)		0.073
23	1.92	2.90	0.463	(0.422)	0.417	0.046
24	2.00	3.00	0.479	0.422 (0.431)		0.057
25	2.08	3.10	0.495	0.422 (0.446)		0.073
26	2.17	4.20	0.671	0.422 (0.604)		0.249
27	2.25	5.00	0.799	0.422 (0.719)		0.376
28	2.33	3.50	0.559	0.422 (0.503)		0.137
29	2.42	6.80	1.086	0.422 (0.978)		0.664
30	2.50	7.30	1.166	0.422 (1.050)		0.744
31	2.58	8.20	1.310	0.422 (1.179)		0.888
32	2.67	5.90	0.943	0.422 (0.848)		0.520
33	2.75	2.00	0.320	(0.422)	0.288	0.032
34	2.83	1.80	0.288	(0.422)	0.259	0.029
35	2.92	1.80	0.288	(0.422)	0.259	0.029
36	3.00	0.60	0.096	(0.422)	0.086	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.39(In)
times area 3.9(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)
Total soil loss = 0.95(In)
Total soil loss = 0.307(Ac.Ft)
Total rainfall = 1.33(In)
Flood volume = 5460.2 Cubic Feet
Total soil loss = 13387.2 Cubic Feet

Peak flow rate of this hydrograph = 2.842(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.02	Q				
0+10	0.0006	0.06	Q				
0+15	0.0011	0.07	Q				
0+20	0.0016	0.08	Q				
0+25	0.0022	0.09	Q				
0+30	0.0029	0.10	Q				
0+35	0.0036	0.10	QV				
0+40	0.0043	0.10	QV				
0+45	0.0050	0.11	QV				
0+50	0.0058	0.11	QV				
0+55	0.0065	0.10	Q V				

1+ 0	0.0072	0.10	Q V						
1+ 5	0.0080	0.12	Q V						
1+10	0.0089	0.13	Q V						
1+15	0.0098	0.13	Q V						
1+20	0.0107	0.13	Q V						
1+25	0.0117	0.14	Q V						
1+30	0.0128	0.16	Q V						
1+35	0.0139	0.16	Q V						
1+40	0.0150	0.16	Q V						
1+45	0.0166	0.24	Q V						
1+50	0.0188	0.32	Q V						
1+55	0.0206	0.26	Q V						
2+ 0	0.0221	0.22	Q V						
2+ 5	0.0238	0.24	Q V						
2+10	0.0271	0.48	Q V						
2+15	0.0337	0.96	Q V						
2+20	0.0407	1.01	Q V						
2+25	0.0494	1.27	Q V						
2+30	0.0652	2.29	Q V						
2+35	0.0848	2.84	Q V						
2+40	0.1042	2.82	Q V						
2+45	0.1158	1.69	Q V						
2+50	0.1205	0.67	Q V						
2+55	0.1231	0.38	Q V						
3+ 0	0.1246	0.22	Q V						
3+ 5	0.1252	0.09	Q V						
3+10	0.1253	0.02	Q V						
3+15	0.1253	0.01	Q V						
3+20	0.1253	0.00	Q V						
3+25	0.1253	0.00	Q V						

Unit Hydrograph Analysis

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 Study date 08/22/13 File: 32786B3Nat65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 3
Existing Natural Condition

 Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
 Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
 Length along longest watercourse = 1062.00 (Ft.)
 Length along longest watercourse measured to centroid = 661.00 (Ft.)
 Length along longest watercourse = 0.201 Mi.
 Length along longest watercourse measured to centroid = 0.125 Mi.
 Difference in elevation = 53.50 (Ft.)
 Slope along watercourse = 265.9887 Ft./Mi.
 Average Manning's 'N' = 0.030
 Lag time = 0.062 Hr.
 Lag time = 3.69 Min.
 25% of lag time = 0.92 Min.
 40% of lag time = 1.48 Min.
 Unit time = 5.00 Min.
 Duration of storm = 6 Hour(s)
 User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	1.38	5.38

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	3.48	13.57

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380(In)
 Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.872(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 1.872(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.900	81.00	0.000
Total Area Entered = 3.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422
 Minimum soil loss rate ((In/Hr)) = 0.211
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum = 100.000			Sum= 3.930

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	0.08	0.50	(0.422)	0.101
2	0.17	0.60	(0.422)	0.121
3	0.25	0.60	(0.422)	0.121
4	0.33	0.60	(0.422)	0.121
5	0.42	0.60	(0.422)	0.121
6	0.50	0.70	(0.422)	0.142
7	0.58	0.70	(0.422)	0.142
8	0.67	0.70	(0.422)	0.142
9	0.75	0.70	(0.422)	0.142
10	0.83	0.70	(0.422)	0.142
11	0.92	0.70	(0.422)	0.142

12	1.00	0.80	0.180	(0.422)	0.162	0.018
13	1.08	0.80	0.180	(0.422)	0.162	0.018
14	1.17	0.80	0.180	(0.422)	0.162	0.018
15	1.25	0.80	0.180	(0.422)	0.162	0.018
16	1.33	0.80	0.180	(0.422)	0.162	0.018
17	1.42	0.80	0.180	(0.422)	0.162	0.018
18	1.50	0.80	0.180	(0.422)	0.162	0.018
19	1.58	0.80	0.180	(0.422)	0.162	0.018
20	1.67	0.80	0.180	(0.422)	0.162	0.018
21	1.75	0.80	0.180	(0.422)	0.162	0.018
22	1.83	0.80	0.180	(0.422)	0.162	0.018
23	1.92	0.80	0.180	(0.422)	0.162	0.018
24	2.00	0.90	0.202	(0.422)	0.182	0.020
25	2.08	0.80	0.180	(0.422)	0.162	0.018
26	2.17	0.90	0.202	(0.422)	0.182	0.020
27	2.25	0.90	0.202	(0.422)	0.182	0.020
28	2.33	0.90	0.202	(0.422)	0.182	0.020
29	2.42	0.90	0.202	(0.422)	0.182	0.020
30	2.50	0.90	0.202	(0.422)	0.182	0.020
31	2.58	0.90	0.202	(0.422)	0.182	0.020
32	2.67	0.90	0.202	(0.422)	0.182	0.020
33	2.75	1.00	0.225	(0.422)	0.202	0.022
34	2.83	1.00	0.225	(0.422)	0.202	0.022
35	2.92	1.00	0.225	(0.422)	0.202	0.022
36	3.00	1.00	0.225	(0.422)	0.202	0.022
37	3.08	1.00	0.225	(0.422)	0.202	0.022
38	3.17	1.10	0.247	(0.422)	0.222	0.025
39	3.25	1.10	0.247	(0.422)	0.222	0.025
40	3.33	1.10	0.247	(0.422)	0.222	0.025
41	3.42	1.20	0.270	(0.422)	0.243	0.027
42	3.50	1.30	0.292	(0.422)	0.263	0.029
43	3.58	1.40	0.314	(0.422)	0.283	0.031
44	3.67	1.40	0.314	(0.422)	0.283	0.031
45	3.75	1.50	0.337	(0.422)	0.303	0.034
46	3.83	1.50	0.337	(0.422)	0.303	0.034
47	3.92	1.60	0.359	(0.422)	0.323	0.036
48	4.00	1.60	0.359	(0.422)	0.323	0.036
49	4.08	1.70	0.382	(0.422)	0.344	0.038
50	4.17	1.80	0.404	(0.422)	0.364	0.040
51	4.25	1.90	0.427	(0.422)	0.384	0.043
52	4.33	2.00	0.449	(0.422)	0.404	0.045
53	4.42	2.10	0.472	0.422	(0.425)	0.049
54	4.50	2.10	0.472	0.422	(0.425)	0.049
55	4.58	2.20	0.494	0.422	(0.445)	0.072
56	4.67	2.30	0.517	0.422	(0.465)	0.094
57	4.75	2.40	0.539	0.422	(0.485)	0.117
58	4.83	2.40	0.539	0.422	(0.485)	0.117
59	4.92	2.50	0.562	0.422	(0.505)	0.139
60	5.00	2.60	0.584	0.422	(0.526)	0.162
61	5.08	3.10	0.696	0.422	(0.627)	0.274
62	5.17	3.60	0.809	0.422	(0.728)	0.386
63	5.25	3.90	0.876	0.422	(0.788)	0.454
64	5.33	4.20	0.943	0.422	(0.849)	0.521
65	5.42	4.70	1.056	0.422	(0.950)	0.633
66	5.50	5.60	1.258	0.422	(1.132)	0.835
67	5.58	1.90	0.427	(0.422)	0.384	0.043
68	5.67	0.90	0.202	(0.422)	0.182	0.020

69	5.75	0.60	0.135	(0.422)	0.121	0.013
70	5.83	0.50	0.112	(0.422)	0.101	0.011
71	5.92	0.30	0.067	(0.422)	0.061	0.007
72	6.00	0.20	0.045	(0.422)	0.040	0.004

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.2

Flood volume = Effective rainfall 0.43(In)

times area 3.9(Ac.)/[(In)/(Ft.)] = 0.1(Ac.Ft)

Total soil loss = 1.44(In)

Total soil loss = 0.468(Ac.Ft)

Total rainfall = 1.87(In)

Flood volume = 6094.4 Cubic Feet

Total soil loss = 20405.3 Cubic Feet

Peak flow rate of this hydrograph = 2.575(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0

0+ 5	0.0001	0.01	Q				
0+10	0.0003	0.04	Q				
0+15	0.0007	0.05	Q				
0+20	0.0010	0.05	Q				
0+25	0.0014	0.05	Q				
0+30	0.0017	0.06	Q				
0+35	0.0022	0.06	Q				
0+40	0.0026	0.06	Q				
0+45	0.0030	0.06	Q				
0+50	0.0034	0.06	Q				
0+55	0.0038	0.06	QV				
1+ 0	0.0043	0.06	QV				
1+ 5	0.0048	0.07	QV				
1+10	0.0052	0.07	QV				
1+15	0.0057	0.07	QV				
1+20	0.0062	0.07	QV				
1+25	0.0067	0.07	QV				
1+30	0.0072	0.07	Q V				
1+35	0.0077	0.07	Q V				
1+40	0.0082	0.07	Q V				
1+45	0.0086	0.07	Q V				
1+50	0.0091	0.07	Q V				
1+55	0.0096	0.07	Q V				
2+ 0	0.0101	0.07	Q V				
2+ 5	0.0106	0.07	Q V				
2+10	0.0112	0.07	Q V				
2+15	0.0117	0.08	Q V				
2+20	0.0122	0.08	Q V				
2+25	0.0128	0.08	Q V				
2+30	0.0133	0.08	Q V				
2+35	0.0139	0.08	Q V				
2+40	0.0144	0.08	Q V				

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Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B3Nat245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 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]
3.90	2.48	9.67

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	6.90	26.91

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 3.900 81.00 0.000
 Total Area Entered = 3.90(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	64.4	0.422	0.000	0.422	1.000	0.422
Sum (F) =						0.422

Area averaged mean soil loss (F) (In/Hr) = 0.422

Minimum soil loss rate ((In/Hr)) = 0.211

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum = 100.000		Sum=	3.930

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	0.08	0.028	(0.749) 0.025	0.003
2	0.17	0.028	(0.746) 0.025	0.003
3	0.25	0.028	(0.743) 0.025	0.003
4	0.33	0.042	(0.740) 0.038	0.004
5	0.42	0.042	(0.737) 0.038	0.004
6	0.50	0.042	(0.735) 0.038	0.004
7	0.58	0.042	(0.732) 0.038	0.004
8	0.67	0.042	(0.729) 0.038	0.004
9	0.75	0.042	(0.726) 0.038	0.004
10	0.83	0.056	(0.723) 0.051	0.006
11	0.92	0.056	(0.720) 0.051	0.006

12	1.00	0.13	0.056	(0.717)	0.051	0.006
13	1.08	0.10	0.042	(0.715)	0.038	0.004
14	1.17	0.10	0.042	(0.712)	0.038	0.004
15	1.25	0.10	0.042	(0.709)	0.038	0.004
16	1.33	0.10	0.042	(0.706)	0.038	0.004
17	1.42	0.10	0.042	(0.703)	0.038	0.004
18	1.50	0.10	0.042	(0.700)	0.038	0.004
19	1.58	0.10	0.042	(0.698)	0.038	0.004
20	1.67	0.10	0.042	(0.695)	0.038	0.004
21	1.75	0.10	0.042	(0.692)	0.038	0.004
22	1.83	0.13	0.056	(0.689)	0.051	0.006
23	1.92	0.13	0.056	(0.687)	0.051	0.006
24	2.00	0.13	0.056	(0.684)	0.051	0.006
25	2.08	0.13	0.056	(0.681)	0.051	0.006
26	2.17	0.13	0.056	(0.678)	0.051	0.006
27	2.25	0.13	0.056	(0.675)	0.051	0.006
28	2.33	0.13	0.056	(0.673)	0.051	0.006
29	2.42	0.13	0.056	(0.670)	0.051	0.006
30	2.50	0.13	0.056	(0.667)	0.051	0.006
31	2.58	0.17	0.070	(0.665)	0.063	0.007
32	2.67	0.17	0.070	(0.662)	0.063	0.007
33	2.75	0.17	0.070	(0.659)	0.063	0.007
34	2.83	0.17	0.070	(0.656)	0.063	0.007
35	2.92	0.17	0.070	(0.654)	0.063	0.007
36	3.00	0.17	0.070	(0.651)	0.063	0.007
37	3.08	0.17	0.070	(0.648)	0.063	0.007
38	3.17	0.17	0.070	(0.646)	0.063	0.007
39	3.25	0.17	0.070	(0.643)	0.063	0.007
40	3.33	0.17	0.070	(0.640)	0.063	0.007
41	3.42	0.17	0.070	(0.638)	0.063	0.007
42	3.50	0.17	0.070	(0.635)	0.063	0.007
43	3.58	0.17	0.070	(0.632)	0.063	0.007
44	3.67	0.17	0.070	(0.630)	0.063	0.007
45	3.75	0.17	0.070	(0.627)	0.063	0.007
46	3.83	0.20	0.084	(0.624)	0.076	0.008
47	3.92	0.20	0.084	(0.622)	0.076	0.008
48	4.00	0.20	0.084	(0.619)	0.076	0.008
49	4.08	0.20	0.084	(0.616)	0.076	0.008
50	4.17	0.20	0.084	(0.614)	0.076	0.008
51	4.25	0.20	0.084	(0.611)	0.076	0.008
52	4.33	0.23	0.098	(0.609)	0.089	0.010
53	4.42	0.23	0.098	(0.606)	0.089	0.010
54	4.50	0.23	0.098	(0.603)	0.089	0.010
55	4.58	0.23	0.098	(0.601)	0.089	0.010
56	4.67	0.23	0.098	(0.598)	0.089	0.010
57	4.75	0.23	0.098	(0.596)	0.089	0.010
58	4.83	0.27	0.112	(0.593)	0.101	0.011
59	4.92	0.27	0.112	(0.590)	0.101	0.011
60	5.00	0.27	0.112	(0.588)	0.101	0.011
61	5.08	0.20	0.084	(0.585)	0.076	0.008
62	5.17	0.20	0.084	(0.583)	0.076	0.008
63	5.25	0.20	0.084	(0.580)	0.076	0.008
64	5.33	0.23	0.098	(0.578)	0.089	0.010
65	5.42	0.23	0.098	(0.575)	0.089	0.010
66	5.50	0.23	0.098	(0.573)	0.089	0.010
67	5.58	0.27	0.112	(0.570)	0.101	0.011
68	5.67	0.27	0.112	(0.568)	0.101	0.011

69	5.75	0.27	0.112	(0.565)	0.101	0.011
70	5.83	0.27	0.112	(0.563)	0.101	0.011
71	5.92	0.27	0.112	(0.560)	0.101	0.011
72	6.00	0.27	0.112	(0.558)	0.101	0.011
73	6.08	0.30	0.127	(0.555)	0.114	0.013
74	6.17	0.30	0.127	(0.553)	0.114	0.013
75	6.25	0.30	0.127	(0.550)	0.114	0.013
76	6.33	0.30	0.127	(0.548)	0.114	0.013
77	6.42	0.30	0.127	(0.545)	0.114	0.013
78	6.50	0.30	0.127	(0.543)	0.114	0.013
79	6.58	0.33	0.141	(0.540)	0.127	0.014
80	6.67	0.33	0.141	(0.538)	0.127	0.014
81	6.75	0.33	0.141	(0.536)	0.127	0.014
82	6.83	0.33	0.141	(0.533)	0.127	0.014
83	6.92	0.33	0.141	(0.531)	0.127	0.014
84	7.00	0.33	0.141	(0.528)	0.127	0.014
85	7.08	0.33	0.141	(0.526)	0.127	0.014
86	7.17	0.33	0.141	(0.524)	0.127	0.014
87	7.25	0.33	0.141	(0.521)	0.127	0.014
88	7.33	0.37	0.155	(0.519)	0.139	0.015
89	7.42	0.37	0.155	(0.516)	0.139	0.015
90	7.50	0.37	0.155	(0.514)	0.139	0.015
91	7.58	0.40	0.169	(0.512)	0.152	0.017
92	7.67	0.40	0.169	(0.509)	0.152	0.017
93	7.75	0.40	0.169	(0.507)	0.152	0.017
94	7.83	0.43	0.183	(0.505)	0.165	0.018
95	7.92	0.43	0.183	(0.502)	0.165	0.018
96	8.00	0.43	0.183	(0.500)	0.165	0.018
97	8.08	0.50	0.211	(0.498)	0.190	0.021
98	8.17	0.50	0.211	(0.495)	0.190	0.021
99	8.25	0.50	0.211	(0.493)	0.190	0.021
100	8.33	0.50	0.211	(0.491)	0.190	0.021
101	8.42	0.50	0.211	(0.488)	0.190	0.021
102	8.50	0.50	0.211	(0.486)	0.190	0.021
103	8.58	0.53	0.225	(0.484)	0.202	0.022
104	8.67	0.53	0.225	(0.482)	0.202	0.022
105	8.75	0.53	0.225	(0.479)	0.202	0.022
106	8.83	0.57	0.239	(0.477)	0.215	0.024
107	8.92	0.57	0.239	(0.475)	0.215	0.024
108	9.00	0.57	0.239	(0.473)	0.215	0.024
109	9.08	0.63	0.267	(0.470)	0.240	0.027
110	9.17	0.63	0.267	(0.468)	0.240	0.027
111	9.25	0.63	0.267	(0.466)	0.240	0.027
112	9.33	0.67	0.281	(0.464)	0.253	0.028
113	9.42	0.67	0.281	(0.461)	0.253	0.028
114	9.50	0.67	0.281	(0.459)	0.253	0.028
115	9.58	0.70	0.295	(0.457)	0.266	0.030
116	9.67	0.70	0.295	(0.455)	0.266	0.030
117	9.75	0.70	0.295	(0.453)	0.266	0.030
118	9.83	0.73	0.309	(0.450)	0.278	0.031
119	9.92	0.73	0.309	(0.448)	0.278	0.031
120	10.00	0.73	0.309	(0.446)	0.278	0.031
121	10.08	0.50	0.211	(0.444)	0.190	0.021
122	10.17	0.50	0.211	(0.442)	0.190	0.021
123	10.25	0.50	0.211	(0.440)	0.190	0.021
124	10.33	0.50	0.211	(0.438)	0.190	0.021
125	10.42	0.50	0.211	(0.435)	0.190	0.021

126	10.50	0.50	0.211	(0.433)	0.190	0.021
127	10.58	0.67	0.281	(0.431)	0.253	0.028
128	10.67	0.67	0.281	(0.429)	0.253	0.028
129	10.75	0.67	0.281	(0.427)	0.253	0.028
130	10.83	0.67	0.281	(0.425)	0.253	0.028
131	10.92	0.67	0.281	(0.423)	0.253	0.028
132	11.00	0.67	0.281	(0.421)	0.253	0.028
133	11.08	0.63	0.267	(0.419)	0.240	0.027
134	11.17	0.63	0.267	(0.417)	0.240	0.027
135	11.25	0.63	0.267	(0.415)	0.240	0.027
136	11.33	0.63	0.267	(0.412)	0.240	0.027
137	11.42	0.63	0.267	(0.410)	0.240	0.027
138	11.50	0.63	0.267	(0.408)	0.240	0.027
139	11.58	0.57	0.239	(0.406)	0.215	0.024
140	11.67	0.57	0.239	(0.404)	0.215	0.024
141	11.75	0.57	0.239	(0.402)	0.215	0.024
142	11.83	0.60	0.253	(0.400)	0.228	0.025
143	11.92	0.60	0.253	(0.398)	0.228	0.025
144	12.00	0.60	0.253	(0.396)	0.228	0.025
145	12.08	0.83	0.352	(0.394)	0.316	0.035
146	12.17	0.83	0.352	(0.392)	0.316	0.035
147	12.25	0.83	0.352	(0.390)	0.316	0.035
148	12.33	0.87	0.366	(0.388)	0.329	0.037
149	12.42	0.87	0.366	(0.387)	0.329	0.037
150	12.50	0.87	0.366	(0.385)	0.329	0.037
151	12.58	0.93	0.394	(0.383)	0.354	0.039
152	12.67	0.93	0.394	(0.381)	0.354	0.039
153	12.75	0.93	0.394	(0.379)	0.354	0.039
154	12.83	0.97	0.408	(0.377)	0.367	0.041
155	12.92	0.97	0.408	(0.375)	0.367	0.041
156	13.00	0.97	0.408	(0.373)	0.367	0.041
157	13.08	1.13	0.478	0.371 (0.430)		0.107
158	13.17	1.13	0.478	0.369 (0.430)		0.109
159	13.25	1.13	0.478	0.367 (0.430)		0.111
160	13.33	1.13	0.478	0.366 (0.430)		0.113
161	13.42	1.13	0.478	0.364 (0.430)		0.114
162	13.50	1.13	0.478	0.362 (0.430)		0.116
163	13.58	0.77	0.323	(0.360)	0.291	0.032
164	13.67	0.77	0.323	(0.358)	0.291	0.032
165	13.75	0.77	0.323	(0.356)	0.291	0.032
166	13.83	0.77	0.323	(0.355)	0.291	0.032
167	13.92	0.77	0.323	(0.353)	0.291	0.032
168	14.00	0.77	0.323	(0.351)	0.291	0.032
169	14.08	0.90	0.380	(0.349)	0.342	0.038
170	14.17	0.90	0.380	(0.347)	0.342	0.038
171	14.25	0.90	0.380	(0.346)	0.342	0.038
172	14.33	0.87	0.366	(0.344)	0.329	0.037
173	14.42	0.87	0.366	(0.342)	0.329	0.037
174	14.50	0.87	0.366	(0.340)	0.329	0.037
175	14.58	0.87	0.366	(0.339)	0.329	0.037
176	14.67	0.87	0.366	(0.337)	0.329	0.037
177	14.75	0.87	0.366	(0.335)	0.329	0.037
178	14.83	0.83	0.352	(0.333)	0.316	0.035
179	14.92	0.83	0.352	(0.332)	0.316	0.035
180	15.00	0.83	0.352	(0.330)	0.316	0.035
181	15.08	0.80	0.337	(0.328)	0.304	0.034
182	15.17	0.80	0.337	(0.327)	0.304	0.034

183	15.25	0.80	0.337	(0.325)	0.304	0.034
184	15.33	0.77	0.323	(0.323)	0.291	0.032
185	15.42	0.77	0.323	(0.322)	0.291	0.032
186	15.50	0.77	0.323	(0.320)	0.291	0.032
187	15.58	0.63	0.267	(0.318)	0.240	0.027
188	15.67	0.63	0.267	(0.317)	0.240	0.027
189	15.75	0.63	0.267	(0.315)	0.240	0.027
190	15.83	0.63	0.267	(0.313)	0.240	0.027
191	15.92	0.63	0.267	(0.312)	0.240	0.027
192	16.00	0.63	0.267	(0.310)	0.240	0.027
193	16.08	0.13	0.056	(0.309)	0.051	0.006
194	16.17	0.13	0.056	(0.307)	0.051	0.006
195	16.25	0.13	0.056	(0.306)	0.051	0.006
196	16.33	0.13	0.056	(0.304)	0.051	0.006
197	16.42	0.13	0.056	(0.302)	0.051	0.006
198	16.50	0.13	0.056	(0.301)	0.051	0.006
199	16.58	0.10	0.042	(0.299)	0.038	0.004
200	16.67	0.10	0.042	(0.298)	0.038	0.004
201	16.75	0.10	0.042	(0.296)	0.038	0.004
202	16.83	0.10	0.042	(0.295)	0.038	0.004
203	16.92	0.10	0.042	(0.293)	0.038	0.004
204	17.00	0.10	0.042	(0.292)	0.038	0.004
205	17.08	0.17	0.070	(0.290)	0.063	0.007
206	17.17	0.17	0.070	(0.289)	0.063	0.007
207	17.25	0.17	0.070	(0.287)	0.063	0.007
208	17.33	0.17	0.070	(0.286)	0.063	0.007
209	17.42	0.17	0.070	(0.285)	0.063	0.007
210	17.50	0.17	0.070	(0.283)	0.063	0.007
211	17.58	0.17	0.070	(0.282)	0.063	0.007
212	17.67	0.17	0.070	(0.280)	0.063	0.007
213	17.75	0.17	0.070	(0.279)	0.063	0.007
214	17.83	0.13	0.056	(0.278)	0.051	0.006
215	17.92	0.13	0.056	(0.276)	0.051	0.006
216	18.00	0.13	0.056	(0.275)	0.051	0.006
217	18.08	0.13	0.056	(0.273)	0.051	0.006
218	18.17	0.13	0.056	(0.272)	0.051	0.006
219	18.25	0.13	0.056	(0.271)	0.051	0.006
220	18.33	0.13	0.056	(0.269)	0.051	0.006
221	18.42	0.13	0.056	(0.268)	0.051	0.006
222	18.50	0.13	0.056	(0.267)	0.051	0.006
223	18.58	0.10	0.042	(0.266)	0.038	0.004
224	18.67	0.10	0.042	(0.264)	0.038	0.004
225	18.75	0.10	0.042	(0.263)	0.038	0.004
226	18.83	0.07	0.028	(0.262)	0.025	0.003
227	18.92	0.07	0.028	(0.260)	0.025	0.003
228	19.00	0.07	0.028	(0.259)	0.025	0.003
229	19.08	0.10	0.042	(0.258)	0.038	0.004
230	19.17	0.10	0.042	(0.257)	0.038	0.004
231	19.25	0.10	0.042	(0.256)	0.038	0.004
232	19.33	0.13	0.056	(0.254)	0.051	0.006
233	19.42	0.13	0.056	(0.253)	0.051	0.006
234	19.50	0.13	0.056	(0.252)	0.051	0.006
235	19.58	0.10	0.042	(0.251)	0.038	0.004
236	19.67	0.10	0.042	(0.250)	0.038	0.004
237	19.75	0.10	0.042	(0.249)	0.038	0.004
238	19.83	0.07	0.028	(0.248)	0.025	0.003
239	19.92	0.07	0.028	(0.246)	0.025	0.003

240	20.00	0.07	0.028	(0.245)	0.025	0.003
241	20.08	0.10	0.042	(0.244)	0.038	0.004
242	20.17	0.10	0.042	(0.243)	0.038	0.004
243	20.25	0.10	0.042	(0.242)	0.038	0.004
244	20.33	0.10	0.042	(0.241)	0.038	0.004
245	20.42	0.10	0.042	(0.240)	0.038	0.004
246	20.50	0.10	0.042	(0.239)	0.038	0.004
247	20.58	0.10	0.042	(0.238)	0.038	0.004
248	20.67	0.10	0.042	(0.237)	0.038	0.004
249	20.75	0.10	0.042	(0.236)	0.038	0.004
250	20.83	0.07	0.028	(0.235)	0.025	0.003
251	20.92	0.07	0.028	(0.234)	0.025	0.003
252	21.00	0.07	0.028	(0.233)	0.025	0.003
253	21.08	0.10	0.042	(0.232)	0.038	0.004
254	21.17	0.10	0.042	(0.231)	0.038	0.004
255	21.25	0.10	0.042	(0.230)	0.038	0.004
256	21.33	0.07	0.028	(0.230)	0.025	0.003
257	21.42	0.07	0.028	(0.229)	0.025	0.003
258	21.50	0.07	0.028	(0.228)	0.025	0.003
259	21.58	0.10	0.042	(0.227)	0.038	0.004
260	21.67	0.10	0.042	(0.226)	0.038	0.004
261	21.75	0.10	0.042	(0.225)	0.038	0.004
262	21.83	0.07	0.028	(0.225)	0.025	0.003
263	21.92	0.07	0.028	(0.224)	0.025	0.003
264	22.00	0.07	0.028	(0.223)	0.025	0.003
265	22.08	0.10	0.042	(0.222)	0.038	0.004
266	22.17	0.10	0.042	(0.222)	0.038	0.004
267	22.25	0.10	0.042	(0.221)	0.038	0.004
268	22.33	0.07	0.028	(0.220)	0.025	0.003
269	22.42	0.07	0.028	(0.220)	0.025	0.003
270	22.50	0.07	0.028	(0.219)	0.025	0.003
271	22.58	0.07	0.028	(0.218)	0.025	0.003
272	22.67	0.07	0.028	(0.218)	0.025	0.003
273	22.75	0.07	0.028	(0.217)	0.025	0.003
274	22.83	0.07	0.028	(0.216)	0.025	0.003
275	22.92	0.07	0.028	(0.216)	0.025	0.003
276	23.00	0.07	0.028	(0.215)	0.025	0.003
277	23.08	0.07	0.028	(0.215)	0.025	0.003
278	23.17	0.07	0.028	(0.214)	0.025	0.003
279	23.25	0.07	0.028	(0.214)	0.025	0.003
280	23.33	0.07	0.028	(0.214)	0.025	0.003
281	23.42	0.07	0.028	(0.213)	0.025	0.003
282	23.50	0.07	0.028	(0.213)	0.025	0.003
283	23.58	0.07	0.028	(0.212)	0.025	0.003
284	23.67	0.07	0.028	(0.212)	0.025	0.003
285	23.75	0.07	0.028	(0.212)	0.025	0.003
286	23.83	0.07	0.028	(0.212)	0.025	0.003
287	23.92	0.07	0.028	(0.211)	0.025	0.003
288	24.00	0.07	0.028	(0.211)	0.025	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.6

Flood volume = Effective rainfall 0.38(In)

times area 3.9(Ac.) / [(In) / (Ft.)] = 0.1(Ac.Ft)

Total soil loss = 3.13(In)

Total soil loss = 1.018(Ac.Ft)

Total rainfall = 3.52(In)

Flood volume = 5427.8 Cubic Feet

Total soil loss = 44337.5 Cubic Feet

Peak flow rate of this hydrograph = 0.449(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0003	0.02	Q				
0+30	0.0004	0.02	Q				
0+35	0.0006	0.02	Q				
0+40	0.0007	0.02	Q				
0+45	0.0008	0.02	Q				
0+50	0.0009	0.02	Q				
0+55	0.0011	0.02	Q				
1+ 0	0.0012	0.02	Q				
1+ 5	0.0013	0.02	Q				
1+10	0.0015	0.02	Q				
1+15	0.0016	0.02	Q				
1+20	0.0017	0.02	Q				
1+25	0.0018	0.02	Q				
1+30	0.0019	0.02	Q				
1+35	0.0020	0.02	Q				
1+40	0.0022	0.02	Q				
1+45	0.0023	0.02	Q				
1+50	0.0024	0.02	Q				
1+55	0.0025	0.02	Q				
2+ 0	0.0027	0.02	Q				
2+ 5	0.0028	0.02	Q				
2+10	0.0030	0.02	Q				
2+15	0.0031	0.02	QV				
2+20	0.0033	0.02	QV				
2+25	0.0034	0.02	QV				
2+30	0.0036	0.02	QV				
2+35	0.0038	0.02	QV				
2+40	0.0039	0.03	QV				
2+45	0.0041	0.03	QV				
2+50	0.0043	0.03	QV				
2+55	0.0045	0.03	QV				
3+ 0	0.0047	0.03	QV				
3+ 5	0.0049	0.03	QV				
3+10	0.0051	0.03	QV				
3+15	0.0053	0.03	QV				
3+20	0.0055	0.03	QV				
3+25	0.0057	0.03	QV				
3+30	0.0058	0.03	QV				
3+35	0.0060	0.03	QV				
3+40	0.0062	0.03	QV				

3+45	0.0064	0.03	Q	V
3+50	0.0066	0.03	Q	V
3+55	0.0068	0.03	Q	V
4+ 0	0.0071	0.03	Q	V
4+ 5	0.0073	0.03	Q	V
4+10	0.0075	0.03	Q	V
4+15	0.0077	0.03	Q	V
4+20	0.0080	0.03	Q	V
4+25	0.0082	0.04	Q	V
4+30	0.0085	0.04	Q	V
4+35	0.0088	0.04	Q	V
4+40	0.0090	0.04	Q	V
4+45	0.0093	0.04	Q	V
4+50	0.0096	0.04	Q	V
4+55	0.0099	0.04	Q	V
5+ 0	0.0102	0.04	Q	V
5+ 5	0.0105	0.04	Q	V
5+10	0.0107	0.04	Q	V
5+15	0.0109	0.03	Q	V
5+20	0.0112	0.04	Q	V
5+25	0.0114	0.04	Q	V
5+30	0.0117	0.04	Q	V
5+35	0.0120	0.04	Q	V
5+40	0.0123	0.04	Q	V
5+45	0.0126	0.04	Q	V
5+50	0.0129	0.04	Q	V
5+55	0.0132	0.04	Q	V
6+ 0	0.0135	0.04	Q	V
6+ 5	0.0138	0.05	Q	V
6+10	0.0141	0.05	Q	V
6+15	0.0145	0.05	Q	V
6+20	0.0148	0.05	Q	V
6+25	0.0152	0.05	Q	V
6+30	0.0155	0.05	Q	V
6+35	0.0159	0.05	Q	V
6+40	0.0162	0.05	Q	V
6+45	0.0166	0.05	Q	V
6+50	0.0170	0.06	Q	V
6+55	0.0174	0.06	Q	V
7+ 0	0.0177	0.06	Q	V
7+ 5	0.0181	0.06	Q	V
7+10	0.0185	0.06	Q	V
7+15	0.0189	0.06	Q	V
7+20	0.0193	0.06	Q	V
7+25	0.0197	0.06	Q	V
7+30	0.0201	0.06	Q	V
7+35	0.0205	0.06	Q	V
7+40	0.0210	0.06	Q	V
7+45	0.0214	0.07	Q	V
7+50	0.0219	0.07	Q	V
7+55	0.0224	0.07	Q	V
8+ 0	0.0229	0.07	Q	V
8+ 5	0.0234	0.07	Q	V
8+10	0.0239	0.08	Q	V
8+15	0.0245	0.08	Q	V
8+20	0.0251	0.08	Q	V
8+25	0.0256	0.08	Q	V

8+30	0.0262	0.08	Q	V				
8+35	0.0268	0.08	Q	V				
8+40	0.0274	0.09	Q	V				
8+45	0.0280	0.09	Q	V				
8+50	0.0286	0.09	Q	V				
8+55	0.0293	0.09	Q	V				
9+ 0	0.0299	0.09	Q	V				
9+ 5	0.0306	0.10	Q	V				
9+10	0.0313	0.10	Q	V				
9+15	0.0320	0.10	Q	V				
9+20	0.0327	0.11	Q	V				
9+25	0.0335	0.11	Q	V				
9+30	0.0342	0.11	Q	V				
9+35	0.0350	0.11	Q	V				
9+40	0.0358	0.11	Q	V				
9+45	0.0366	0.12	Q	V				
9+50	0.0374	0.12	Q	V				
9+55	0.0382	0.12	Q	V				
10+ 0	0.0391	0.12	Q	V				
10+ 5	0.0398	0.11	Q	V				
10+10	0.0404	0.09	Q	V				
10+15	0.0410	0.09	Q	V				
10+20	0.0416	0.08	Q	V				
10+25	0.0422	0.08	Q	V				
10+30	0.0428	0.08	Q	V				
10+35	0.0434	0.09	Q	V				
10+40	0.0441	0.10	Q	V				
10+45	0.0449	0.11	Q	V				
10+50	0.0456	0.11	Q	V				
10+55	0.0464	0.11	Q	V				
11+ 0	0.0471	0.11	Q	V				
11+ 5	0.0479	0.11	Q	V				
11+10	0.0486	0.11	Q	V				
11+15	0.0494	0.11	Q	V				
11+20	0.0501	0.11	Q	V				
11+25	0.0508	0.11	Q	V				
11+30	0.0515	0.11	Q	V				
11+35	0.0522	0.10	Q	V				
11+40	0.0529	0.10	Q	V				
11+45	0.0535	0.10	Q	V				
11+50	0.0542	0.10	Q	V				
11+55	0.0549	0.10	Q	V				
12+ 0	0.0556	0.10	Q	V				
12+ 5	0.0563	0.11	Q	V				
12+10	0.0572	0.13	Q	V				
12+15	0.0581	0.13	Q	V				
12+20	0.0591	0.14	Q	V				
12+25	0.0601	0.14	Q	V				
12+30	0.0611	0.14	Q	V				
12+35	0.0621	0.15	Q	V				
12+40	0.0631	0.15	Q	V				
12+45	0.0642	0.15	Q	V				
12+50	0.0652	0.16	Q	V				
12+55	0.0663	0.16	Q	V				
13+ 0	0.0674	0.16	Q	V				
13+ 5	0.0691	0.24	Q	V				
13+10	0.0716	0.36	Q	V				

13+15	0.0743	0.40	Q		V		
13+20	0.0772	0.42	Q		V		
13+25	0.0803	0.44	Q		V		
13+30	0.0833	0.45	Q		V		
13+35	0.0858	0.36	Q		V		
13+40	0.0872	0.20	Q		V		
13+45	0.0883	0.16	Q		V		
13+50	0.0893	0.14	Q		V		
13+55	0.0902	0.13	Q		V		
14+ 0	0.0911	0.13	Q		V		
14+ 5	0.0920	0.13	Q		V		
14+10	0.0930	0.14	Q		V		
14+15	0.0940	0.15	Q		V		
14+20	0.0950	0.15	Q		V		
14+25	0.0960	0.14	Q		V		
14+30	0.0970	0.14	Q		V		
14+35	0.0980	0.14	Q		V		
14+40	0.0990	0.14	Q		V		
14+45	0.1000	0.14	Q		V		
14+50	0.1010	0.14	Q		V		
14+55	0.1019	0.14	Q		V		
15+ 0	0.1029	0.14	Q		V		
15+ 5	0.1038	0.14	Q		V		
15+10	0.1047	0.13	Q		V		
15+15	0.1057	0.13	Q		V		
15+20	0.1066	0.13	Q		V		
15+25	0.1074	0.13	Q		V		
15+30	0.1083	0.13	Q		V		
15+35	0.1092	0.12	Q		V		
15+40	0.1099	0.11	Q		V		
15+45	0.1107	0.11	Q		V		
15+50	0.1114	0.11	Q		V		
15+55	0.1121	0.11	Q		V		
16+ 0	0.1128	0.11	Q		V		
16+ 5	0.1134	0.08	Q		V		
16+10	0.1137	0.04	Q		V		
16+15	0.1139	0.03	Q		V		
16+20	0.1141	0.03	Q		V		
16+25	0.1142	0.02	Q		V		
16+30	0.1144	0.02	Q		V		
16+35	0.1145	0.02	Q		V		
16+40	0.1146	0.02	Q		V		
16+45	0.1148	0.02	Q		V		
16+50	0.1149	0.02	Q		V		
16+55	0.1150	0.02	Q		V		
17+ 0	0.1151	0.02	Q		V		
17+ 5	0.1152	0.02	Q		V		
17+10	0.1154	0.03	Q		V		
17+15	0.1156	0.03	Q		V		
17+20	0.1158	0.03	Q		V		
17+25	0.1160	0.03	Q		V		
17+30	0.1162	0.03	Q		V		
17+35	0.1164	0.03	Q		V		
17+40	0.1165	0.03	Q		V		
17+45	0.1167	0.03	Q		V		
17+50	0.1169	0.03	Q		V		
17+55	0.1171	0.02	Q		V		

18+ 0	0.1172	0.02	Q				V
18+ 5	0.1174	0.02	Q				V
18+10	0.1175	0.02	Q				V
18+15	0.1177	0.02	Q				V
18+20	0.1178	0.02	Q				V
18+25	0.1180	0.02	Q				V
18+30	0.1182	0.02	Q				V
18+35	0.1183	0.02	Q				V
18+40	0.1184	0.02	Q				V
18+45	0.1185	0.02	Q				V
18+50	0.1186	0.02	Q				V
18+55	0.1187	0.01	Q				V
19+ 0	0.1188	0.01	Q				V
19+ 5	0.1189	0.01	Q				V
19+10	0.1190	0.02	Q				V
19+15	0.1191	0.02	Q				V
19+20	0.1192	0.02	Q				V
19+25	0.1194	0.02	Q				V
19+30	0.1195	0.02	Q				V
19+35	0.1197	0.02	Q				V
19+40	0.1198	0.02	Q				V
19+45	0.1199	0.02	Q				V
19+50	0.1200	0.02	Q				V
19+55	0.1201	0.01	Q				V
20+ 0	0.1202	0.01	Q				V
20+ 5	0.1203	0.01	Q				V
20+10	0.1204	0.02	Q				V
20+15	0.1205	0.02	Q				V
20+20	0.1206	0.02	Q				V
20+25	0.1207	0.02	Q				V
20+30	0.1208	0.02	Q				V
20+35	0.1209	0.02	Q				V
20+40	0.1211	0.02	Q				V
20+45	0.1212	0.02	Q				V
20+50	0.1213	0.01	Q				V
20+55	0.1214	0.01	Q				V
21+ 0	0.1214	0.01	Q				V
21+ 5	0.1215	0.01	Q				V
21+10	0.1216	0.02	Q				V
21+15	0.1217	0.02	Q				V
21+20	0.1218	0.01	Q				V
21+25	0.1219	0.01	Q				V
21+30	0.1220	0.01	Q				V
21+35	0.1221	0.01	Q				V
21+40	0.1222	0.02	Q				V
21+45	0.1223	0.02	Q				V
21+50	0.1224	0.01	Q				V
21+55	0.1225	0.01	Q				V
22+ 0	0.1226	0.01	Q				V
22+ 5	0.1227	0.01	Q				V
22+10	0.1228	0.02	Q				V
22+15	0.1229	0.02	Q				V
22+20	0.1230	0.01	Q				V
22+25	0.1231	0.01	Q				V
22+30	0.1231	0.01	Q				V
22+35	0.1232	0.01	Q				V
22+40	0.1233	0.01	Q				V

22+45	0.1234	0.01	Q				V
22+50	0.1235	0.01	Q				V
22+55	0.1235	0.01	Q				V
23+ 0	0.1236	0.01	Q				V
23+ 5	0.1237	0.01	Q				V
23+10	0.1238	0.01	Q				V
23+15	0.1238	0.01	Q				V
23+20	0.1239	0.01	Q				V
23+25	0.1240	0.01	Q				V
23+30	0.1241	0.01	Q				V
23+35	0.1241	0.01	Q				V
23+40	0.1242	0.01	Q				V
23+45	0.1243	0.01	Q				V
23+50	0.1244	0.01	Q				V
23+55	0.1244	0.01	Q				V
24+ 0	0.1245	0.01	Q				V
24+ 5	0.1246	0.01	Q				V
24+10	0.1246	0.00	Q				V
24+15	0.1246	0.00	Q				V
24+20	0.1246	0.00	Q				V
24+25	0.1246	0.00	Q				V

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	0.58	2.26

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	1.45	5.65

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 0.938(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.900	81.00	0.000
Total Area Entered = 3.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
Sum (F) =						0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233
 Minimum soil loss rate ((In/Hr)) = 0.116
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

 Slope of intensity-duration curve for a 1 hour storm = 0.4800

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	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum = 100.000		Sum=	3.930

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)		Effective (In/Hr)
			Max	Low	
1	0.08	4.40	0.495	(0.233)	0.263
2	0.17	4.50	0.506	(0.233)	0.274
3	0.25	5.40	0.608	(0.233)	0.375
4	0.33	5.40	0.608	(0.233)	0.375
5	0.42	5.70	0.642	(0.233)	0.409
6	0.50	6.40	0.720	(0.233)	0.488
7	0.58	7.90	0.889	(0.233)	0.657
8	0.67	9.10	1.024	(0.233)	0.792
9	0.75	12.80	1.441	(0.233)	1.208

10	0.83	25.60	2.881	0.233	(2.593)	2.649
11	0.92	7.90	0.889	0.233	(0.800)	0.657
12	1.00	4.90	0.551	0.233	(0.496)	0.319

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.5

Flood volume = Effective rainfall 0.71(In)

times area 3.9(Ac.)/[(In)/(Ft.)] = 0.2(Ac.Ft)

Total soil loss = 0.23(In)

Total soil loss = 0.076(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 9984.8 Cubic Feet

Total soil loss = 3292.9 Cubic Feet

Peak flow rate of this hydrograph = 6.618(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0021	0.30	VQ					
0+10	0.0077	0.81	V Q					
0+15	0.0151	1.08	V Q					
0+20	0.0243	1.33	VQ					
0+25	0.0342	1.45	Q					
0+30	0.0456	1.65	QV					
0+35	0.0595	2.02	Q V					
0+40	0.0771	2.55	Q	V				
0+45	0.1004	3.39	Q	V				
0+50	0.1414	5.96			QV			
0+55	0.1870	6.62			Q	V		
1+ 0	0.2096	3.27		Q			V	
1+ 5	0.2211	1.68		Q			V	
1+10	0.2259	0.70	Q				V	
1+15	0.2284	0.36	Q				V	
1+20	0.2290	0.09	Q				V	
1+25	0.2292	0.03	Q				V	

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Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 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]
3.90	0.98	3.82

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	2.48	9.67

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 1.597(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.900	81.00	0.000
Total Area Entered = 3.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
Sum (F) =						0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233

Minimum soil loss rate ((In/Hr)) = 0.116

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum =		100.000	Sum= 3.930

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)		Effective (In/Hr)
			Max	Low	
1	0.08	1.30	0.249	(0.233)	0.025
2	0.17	1.30	0.249	(0.233)	0.025
3	0.25	1.10	0.211	(0.233)	0.021
4	0.33	1.50	0.287	0.233 (0.259)	0.055
5	0.42	1.50	0.287	0.233 (0.259)	0.055
6	0.50	1.80	0.345	0.233 (0.310)	0.112
7	0.58	1.50	0.287	0.233 (0.259)	0.055
8	0.67	1.80	0.345	0.233 (0.310)	0.112
9	0.75	1.80	0.345	0.233 (0.310)	0.112
10	0.83	1.50	0.287	0.233 (0.259)	0.055
11	0.92	1.60	0.307	0.233 (0.276)	0.074

12	1.00	1.80	0.345	0.233	(0.310)	0.112
13	1.08	2.20	0.422	0.233	(0.379)	0.189
14	1.17	2.20	0.422	0.233	(0.379)	0.189
15	1.25	2.20	0.422	0.233	(0.379)	0.189
16	1.33	2.00	0.383	0.233	(0.345)	0.151
17	1.42	2.60	0.498	0.233	(0.448)	0.266
18	1.50	2.70	0.517	0.233	(0.466)	0.285
19	1.58	2.40	0.460	0.233	(0.414)	0.227
20	1.67	2.70	0.517	0.233	(0.466)	0.285
21	1.75	3.30	0.632	0.233	(0.569)	0.400
22	1.83	3.10	0.594	0.233	(0.535)	0.362
23	1.92	2.90	0.556	0.233	(0.500)	0.323
24	2.00	3.00	0.575	0.233	(0.517)	0.342
25	2.08	3.10	0.594	0.233	(0.535)	0.362
26	2.17	4.20	0.805	0.233	(0.724)	0.572
27	2.25	5.00	0.958	0.233	(0.862)	0.726
28	2.33	3.50	0.671	0.233	(0.604)	0.438
29	2.42	6.80	1.303	0.233	(1.173)	1.071
30	2.50	7.30	1.399	0.233	(1.259)	1.166
31	2.58	8.20	1.572	0.233	(1.414)	1.339
32	2.67	5.90	1.131	0.233	(1.018)	0.898
33	2.75	2.00	0.383	0.233	(0.345)	0.151
34	2.83	1.80	0.345	0.233	(0.310)	0.112
35	2.92	1.80	0.345	0.233	(0.310)	0.112
36	3.00	0.60	0.115	(0.233)	0.103	0.011

(Loss Rate Not Used)

Sum = 100.0

Sum = 11.0

Flood volume = Effective rainfall 0.92(In)

times area 3.9(Ac.)/[(In)/(Ft.)] = 0.3(Ac.Ft)

Total soil loss = 0.68(In)

Total soil loss = 0.222(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 12953.8 Cubic Feet

Total soil loss = 9656.1 Cubic Feet

Peak flow rate of this hydrograph = 4.488(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.03	Q				
0+10	0.0007	0.08	Q				
0+15	0.0013	0.08	Q				
0+20	0.0021	0.12	Q				
0+25	0.0034	0.19	Q				
0+30	0.0053	0.27	VQ				
0+35	0.0074	0.32	Q				
0+40	0.0096	0.31	Q				
0+45	0.0123	0.40	Q				
0+50	0.0148	0.36	Q				
0+55	0.0168	0.28	QV				

1+ 0	0.0191	0.34	QV						
1+ 5	0.0225	0.50	QV						
1+10	0.0271	0.66	QV						
1+15	0.0319	0.70	Q V						
1+20	0.0366	0.68	Q V						
1+25	0.0418	0.75	Q V						
1+30	0.0485	0.98	Q V						
1+35	0.0554	1.00	Q V						
1+40	0.0622	0.98	Q V						
1+45	0.0705	1.21	Q V						
1+50	0.0803	1.41	Q V						
1+55	0.0896	1.36	Q V						
2+ 0	0.0987	1.32	Q V						
2+ 5	0.1081	1.37	Q V						
2+10	0.1195	1.65	Q V						
2+15	0.1348	2.23	Q V						
2+20	0.1506	2.29	Q V						
2+25	0.1686	2.61	Q V						
2+30	0.1950	3.83	Q V						
2+35	0.2259	4.49	Q V						
2+40	0.2566	4.46	Q V						
2+45	0.2766	2.91	Q V						
2+50	0.2859	1.35	Q V						
2+55	0.2918	0.85	Q V						
3+ 0	0.2954	0.53	Q V						
3+ 5	0.2968	0.19	Q V						
3+10	0.2971	0.05	Q V						
3+15	0.2973	0.02	Q V						
3+20	0.2974	0.01	Q V						
3+25	0.2974	0.00	Q V						



Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B3Nat610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90 (Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90 (Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00 (Ft.)
Length along longest watercourse measured to centroid = 661.00 (Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50 (Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	1.38	5.38

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
3.90	3.48	13.57

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380(In)
 Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 2.244(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 2.244(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 3.900 81.00 0.000
 Total Area Entered = 3.90(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
Sum (F) =						0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233

Minimum soil loss rate ((In/Hr)) = 0.116

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum = 100.000		Sum=	3.930

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	0.08	0.135	(0.233)	0.121
2	0.17	0.162	(0.233)	0.145
3	0.25	0.162	(0.233)	0.145
4	0.33	0.162	(0.233)	0.145
5	0.42	0.162	(0.233)	0.145
6	0.50	0.188	(0.233)	0.170
7	0.58	0.188	(0.233)	0.170
8	0.67	0.188	(0.233)	0.170
9	0.75	0.188	(0.233)	0.170
10	0.83	0.188	(0.233)	0.170
11	0.92	0.188	(0.233)	0.170

12	1.00	0.80	0.215	(0.233)	0.194	0.022
13	1.08	0.80	0.215	(0.233)	0.194	0.022
14	1.17	0.80	0.215	(0.233)	0.194	0.022
15	1.25	0.80	0.215	(0.233)	0.194	0.022
16	1.33	0.80	0.215	(0.233)	0.194	0.022
17	1.42	0.80	0.215	(0.233)	0.194	0.022
18	1.50	0.80	0.215	(0.233)	0.194	0.022
19	1.58	0.80	0.215	(0.233)	0.194	0.022
20	1.67	0.80	0.215	(0.233)	0.194	0.022
21	1.75	0.80	0.215	(0.233)	0.194	0.022
22	1.83	0.80	0.215	(0.233)	0.194	0.022
23	1.92	0.80	0.215	(0.233)	0.194	0.022
24	2.00	0.90	0.242	(0.233)	0.218	0.024
25	2.08	0.80	0.215	(0.233)	0.194	0.022
26	2.17	0.90	0.242	(0.233)	0.218	0.024
27	2.25	0.90	0.242	(0.233)	0.218	0.024
28	2.33	0.90	0.242	(0.233)	0.218	0.024
29	2.42	0.90	0.242	(0.233)	0.218	0.024
30	2.50	0.90	0.242	(0.233)	0.218	0.024
31	2.58	0.90	0.242	(0.233)	0.218	0.024
32	2.67	0.90	0.242	(0.233)	0.218	0.024
33	2.75	1.00	0.269	0.233	(0.242)	0.037
34	2.83	1.00	0.269	0.233	(0.242)	0.037
35	2.92	1.00	0.269	0.233	(0.242)	0.037
36	3.00	1.00	0.269	0.233	(0.242)	0.037
37	3.08	1.00	0.269	0.233	(0.242)	0.037
38	3.17	1.10	0.296	0.233	(0.267)	0.064
39	3.25	1.10	0.296	0.233	(0.267)	0.064
40	3.33	1.10	0.296	0.233	(0.267)	0.064
41	3.42	1.20	0.323	0.233	(0.291)	0.091
42	3.50	1.30	0.350	0.233	(0.315)	0.117
43	3.58	1.40	0.377	0.233	(0.339)	0.144
44	3.67	1.40	0.377	0.233	(0.339)	0.144
45	3.75	1.50	0.404	0.233	(0.364)	0.171
46	3.83	1.50	0.404	0.233	(0.364)	0.171
47	3.92	1.60	0.431	0.233	(0.388)	0.198
48	4.00	1.60	0.431	0.233	(0.388)	0.198
49	4.08	1.70	0.458	0.233	(0.412)	0.225
50	4.17	1.80	0.485	0.233	(0.436)	0.252
51	4.25	1.90	0.512	0.233	(0.460)	0.279
52	4.33	2.00	0.539	0.233	(0.485)	0.306
53	4.42	2.10	0.565	0.233	(0.509)	0.333
54	4.50	2.10	0.565	0.233	(0.509)	0.333
55	4.58	2.20	0.592	0.233	(0.533)	0.360
56	4.67	2.30	0.619	0.233	(0.557)	0.387
57	4.75	2.40	0.646	0.233	(0.582)	0.414
58	4.83	2.40	0.646	0.233	(0.582)	0.414
59	4.92	2.50	0.673	0.233	(0.606)	0.441
60	5.00	2.60	0.700	0.233	(0.630)	0.468
61	5.08	3.10	0.835	0.233	(0.751)	0.602
62	5.17	3.60	0.969	0.233	(0.872)	0.737
63	5.25	3.90	1.050	0.233	(0.945)	0.818
64	5.33	4.20	1.131	0.233	(1.018)	0.898
65	5.42	4.70	1.266	0.233	(1.139)	1.033
66	5.50	5.60	1.508	0.233	(1.357)	1.275
67	5.58	1.90	0.512	0.233	(0.460)	0.279
68	5.67	0.90	0.242	(0.233)	0.218	0.024

69	5.75	0.60	0.162	(0.233)	0.145	0.016
70	5.83	0.50	0.135	(0.233)	0.121	0.013
71	5.92	0.30	0.081	(0.233)	0.073	0.008
72	6.00	0.20	0.054	(0.233)	0.048	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.2

Flood volume = Effective rainfall 1.02 (In)

times area 3.9 (Ac.) / [(In) / (Ft.)] = 0.3 (Ac.Ft)

Total soil loss = 1.23 (In)

Total soil loss = 0.399 (Ac.Ft)

Total rainfall = 2.24 (In)

Flood volume = 14386.3 Cubic Feet

Total soil loss = 17381.0 Cubic Feet

Peak flow rate of this hydrograph = 4.164 (CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0

0+ 5	0.0001	0.02	Q				
0+10	0.0004	0.04	Q				
0+15	0.0008	0.06	Q				
0+20	0.0012	0.06	Q				
0+25	0.0016	0.06	Q				
0+30	0.0021	0.07	Q				
0+35	0.0026	0.07	Q				
0+40	0.0031	0.07	Q				
0+45	0.0036	0.07	Q				
0+50	0.0041	0.07	Q				
0+55	0.0046	0.07	Q				
1+ 0	0.0051	0.08	Q				
1+ 5	0.0057	0.08	Q				
1+10	0.0063	0.08	Q				
1+15	0.0069	0.08	Q				
1+20	0.0074	0.08	Q				
1+25	0.0080	0.08	Q				
1+30	0.0086	0.08	QV				
1+35	0.0092	0.08	QV				
1+40	0.0098	0.08	QV				
1+45	0.0104	0.08	QV				
1+50	0.0110	0.08	QV				
1+55	0.0115	0.08	QV				
2+ 0	0.0121	0.09	QV				
2+ 5	0.0128	0.09	QV				
2+10	0.0134	0.09	QV				
2+15	0.0140	0.09	QV				
2+20	0.0147	0.09	QV				
2+25	0.0153	0.09	QV				
2+30	0.0160	0.10	QV				
2+35	0.0166	0.10	Q V				
2+40	0.0173	0.10	Q V				

2+45	0.0180	0.11	Q V						
2+50	0.0190	0.13	Q V						
2+55	0.0199	0.14	Q V						
3+ 0	0.0209	0.14	Q V						
3+ 5	0.0219	0.14	Q V						
3+10	0.0231	0.18	Q V						
3+15	0.0246	0.23	Q V						
3+20	0.0263	0.24	Q V						
3+25	0.0282	0.28	Q V						
3+30	0.0307	0.36	Q V						
3+35	0.0338	0.46	Q V						
3+40	0.0375	0.53	Q V						
3+45	0.0415	0.58	Q V						
3+50	0.0459	0.64	Q V						
3+55	0.0507	0.69	Q V						
4+ 0	0.0558	0.75	Q V						
4+ 5	0.0613	0.80	Q V						
4+10	0.0674	0.89	Q V						
4+15	0.0742	0.99	Q V						
4+20	0.0817	1.09	Q V						
4+25	0.0899	1.19	Q V						
4+30	0.0986	1.27	Q V						
4+35	0.1077	1.32	Q V						
4+40	0.1175	1.41	Q V						
4+45	0.1279	1.51	Q V						
4+50	0.1388	1.59	Q V						
4+55	0.1501	1.64	Q V						
5+ 0	0.1621	1.73	Q V						
5+ 5	0.1755	1.96	Q V						
5+10	0.1920	2.39	Q V						
5+15	0.2113	2.81	Q V						
5+20	0.2331	3.15	Q V						
5+25	0.2575	3.55	Q V						
5+30	0.2862	4.16	Q V						
5+35	0.3107	3.57	Q V						
5+40	0.3214	1.55	Q V						
5+45	0.3260	0.66	Q V						
5+50	0.3284	0.35	Q V						
5+55	0.3296	0.19	Q V						
6+ 0	0.3300	0.06	Q V						
6+ 5	0.3302	0.02	Q V						
6+10	0.3302	0.01	Q V						
6+15	0.3303	0.00	Q V						
6+20	0.3303	0.00	Q V						
6+25	0.3303	0.00	Q V						



Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786B3Nat2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "B" Subarea 3 Existing Natural Condition

Drainage Area = 3.90(Ac.) = 0.006 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 3.90(Ac.) = 0.006 Sq. Mi.
Length along longest watercourse = 1062.00(Ft.)
Length along longest watercourse measured to centroid = 661.00(Ft.)
Length along longest watercourse = 0.201 Mi.
Length along longest watercourse measured to centroid = 0.125 Mi.
Difference in elevation = 53.50(Ft.)
Slope along watercourse = 265.9887 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.062 Hr.
Lag time = 3.69 Min.
25% of lag time = 0.92 Min.
40% of lag time = 1.48 Min.
Unit time = 5.00 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]
3.90	2.48	9.67

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
3.90	6.90	26.91

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 4.298(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 4.298(In)

Sub-Area Data:

Area(Ac.) Runoff Index Impervious %
 3.900 81.00 0.000
 Total Area Entered = 3.90(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
81.0	81.0	0.233	0.000	0.233	1.000	0.233
Sum (F) =						0.233

Area averaged mean soil loss (F) (In/Hr) = 0.233

Minimum soil loss rate ((In/Hr)) = 0.116

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	135.459	29.490
2	0.167	270.918	47.989
3	0.250	406.377	12.112
4	0.333	541.836	5.367
5	0.417	677.295	2.915
6	0.500	812.755	2.128
Sum = 100.000		Sum=	3.930

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	0.08	0.07	(0.412)	0.031
2	0.17	0.07	(0.411)	0.031
3	0.25	0.07	(0.409)	0.031
4	0.33	0.10	(0.408)	0.046
5	0.42	0.10	(0.406)	0.046
6	0.50	0.10	(0.404)	0.046
7	0.58	0.10	(0.403)	0.046
8	0.67	0.10	(0.401)	0.046
9	0.75	0.10	(0.400)	0.046
10	0.83	0.13	(0.398)	0.062
11	0.92	0.13	(0.397)	0.062

12	1.00	0.13	0.069	(0.395)	0.062	0.007
13	1.08	0.10	0.052	(0.393)	0.046	0.005
14	1.17	0.10	0.052	(0.392)	0.046	0.005
15	1.25	0.10	0.052	(0.390)	0.046	0.005
16	1.33	0.10	0.052	(0.389)	0.046	0.005
17	1.42	0.10	0.052	(0.387)	0.046	0.005
18	1.50	0.10	0.052	(0.386)	0.046	0.005
19	1.58	0.10	0.052	(0.384)	0.046	0.005
20	1.67	0.10	0.052	(0.383)	0.046	0.005
21	1.75	0.10	0.052	(0.381)	0.046	0.005
22	1.83	0.13	0.069	(0.379)	0.062	0.007
23	1.92	0.13	0.069	(0.378)	0.062	0.007
24	2.00	0.13	0.069	(0.376)	0.062	0.007
25	2.08	0.13	0.069	(0.375)	0.062	0.007
26	2.17	0.13	0.069	(0.373)	0.062	0.007
27	2.25	0.13	0.069	(0.372)	0.062	0.007
28	2.33	0.13	0.069	(0.370)	0.062	0.007
29	2.42	0.13	0.069	(0.369)	0.062	0.007
30	2.50	0.13	0.069	(0.367)	0.062	0.007
31	2.58	0.17	0.086	(0.366)	0.077	0.009
32	2.67	0.17	0.086	(0.364)	0.077	0.009
33	2.75	0.17	0.086	(0.363)	0.077	0.009
34	2.83	0.17	0.086	(0.361)	0.077	0.009
35	2.92	0.17	0.086	(0.360)	0.077	0.009
36	3.00	0.17	0.086	(0.358)	0.077	0.009
37	3.08	0.17	0.086	(0.357)	0.077	0.009
38	3.17	0.17	0.086	(0.355)	0.077	0.009
39	3.25	0.17	0.086	(0.354)	0.077	0.009
40	3.33	0.17	0.086	(0.352)	0.077	0.009
41	3.42	0.17	0.086	(0.351)	0.077	0.009
42	3.50	0.17	0.086	(0.350)	0.077	0.009
43	3.58	0.17	0.086	(0.348)	0.077	0.009
44	3.67	0.17	0.086	(0.347)	0.077	0.009
45	3.75	0.17	0.086	(0.345)	0.077	0.009
46	3.83	0.20	0.103	(0.344)	0.093	0.010
47	3.92	0.20	0.103	(0.342)	0.093	0.010
48	4.00	0.20	0.103	(0.341)	0.093	0.010
49	4.08	0.20	0.103	(0.339)	0.093	0.010
50	4.17	0.20	0.103	(0.338)	0.093	0.010
51	4.25	0.20	0.103	(0.336)	0.093	0.010
52	4.33	0.23	0.120	(0.335)	0.108	0.012
53	4.42	0.23	0.120	(0.334)	0.108	0.012
54	4.50	0.23	0.120	(0.332)	0.108	0.012
55	4.58	0.23	0.120	(0.331)	0.108	0.012
56	4.67	0.23	0.120	(0.329)	0.108	0.012
57	4.75	0.23	0.120	(0.328)	0.108	0.012
58	4.83	0.27	0.138	(0.326)	0.124	0.014
59	4.92	0.27	0.138	(0.325)	0.124	0.014
60	5.00	0.27	0.138	(0.324)	0.124	0.014
61	5.08	0.20	0.103	(0.322)	0.093	0.010
62	5.17	0.20	0.103	(0.321)	0.093	0.010
63	5.25	0.20	0.103	(0.319)	0.093	0.010
64	5.33	0.23	0.120	(0.318)	0.108	0.012
65	5.42	0.23	0.120	(0.317)	0.108	0.012
66	5.50	0.23	0.120	(0.315)	0.108	0.012
67	5.58	0.27	0.138	(0.314)	0.124	0.014
68	5.67	0.27	0.138	(0.313)	0.124	0.014

69	5.75	0.27	0.138	(0.311)	0.124	0.014
70	5.83	0.27	0.138	(0.310)	0.124	0.014
71	5.92	0.27	0.138	(0.308)	0.124	0.014
72	6.00	0.27	0.138	(0.307)	0.124	0.014
73	6.08	0.30	0.155	(0.306)	0.139	0.015
74	6.17	0.30	0.155	(0.304)	0.139	0.015
75	6.25	0.30	0.155	(0.303)	0.139	0.015
76	6.33	0.30	0.155	(0.302)	0.139	0.015
77	6.42	0.30	0.155	(0.300)	0.139	0.015
78	6.50	0.30	0.155	(0.299)	0.139	0.015
79	6.58	0.33	0.172	(0.298)	0.155	0.017
80	6.67	0.33	0.172	(0.296)	0.155	0.017
81	6.75	0.33	0.172	(0.295)	0.155	0.017
82	6.83	0.33	0.172	(0.294)	0.155	0.017
83	6.92	0.33	0.172	(0.292)	0.155	0.017
84	7.00	0.33	0.172	(0.291)	0.155	0.017
85	7.08	0.33	0.172	(0.290)	0.155	0.017
86	7.17	0.33	0.172	(0.288)	0.155	0.017
87	7.25	0.33	0.172	(0.287)	0.155	0.017
88	7.33	0.37	0.189	(0.286)	0.170	0.019
89	7.42	0.37	0.189	(0.284)	0.170	0.019
90	7.50	0.37	0.189	(0.283)	0.170	0.019
91	7.58	0.40	0.206	(0.282)	0.186	0.021
92	7.67	0.40	0.206	(0.280)	0.186	0.021
93	7.75	0.40	0.206	(0.279)	0.186	0.021
94	7.83	0.43	0.224	(0.278)	0.201	0.022
95	7.92	0.43	0.224	(0.277)	0.201	0.022
96	8.00	0.43	0.224	(0.275)	0.201	0.022
97	8.08	0.50	0.258	(0.274)	0.232	0.026
98	8.17	0.50	0.258	(0.273)	0.232	0.026
99	8.25	0.50	0.258	(0.271)	0.232	0.026
100	8.33	0.50	0.258	(0.270)	0.232	0.026
101	8.42	0.50	0.258	(0.269)	0.232	0.026
102	8.50	0.50	0.258	(0.268)	0.232	0.026
103	8.58	0.53	0.275	(0.266)	0.248	0.028
104	8.67	0.53	0.275	(0.265)	0.248	0.028
105	8.75	0.53	0.275	(0.264)	0.248	0.028
106	8.83	0.57	0.292	0.263	(0.263)	0.030
107	8.92	0.57	0.292	0.261	(0.263)	0.031
108	9.00	0.57	0.292	0.260	(0.263)	0.032
109	9.08	0.63	0.327	0.259	(0.294)	0.068
110	9.17	0.63	0.327	0.258	(0.294)	0.069
111	9.25	0.63	0.327	0.256	(0.294)	0.070
112	9.33	0.67	0.344	0.255	(0.309)	0.089
113	9.42	0.67	0.344	0.254	(0.309)	0.090
114	9.50	0.67	0.344	0.253	(0.309)	0.091
115	9.58	0.70	0.361	0.252	(0.325)	0.109
116	9.67	0.70	0.361	0.250	(0.325)	0.111
117	9.75	0.70	0.361	0.249	(0.325)	0.112
118	9.83	0.73	0.378	0.248	(0.340)	0.130
119	9.92	0.73	0.378	0.247	(0.340)	0.131
120	10.00	0.73	0.378	0.246	(0.340)	0.133
121	10.08	0.50	0.258	(0.244)	0.232	0.026
122	10.17	0.50	0.258	(0.243)	0.232	0.026
123	10.25	0.50	0.258	(0.242)	0.232	0.026
124	10.33	0.50	0.258	(0.241)	0.232	0.026
125	10.42	0.50	0.258	(0.240)	0.232	0.026

126	10.50	0.50	0.258	(0.239)	0.232	0.026
127	10.58	0.67	0.344	0.237	(0.309)	0.106
128	10.67	0.67	0.344	0.236	(0.309)	0.108
129	10.75	0.67	0.344	0.235	(0.309)	0.109
130	10.83	0.67	0.344	0.234	(0.309)	0.110
131	10.92	0.67	0.344	0.233	(0.309)	0.111
132	11.00	0.67	0.344	0.232	(0.309)	0.112
133	11.08	0.63	0.327	0.230	(0.294)	0.096
134	11.17	0.63	0.327	0.229	(0.294)	0.097
135	11.25	0.63	0.327	0.228	(0.294)	0.098
136	11.33	0.63	0.327	0.227	(0.294)	0.100
137	11.42	0.63	0.327	0.226	(0.294)	0.101
138	11.50	0.63	0.327	0.225	(0.294)	0.102
139	11.58	0.57	0.292	0.224	(0.263)	0.069
140	11.67	0.57	0.292	0.223	(0.263)	0.070
141	11.75	0.57	0.292	0.222	(0.263)	0.071
142	11.83	0.60	0.309	0.220	(0.279)	0.089
143	11.92	0.60	0.309	0.219	(0.279)	0.090
144	12.00	0.60	0.309	0.218	(0.279)	0.091
145	12.08	0.83	0.430	0.217	(0.387)	0.213
146	12.17	0.83	0.430	0.216	(0.387)	0.214
147	12.25	0.83	0.430	0.215	(0.387)	0.215
148	12.33	0.87	0.447	0.214	(0.402)	0.233
149	12.42	0.87	0.447	0.213	(0.402)	0.234
150	12.50	0.87	0.447	0.212	(0.402)	0.235
151	12.58	0.93	0.481	0.211	(0.433)	0.271
152	12.67	0.93	0.481	0.210	(0.433)	0.272
153	12.75	0.93	0.481	0.209	(0.433)	0.273
154	12.83	0.97	0.499	0.207	(0.449)	0.291
155	12.92	0.97	0.499	0.206	(0.449)	0.292
156	13.00	0.97	0.499	0.205	(0.449)	0.293
157	13.08	1.13	0.585	0.204	(0.526)	0.380
158	13.17	1.13	0.585	0.203	(0.526)	0.381
159	13.25	1.13	0.585	0.202	(0.526)	0.382
160	13.33	1.13	0.585	0.201	(0.526)	0.383
161	13.42	1.13	0.585	0.200	(0.526)	0.384
162	13.50	1.13	0.585	0.199	(0.526)	0.385
163	13.58	0.77	0.395	0.198	(0.356)	0.197
164	13.67	0.77	0.395	0.197	(0.356)	0.198
165	13.75	0.77	0.395	0.196	(0.356)	0.199
166	13.83	0.77	0.395	0.195	(0.356)	0.200
167	13.92	0.77	0.395	0.194	(0.356)	0.201
168	14.00	0.77	0.395	0.193	(0.356)	0.202
169	14.08	0.90	0.464	0.192	(0.418)	0.272
170	14.17	0.90	0.464	0.191	(0.418)	0.273
171	14.25	0.90	0.464	0.190	(0.418)	0.274
172	14.33	0.87	0.447	0.189	(0.402)	0.258
173	14.42	0.87	0.447	0.188	(0.402)	0.259
174	14.50	0.87	0.447	0.187	(0.402)	0.260
175	14.58	0.87	0.447	0.186	(0.402)	0.261
176	14.67	0.87	0.447	0.185	(0.402)	0.262
177	14.75	0.87	0.447	0.184	(0.402)	0.263
178	14.83	0.83	0.430	0.184	(0.387)	0.246
179	14.92	0.83	0.430	0.183	(0.387)	0.247
180	15.00	0.83	0.430	0.182	(0.387)	0.248
181	15.08	0.80	0.413	0.181	(0.371)	0.232
182	15.17	0.80	0.413	0.180	(0.371)	0.233

183	15.25	0.80	0.413	0.179	(0.371)	0.234
184	15.33	0.77	0.395	0.178	(0.356)	0.217
185	15.42	0.77	0.395	0.177	(0.356)	0.218
186	15.50	0.77	0.395	0.176	(0.356)	0.219
187	15.58	0.63	0.327	0.175	(0.294)	0.151
188	15.67	0.63	0.327	0.174	(0.294)	0.152
189	15.75	0.63	0.327	0.173	(0.294)	0.153
190	15.83	0.63	0.327	0.173	(0.294)	0.154
191	15.92	0.63	0.327	0.172	(0.294)	0.155
192	16.00	0.63	0.327	0.171	(0.294)	0.156
193	16.08	0.13	0.069	(0.170)	0.062	0.007
194	16.17	0.13	0.069	(0.169)	0.062	0.007
195	16.25	0.13	0.069	(0.168)	0.062	0.007
196	16.33	0.13	0.069	(0.167)	0.062	0.007
197	16.42	0.13	0.069	(0.166)	0.062	0.007
198	16.50	0.13	0.069	(0.166)	0.062	0.007
199	16.58	0.10	0.052	(0.165)	0.046	0.005
200	16.67	0.10	0.052	(0.164)	0.046	0.005
201	16.75	0.10	0.052	(0.163)	0.046	0.005
202	16.83	0.10	0.052	(0.162)	0.046	0.005
203	16.92	0.10	0.052	(0.161)	0.046	0.005
204	17.00	0.10	0.052	(0.161)	0.046	0.005
205	17.08	0.17	0.086	(0.160)	0.077	0.009
206	17.17	0.17	0.086	(0.159)	0.077	0.009
207	17.25	0.17	0.086	(0.158)	0.077	0.009
208	17.33	0.17	0.086	(0.157)	0.077	0.009
209	17.42	0.17	0.086	(0.157)	0.077	0.009
210	17.50	0.17	0.086	(0.156)	0.077	0.009
211	17.58	0.17	0.086	(0.155)	0.077	0.009
212	17.67	0.17	0.086	(0.154)	0.077	0.009
213	17.75	0.17	0.086	(0.154)	0.077	0.009
214	17.83	0.13	0.069	(0.153)	0.062	0.007
215	17.92	0.13	0.069	(0.152)	0.062	0.007
216	18.00	0.13	0.069	(0.151)	0.062	0.007
217	18.08	0.13	0.069	(0.151)	0.062	0.007
218	18.17	0.13	0.069	(0.150)	0.062	0.007
219	18.25	0.13	0.069	(0.149)	0.062	0.007
220	18.33	0.13	0.069	(0.148)	0.062	0.007
221	18.42	0.13	0.069	(0.148)	0.062	0.007
222	18.50	0.13	0.069	(0.147)	0.062	0.007
223	18.58	0.10	0.052	(0.146)	0.046	0.005
224	18.67	0.10	0.052	(0.145)	0.046	0.005
225	18.75	0.10	0.052	(0.145)	0.046	0.005
226	18.83	0.07	0.034	(0.144)	0.031	0.003
227	18.92	0.07	0.034	(0.143)	0.031	0.003
228	19.00	0.07	0.034	(0.143)	0.031	0.003
229	19.08	0.10	0.052	(0.142)	0.046	0.005
230	19.17	0.10	0.052	(0.141)	0.046	0.005
231	19.25	0.10	0.052	(0.141)	0.046	0.005
232	19.33	0.13	0.069	(0.140)	0.062	0.007
233	19.42	0.13	0.069	(0.139)	0.062	0.007
234	19.50	0.13	0.069	(0.139)	0.062	0.007
235	19.58	0.10	0.052	(0.138)	0.046	0.005
236	19.67	0.10	0.052	(0.138)	0.046	0.005
237	19.75	0.10	0.052	(0.137)	0.046	0.005
238	19.83	0.07	0.034	(0.136)	0.031	0.003
239	19.92	0.07	0.034	(0.136)	0.031	0.003

240	20.00	0.07	0.034	(0.135)	0.031	0.003
241	20.08	0.10	0.052	(0.134)	0.046	0.005
242	20.17	0.10	0.052	(0.134)	0.046	0.005
243	20.25	0.10	0.052	(0.133)	0.046	0.005
244	20.33	0.10	0.052	(0.133)	0.046	0.005
245	20.42	0.10	0.052	(0.132)	0.046	0.005
246	20.50	0.10	0.052	(0.132)	0.046	0.005
247	20.58	0.10	0.052	(0.131)	0.046	0.005
248	20.67	0.10	0.052	(0.130)	0.046	0.005
249	20.75	0.10	0.052	(0.130)	0.046	0.005
250	20.83	0.07	0.034	(0.129)	0.031	0.003
251	20.92	0.07	0.034	(0.129)	0.031	0.003
252	21.00	0.07	0.034	(0.128)	0.031	0.003
253	21.08	0.10	0.052	(0.128)	0.046	0.005
254	21.17	0.10	0.052	(0.127)	0.046	0.005
255	21.25	0.10	0.052	(0.127)	0.046	0.005
256	21.33	0.07	0.034	(0.126)	0.031	0.003
257	21.42	0.07	0.034	(0.126)	0.031	0.003
258	21.50	0.07	0.034	(0.125)	0.031	0.003
259	21.58	0.10	0.052	(0.125)	0.046	0.005
260	21.67	0.10	0.052	(0.125)	0.046	0.005
261	21.75	0.10	0.052	(0.124)	0.046	0.005
262	21.83	0.07	0.034	(0.124)	0.031	0.003
263	21.92	0.07	0.034	(0.123)	0.031	0.003
264	22.00	0.07	0.034	(0.123)	0.031	0.003
265	22.08	0.10	0.052	(0.122)	0.046	0.005
266	22.17	0.10	0.052	(0.122)	0.046	0.005
267	22.25	0.10	0.052	(0.122)	0.046	0.005
268	22.33	0.07	0.034	(0.121)	0.031	0.003
269	22.42	0.07	0.034	(0.121)	0.031	0.003
270	22.50	0.07	0.034	(0.121)	0.031	0.003
271	22.58	0.07	0.034	(0.120)	0.031	0.003
272	22.67	0.07	0.034	(0.120)	0.031	0.003
273	22.75	0.07	0.034	(0.120)	0.031	0.003
274	22.83	0.07	0.034	(0.119)	0.031	0.003
275	22.92	0.07	0.034	(0.119)	0.031	0.003
276	23.00	0.07	0.034	(0.119)	0.031	0.003
277	23.08	0.07	0.034	(0.118)	0.031	0.003
278	23.17	0.07	0.034	(0.118)	0.031	0.003
279	23.25	0.07	0.034	(0.118)	0.031	0.003
280	23.33	0.07	0.034	(0.118)	0.031	0.003
281	23.42	0.07	0.034	(0.117)	0.031	0.003
282	23.50	0.07	0.034	(0.117)	0.031	0.003
283	23.58	0.07	0.034	(0.117)	0.031	0.003
284	23.67	0.07	0.034	(0.117)	0.031	0.003
285	23.75	0.07	0.034	(0.117)	0.031	0.003
286	23.83	0.07	0.034	(0.116)	0.031	0.003
287	23.92	0.07	0.034	(0.116)	0.031	0.003
288	24.00	0.07	0.034	(0.116)	0.031	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 16.9

Flood volume = Effective rainfall 1.41(In)

times area 3.9(Ac.) / [(In) / (Ft.)] = 0.5(Ac.Ft)

Total soil loss = 2.89(In)

Total soil loss = 0.939(Ac.Ft)

Total rainfall = 4.30(In)

Flood volume = 19935.4 Cubic Feet

Total soil loss = 40916.9 Cubic Feet

Peak flow rate of this hydrograph = 1.511 (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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0002	0.01	Q				
0+20	0.0003	0.01	Q				
0+25	0.0004	0.02	Q				
0+30	0.0005	0.02	Q				
0+35	0.0007	0.02	Q				
0+40	0.0008	0.02	Q				
0+45	0.0010	0.02	Q				
0+50	0.0011	0.02	Q				
0+55	0.0013	0.03	Q				
1+ 0	0.0015	0.03	Q				
1+ 5	0.0016	0.02	Q				
1+10	0.0018	0.02	Q				
1+15	0.0019	0.02	Q				
1+20	0.0021	0.02	Q				
1+25	0.0022	0.02	Q				
1+30	0.0024	0.02	Q				
1+35	0.0025	0.02	Q				
1+40	0.0026	0.02	Q				
1+45	0.0028	0.02	Q				
1+50	0.0029	0.02	Q				
1+55	0.0031	0.03	Q				
2+ 0	0.0033	0.03	Q				
2+ 5	0.0035	0.03	Q				
2+10	0.0037	0.03	Q				
2+15	0.0038	0.03	Q				
2+20	0.0040	0.03	Q				
2+25	0.0042	0.03	Q				
2+30	0.0044	0.03	Q				
2+35	0.0046	0.03	Q				
2+40	0.0048	0.03	Q				
2+45	0.0051	0.03	Q				
2+50	0.0053	0.03	Q				
2+55	0.0055	0.03	Q				
3+ 0	0.0057	0.03	Q				
3+ 5	0.0060	0.03	Q				
3+10	0.0062	0.03	Q				
3+15	0.0064	0.03	Q				
3+20	0.0067	0.03	Q				
3+25	0.0069	0.03	Q				
3+30	0.0071	0.03	Q				
3+35	0.0074	0.03	Q				
3+40	0.0076	0.03	Q				

3+45	0.0078	0.03	Q
3+50	0.0081	0.04	Q
3+55	0.0084	0.04	Q
4+ 0	0.0086	0.04	Q
4+ 5	0.0089	0.04	Q
4+10	0.0092	0.04	Q
4+15	0.0095	0.04	Q
4+20	0.0098	0.04	Q
4+25	0.0101	0.05	Q
4+30	0.0104	0.05	Q
4+35	0.0107	0.05	Q
4+40	0.0110	0.05	Q
4+45	0.0114	0.05	Q
4+50	0.0117	0.05	QV
4+55	0.0121	0.05	QV
5+ 0	0.0124	0.05	QV
5+ 5	0.0128	0.05	QV
5+10	0.0131	0.04	QV
5+15	0.0134	0.04	QV
5+20	0.0137	0.04	QV
5+25	0.0140	0.05	QV
5+30	0.0143	0.05	QV
5+35	0.0146	0.05	QV
5+40	0.0150	0.05	QV
5+45	0.0154	0.05	QV
5+50	0.0157	0.05	QV
5+55	0.0161	0.05	QV
6+ 0	0.0165	0.05	QV
6+ 5	0.0169	0.06	QV
6+10	0.0173	0.06	QV
6+15	0.0177	0.06	QV
6+20	0.0181	0.06	QV
6+25	0.0185	0.06	QV
6+30	0.0190	0.06	QV
6+35	0.0194	0.06	QV
6+40	0.0198	0.07	QV
6+45	0.0203	0.07	QV
6+50	0.0208	0.07	QV
6+55	0.0212	0.07	QV
7+ 0	0.0217	0.07	QV
7+ 5	0.0222	0.07	QV
7+10	0.0226	0.07	QV
7+15	0.0231	0.07	Q V
7+20	0.0236	0.07	Q V
7+25	0.0241	0.07	Q V
7+30	0.0246	0.07	Q V
7+35	0.0251	0.08	Q V
7+40	0.0257	0.08	Q V
7+45	0.0262	0.08	Q V
7+50	0.0268	0.08	Q V
7+55	0.0274	0.09	Q V
8+ 0	0.0280	0.09	Q V
8+ 5	0.0286	0.09	Q V
8+10	0.0293	0.10	Q V
8+15	0.0300	0.10	Q V
8+20	0.0307	0.10	Q V
8+25	0.0314	0.10	Q V

8+30	0.0321	0.10	Q V						
8+35	0.0328	0.10	Q V						
8+40	0.0335	0.11	Q V						
8+45	0.0342	0.11	Q V						
8+50	0.0350	0.11	Q V						
8+55	0.0358	0.12	Q V						
9+ 0	0.0366	0.12	Q V						
9+ 5	0.0378	0.17	Q V						
9+10	0.0394	0.24	Q V						
9+15	0.0412	0.26	Q V						
9+20	0.0431	0.29	Q V						
9+25	0.0454	0.33	Q V						
9+30	0.0478	0.35	Q V						
9+35	0.0504	0.37	Q V						
9+40	0.0532	0.41	Q V						
9+45	0.0562	0.43	Q V						
9+50	0.0593	0.46	Q V						
9+55	0.0627	0.50	Q V						
10+ 0	0.0662	0.51	Q V						
10+ 5	0.0689	0.39	Q V						
10+10	0.0703	0.19	Q V						
10+15	0.0713	0.14	Q V						
10+20	0.0721	0.12	Q V						
10+25	0.0729	0.11	Q V						
10+30	0.0736	0.10	Q V						
10+35	0.0749	0.19	Q V						
10+40	0.0773	0.35	Q V						
10+45	0.0800	0.39	Q V						
10+50	0.0828	0.41	Q V						
10+55	0.0858	0.43	Q V						
11+ 0	0.0888	0.44	Q V						
11+ 5	0.0917	0.42	Q V						
11+10	0.0944	0.39	Q V						
11+15	0.0971	0.39	Q V						
11+20	0.0997	0.39	Q V						
11+25	0.1024	0.39	Q V						
11+30	0.1052	0.40	Q V						
11+35	0.1076	0.36	Q V						
11+40	0.1097	0.30	Q V						
11+45	0.1117	0.29	Q V						
11+50	0.1138	0.30	Q V						
11+55	0.1161	0.34	Q V						
12+ 0	0.1185	0.35	Q V						
12+ 5	0.1219	0.49	Q V						
12+10	0.1269	0.73	Q V						
12+15	0.1324	0.79	Q V						
12+20	0.1382	0.84	Q V						
12+25	0.1443	0.89	Q V						
12+30	0.1506	0.91	Q V						
12+35	0.1572	0.96	Q V						
12+40	0.1643	1.03	Q V						
12+45	0.1716	1.05	Q V						
12+50	0.1791	1.09	Q V						
12+55	0.1868	1.13	Q V						
13+ 0	0.1947	1.14	Q V						
13+ 5	0.2033	1.25	Q V						
13+10	0.2130	1.42	Q V						

13+15	0.2231	1.46	Q	V		
13+20	0.2334	1.49	Q	V		
13+25	0.2437	1.50	Q	V		
13+30	0.2541	1.51	Q	V		
13+35	0.2630	1.30	Q	V		
13+40	0.2695	0.94	Q	V		
13+45	0.2754	0.86	Q	V		
13+50	0.2811	0.82	Q	V		
13+55	0.2866	0.80	Q	V		
14+ 0	0.2920	0.79	Q	V		
14+ 5	0.2981	0.87	Q	V		
14+10	0.3050	1.01	Q	V		
14+15	0.3122	1.04	Q	V		
14+20	0.3194	1.04	Q	V		
14+25	0.3264	1.02	Q	V		
14+30	0.3335	1.02	Q	V		
14+35	0.3405	1.02	Q	V		
14+40	0.3476	1.03	Q	V		
14+45	0.3547	1.03	Q	V		
14+50	0.3616	1.01	Q	V		
14+55	0.3684	0.98	Q	V		
15+ 0	0.3752	0.98	Q	V		
15+ 5	0.3818	0.96	Q	V		
15+10	0.3882	0.93	Q	V		
15+15	0.3945	0.92	Q	V		
15+20	0.4007	0.90	Q	V		
15+25	0.4067	0.87	Q	V		
15+30	0.4127	0.87	Q	V		
15+35	0.4181	0.79	Q	V		
15+40	0.4226	0.66	Q	V		
15+45	0.4269	0.63	Q	V		
15+50	0.4312	0.62	Q	V		
15+55	0.4354	0.61	Q	V		
16+ 0	0.4396	0.61	Q	V		
16+ 5	0.4426	0.44	Q	V		
16+10	0.4437	0.16	Q	V		
16+15	0.4443	0.09	Q	V		
16+20	0.4447	0.06	Q	V		
16+25	0.4450	0.04	Q	V		
16+30	0.4452	0.03	Q	V		
16+35	0.4453	0.03	Q	V		
16+40	0.4455	0.02	Q	V		
16+45	0.4456	0.02	Q	V		
16+50	0.4458	0.02	Q	V		
16+55	0.4459	0.02	Q	V		
17+ 0	0.4460	0.02	Q	V		
17+ 5	0.4462	0.02	Q	V		
17+10	0.4464	0.03	Q	V		
17+15	0.4466	0.03	Q	V		
17+20	0.4469	0.03	Q	V		
17+25	0.4471	0.03	Q	V		
17+30	0.4473	0.03	Q	V		
17+35	0.4476	0.03	Q	V		
17+40	0.4478	0.03	Q	V		
17+45	0.4480	0.03	Q	V		
17+50	0.4483	0.03	Q	V		
17+55	0.4485	0.03	Q	V		

18+ 0	0.4486	0.03	Q				V
18+ 5	0.4488	0.03	Q				V
18+10	0.4490	0.03	Q				V
18+15	0.4492	0.03	Q				V
18+20	0.4494	0.03	Q				V
18+25	0.4496	0.03	Q				V
18+30	0.4498	0.03	Q				V
18+35	0.4499	0.03	Q				V
18+40	0.4501	0.02	Q				V
18+45	0.4502	0.02	Q				V
18+50	0.4504	0.02	Q				V
18+55	0.4505	0.02	Q				V
19+ 0	0.4506	0.01	Q				V
19+ 5	0.4507	0.02	Q				V
19+10	0.4508	0.02	Q				V
19+15	0.4509	0.02	Q				V
19+20	0.4511	0.02	Q				V
19+25	0.4513	0.03	Q				V
19+30	0.4514	0.03	Q				V
19+35	0.4516	0.02	Q				V
19+40	0.4518	0.02	Q				V
19+45	0.4519	0.02	Q				V
19+50	0.4520	0.02	Q				V
19+55	0.4521	0.02	Q				V
20+ 0	0.4522	0.01	Q				V
20+ 5	0.4523	0.02	Q				V
20+10	0.4525	0.02	Q				V
20+15	0.4526	0.02	Q				V
20+20	0.4528	0.02	Q				V
20+25	0.4529	0.02	Q				V
20+30	0.4530	0.02	Q				V
20+35	0.4532	0.02	Q				V
20+40	0.4533	0.02	Q				V
20+45	0.4534	0.02	Q				V
20+50	0.4536	0.02	Q				V
20+55	0.4537	0.02	Q				V
21+ 0	0.4538	0.01	Q				V
21+ 5	0.4539	0.02	Q				V
21+10	0.4540	0.02	Q				V
21+15	0.4542	0.02	Q				V
21+20	0.4543	0.02	Q				V
21+25	0.4544	0.01	Q				V
21+30	0.4545	0.01	Q				V
21+35	0.4546	0.02	Q				V
21+40	0.4547	0.02	Q				V
21+45	0.4548	0.02	Q				V
21+50	0.4550	0.02	Q				V
21+55	0.4551	0.01	Q				V
22+ 0	0.4552	0.01	Q				V
22+ 5	0.4553	0.02	Q				V
22+10	0.4554	0.02	Q				V
22+15	0.4555	0.02	Q				V
22+20	0.4557	0.02	Q				V
22+25	0.4558	0.01	Q				V
22+30	0.4559	0.01	Q				V
22+35	0.4560	0.01	Q				V
22+40	0.4561	0.01	Q				V

22+45	0.4562	0.01	Q				V
22+50	0.4562	0.01	Q				V
22+55	0.4563	0.01	Q				V
23+ 0	0.4564	0.01	Q				V
23+ 5	0.4565	0.01	Q				V
23+10	0.4566	0.01	Q				V
23+15	0.4567	0.01	Q				V
23+20	0.4568	0.01	Q				V
23+25	0.4569	0.01	Q				V
23+30	0.4570	0.01	Q				V
23+35	0.4571	0.01	Q				V
23+40	0.4572	0.01	Q				V
23+45	0.4573	0.01	Q				V
23+50	0.4574	0.01	Q				V
23+55	0.4575	0.01	Q				V
24+ 0	0.4576	0.01	Q				V
24+ 5	0.4576	0.01	Q				V
24+10	0.4576	0.00	Q				V
24+15	0.4576	0.00	Q				V
24+20	0.4577	0.00	Q				V
24+25	0.4577	0.00	Q				V



Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
130.90	0.58	75.92

100 YEAR Area rainfall data:

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

130.90

1.45

189.81

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)

Areal adjustment factor = 99.88 %

Adjusted average point rain = 0.579(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.829

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	6.037
2	0.167	99.060	25.748
3	0.250	148.589	28.890
4	0.333	198.119	13.126
5	0.417	247.649	6.841
6	0.500	297.179	4.751
7	0.583	346.708	3.423
8	0.667	396.238	2.627
9	0.750	445.768	1.927
10	0.833	495.298	1.545
11	0.917	544.827	1.324
12	1.000	594.357	1.012

13	1.083	643.887	0.815	1.075
14	1.167	693.417	0.619	0.816
15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426

Sum = 100.000 Sum= 131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.398)	0.253	0.052
2	0.17	4.50	0.313	(0.398)	0.259	0.054
3	0.25	5.40	0.375	(0.398)	0.311	0.064
4	0.33	5.40	0.375	(0.398)	0.311	0.064
5	0.42	5.70	0.396	(0.398)	0.328	0.068
6	0.50	6.40	0.445	(0.398)	0.369	0.076
7	0.58	7.90	0.549	0.398	(0.455)	0.151
8	0.67	9.10	0.633	0.398	(0.524)	0.234
9	0.75	12.80	0.890	0.398	(0.737)	0.492
10	0.83	25.60	1.780	0.398	(1.475)	1.381
11	0.92	7.90	0.549	0.398	(0.455)	0.151
12	1.00	4.90	0.341	(0.398)	0.282	0.058

(Loss Rate Not Used)

Sum = 100.0

Sum = 2.8

Flood volume = Effective rainfall 0.24 (In)

times area 130.9 (Ac.) / [(In) / (Ft.)] = 2.6 (Ac.Ft)

Total soil loss = 0.34 (In)

Total soil loss = 3.732 (Ac.Ft)

Total rainfall = 0.58 (In)

Flood volume = 112725.8 Cubic Feet

Total soil loss = 162544.2 Cubic Feet

Peak flow rate of this hydrograph = 73.696 (CFS)

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1 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q (CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0029	0.42	Q				
0+10	0.0181	2.21	VQ				
0+15	0.0479	4.33	V Q				
0+20	0.0869	5.65	VQ				
0+25	0.1322	6.58	VQ				

0+30	0.1825	7.30	VQ						
0+35	0.2421	8.65	VQ						
0+40	0.3281	12.49	VQ						
0+45	0.4699	20.59	V	Q					
0+50	0.7533	41.14		V	Q				
0+55	1.2608	73.70			V			Q	
1+ 0	1.7491	70.89				V		Q	
1+ 5	2.0182	39.08			Q		V		
1+10	2.1739	22.61		Q			V		
1+15	2.2770	14.96						V	
1+20	2.3509	10.74						V	
1+25	2.4071	8.16						V	
1+30	2.4496	6.16						V	
1+35	2.4834	4.92		Q				V	
1+40	2.5111	4.02		Q				V	
1+45	2.5327	3.13		Q				V	
1+50	2.5497	2.48		Q				V	
1+55	2.5629	1.91	Q					V	
2+ 0	2.5733	1.51	Q					V	
2+ 5	2.5820	1.26	Q					V	
2+10	2.5870	0.73	Q					V	
2+15	2.5877	0.10	Q					V	
2+20	2.5878	0.02	Q					V	

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 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]
130.90	0.98	128.28

100 YEAR Area rainfall data:

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

130.90

2.48

324.63

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 0.980(In)

Areal adjustment factor = 99.94 %

Adjusted average point rain = 0.979(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.829

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335
13	1.083	643.887	1.075
14	1.167	693.417	0.816

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.398)	0.127	0.026
2	0.17	1.30	0.153	(0.398)	0.127	0.026
3	0.25	1.10	0.129	(0.398)	0.107	0.022
4	0.33	1.50	0.176	(0.398)	0.146	0.030
5	0.42	1.50	0.176	(0.398)	0.146	0.030
6	0.50	1.80	0.212	(0.398)	0.175	0.036
7	0.58	1.50	0.176	(0.398)	0.146	0.030
8	0.67	1.80	0.212	(0.398)	0.175	0.036
9	0.75	1.80	0.212	(0.398)	0.175	0.036
10	0.83	1.50	0.176	(0.398)	0.146	0.030
11	0.92	1.60	0.188	(0.398)	0.156	0.032
12	1.00	1.80	0.212	(0.398)	0.175	0.036
13	1.08	2.20	0.259	(0.398)	0.214	0.044
14	1.17	2.20	0.259	(0.398)	0.214	0.044
15	1.25	2.20	0.259	(0.398)	0.214	0.044
16	1.33	2.00	0.235	(0.398)	0.195	0.040
17	1.42	2.60	0.306	(0.398)	0.253	0.052
18	1.50	2.70	0.317	(0.398)	0.263	0.054
19	1.58	2.40	0.282	(0.398)	0.234	0.048
20	1.67	2.70	0.317	(0.398)	0.263	0.054
21	1.75	3.30	0.388	(0.398)	0.321	0.066
22	1.83	3.10	0.364	(0.398)	0.302	0.062
23	1.92	2.90	0.341	(0.398)	0.282	0.058
24	2.00	3.00	0.353	(0.398)	0.292	0.060
25	2.08	3.10	0.364	(0.398)	0.302	0.062
26	2.17	4.20	0.494	0.398	(0.409)	0.095
27	2.25	5.00	0.588	0.398	(0.487)	0.189
28	2.33	3.50	0.411	(0.398)	0.341	0.071
29	2.42	6.80	0.799	0.398	(0.662)	0.401
30	2.50	7.30	0.858	0.398	(0.711)	0.460
31	2.58	8.20	0.964	0.398	(0.799)	0.566
32	2.67	5.90	0.693	0.398	(0.575)	0.295
33	2.75	2.00	0.235	(0.398)	0.195	0.040
34	2.83	1.80	0.212	(0.398)	0.175	0.036
35	2.92	1.80	0.212	(0.398)	0.175	0.036
36	3.00	0.60	0.071	(0.398)	0.058	0.012

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.3

Flood volume = Effective rainfall 0.27(In)

times area 130.9(Ac.)/[(In)/(Ft.)] = 3.0(Ac.Ft)

Total soil loss = 0.71(In)
 Total soil loss = 7.714(Ac.Ft)
 Total rainfall = 0.98(In)
 Flood volume = 129391.2 Cubic Feet
 Total soil loss = 336005.8 Cubic Feet

 Peak flow rate of this hydrograph = 49.183 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0014	0.21	Q					
0+10	0.0090	1.10	Q					
0+15	0.0232	2.07	VQ					
0+20	0.0401	2.45	VQ					
0+25	0.0594	2.80	V Q					
0+30	0.0818	3.25	VQ					
0+35	0.1068	3.63	VQ					
0+40	0.1333	3.84	V Q					
0+45	0.1610	4.02	VQ					
0+50	0.1901	4.23	VQ					
0+55	0.2190	4.19	VQ					
1+ 0	0.2476	4.15	Q					
1+ 5	0.2778	4.40	Q					
1+10	0.3113	4.86	QV					
1+15	0.3475	5.25	Q					
1+20	0.3848	5.42	QV					
1+25	0.4226	5.49	QV					
1+30	0.4628	5.84	Q V					
1+35	0.5062	6.30	QV					
1+40	0.5505	6.43	Q V					
1+45	0.5963	6.65	Q V					
1+50	0.6462	7.25	Q V					
1+55	0.6990	7.67	Q V					
2+ 0	0.7519	7.68	Q V					
2+ 5	0.8049	7.70	Q V					
2+10	0.8608	8.11	Q V					
2+15	0.9305	10.12	Q V					
2+20	1.0248	13.70	Q V					
2+25	1.1384	16.50	Q V					
2+30	1.3149	25.62	V					
2+35	1.5910	40.09	Q V					
2+40	1.9297	49.18	V					
2+45	2.2452	45.81	V					
2+50	2.4596	31.12	Q					
2+55	2.5925	19.30	Q					
3+ 0	2.6898	14.13	Q					
3+ 5	2.7630	10.63	Q					

3+10	2.8153	7.59		Q				V
3+15	2.8534	5.53		Q				V
3+20	2.8826	4.24		Q				V
3+25	2.9058	3.37		Q				V
3+30	2.9241	2.66		Q				V
3+35	2.9382	2.05		Q				V
3+40	2.9492	1.59		Q				V
3+45	2.9579	1.26		Q				V
3+50	2.9641	0.90	Q					V
3+55	2.9679	0.55	Q					V
4+ 0	2.9694	0.22	Q					V
4+ 5	2.9699	0.07	Q					V
4+10	2.9702	0.05	Q					V
4+15	2.9704	0.02	Q					V
4+20	2.9704	0.01	Q					V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "B" **Existing Condition**

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
130.90	1.38	180.64

100 YEAR Area rainfall data:

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

130.90

3.48

455.53

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 1.379(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.829

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335
13	1.083	643.887	1.075
14	1.167	693.417	0.816

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.083	(0.398)	0.069	0.014
2	0.17	0.60	0.099	(0.398)	0.082	0.017
3	0.25	0.60	0.099	(0.398)	0.082	0.017
4	0.33	0.60	0.099	(0.398)	0.082	0.017
5	0.42	0.60	0.099	(0.398)	0.082	0.017
6	0.50	0.70	0.116	(0.398)	0.096	0.020
7	0.58	0.70	0.116	(0.398)	0.096	0.020
8	0.67	0.70	0.116	(0.398)	0.096	0.020
9	0.75	0.70	0.116	(0.398)	0.096	0.020
10	0.83	0.70	0.116	(0.398)	0.096	0.020
11	0.92	0.70	0.116	(0.398)	0.096	0.020
12	1.00	0.80	0.132	(0.398)	0.110	0.023
13	1.08	0.80	0.132	(0.398)	0.110	0.023
14	1.17	0.80	0.132	(0.398)	0.110	0.023
15	1.25	0.80	0.132	(0.398)	0.110	0.023
16	1.33	0.80	0.132	(0.398)	0.110	0.023
17	1.42	0.80	0.132	(0.398)	0.110	0.023
18	1.50	0.80	0.132	(0.398)	0.110	0.023
19	1.58	0.80	0.132	(0.398)	0.110	0.023
20	1.67	0.80	0.132	(0.398)	0.110	0.023
21	1.75	0.80	0.132	(0.398)	0.110	0.023
22	1.83	0.80	0.132	(0.398)	0.110	0.023
23	1.92	0.80	0.132	(0.398)	0.110	0.023
24	2.00	0.90	0.149	(0.398)	0.123	0.026
25	2.08	0.80	0.132	(0.398)	0.110	0.023
26	2.17	0.90	0.149	(0.398)	0.123	0.026
27	2.25	0.90	0.149	(0.398)	0.123	0.026
28	2.33	0.90	0.149	(0.398)	0.123	0.026
29	2.42	0.90	0.149	(0.398)	0.123	0.026
30	2.50	0.90	0.149	(0.398)	0.123	0.026
31	2.58	0.90	0.149	(0.398)	0.123	0.026
32	2.67	0.90	0.149	(0.398)	0.123	0.026
33	2.75	1.00	0.166	(0.398)	0.137	0.028
34	2.83	1.00	0.166	(0.398)	0.137	0.028
35	2.92	1.00	0.166	(0.398)	0.137	0.028
36	3.00	1.00	0.166	(0.398)	0.137	0.028
37	3.08	1.00	0.166	(0.398)	0.137	0.028
38	3.17	1.10	0.182	(0.398)	0.151	0.031
39	3.25	1.10	0.182	(0.398)	0.151	0.031
40	3.33	1.10	0.182	(0.398)	0.151	0.031

41	3.42	1.20	0.199	(0.398)	0.165	0.034
42	3.50	1.30	0.215	(0.398)	0.178	0.037
43	3.58	1.40	0.232	(0.398)	0.192	0.040
44	3.67	1.40	0.232	(0.398)	0.192	0.040
45	3.75	1.50	0.248	(0.398)	0.206	0.043
46	3.83	1.50	0.248	(0.398)	0.206	0.043
47	3.92	1.60	0.265	(0.398)	0.219	0.045
48	4.00	1.60	0.265	(0.398)	0.219	0.045
49	4.08	1.70	0.281	(0.398)	0.233	0.048
50	4.17	1.80	0.298	(0.398)	0.247	0.051
51	4.25	1.90	0.314	(0.398)	0.261	0.054
52	4.33	2.00	0.331	(0.398)	0.274	0.057
53	4.42	2.10	0.348	(0.398)	0.288	0.060
54	4.50	2.10	0.348	(0.398)	0.288	0.060
55	4.58	2.20	0.364	(0.398)	0.302	0.062
56	4.67	2.30	0.381	(0.398)	0.315	0.065
57	4.75	2.40	0.397	(0.398)	0.329	0.068
58	4.83	2.40	0.397	(0.398)	0.329	0.068
59	4.92	2.50	0.414	(0.398)	0.343	0.071
60	5.00	2.60	0.430	(0.398)	0.357	0.074
61	5.08	3.10	0.513	0.398	(0.425)	0.115
62	5.17	3.60	0.596	0.398	(0.494)	0.198
63	5.25	3.90	0.646	0.398	(0.535)	0.247
64	5.33	4.20	0.695	0.398	(0.576)	0.297
65	5.42	4.70	0.778	0.398	(0.645)	0.380
66	5.50	5.60	0.927	0.398	(0.768)	0.529
67	5.58	1.90	0.314	(0.398)	0.261	0.054
68	5.67	0.90	0.149	(0.398)	0.123	0.026
69	5.75	0.60	0.099	(0.398)	0.082	0.017
70	5.83	0.50	0.083	(0.398)	0.069	0.014
71	5.92	0.30	0.050	(0.398)	0.041	0.009
72	6.00	0.20	0.033	(0.398)	0.027	0.006

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.9

Flood volume = Effective rainfall 0.32(In)
times area 130.9(Ac.)/[(In)/(Ft.)) = 3.5(Ac.Ft)
Total soil loss = 1.06(In)
Total soil loss = 11.510(Ac.Ft)
Total rainfall = 1.38(In)
Flood volume = 154055.4 Cubic Feet
Total soil loss = 501380.0 Cubic Feet

Peak flow rate of this hydrograph = 43.016(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0008	0.11	Q				

0+10	0.0050	0.62	Q				
0+15	0.0137	1.26	VQ				
0+20	0.0248	1.61	VQ				
0+25	0.0371	1.79	VQ				
0+30	0.0503	1.92	VQ				
0+35	0.0648	2.10	VQ				
0+40	0.0804	2.27	VQ				
0+45	0.0967	2.37	Q				
0+50	0.1135	2.43	Q				
0+55	0.1305	2.48	Q				
1+ 0	0.1480	2.54	VQ				
1+ 5	0.1663	2.66	VQ				
1+10	0.1855	2.79	Q				
1+15	0.2052	2.86	Q				
1+20	0.2252	2.90	Q				
1+25	0.2454	2.93	Q				
1+30	0.2657	2.95	QV				
1+35	0.2861	2.96	QV				
1+40	0.3065	2.97	QV				
1+45	0.3270	2.98	QV				
1+50	0.3475	2.98	QV				
1+55	0.3681	2.99	Q V				
2+ 0	0.3888	3.01	Q V				
2+ 5	0.4101	3.09	Q V				
2+10	0.4316	3.12	Q V				
2+15	0.4534	3.16	Q V				
2+20	0.4757	3.25	Q V				
2+25	0.4984	3.29	Q V				
2+30	0.5212	3.31	Q V				
2+35	0.5441	3.33	Q V				
2+40	0.5671	3.34	Q V				
2+45	0.5903	3.37	Q V				
2+50	0.6142	3.47	Q V				
2+55	0.6388	3.58	Q V				
3+ 0	0.6639	3.64	Q V				
3+ 5	0.6891	3.66	Q V				
3+10	0.7146	3.71	Q V				
3+15	0.7409	3.82	Q V				
3+20	0.7681	3.94	Q V				
3+25	0.7957	4.02	Q V				
3+30	0.8244	4.17	Q V				
3+35	0.8549	4.42	Q V				
3+40	0.8872	4.69	Q V				
3+45	0.9210	4.91	Q V				
3+50	0.9561	5.11	Q V				
3+55	0.9927	5.30	Q V				
4+ 0	1.0305	5.49	Q V				
4+ 5	1.0697	5.69	Q V				
4+10	1.1103	5.90	Q V				
4+15	1.1528	6.18	Q V				
4+20	1.1976	6.50	Q V				
4+25	1.2447	6.84	Q V				
4+30	1.2941	7.16	Q V				
4+35	1.3452	7.42	Q V				

4+40	1.3980	7.67		Q		V			
4+45	1.4529	7.98		Q		V			
4+50	1.5101	8.30		Q		V			
4+55	1.5690	8.55		Q		V			
5+ 0	1.6295	8.80		Q		V			
5+ 5	1.6944	9.41		Q		V			
5+10	1.7749	11.69			Q		V		
5+15	1.8892	16.59				Q	V		
5+20	2.0450	22.62					Q	V	
5+25	2.2429	28.73						Q	V
5+30	2.4945	36.53							VQ
5+35	2.7907	43.02							V
5+40	3.0322	35.07						Q	Q
5+45	3.1714	20.20				Q			V
5+50	3.2620	13.15			Q				V
5+55	3.3292	9.77							V
6+ 0	3.3806	7.46			Q				V
6+ 5	3.4201	5.73			Q				V
6+10	3.4497	4.30			Q				V
6+15	3.4723	3.29		Q					V
6+20	3.4902	2.59		Q					V
6+25	3.5040	2.01	Q						V
6+30	3.5148	1.56	Q						V
6+35	3.5228	1.17	Q						V
6+40	3.5288	0.87	Q						V
6+45	3.5332	0.63	Q						V
6+50	3.5354	0.33	Q						V
6+55	3.5360	0.08	Q						V
7+ 0	3.5363	0.04	Q						V
7+ 5	3.5365	0.03	Q						V
7+10	3.5366	0.02	Q						V
7+15	3.5366	0.01	Q						V
7+20	3.5366	0.00	Q						V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "B"

Existing Condition

Drainage Area = 130.90(Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90(Ac.) = 0.205 Sq.Mi.
Length along longest watercourse = 4200.00(Ft.)
Length along longest watercourse measured to centroid = 2103.00(Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00(Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 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]
130.90	2.48	324.63

100 YEAR Area rainfall data:

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

130.90

6.90

903.21

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)
 Areal adjustment factor = 99.97 %
 Adjusted average point rain = 2.479(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.829

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	6.037
2	0.167	99.060	25.748
3	0.250	148.589	28.890
4	0.333	198.119	13.126
5	0.417	247.649	6.841
6	0.500	297.179	4.751
7	0.583	346.708	3.423
8	0.667	396.238	2.627
9	0.750	445.768	1.927
10	0.833	495.298	1.545
11	0.917	544.827	1.324
12	1.000	594.357	1.012
13	1.083	643.887	0.815
14	1.167	693.417	0.619

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.020	(0.706)	0.016	0.003
2	0.17	0.07	0.020	(0.703)	0.016	0.003
3	0.25	0.07	0.020	(0.700)	0.016	0.003
4	0.33	0.10	0.030	(0.698)	0.025	0.005
5	0.42	0.10	0.030	(0.695)	0.025	0.005
6	0.50	0.10	0.030	(0.692)	0.025	0.005
7	0.58	0.10	0.030	(0.690)	0.025	0.005
8	0.67	0.10	0.030	(0.687)	0.025	0.005
9	0.75	0.10	0.030	(0.684)	0.025	0.005
10	0.83	0.13	0.040	(0.681)	0.033	0.007
11	0.92	0.13	0.040	(0.679)	0.033	0.007
12	1.00	0.13	0.040	(0.676)	0.033	0.007
13	1.08	0.10	0.030	(0.673)	0.025	0.005
14	1.17	0.10	0.030	(0.671)	0.025	0.005
15	1.25	0.10	0.030	(0.668)	0.025	0.005
16	1.33	0.10	0.030	(0.665)	0.025	0.005
17	1.42	0.10	0.030	(0.663)	0.025	0.005
18	1.50	0.10	0.030	(0.660)	0.025	0.005
19	1.58	0.10	0.030	(0.658)	0.025	0.005
20	1.67	0.10	0.030	(0.655)	0.025	0.005
21	1.75	0.10	0.030	(0.652)	0.025	0.005
22	1.83	0.13	0.040	(0.650)	0.033	0.007
23	1.92	0.13	0.040	(0.647)	0.033	0.007
24	2.00	0.13	0.040	(0.644)	0.033	0.007
25	2.08	0.13	0.040	(0.642)	0.033	0.007
26	2.17	0.13	0.040	(0.639)	0.033	0.007
27	2.25	0.13	0.040	(0.637)	0.033	0.007
28	2.33	0.13	0.040	(0.634)	0.033	0.007
29	2.42	0.13	0.040	(0.631)	0.033	0.007
30	2.50	0.13	0.040	(0.629)	0.033	0.007
31	2.58	0.17	0.050	(0.626)	0.041	0.008
32	2.67	0.17	0.050	(0.624)	0.041	0.008
33	2.75	0.17	0.050	(0.621)	0.041	0.008
34	2.83	0.17	0.050	(0.619)	0.041	0.008
35	2.92	0.17	0.050	(0.616)	0.041	0.008
36	3.00	0.17	0.050	(0.614)	0.041	0.008
37	3.08	0.17	0.050	(0.611)	0.041	0.008
38	3.17	0.17	0.050	(0.608)	0.041	0.008
39	3.25	0.17	0.050	(0.606)	0.041	0.008
40	3.33	0.17	0.050	(0.603)	0.041	0.008

41	3.42	0.17	0.050	(0.601)	0.041	0.008
42	3.50	0.17	0.050	(0.598)	0.041	0.008
43	3.58	0.17	0.050	(0.596)	0.041	0.008
44	3.67	0.17	0.050	(0.593)	0.041	0.008
45	3.75	0.17	0.050	(0.591)	0.041	0.008
46	3.83	0.20	0.060	(0.588)	0.049	0.010
47	3.92	0.20	0.060	(0.586)	0.049	0.010
48	4.00	0.20	0.060	(0.583)	0.049	0.010
49	4.08	0.20	0.060	(0.581)	0.049	0.010
50	4.17	0.20	0.060	(0.578)	0.049	0.010
51	4.25	0.20	0.060	(0.576)	0.049	0.010
52	4.33	0.23	0.069	(0.574)	0.058	0.012
53	4.42	0.23	0.069	(0.571)	0.058	0.012
54	4.50	0.23	0.069	(0.569)	0.058	0.012
55	4.58	0.23	0.069	(0.566)	0.058	0.012
56	4.67	0.23	0.069	(0.564)	0.058	0.012
57	4.75	0.23	0.069	(0.561)	0.058	0.012
58	4.83	0.27	0.079	(0.559)	0.066	0.014
59	4.92	0.27	0.079	(0.556)	0.066	0.014
60	5.00	0.27	0.079	(0.554)	0.066	0.014
61	5.08	0.20	0.060	(0.552)	0.049	0.010
62	5.17	0.20	0.060	(0.549)	0.049	0.010
63	5.25	0.20	0.060	(0.547)	0.049	0.010
64	5.33	0.23	0.069	(0.544)	0.058	0.012
65	5.42	0.23	0.069	(0.542)	0.058	0.012
66	5.50	0.23	0.069	(0.540)	0.058	0.012
67	5.58	0.27	0.079	(0.537)	0.066	0.014
68	5.67	0.27	0.079	(0.535)	0.066	0.014
69	5.75	0.27	0.079	(0.533)	0.066	0.014
70	5.83	0.27	0.079	(0.530)	0.066	0.014
71	5.92	0.27	0.079	(0.528)	0.066	0.014
72	6.00	0.27	0.079	(0.526)	0.066	0.014
73	6.08	0.30	0.089	(0.523)	0.074	0.015
74	6.17	0.30	0.089	(0.521)	0.074	0.015
75	6.25	0.30	0.089	(0.519)	0.074	0.015
76	6.33	0.30	0.089	(0.516)	0.074	0.015
77	6.42	0.30	0.089	(0.514)	0.074	0.015
78	6.50	0.30	0.089	(0.512)	0.074	0.015
79	6.58	0.33	0.099	(0.509)	0.082	0.017
80	6.67	0.33	0.099	(0.507)	0.082	0.017
81	6.75	0.33	0.099	(0.505)	0.082	0.017
82	6.83	0.33	0.099	(0.503)	0.082	0.017
83	6.92	0.33	0.099	(0.500)	0.082	0.017
84	7.00	0.33	0.099	(0.498)	0.082	0.017
85	7.08	0.33	0.099	(0.496)	0.082	0.017
86	7.17	0.33	0.099	(0.493)	0.082	0.017
87	7.25	0.33	0.099	(0.491)	0.082	0.017
88	7.33	0.37	0.109	(0.489)	0.090	0.019
89	7.42	0.37	0.109	(0.487)	0.090	0.019
90	7.50	0.37	0.109	(0.484)	0.090	0.019
91	7.58	0.40	0.119	(0.482)	0.099	0.020
92	7.67	0.40	0.119	(0.480)	0.099	0.020
93	7.75	0.40	0.119	(0.478)	0.099	0.020
94	7.83	0.43	0.129	(0.476)	0.107	0.022

95	7.92	0.43	0.129	(0.473)	0.107	0.022
96	8.00	0.43	0.129	(0.471)	0.107	0.022
97	8.08	0.50	0.149	(0.469)	0.123	0.025
98	8.17	0.50	0.149	(0.467)	0.123	0.025
99	8.25	0.50	0.149	(0.465)	0.123	0.025
100	8.33	0.50	0.149	(0.463)	0.123	0.025
101	8.42	0.50	0.149	(0.460)	0.123	0.025
102	8.50	0.50	0.149	(0.458)	0.123	0.025
103	8.58	0.53	0.159	(0.456)	0.131	0.027
104	8.67	0.53	0.159	(0.454)	0.131	0.027
105	8.75	0.53	0.159	(0.452)	0.131	0.027
106	8.83	0.57	0.169	(0.450)	0.140	0.029
107	8.92	0.57	0.169	(0.448)	0.140	0.029
108	9.00	0.57	0.169	(0.445)	0.140	0.029
109	9.08	0.63	0.188	(0.443)	0.156	0.032
110	9.17	0.63	0.188	(0.441)	0.156	0.032
111	9.25	0.63	0.188	(0.439)	0.156	0.032
112	9.33	0.67	0.198	(0.437)	0.164	0.034
113	9.42	0.67	0.198	(0.435)	0.164	0.034
114	9.50	0.67	0.198	(0.433)	0.164	0.034
115	9.58	0.70	0.208	(0.431)	0.173	0.036
116	9.67	0.70	0.208	(0.429)	0.173	0.036
117	9.75	0.70	0.208	(0.427)	0.173	0.036
118	9.83	0.73	0.218	(0.425)	0.181	0.037
119	9.92	0.73	0.218	(0.423)	0.181	0.037
120	10.00	0.73	0.218	(0.420)	0.181	0.037
121	10.08	0.50	0.149	(0.418)	0.123	0.025
122	10.17	0.50	0.149	(0.416)	0.123	0.025
123	10.25	0.50	0.149	(0.414)	0.123	0.025
124	10.33	0.50	0.149	(0.412)	0.123	0.025
125	10.42	0.50	0.149	(0.410)	0.123	0.025
126	10.50	0.50	0.149	(0.408)	0.123	0.025
127	10.58	0.67	0.198	(0.406)	0.164	0.034
128	10.67	0.67	0.198	(0.404)	0.164	0.034
129	10.75	0.67	0.198	(0.402)	0.164	0.034
130	10.83	0.67	0.198	(0.400)	0.164	0.034
131	10.92	0.67	0.198	(0.398)	0.164	0.034
132	11.00	0.67	0.198	(0.397)	0.164	0.034
133	11.08	0.63	0.188	(0.395)	0.156	0.032
134	11.17	0.63	0.188	(0.393)	0.156	0.032
135	11.25	0.63	0.188	(0.391)	0.156	0.032
136	11.33	0.63	0.188	(0.389)	0.156	0.032
137	11.42	0.63	0.188	(0.387)	0.156	0.032
138	11.50	0.63	0.188	(0.385)	0.156	0.032
139	11.58	0.57	0.169	(0.383)	0.140	0.029
140	11.67	0.57	0.169	(0.381)	0.140	0.029
141	11.75	0.57	0.169	(0.379)	0.140	0.029
142	11.83	0.60	0.179	(0.377)	0.148	0.031
143	11.92	0.60	0.179	(0.375)	0.148	0.031
144	12.00	0.60	0.179	(0.374)	0.148	0.031
145	12.08	0.83	0.248	(0.372)	0.205	0.042
146	12.17	0.83	0.248	(0.370)	0.205	0.042
147	12.25	0.83	0.248	(0.368)	0.205	0.042
148	12.33	0.87	0.258	(0.366)	0.214	0.044

149	12.42	0.87	0.258	(0.364)	0.214	0.044
150	12.50	0.87	0.258	(0.362)	0.214	0.044
151	12.58	0.93	0.278	(0.361)	0.230	0.048
152	12.67	0.93	0.278	(0.359)	0.230	0.048
153	12.75	0.93	0.278	(0.357)	0.230	0.048
154	12.83	0.97	0.288	(0.355)	0.238	0.049
155	12.92	0.97	0.288	(0.353)	0.238	0.049
156	13.00	0.97	0.288	(0.352)	0.238	0.049
157	13.08	1.13	0.337	(0.350)	0.279	0.058
158	13.17	1.13	0.337	(0.348)	0.279	0.058
159	13.25	1.13	0.337	(0.346)	0.279	0.058
160	13.33	1.13	0.337	(0.345)	0.279	0.058
161	13.42	1.13	0.337	(0.343)	0.279	0.058
162	13.50	1.13	0.337	(0.341)	0.279	0.058
163	13.58	0.77	0.228	(0.339)	0.189	0.039
164	13.67	0.77	0.228	(0.338)	0.189	0.039
165	13.75	0.77	0.228	(0.336)	0.189	0.039
166	13.83	0.77	0.228	(0.334)	0.189	0.039
167	13.92	0.77	0.228	(0.332)	0.189	0.039
168	14.00	0.77	0.228	(0.331)	0.189	0.039
169	14.08	0.90	0.268	(0.329)	0.222	0.046
170	14.17	0.90	0.268	(0.327)	0.222	0.046
171	14.25	0.90	0.268	(0.326)	0.222	0.046
172	14.33	0.87	0.258	(0.324)	0.214	0.044
173	14.42	0.87	0.258	(0.322)	0.214	0.044
174	14.50	0.87	0.258	(0.321)	0.214	0.044
175	14.58	0.87	0.258	(0.319)	0.214	0.044
176	14.67	0.87	0.258	(0.317)	0.214	0.044
177	14.75	0.87	0.258	(0.316)	0.214	0.044
178	14.83	0.83	0.248	(0.314)	0.205	0.042
179	14.92	0.83	0.248	(0.313)	0.205	0.042
180	15.00	0.83	0.248	(0.311)	0.205	0.042
181	15.08	0.80	0.238	(0.309)	0.197	0.041
182	15.17	0.80	0.238	(0.308)	0.197	0.041
183	15.25	0.80	0.238	(0.306)	0.197	0.041
184	15.33	0.77	0.228	(0.305)	0.189	0.039
185	15.42	0.77	0.228	(0.303)	0.189	0.039
186	15.50	0.77	0.228	(0.302)	0.189	0.039
187	15.58	0.63	0.188	(0.300)	0.156	0.032
188	15.67	0.63	0.188	(0.298)	0.156	0.032
189	15.75	0.63	0.188	(0.297)	0.156	0.032
190	15.83	0.63	0.188	(0.295)	0.156	0.032
191	15.92	0.63	0.188	(0.294)	0.156	0.032
192	16.00	0.63	0.188	(0.292)	0.156	0.032
193	16.08	0.13	0.040	(0.291)	0.033	0.007
194	16.17	0.13	0.040	(0.289)	0.033	0.007
195	16.25	0.13	0.040	(0.288)	0.033	0.007
196	16.33	0.13	0.040	(0.286)	0.033	0.007
197	16.42	0.13	0.040	(0.285)	0.033	0.007
198	16.50	0.13	0.040	(0.284)	0.033	0.007
199	16.58	0.10	0.030	(0.282)	0.025	0.005
200	16.67	0.10	0.030	(0.281)	0.025	0.005
201	16.75	0.10	0.030	(0.279)	0.025	0.005
202	16.83	0.10	0.030	(0.278)	0.025	0.005

203	16.92	0.10	0.030	(0.276)	0.025	0.005
204	17.00	0.10	0.030	(0.275)	0.025	0.005
205	17.08	0.17	0.050	(0.274)	0.041	0.008
206	17.17	0.17	0.050	(0.272)	0.041	0.008
207	17.25	0.17	0.050	(0.271)	0.041	0.008
208	17.33	0.17	0.050	(0.270)	0.041	0.008
209	17.42	0.17	0.050	(0.268)	0.041	0.008
210	17.50	0.17	0.050	(0.267)	0.041	0.008
211	17.58	0.17	0.050	(0.266)	0.041	0.008
212	17.67	0.17	0.050	(0.264)	0.041	0.008
213	17.75	0.17	0.050	(0.263)	0.041	0.008
214	17.83	0.13	0.040	(0.262)	0.033	0.007
215	17.92	0.13	0.040	(0.260)	0.033	0.007
216	18.00	0.13	0.040	(0.259)	0.033	0.007
217	18.08	0.13	0.040	(0.258)	0.033	0.007
218	18.17	0.13	0.040	(0.256)	0.033	0.007
219	18.25	0.13	0.040	(0.255)	0.033	0.007
220	18.33	0.13	0.040	(0.254)	0.033	0.007
221	18.42	0.13	0.040	(0.253)	0.033	0.007
222	18.50	0.13	0.040	(0.251)	0.033	0.007
223	18.58	0.10	0.030	(0.250)	0.025	0.005
224	18.67	0.10	0.030	(0.249)	0.025	0.005
225	18.75	0.10	0.030	(0.248)	0.025	0.005
226	18.83	0.07	0.020	(0.247)	0.016	0.003
227	18.92	0.07	0.020	(0.246)	0.016	0.003
228	19.00	0.07	0.020	(0.244)	0.016	0.003
229	19.08	0.10	0.030	(0.243)	0.025	0.005
230	19.17	0.10	0.030	(0.242)	0.025	0.005
231	19.25	0.10	0.030	(0.241)	0.025	0.005
232	19.33	0.13	0.040	(0.240)	0.033	0.007
233	19.42	0.13	0.040	(0.239)	0.033	0.007
234	19.50	0.13	0.040	(0.238)	0.033	0.007
235	19.58	0.10	0.030	(0.236)	0.025	0.005
236	19.67	0.10	0.030	(0.235)	0.025	0.005
237	19.75	0.10	0.030	(0.234)	0.025	0.005
238	19.83	0.07	0.020	(0.233)	0.016	0.003
239	19.92	0.07	0.020	(0.232)	0.016	0.003
240	20.00	0.07	0.020	(0.231)	0.016	0.003
241	20.08	0.10	0.030	(0.230)	0.025	0.005
242	20.17	0.10	0.030	(0.229)	0.025	0.005
243	20.25	0.10	0.030	(0.228)	0.025	0.005
244	20.33	0.10	0.030	(0.227)	0.025	0.005
245	20.42	0.10	0.030	(0.226)	0.025	0.005
246	20.50	0.10	0.030	(0.225)	0.025	0.005
247	20.58	0.10	0.030	(0.224)	0.025	0.005
248	20.67	0.10	0.030	(0.223)	0.025	0.005
249	20.75	0.10	0.030	(0.222)	0.025	0.005
250	20.83	0.07	0.020	(0.222)	0.016	0.003
251	20.92	0.07	0.020	(0.221)	0.016	0.003
252	21.00	0.07	0.020	(0.220)	0.016	0.003
253	21.08	0.10	0.030	(0.219)	0.025	0.005
254	21.17	0.10	0.030	(0.218)	0.025	0.005
255	21.25	0.10	0.030	(0.217)	0.025	0.005
256	21.33	0.07	0.020	(0.216)	0.016	0.003

257	21.42	0.07	0.020	(0.216)	0.016	0.003
258	21.50	0.07	0.020	(0.215)	0.016	0.003
259	21.58	0.10	0.030	(0.214)	0.025	0.005
260	21.67	0.10	0.030	(0.213)	0.025	0.005
261	21.75	0.10	0.030	(0.212)	0.025	0.005
262	21.83	0.07	0.020	(0.212)	0.016	0.003
263	21.92	0.07	0.020	(0.211)	0.016	0.003
264	22.00	0.07	0.020	(0.210)	0.016	0.003
265	22.08	0.10	0.030	(0.210)	0.025	0.005
266	22.17	0.10	0.030	(0.209)	0.025	0.005
267	22.25	0.10	0.030	(0.208)	0.025	0.005
268	22.33	0.07	0.020	(0.208)	0.016	0.003
269	22.42	0.07	0.020	(0.207)	0.016	0.003
270	22.50	0.07	0.020	(0.206)	0.016	0.003
271	22.58	0.07	0.020	(0.206)	0.016	0.003
272	22.67	0.07	0.020	(0.205)	0.016	0.003
273	22.75	0.07	0.020	(0.205)	0.016	0.003
274	22.83	0.07	0.020	(0.204)	0.016	0.003
275	22.92	0.07	0.020	(0.204)	0.016	0.003
276	23.00	0.07	0.020	(0.203)	0.016	0.003
277	23.08	0.07	0.020	(0.203)	0.016	0.003
278	23.17	0.07	0.020	(0.202)	0.016	0.003
279	23.25	0.07	0.020	(0.202)	0.016	0.003
280	23.33	0.07	0.020	(0.201)	0.016	0.003
281	23.42	0.07	0.020	(0.201)	0.016	0.003
282	23.50	0.07	0.020	(0.201)	0.016	0.003
283	23.58	0.07	0.020	(0.200)	0.016	0.003
284	23.67	0.07	0.020	(0.200)	0.016	0.003
285	23.75	0.07	0.020	(0.200)	0.016	0.003
286	23.83	0.07	0.020	(0.199)	0.016	0.003
287	23.92	0.07	0.020	(0.199)	0.016	0.003
288	24.00	0.07	0.020	(0.199)	0.016	0.003

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.1

Flood volume = Effective rainfall 0.42(In)
times area 130.9(Ac.)/[(In)/(Ft.)] = 4.6(Ac.Ft)
Total soil loss = 2.05(In)
Total soil loss = 22.410(Ac.Ft)
Total rainfall = 2.48(In)
Flood volume = 201928.5 Cubic Feet
Total soil loss = 976184.3 Cubic Feet

Peak flow rate of this hydrograph = 7.435(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.03	Q				

0+10	0.0012	0.14	Q
0+15	0.0030	0.27	VQ
0+20	0.0054	0.34	VQ
0+25	0.0084	0.43	VQ
0+30	0.0120	0.52	V Q
0+35	0.0159	0.56	V Q
0+40	0.0199	0.59	V Q
0+45	0.0241	0.61	V Q
0+50	0.0285	0.64	V Q
0+55	0.0334	0.71	V Q
1+ 0	0.0388	0.78	V Q
1+ 5	0.0443	0.81	V Q
1+10	0.0496	0.77	V Q
1+15	0.0546	0.72	V Q
1+20	0.0594	0.70	V Q
1+25	0.0642	0.69	V Q
1+30	0.0689	0.69	V Q
1+35	0.0737	0.69	V Q
1+40	0.0784	0.68	V Q
1+45	0.0831	0.68	V Q
1+50	0.0879	0.69	V Q
1+55	0.0930	0.75	V Q
2+ 0	0.0986	0.81	V Q
2+ 5	0.1044	0.84	V Q
2+10	0.1103	0.86	V Q
2+15	0.1163	0.87	V Q
2+20	0.1223	0.87	V Q
2+25	0.1284	0.88	V Q
2+30	0.1344	0.88	V Q
2+35	0.1406	0.90	V Q
2+40	0.1472	0.96	V Q
2+45	0.1543	1.03	V Q
2+50	0.1616	1.06	V Q
2+55	0.1690	1.08	V Q
3+ 0	0.1765	1.09	V Q
3+ 5	0.1841	1.10	V Q
3+10	0.1916	1.10	V Q
3+15	0.1993	1.11	V Q
3+20	0.2069	1.11	V Q
3+25	0.2146	1.11	V Q
3+30	0.2223	1.12	V Q
3+35	0.2300	1.12	V Q
3+40	0.2377	1.12	V Q
3+45	0.2454	1.12	V Q
3+50	0.2532	1.13	V Q
3+55	0.2614	1.19	V Q
4+ 0	0.2701	1.26	V Q
4+ 5	0.2789	1.29	V Q
4+10	0.2879	1.30	V Q
4+15	0.2970	1.31	V Q
4+20	0.3062	1.33	V Q
4+25	0.3158	1.40	V Q
4+30	0.3259	1.47	V Q
4+35	0.3362	1.50	V Q

4+40	0.3467	1.52	V	Q				
4+45	0.3572	1.53	V	Q				
4+50	0.3679	1.55	V	Q				
4+55	0.3791	1.62	V	Q				
5+ 0	0.3907	1.69	V	Q				
5+ 5	0.4024	1.70	V	Q				
5+10	0.4134	1.60	V	Q				
5+15	0.4237	1.48	V	Q				
5+20	0.4336	1.45	V	Q				
5+25	0.4438	1.48	V	Q				
5+30	0.4544	1.53	V	Q				
5+35	0.4652	1.56	V	Q				
5+40	0.4764	1.63	V	Q				
5+45	0.4881	1.70	V	Q				
5+50	0.5000	1.73	V	Q				
5+55	0.5120	1.75	V	Q				
6+ 0	0.5241	1.76	V	Q				
6+ 5	0.5364	1.78	V	Q				
6+10	0.5491	1.84	V	Q				
6+15	0.5622	1.91	V	Q				
6+20	0.5756	1.95	V	Q				
6+25	0.5892	1.96	V	Q				
6+30	0.6028	1.98	V	Q				
6+35	0.6166	2.00	V	Q				
6+40	0.6308	2.07	V	Q				
6+45	0.6456	2.14	V	Q				
6+50	0.6605	2.17	V	Q				
6+55	0.6756	2.19	V	Q				
7+ 0	0.6908	2.20	V	Q				
7+ 5	0.7061	2.21	V	Q				
7+10	0.7214	2.22	V	Q				
7+15	0.7367	2.23	V	Q				
7+20	0.7522	2.25	V	Q				
7+25	0.7680	2.31	V	Q				
7+30	0.7844	2.37	V	Q				
7+35	0.8010	2.42	V	Q				
7+40	0.8182	2.49	V	Q				
7+45	0.8359	2.57	V	Q				
7+50	0.8540	2.62	V	Q				
7+55	0.8726	2.70	V	Q				
8+ 0	0.8917	2.78	V	Q				
8+ 5	0.9113	2.85	V	Q				
8+10	0.9319	2.99	V	Q				
8+15	0.9535	3.14	V	Q				
8+20	0.9756	3.21	V	Q				
8+25	0.9980	3.25	V	Q				
8+30	1.0205	3.28	V	Q				
8+35	1.0433	3.31	V	Q				
8+40	1.0667	3.39	V	Q				
8+45	1.0905	3.46	V	Q				
8+50	1.1148	3.52	V	Q				
8+55	1.1395	3.60	V	Q				
9+ 0	1.1649	3.68	V	Q				
9+ 5	1.1907	3.75	V	Q				

9+10	1.2175	3.89	V	Q		
9+15	1.2453	4.04	V	Q		
9+20	1.2736	4.12	V	Q		
9+25	1.3027	4.22	V	Q		
9+30	1.3324	4.31	V	Q		
9+35	1.3625	4.38	V	Q		
9+40	1.3933	4.47	V	Q		
9+45	1.4246	4.55	V	Q		
9+50	1.4564	4.61	V	Q		
9+55	1.4888	4.70	V	Q		
10+ 0	1.5217	4.79	V	Q		
10+ 5	1.5544	4.74	V	Q		
10+10	1.5844	4.36	V	Q		
10+15	1.6114	3.93	V	Q		
10+20	1.6372	3.73	Q			
10+25	1.6622	3.64	Q			
10+30	1.6868	3.57	Q			
10+35	1.7116	3.59	Q			
10+40	1.7380	3.85	VQ			
10+45	1.7666	4.14	VQ			
10+50	1.7960	4.27	V Q			
10+55	1.8258	4.33	V Q			
11+ 0	1.8558	4.36	VQ			
11+ 5	1.8860	4.38	VQ			
11+10	1.9159	4.34	VQ			
11+15	1.9454	4.29	VQ			
11+20	1.9748	4.27	Q			
11+25	2.0042	4.26	Q			
11+30	2.0336	4.26	Q			
11+35	2.0627	4.24	QV			
11+40	2.0912	4.12	Q V			
11+45	2.1187	4.00	Q V			
11+50	2.1459	3.95	Q V			
11+55	2.1733	3.98	Q V			
12+ 0	2.2010	4.02	Q V			
12+ 5	2.2295	4.13	Q V			
12+10	2.2607	4.54	QV			
12+15	2.2951	4.99	Q			
12+20	2.3309	5.21	Q			
12+25	2.3680	5.37	VQ			
12+30	2.4059	5.51	V Q			
12+35	2.4447	5.62	VQ			
12+40	2.4846	5.80	V Q			
12+45	2.5257	5.97	V Q			
12+50	2.5675	6.07	V Q			
12+55	2.6101	6.19	V Q			
13+ 0	2.6534	6.29	V Q			
13+ 5	2.6976	6.42	V Q			
13+10	2.7441	6.75	V Q			
13+15	2.7931	7.11	V Q			
13+20	2.8432	7.28	V Q			
13+25	2.8940	7.37	V Q			
13+30	2.9452	7.44	V Q			
13+35	2.9957	7.33	V Q			

[illegible]

18+10	4.3363	0.93	Q				V
18+15	4.3427	0.93	Q				V
18+20	4.3490	0.92	Q				V
18+25	4.3554	0.92	Q				V
18+30	4.3616	0.91	Q				V
18+35	4.3678	0.90	Q				V
18+40	4.3736	0.83	Q				V
18+45	4.3788	0.77	Q				V
18+50	4.3838	0.72	Q				V
18+55	4.3883	0.65	Q				V
19+ 0	4.3922	0.57	Q				V
19+ 5	4.3960	0.55	Q				V
19+10	4.4000	0.58	Q				V
19+15	4.4044	0.63	Q				V
19+20	4.4089	0.66	Q				V
19+25	4.4139	0.73	Q				V
19+30	4.4194	0.80	Q				V
19+35	4.4251	0.82	Q				V
19+40	4.4304	0.77	Q				V
19+45	4.4354	0.72	Q				V
19+50	4.4401	0.69	Q				V
19+55	4.4444	0.62	Q				V
20+ 0	4.4482	0.55	Q				V
20+ 5	4.4518	0.53	Q				V
20+10	4.4558	0.57	Q				V
20+15	4.4601	0.62	Q				V
20+20	4.4645	0.65	Q				V
20+25	4.4690	0.65	Q				V
20+30	4.4736	0.66	Q				V
20+35	4.4781	0.66	Q				V
20+40	4.4827	0.67	Q				V
20+45	4.4873	0.67	Q				V
20+50	4.4918	0.65	Q				V
20+55	4.4959	0.60	Q				V
21+ 0	4.4996	0.53	Q				V
21+ 5	4.5031	0.52	Q				V
21+10	4.5070	0.56	Q				V
21+15	4.5112	0.62	Q				V
21+20	4.5155	0.63	Q				V
21+25	4.5195	0.58	Q				V
21+30	4.5231	0.52	Q				V
21+35	4.5266	0.51	Q				V
21+40	4.5304	0.55	Q				V
21+45	4.5346	0.61	Q				V
21+50	4.5388	0.62	Q				V
21+55	4.5428	0.57	Q				V
22+ 0	4.5463	0.51	Q				V
22+ 5	4.5498	0.50	Q				V
22+10	4.5536	0.55	Q				V
22+15	4.5578	0.61	Q				V
22+20	4.5620	0.62	Q				V
22+25	4.5660	0.57	Q				V
22+30	4.5695	0.51	Q				V
22+35	4.5729	0.49	Q				V

22+40	4.5762	0.48	Q				V
22+45	4.5794	0.47	Q				V
22+50	4.5826	0.47	Q				V
22+55	4.5858	0.46	Q				V
23+ 0	4.5890	0.46	Q				V
23+ 5	4.5921	0.46	Q				V
23+10	4.5952	0.45	Q				V
23+15	4.5984	0.45	Q				V
23+20	4.6015	0.45	Q				V
23+25	4.6046	0.45	Q				V
23+30	4.6077	0.45	Q				V
23+35	4.6108	0.45	Q				V
23+40	4.6139	0.45	Q				V
23+45	4.6170	0.45	Q				V
23+50	4.6201	0.45	Q				V
23+55	4.6232	0.45	Q				V
24+ 0	4.6262	0.45	Q				V
24+ 5	4.6291	0.42	Q				V
24+10	4.6313	0.31	Q				V
24+15	4.6325	0.18	Q				V
24+20	4.6333	0.12	Q				V
24+25	4.6339	0.09	Q				V
24+30	4.6343	0.07	Q				V
24+35	4.6347	0.05	Q				V
24+40	4.6349	0.04	Q				V
24+45	4.6351	0.03	Q				V
24+50	4.6353	0.02	Q				V
24+55	4.6354	0.02	Q				V
25+ 0	4.6355	0.01	Q				V
25+ 5	4.6356	0.01	Q				V
25+10	4.6356	0.01	Q				V
25+15	4.6356	0.00	Q				V
25+20	4.6356	0.00	Q				V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90(Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90(Ac.) = 0.205 Sq.Mi.
Length along longest watercourse = 4200.00(Ft.)
Length along longest watercourse measured to centroid = 2103.00(Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00(Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
130.90	0.58	75.92

100 YEAR Area rainfall data:

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

130.90

1.45

189.81

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)

Areal adjustment factor = 99.88 %

Adjusted average point rain = 0.783(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.829

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335

13	1.083	643.887	0.815	1.075
14	1.167	693.417	0.619	0.816
15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426

Sum = 100.000 Sum= 131.923

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	0.08	4.40	0.413	(0.398)	0.342	0.071
2	0.17	4.50	0.423	(0.398)	0.350	0.072
3	0.25	5.40	0.507	0.398	(0.420)	0.109
4	0.33	5.40	0.507	0.398	(0.420)	0.109
5	0.42	5.70	0.535	0.398	(0.444)	0.137
6	0.50	6.40	0.601	0.398	(0.498)	0.203
7	0.58	7.90	0.742	0.398	(0.615)	0.344
8	0.67	9.10	0.855	0.398	(0.708)	0.457
9	0.75	12.80	1.202	0.398	(0.996)	0.804
10	0.83	25.60	2.405	0.398	(1.993)	2.007
11	0.92	7.90	0.742	0.398	(0.615)	0.344
12	1.00	4.90	0.460	(0.398)	0.381	0.079

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.7

Flood volume = Effective rainfall 0.39(In)
times area 130.9(Ac.) / [(In)/(Ft.)] = 4.3(Ac.Ft)
Total soil loss = 0.39(In)
Total soil loss = 4.234(Ac.Ft)
Total rainfall = 0.78(In)
Flood volume = 187543.2 Cubic Feet
Total soil loss = 184439.1 Cubic Feet

Peak flow rate of this hydrograph = 115.444(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0039	0.56	Q				
0+10	0.0244	2.99	Q				
0+15	0.0660	6.03	VQ				
0+20	0.1250	8.57	Q				
0+25	0.1998	10.86	VQ				

0+30	0.2923	13.43	Q				
0+35	0.4199	18.53	Q				
0+40	0.6106	27.69	Q				
0+45	0.8958	41.41	Q				
0+50	1.3819	70.59		V Q			
0+55	2.1770	115.44			V Q		
1+ 0	2.9426	111.17			Q	V	
1+ 5	3.3826	63.88		Q			V
1+10	3.6350	36.66	Q				V
1+15	3.8015	24.17	Q				V
1+20	3.9215	17.43	Q				V
1+25	4.0127	13.24	Q				V
1+30	4.0820	10.06	Q				V
1+35	4.1371	8.00	Q				V
1+40	4.1820	6.52	Q				V
1+45	4.2171	5.10	Q				V
1+50	4.2448	4.02	Q				V
1+55	4.2661	3.09	Q				V
2+ 0	4.2826	2.40	Q				V
2+ 5	4.2960	1.94	Q				V
2+10	4.3038	1.13	Q				V
2+15	4.3052	0.20	Q				V
2+20	4.3054	0.03	Q				V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 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]
130.90	0.98	128.28

100 YEAR Area rainfall data:

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

130.90

2.48

324.63

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.331 (In)

Areal adjustment factor = 99.94 %

Adjusted average point rain = 1.331 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.829

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335
13	1.083	643.887	1.075
14	1.167	693.417	0.816

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.208	(0.398)	0.172	0.036
2	0.17	1.30	0.208	(0.398)	0.172	0.036
3	0.25	1.10	0.176	(0.398)	0.146	0.030
4	0.33	1.50	0.240	(0.398)	0.198	0.041
5	0.42	1.50	0.240	(0.398)	0.198	0.041
6	0.50	1.80	0.287	(0.398)	0.238	0.049
7	0.58	1.50	0.240	(0.398)	0.198	0.041
8	0.67	1.80	0.287	(0.398)	0.238	0.049
9	0.75	1.80	0.287	(0.398)	0.238	0.049
10	0.83	1.50	0.240	(0.398)	0.198	0.041
11	0.92	1.60	0.255	(0.398)	0.212	0.044
12	1.00	1.80	0.287	(0.398)	0.238	0.049
13	1.08	2.20	0.351	(0.398)	0.291	0.060
14	1.17	2.20	0.351	(0.398)	0.291	0.060
15	1.25	2.20	0.351	(0.398)	0.291	0.060
16	1.33	2.00	0.319	(0.398)	0.265	0.055
17	1.42	2.60	0.415	(0.398)	0.344	0.071
18	1.50	2.70	0.431	(0.398)	0.357	0.074
19	1.58	2.40	0.383	(0.398)	0.318	0.066
20	1.67	2.70	0.431	(0.398)	0.357	0.074
21	1.75	3.30	0.527	0.398	(0.437)	0.129
22	1.83	3.10	0.495	0.398	(0.410)	0.097
23	1.92	2.90	0.463	(0.398)	0.384	0.079
24	2.00	3.00	0.479	(0.398)	0.397	0.082
25	2.08	3.10	0.495	0.398	(0.410)	0.097
26	2.17	4.20	0.671	0.398	(0.556)	0.272
27	2.25	5.00	0.798	0.398	(0.662)	0.400
28	2.33	3.50	0.559	0.398	(0.463)	0.161
29	2.42	6.80	1.086	0.398	(0.900)	0.688
30	2.50	7.30	1.166	0.398	(0.966)	0.767
31	2.58	8.20	1.309	0.398	(1.085)	0.911
32	2.67	5.90	0.942	0.398	(0.781)	0.544
33	2.75	2.00	0.319	(0.398)	0.265	0.055
34	2.83	1.80	0.287	(0.398)	0.238	0.049
35	2.92	1.80	0.287	(0.398)	0.238	0.049
36	3.00	0.60	0.096	(0.398)	0.079	0.016

(Loss Rate Not Used)

Sum = 100.0

Sum = 5.4

Flood volume = Effective rainfall 0.45(In)

times area 130.9(Ac.)/[(In)/(Ft.)] = 4.9(Ac.Ft)

Total soil loss = 0.88(In)
 Total soil loss = 9.585(Ac.Ft)
 Total rainfall = 1.33(In)
 Flood volume = 214730.1 Cubic Feet
 Total soil loss = 417514.7 Cubic Feet

 Peak flow rate of this hydrograph = 82.961(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0
0+ 5	0.0020	0.28	Q				
0+10	0.0122	1.49	Q				
0+15	0.0316	2.81	VQ				
0+20	0.0544	3.32	VQ				
0+25	0.0807	3.81	VQ				
0+30	0.1111	4.42	VQ				
0+35	0.1451	4.93	VQ				
0+40	0.1810	5.22	VQ				
0+45	0.2187	5.46	VQ				
0+50	0.2582	5.75	Q				
0+55	0.2975	5.69	Q				
1+ 0	0.3363	5.64	Q				
1+ 5	0.3774	5.97	QV				
1+10	0.4229	6.60	QV				
1+15	0.4720	7.14	Q				
1+20	0.5227	7.36	QV				
1+25	0.5741	7.46	QV				
1+30	0.6287	7.93	Q V				
1+35	0.6876	8.56	Q V				
1+40	0.7478	8.74	Q V				
1+45	0.8121	9.34	Q V				
1+50	0.8897	11.26	Q V				
1+55	0.9743	12.29	Q V				
2+ 0	1.0538	11.55	Q V				
2+ 5	1.1303	11.10	Q V				
2+10	1.2192	12.91	Q V				
2+15	1.3600	20.44	Q V				
2+20	1.5654	29.82	VQ				
2+25	1.7989	33.92	VQ				
2+30	2.1241	47.22	V				
2+35	2.6017	69.35	Q				
2+40	3.1731	82.96					
2+45	3.7098	77.93					
2+50	4.0789	53.60					
2+55	4.3025	32.46					
3+ 0	4.4627	23.27					
3+ 5	4.5829	17.45					

3+10	4.6695	12.57		Q				V	
3+15	4.7334	9.27		Q				V	
3+20	4.7826	7.15		Q				V	
3+25	4.8220	5.71		Q				V	
3+30	4.8531	4.52		Q				V	
3+35	4.8768	3.44		Q				V	
3+40	4.8950	2.65		Q				V	
3+45	4.9094	2.08	Q					V	
3+50	4.9195	1.47	Q					V	
3+55	4.9257	0.89	Q					V	
4+ 0	4.9281	0.36	Q					V	
4+ 5	4.9288	0.10	Q					V	
4+10	4.9293	0.06	Q					V	
4+15	4.9295	0.03	Q					V	
4+20	4.9295	0.01	Q					V	

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90(Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90(Ac.) = 0.205 Sq.Mi.
Length along longest watercourse = 4200.00(Ft.)
Length along longest watercourse measured to centroid = 2103.00(Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00(Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
130.90	1.38	180.64

100 YEAR Area rainfall data:

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

130.90

3.48

455.53

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.872 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 1.871 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.829

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335
13	1.083	643.887	1.075
14	1.167	693.417	0.816

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.112	(0.398)	0.093	0.019
2	0.17	0.60	0.135	(0.398)	0.112	0.023
3	0.25	0.60	0.135	(0.398)	0.112	0.023
4	0.33	0.60	0.135	(0.398)	0.112	0.023
5	0.42	0.60	0.135	(0.398)	0.112	0.023
6	0.50	0.70	0.157	(0.398)	0.130	0.027
7	0.58	0.70	0.157	(0.398)	0.130	0.027
8	0.67	0.70	0.157	(0.398)	0.130	0.027
9	0.75	0.70	0.157	(0.398)	0.130	0.027
10	0.83	0.70	0.157	(0.398)	0.130	0.027
11	0.92	0.70	0.157	(0.398)	0.130	0.027
12	1.00	0.80	0.180	(0.398)	0.149	0.031
13	1.08	0.80	0.180	(0.398)	0.149	0.031
14	1.17	0.80	0.180	(0.398)	0.149	0.031
15	1.25	0.80	0.180	(0.398)	0.149	0.031
16	1.33	0.80	0.180	(0.398)	0.149	0.031
17	1.42	0.80	0.180	(0.398)	0.149	0.031
18	1.50	0.80	0.180	(0.398)	0.149	0.031
19	1.58	0.80	0.180	(0.398)	0.149	0.031
20	1.67	0.80	0.180	(0.398)	0.149	0.031
21	1.75	0.80	0.180	(0.398)	0.149	0.031
22	1.83	0.80	0.180	(0.398)	0.149	0.031
23	1.92	0.80	0.180	(0.398)	0.149	0.031
24	2.00	0.90	0.202	(0.398)	0.167	0.035
25	2.08	0.80	0.180	(0.398)	0.149	0.031
26	2.17	0.90	0.202	(0.398)	0.167	0.035
27	2.25	0.90	0.202	(0.398)	0.167	0.035
28	2.33	0.90	0.202	(0.398)	0.167	0.035
29	2.42	0.90	0.202	(0.398)	0.167	0.035
30	2.50	0.90	0.202	(0.398)	0.167	0.035
31	2.58	0.90	0.202	(0.398)	0.167	0.035
32	2.67	0.90	0.202	(0.398)	0.167	0.035
33	2.75	1.00	0.225	(0.398)	0.186	0.038
34	2.83	1.00	0.225	(0.398)	0.186	0.038
35	2.92	1.00	0.225	(0.398)	0.186	0.038
36	3.00	1.00	0.225	(0.398)	0.186	0.038
37	3.08	1.00	0.225	(0.398)	0.186	0.038
38	3.17	1.10	0.247	(0.398)	0.205	0.042
39	3.25	1.10	0.247	(0.398)	0.205	0.042
40	3.33	1.10	0.247	(0.398)	0.205	0.042

41	3.42	1.20	0.269	(0.398)	0.223	0.046
42	3.50	1.30	0.292	(0.398)	0.242	0.050
43	3.58	1.40	0.314	(0.398)	0.260	0.054
44	3.67	1.40	0.314	(0.398)	0.260	0.054
45	3.75	1.50	0.337	(0.398)	0.279	0.058
46	3.83	1.50	0.337	(0.398)	0.279	0.058
47	3.92	1.60	0.359	(0.398)	0.298	0.062
48	4.00	1.60	0.359	(0.398)	0.298	0.062
49	4.08	1.70	0.382	(0.398)	0.316	0.065
50	4.17	1.80	0.404	(0.398)	0.335	0.069
51	4.25	1.90	0.427	(0.398)	0.353	0.073
52	4.33	2.00	0.449	(0.398)	0.372	0.077
53	4.42	2.10	0.471	(0.398)	0.391	0.081
54	4.50	2.10	0.471	(0.398)	0.391	0.081
55	4.58	2.20	0.494	0.398 (0.409)		0.096
56	4.67	2.30	0.516	0.398 (0.428)		0.118
57	4.75	2.40	0.539	0.398 (0.446)		0.141
58	4.83	2.40	0.539	0.398 (0.446)		0.141
59	4.92	2.50	0.561	0.398 (0.465)		0.163
60	5.00	2.60	0.584	0.398 (0.484)		0.186
61	5.08	3.10	0.696	0.398 (0.577)		0.298
62	5.17	3.60	0.808	0.398 (0.670)		0.410
63	5.25	3.90	0.876	0.398 (0.726)		0.477
64	5.33	4.20	0.943	0.398 (0.781)		0.545
65	5.42	4.70	1.055	0.398 (0.874)		0.657
66	5.50	5.60	1.257	0.398 (1.042)		0.859
67	5.58	1.90	0.427	(0.398)	0.353	0.073
68	5.67	0.90	0.202	(0.398)	0.167	0.035
69	5.75	0.60	0.135	(0.398)	0.112	0.023
70	5.83	0.50	0.112	(0.398)	0.093	0.019
71	5.92	0.30	0.067	(0.398)	0.056	0.012
72	6.00	0.20	0.045	(0.398)	0.037	0.008

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.4

Flood volume = Effective rainfall 0.53(In)
times area 130.9(Ac.)/[(In)/(Ft.)] = 5.8(Ac.Ft)
Total soil loss = 1.34(In)
Total soil loss = 14.575(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 254161.6 Cubic Feet
Total soil loss = 634889.4 Cubic Feet

Peak flow rate of this hydrograph = 74.556(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0011	0.15	Q				

0+10	0.0068	0.84	Q				
0+15	0.0186	1.70	Q				
0+20	0.0336	2.18	VQ				
0+25	0.0503	2.42	VQ				
0+30	0.0682	2.61	VQ				
0+35	0.0879	2.85	VQ				
0+40	0.1091	3.08	VQ				
0+45	0.1312	3.21	VQ				
0+50	0.1539	3.29	Q				
0+55	0.1770	3.36	Q				
1+ 0	0.2007	3.44	Q				
1+ 5	0.2256	3.61	Q				
1+10	0.2517	3.79	Q				
1+15	0.2784	3.88	Q				
1+20	0.3055	3.93	QV				
1+25	0.3328	3.97	QV				
1+30	0.3604	4.00	QV				
1+35	0.3880	4.01	Q				
1+40	0.4157	4.03	Q				
1+45	0.4435	4.04	QV				
1+50	0.4714	4.04	QV				
1+55	0.4993	4.05	QV				
2+ 0	0.5274	4.08	QV				
2+ 5	0.5562	4.19	QV				
2+10	0.5854	4.24	Q V				
2+15	0.6150	4.29	Q V				
2+20	0.6453	4.41	Q V				
2+25	0.6761	4.46	Q V				
2+30	0.7070	4.49	Q V				
2+35	0.7380	4.51	Q V				
2+40	0.7692	4.52	Q V				
2+45	0.8007	4.57	Q V				
2+50	0.8331	4.71	Q V				
2+55	0.8665	4.86	Q V				
3+ 0	0.9005	4.93	Q V				
3+ 5	0.9347	4.97	Q V				
3+10	0.9694	5.03	Q V				
3+15	1.0050	5.18	Q V				
3+20	1.0418	5.34	Q V				
3+25	1.0793	5.45	Q V				
3+30	1.1183	5.66	Q V				
3+35	1.1596	5.99	Q V				
3+40	1.2034	6.36	Q V				
3+45	1.2492	6.66	Q V				
3+50	1.2969	6.93	Q V				
3+55	1.3465	7.19	Q V				
4+ 0	1.3978	7.45	Q V				
4+ 5	1.4509	7.71	Q V				
4+10	1.5060	8.00	Q V				
4+15	1.5638	8.39	Q V				
4+20	1.6245	8.82	Q V				
4+25	1.6884	9.28	Q V				
4+30	1.7553	9.72	Q V				
4+35	1.8252	10.15	Q V				

4+40	1.9011	11.01		Q		V			
4+45	1.9882	12.64		Q		V			
4+50	2.0888	14.61		Q		V			
4+55	2.2005	16.23		Q		V			
5+ 0	2.3238	17.91		Q		V			
5+ 5	2.4676	20.87			Q	V			
5+10	2.6545	27.15				Q	V		
5+15	2.9067	36.61					QV		
5+20	3.2248	46.19						VQ	
5+25	3.6055	55.29						V	Q
5+30	4.0632	66.46						V	
5+35	4.5767	74.56							Q
5+40	4.9850	59.29						Q	
5+45	5.2189	33.97				Q			
5+50	5.3715	22.15				Q			
5+55	5.4848	16.45			Q				
6+ 0	5.5713	12.56			Q				
6+ 5	5.6379	9.67			Q				
6+10	5.6883	7.31			Q				
6+15	5.7270	5.63		Q					
6+20	5.7576	4.44		Q					
6+25	5.7813	3.43		Q					
6+30	5.7994	2.63		Q					
6+35	5.8129	1.95	Q						
6+40	5.8227	1.43	Q						
6+45	5.8296	1.00	Q						
6+50	5.8331	0.51	Q						
6+55	5.8338	0.11	Q						
7+ 0	5.8343	0.06	Q						
7+ 5	5.8345	0.04	Q						
7+10	5.8347	0.02	Q						
7+15	5.8347	0.01	Q						
7+20	5.8347	0.00	Q						

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 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]
130.90	2.48	324.63

100 YEAR Area rainfall data:

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

130.90

6.90

903.21

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 3.514(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.006	0.002
69.0	49.8	0.574	0.500	0.316	0.016	0.005
75.0	57.0	0.501	0.500	0.275	0.152	0.042
81.0	64.4	0.422	0.000	0.422	0.826	0.349
Sum (F) =						0.398

Area averaged mean soil loss (F) (In/Hr) = 0.398

Minimum soil loss rate ((In/Hr)) = 0.199

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.829

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335
13	1.083	643.887	1.075
14	1.167	693.417	0.816

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.028	(0.706)	0.023	0.005
2	0.17	0.07	0.028	(0.703)	0.023	0.005
3	0.25	0.07	0.028	(0.700)	0.023	0.005
4	0.33	0.10	0.042	(0.698)	0.035	0.007
5	0.42	0.10	0.042	(0.695)	0.035	0.007
6	0.50	0.10	0.042	(0.692)	0.035	0.007
7	0.58	0.10	0.042	(0.690)	0.035	0.007
8	0.67	0.10	0.042	(0.687)	0.035	0.007
9	0.75	0.10	0.042	(0.684)	0.035	0.007
10	0.83	0.13	0.056	(0.681)	0.047	0.010
11	0.92	0.13	0.056	(0.679)	0.047	0.010
12	1.00	0.13	0.056	(0.676)	0.047	0.010
13	1.08	0.10	0.042	(0.673)	0.035	0.007
14	1.17	0.10	0.042	(0.671)	0.035	0.007
15	1.25	0.10	0.042	(0.668)	0.035	0.007
16	1.33	0.10	0.042	(0.665)	0.035	0.007
17	1.42	0.10	0.042	(0.663)	0.035	0.007
18	1.50	0.10	0.042	(0.660)	0.035	0.007
19	1.58	0.10	0.042	(0.658)	0.035	0.007
20	1.67	0.10	0.042	(0.655)	0.035	0.007
21	1.75	0.10	0.042	(0.652)	0.035	0.007
22	1.83	0.13	0.056	(0.650)	0.047	0.010
23	1.92	0.13	0.056	(0.647)	0.047	0.010
24	2.00	0.13	0.056	(0.644)	0.047	0.010
25	2.08	0.13	0.056	(0.642)	0.047	0.010
26	2.17	0.13	0.056	(0.639)	0.047	0.010
27	2.25	0.13	0.056	(0.637)	0.047	0.010
28	2.33	0.13	0.056	(0.634)	0.047	0.010
29	2.42	0.13	0.056	(0.631)	0.047	0.010
30	2.50	0.13	0.056	(0.629)	0.047	0.010
31	2.58	0.17	0.070	(0.626)	0.058	0.012
32	2.67	0.17	0.070	(0.624)	0.058	0.012
33	2.75	0.17	0.070	(0.621)	0.058	0.012
34	2.83	0.17	0.070	(0.619)	0.058	0.012
35	2.92	0.17	0.070	(0.616)	0.058	0.012
36	3.00	0.17	0.070	(0.614)	0.058	0.012
37	3.08	0.17	0.070	(0.611)	0.058	0.012
38	3.17	0.17	0.070	(0.608)	0.058	0.012
39	3.25	0.17	0.070	(0.606)	0.058	0.012
40	3.33	0.17	0.070	(0.603)	0.058	0.012

41	3.42	0.17	0.070	(0.601)	0.058	0.012
42	3.50	0.17	0.070	(0.598)	0.058	0.012
43	3.58	0.17	0.070	(0.596)	0.058	0.012
44	3.67	0.17	0.070	(0.593)	0.058	0.012
45	3.75	0.17	0.070	(0.591)	0.058	0.012
46	3.83	0.20	0.084	(0.588)	0.070	0.014
47	3.92	0.20	0.084	(0.586)	0.070	0.014
48	4.00	0.20	0.084	(0.583)	0.070	0.014
49	4.08	0.20	0.084	(0.581)	0.070	0.014
50	4.17	0.20	0.084	(0.578)	0.070	0.014
51	4.25	0.20	0.084	(0.576)	0.070	0.014
52	4.33	0.23	0.098	(0.574)	0.082	0.017
53	4.42	0.23	0.098	(0.571)	0.082	0.017
54	4.50	0.23	0.098	(0.569)	0.082	0.017
55	4.58	0.23	0.098	(0.566)	0.082	0.017
56	4.67	0.23	0.098	(0.564)	0.082	0.017
57	4.75	0.23	0.098	(0.561)	0.082	0.017
58	4.83	0.27	0.112	(0.559)	0.093	0.019
59	4.92	0.27	0.112	(0.556)	0.093	0.019
60	5.00	0.27	0.112	(0.554)	0.093	0.019
61	5.08	0.20	0.084	(0.552)	0.070	0.014
62	5.17	0.20	0.084	(0.549)	0.070	0.014
63	5.25	0.20	0.084	(0.547)	0.070	0.014
64	5.33	0.23	0.098	(0.544)	0.082	0.017
65	5.42	0.23	0.098	(0.542)	0.082	0.017
66	5.50	0.23	0.098	(0.540)	0.082	0.017
67	5.58	0.27	0.112	(0.537)	0.093	0.019
68	5.67	0.27	0.112	(0.535)	0.093	0.019
69	5.75	0.27	0.112	(0.533)	0.093	0.019
70	5.83	0.27	0.112	(0.530)	0.093	0.019
71	5.92	0.27	0.112	(0.528)	0.093	0.019
72	6.00	0.27	0.112	(0.526)	0.093	0.019
73	6.08	0.30	0.127	(0.523)	0.105	0.022
74	6.17	0.30	0.127	(0.521)	0.105	0.022
75	6.25	0.30	0.127	(0.519)	0.105	0.022
76	6.33	0.30	0.127	(0.516)	0.105	0.022
77	6.42	0.30	0.127	(0.514)	0.105	0.022
78	6.50	0.30	0.127	(0.512)	0.105	0.022
79	6.58	0.33	0.141	(0.509)	0.116	0.024
80	6.67	0.33	0.141	(0.507)	0.116	0.024
81	6.75	0.33	0.141	(0.505)	0.116	0.024
82	6.83	0.33	0.141	(0.503)	0.116	0.024
83	6.92	0.33	0.141	(0.500)	0.116	0.024
84	7.00	0.33	0.141	(0.498)	0.116	0.024
85	7.08	0.33	0.141	(0.496)	0.116	0.024
86	7.17	0.33	0.141	(0.493)	0.116	0.024
87	7.25	0.33	0.141	(0.491)	0.116	0.024
88	7.33	0.37	0.155	(0.489)	0.128	0.027
89	7.42	0.37	0.155	(0.487)	0.128	0.027
90	7.50	0.37	0.155	(0.484)	0.128	0.027
91	7.58	0.40	0.169	(0.482)	0.140	0.029
92	7.67	0.40	0.169	(0.480)	0.140	0.029
93	7.75	0.40	0.169	(0.478)	0.140	0.029
94	7.83	0.43	0.183	(0.476)	0.151	0.031

95	7.92	0.43	0.183	(0.473)	0.151	0.031
96	8.00	0.43	0.183	(0.471)	0.151	0.031
97	8.08	0.50	0.211	(0.469)	0.175	0.036
98	8.17	0.50	0.211	(0.467)	0.175	0.036
99	8.25	0.50	0.211	(0.465)	0.175	0.036
100	8.33	0.50	0.211	(0.463)	0.175	0.036
101	8.42	0.50	0.211	(0.460)	0.175	0.036
102	8.50	0.50	0.211	(0.458)	0.175	0.036
103	8.58	0.53	0.225	(0.456)	0.186	0.039
104	8.67	0.53	0.225	(0.454)	0.186	0.039
105	8.75	0.53	0.225	(0.452)	0.186	0.039
106	8.83	0.57	0.239	(0.450)	0.198	0.041
107	8.92	0.57	0.239	(0.448)	0.198	0.041
108	9.00	0.57	0.239	(0.445)	0.198	0.041
109	9.08	0.63	0.267	(0.443)	0.221	0.046
110	9.17	0.63	0.267	(0.441)	0.221	0.046
111	9.25	0.63	0.267	(0.439)	0.221	0.046
112	9.33	0.67	0.281	(0.437)	0.233	0.048
113	9.42	0.67	0.281	(0.435)	0.233	0.048
114	9.50	0.67	0.281	(0.433)	0.233	0.048
115	9.58	0.70	0.295	(0.431)	0.245	0.051
116	9.67	0.70	0.295	(0.429)	0.245	0.051
117	9.75	0.70	0.295	(0.427)	0.245	0.051
118	9.83	0.73	0.309	(0.425)	0.256	0.053
119	9.92	0.73	0.309	(0.423)	0.256	0.053
120	10.00	0.73	0.309	(0.420)	0.256	0.053
121	10.08	0.50	0.211	(0.418)	0.175	0.036
122	10.17	0.50	0.211	(0.416)	0.175	0.036
123	10.25	0.50	0.211	(0.414)	0.175	0.036
124	10.33	0.50	0.211	(0.412)	0.175	0.036
125	10.42	0.50	0.211	(0.410)	0.175	0.036
126	10.50	0.50	0.211	(0.408)	0.175	0.036
127	10.58	0.67	0.281	(0.406)	0.233	0.048
128	10.67	0.67	0.281	(0.404)	0.233	0.048
129	10.75	0.67	0.281	(0.402)	0.233	0.048
130	10.83	0.67	0.281	(0.400)	0.233	0.048
131	10.92	0.67	0.281	(0.398)	0.233	0.048
132	11.00	0.67	0.281	(0.397)	0.233	0.048
133	11.08	0.63	0.267	(0.395)	0.221	0.046
134	11.17	0.63	0.267	(0.393)	0.221	0.046
135	11.25	0.63	0.267	(0.391)	0.221	0.046
136	11.33	0.63	0.267	(0.389)	0.221	0.046
137	11.42	0.63	0.267	(0.387)	0.221	0.046
138	11.50	0.63	0.267	(0.385)	0.221	0.046
139	11.58	0.57	0.239	(0.383)	0.198	0.041
140	11.67	0.57	0.239	(0.381)	0.198	0.041
141	11.75	0.57	0.239	(0.379)	0.198	0.041
142	11.83	0.60	0.253	(0.377)	0.210	0.043
143	11.92	0.60	0.253	(0.375)	0.210	0.043
144	12.00	0.60	0.253	(0.374)	0.210	0.043
145	12.08	0.83	0.351	(0.372)	0.291	0.060
146	12.17	0.83	0.351	(0.370)	0.291	0.060
147	12.25	0.83	0.351	(0.368)	0.291	0.060
148	12.33	0.87	0.365	(0.366)	0.303	0.063

149	12.42	0.87	0.365	(0.364)	0.303	0.063
150	12.50	0.87	0.365	(0.362)	0.303	0.063
151	12.58	0.93	0.394	(0.361)	0.326	0.067
152	12.67	0.93	0.394	(0.359)	0.326	0.067
153	12.75	0.93	0.394	(0.357)	0.326	0.067
154	12.83	0.97	0.408	(0.355)	0.338	0.070
155	12.92	0.97	0.408	(0.353)	0.338	0.070
156	13.00	0.97	0.408	(0.352)	0.338	0.070
157	13.08	1.13	0.478	0.350 (0.396)		0.128
158	13.17	1.13	0.478	0.348 (0.396)		0.130
159	13.25	1.13	0.478	0.346 (0.396)		0.132
160	13.33	1.13	0.478	0.345 (0.396)		0.133
161	13.42	1.13	0.478	0.343 (0.396)		0.135
162	13.50	1.13	0.478	0.341 (0.396)		0.137
163	13.58	0.77	0.323	(0.339)	0.268	0.055
164	13.67	0.77	0.323	(0.338)	0.268	0.055
165	13.75	0.77	0.323	(0.336)	0.268	0.055
166	13.83	0.77	0.323	(0.334)	0.268	0.055
167	13.92	0.77	0.323	(0.332)	0.268	0.055
168	14.00	0.77	0.323	(0.331)	0.268	0.055
169	14.08	0.90	0.380	(0.329)	0.314	0.065
170	14.17	0.90	0.380	(0.327)	0.314	0.065
171	14.25	0.90	0.380	(0.326)	0.314	0.065
172	14.33	0.87	0.365	(0.324)	0.303	0.063
173	14.42	0.87	0.365	(0.322)	0.303	0.063
174	14.50	0.87	0.365	(0.321)	0.303	0.063
175	14.58	0.87	0.365	(0.319)	0.303	0.063
176	14.67	0.87	0.365	(0.317)	0.303	0.063
177	14.75	0.87	0.365	(0.316)	0.303	0.063
178	14.83	0.83	0.351	(0.314)	0.291	0.060
179	14.92	0.83	0.351	(0.313)	0.291	0.060
180	15.00	0.83	0.351	(0.311)	0.291	0.060
181	15.08	0.80	0.337	(0.309)	0.280	0.058
182	15.17	0.80	0.337	(0.308)	0.280	0.058
183	15.25	0.80	0.337	(0.306)	0.280	0.058
184	15.33	0.77	0.323	(0.305)	0.268	0.055
185	15.42	0.77	0.323	(0.303)	0.268	0.055
186	15.50	0.77	0.323	(0.302)	0.268	0.055
187	15.58	0.63	0.267	(0.300)	0.221	0.046
188	15.67	0.63	0.267	(0.298)	0.221	0.046
189	15.75	0.63	0.267	(0.297)	0.221	0.046
190	15.83	0.63	0.267	(0.295)	0.221	0.046
191	15.92	0.63	0.267	(0.294)	0.221	0.046
192	16.00	0.63	0.267	(0.292)	0.221	0.046
193	16.08	0.13	0.056	(0.291)	0.047	0.010
194	16.17	0.13	0.056	(0.289)	0.047	0.010
195	16.25	0.13	0.056	(0.288)	0.047	0.010
196	16.33	0.13	0.056	(0.286)	0.047	0.010
197	16.42	0.13	0.056	(0.285)	0.047	0.010
198	16.50	0.13	0.056	(0.284)	0.047	0.010
199	16.58	0.10	0.042	(0.282)	0.035	0.007
200	16.67	0.10	0.042	(0.281)	0.035	0.007
201	16.75	0.10	0.042	(0.279)	0.035	0.007
202	16.83	0.10	0.042	(0.278)	0.035	0.007

203	16.92	0.10	0.042	(0.276)	0.035	0.007
204	17.00	0.10	0.042	(0.275)	0.035	0.007
205	17.08	0.17	0.070	(0.274)	0.058	0.012
206	17.17	0.17	0.070	(0.272)	0.058	0.012
207	17.25	0.17	0.070	(0.271)	0.058	0.012
208	17.33	0.17	0.070	(0.270)	0.058	0.012
209	17.42	0.17	0.070	(0.268)	0.058	0.012
210	17.50	0.17	0.070	(0.267)	0.058	0.012
211	17.58	0.17	0.070	(0.266)	0.058	0.012
212	17.67	0.17	0.070	(0.264)	0.058	0.012
213	17.75	0.17	0.070	(0.263)	0.058	0.012
214	17.83	0.13	0.056	(0.262)	0.047	0.010
215	17.92	0.13	0.056	(0.260)	0.047	0.010
216	18.00	0.13	0.056	(0.259)	0.047	0.010
217	18.08	0.13	0.056	(0.258)	0.047	0.010
218	18.17	0.13	0.056	(0.256)	0.047	0.010
219	18.25	0.13	0.056	(0.255)	0.047	0.010
220	18.33	0.13	0.056	(0.254)	0.047	0.010
221	18.42	0.13	0.056	(0.253)	0.047	0.010
222	18.50	0.13	0.056	(0.251)	0.047	0.010
223	18.58	0.10	0.042	(0.250)	0.035	0.007
224	18.67	0.10	0.042	(0.249)	0.035	0.007
225	18.75	0.10	0.042	(0.248)	0.035	0.007
226	18.83	0.07	0.028	(0.247)	0.023	0.005
227	18.92	0.07	0.028	(0.246)	0.023	0.005
228	19.00	0.07	0.028	(0.244)	0.023	0.005
229	19.08	0.10	0.042	(0.243)	0.035	0.007
230	19.17	0.10	0.042	(0.242)	0.035	0.007
231	19.25	0.10	0.042	(0.241)	0.035	0.007
232	19.33	0.13	0.056	(0.240)	0.047	0.010
233	19.42	0.13	0.056	(0.239)	0.047	0.010
234	19.50	0.13	0.056	(0.238)	0.047	0.010
235	19.58	0.10	0.042	(0.236)	0.035	0.007
236	19.67	0.10	0.042	(0.235)	0.035	0.007
237	19.75	0.10	0.042	(0.234)	0.035	0.007
238	19.83	0.07	0.028	(0.233)	0.023	0.005
239	19.92	0.07	0.028	(0.232)	0.023	0.005
240	20.00	0.07	0.028	(0.231)	0.023	0.005
241	20.08	0.10	0.042	(0.230)	0.035	0.007
242	20.17	0.10	0.042	(0.229)	0.035	0.007
243	20.25	0.10	0.042	(0.228)	0.035	0.007
244	20.33	0.10	0.042	(0.227)	0.035	0.007
245	20.42	0.10	0.042	(0.226)	0.035	0.007
246	20.50	0.10	0.042	(0.225)	0.035	0.007
247	20.58	0.10	0.042	(0.224)	0.035	0.007
248	20.67	0.10	0.042	(0.223)	0.035	0.007
249	20.75	0.10	0.042	(0.222)	0.035	0.007
250	20.83	0.07	0.028	(0.222)	0.023	0.005
251	20.92	0.07	0.028	(0.221)	0.023	0.005
252	21.00	0.07	0.028	(0.220)	0.023	0.005
253	21.08	0.10	0.042	(0.219)	0.035	0.007
254	21.17	0.10	0.042	(0.218)	0.035	0.007
255	21.25	0.10	0.042	(0.217)	0.035	0.007
256	21.33	0.07	0.028	(0.216)	0.023	0.005

257	21.42	0.07	0.028	(0.216)	0.023	0.005
258	21.50	0.07	0.028	(0.215)	0.023	0.005
259	21.58	0.10	0.042	(0.214)	0.035	0.007
260	21.67	0.10	0.042	(0.213)	0.035	0.007
261	21.75	0.10	0.042	(0.212)	0.035	0.007
262	21.83	0.07	0.028	(0.212)	0.023	0.005
263	21.92	0.07	0.028	(0.211)	0.023	0.005
264	22.00	0.07	0.028	(0.210)	0.023	0.005
265	22.08	0.10	0.042	(0.210)	0.035	0.007
266	22.17	0.10	0.042	(0.209)	0.035	0.007
267	22.25	0.10	0.042	(0.208)	0.035	0.007
268	22.33	0.07	0.028	(0.208)	0.023	0.005
269	22.42	0.07	0.028	(0.207)	0.023	0.005
270	22.50	0.07	0.028	(0.206)	0.023	0.005
271	22.58	0.07	0.028	(0.206)	0.023	0.005
272	22.67	0.07	0.028	(0.205)	0.023	0.005
273	22.75	0.07	0.028	(0.205)	0.023	0.005
274	22.83	0.07	0.028	(0.204)	0.023	0.005
275	22.92	0.07	0.028	(0.204)	0.023	0.005
276	23.00	0.07	0.028	(0.203)	0.023	0.005
277	23.08	0.07	0.028	(0.203)	0.023	0.005
278	23.17	0.07	0.028	(0.202)	0.023	0.005
279	23.25	0.07	0.028	(0.202)	0.023	0.005
280	23.33	0.07	0.028	(0.201)	0.023	0.005
281	23.42	0.07	0.028	(0.201)	0.023	0.005
282	23.50	0.07	0.028	(0.201)	0.023	0.005
283	23.58	0.07	0.028	(0.200)	0.023	0.005
284	23.67	0.07	0.028	(0.200)	0.023	0.005
285	23.75	0.07	0.028	(0.200)	0.023	0.005
286	23.83	0.07	0.028	(0.199)	0.023	0.005
287	23.92	0.07	0.028	(0.199)	0.023	0.005
288	24.00	0.07	0.028	(0.199)	0.023	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 7.5

Flood volume = Effective rainfall 0.63 (In)

times area 130.9 (Ac.) / [(In) / (Ft.)] = 6.8 (Ac.Ft)

Total soil loss = 2.89 (In)

Total soil loss = 31.489 (Ac.Ft)

Total rainfall = 3.51 (In)

Flood volume = 298243.6 Cubic Feet

Total soil loss = 1371670.3 Cubic Feet

Peak flow rate of this hydrograph = 16.334 (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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0003	0.04	Q				

0+10	0.0017	0.20	Q
0+15	0.0043	0.39	Q
0+20	0.0077	0.49	Q
0+25	0.0119	0.61	VQ
0+30	0.0170	0.74	VQ
0+35	0.0225	0.80	VQ
0+40	0.0283	0.84	VQ
0+45	0.0342	0.87	VQ
0+50	0.0405	0.91	VQ
0+55	0.0474	1.00	V Q
1+ 0	0.0550	1.11	V Q
1+ 5	0.0629	1.14	V Q
1+10	0.0704	1.09	V Q
1+15	0.0774	1.02	V Q
1+20	0.0842	0.99	VQ
1+25	0.0910	0.98	VQ
1+30	0.0977	0.98	VQ
1+35	0.1044	0.97	VQ
1+40	0.1111	0.97	VQ
1+45	0.1178	0.97	VQ
1+50	0.1245	0.98	VQ
1+55	0.1318	1.06	V Q
2+ 0	0.1398	1.15	V Q
2+ 5	0.1480	1.19	V Q
2+10	0.1564	1.21	V Q
2+15	0.1648	1.23	V Q
2+20	0.1734	1.24	VQ
2+25	0.1819	1.24	VQ
2+30	0.1906	1.25	VQ
2+35	0.1993	1.28	VQ
2+40	0.2087	1.36	VQ
2+45	0.2187	1.46	VQ
2+50	0.2291	1.50	V Q
2+55	0.2396	1.52	V Q
3+ 0	0.2502	1.54	V Q
3+ 5	0.2609	1.55	V Q
3+10	0.2716	1.56	V Q
3+15	0.2825	1.57	V Q
3+20	0.2933	1.57	V Q
3+25	0.3042	1.58	V Q
3+30	0.3151	1.58	V Q
3+35	0.3260	1.58	V Q
3+40	0.3369	1.59	V Q
3+45	0.3478	1.59	VQ
3+50	0.3589	1.61	VQ
3+55	0.3705	1.69	VQ
4+ 0	0.3828	1.78	VQ
4+ 5	0.3954	1.82	VQ
4+10	0.4081	1.85	VQ
4+15	0.4209	1.86	VQ
4+20	0.4340	1.89	VQ
4+25	0.4476	1.98	VQ
4+30	0.4619	2.08	V Q
4+35	0.4766	2.13	V Q

4+40	0.4914	2.15	V Q			
4+45	0.5064	2.17	V Q			
4+50	0.5215	2.20	VQ			
4+55	0.5373	2.30	VQ			
5+ 0	0.5538	2.40	VQ			
5+ 5	0.5704	2.41	VQ			
5+10	0.5860	2.27	VQ			
5+15	0.6005	2.10	VQ			
5+20	0.6147	2.05	VQ			
5+25	0.6291	2.10	VQ			
5+30	0.6441	2.17	VQ			
5+35	0.6593	2.22	VQ			
5+40	0.6752	2.31	VQ			
5+45	0.6918	2.41	Q			
5+50	0.7087	2.45	Q			
5+55	0.7257	2.48	Q			
6+ 0	0.7429	2.49	Q			
6+ 5	0.7603	2.52	VQ			
6+10	0.7783	2.61	VQ			
6+15	0.7969	2.71	VQ			
6+20	0.8159	2.76	VQ			
6+25	0.8351	2.78	VQ			
6+30	0.8544	2.80	VQ			
6+35	0.8740	2.84	Q			
6+40	0.8942	2.93	Q			
6+45	0.9151	3.03	VQ			
6+50	0.9363	3.08	VQ			
6+55	0.9577	3.11	VQ			
7+ 0	0.9792	3.13	VQ			
7+ 5	1.0008	3.14	VQ			
7+10	1.0225	3.15	VQ			
7+15	1.0442	3.16	Q			
7+20	1.0661	3.18	Q			
7+25	1.0887	3.27	Q			
7+30	1.1118	3.36	Q			
7+35	1.1354	3.43	Q			
7+40	1.1598	3.53	VQ			
7+45	1.1849	3.64	VQ			
7+50	1.2105	3.72	Q			
7+55	1.2368	3.83	Q			
8+ 0	1.2640	3.94	Q			
8+ 5	1.2918	4.04	VQ			
8+10	1.3209	4.24	VQ			
8+15	1.3516	4.44	VQ			
8+20	1.3829	4.55	VQ			
8+25	1.4146	4.60	VQ			
8+30	1.4466	4.65	VQ			
8+35	1.4789	4.70	VQ			
8+40	1.5120	4.80	VQ			
8+45	1.5458	4.91	Q			
8+50	1.5801	4.98	Q			
8+55	1.6152	5.10	VQ			
9+ 0	1.6511	5.21	VQ			
9+ 5	1.6877	5.31	VQ			

13+40	4.5314	13.72					VQ
13+45	4.6061	10.84				Q	V
13+50	4.6721	9.59					V
13+55	4.7341	9.00				Q	V
14+ 0	4.7933	8.59				Q	V
14+ 5	4.8510	8.38				Q	V
14+10	4.9095	8.49				Q	V
14+15	4.9694	8.70				Q	V
14+20	5.0295	8.73				Q	V
14+25	5.0890	8.63				Q	V
14+30	5.1475	8.49				Q	V
14+35	5.2054	8.41				Q	V
14+40	5.2630	8.36				Q	V
14+45	5.3203	8.32				Q	V
14+50	5.3771	8.26				Q	V
14+55	5.4332	8.15				Q	V
15+ 0	5.4887	8.06				Q	V
15+ 5	5.5439	8.01				Q	V
15+10	5.5983	7.91				Q	V
15+15	5.6521	7.80				Q	V
15+20	5.7053	7.73				Q	V
15+25	5.7578	7.62				Q	V
15+30	5.8096	7.51				Q	V
15+35	5.8603	7.37				Q	V
15+40	5.9086	7.01				Q	V
15+45	5.9542	6.62				Q	V
15+50	5.9985	6.43				Q	V
15+55	6.0421	6.33				Q	V
16+ 0	6.0853	6.26				Q	V
16+ 5	6.1260	5.92				Q	V
16+10	6.1581	4.65				Q	V
16+15	6.1804	3.24				Q	V
16+20	6.1983	2.59				Q	V
16+25	6.2137	2.25				Q	V
16+30	6.2276	2.01				Q	V
16+35	6.2400	1.81				Q	V
16+40	6.2510	1.60				Q	V
16+45	6.2607	1.41				Q	V
16+50	6.2696	1.28				Q	V
16+55	6.2778	1.20				Q	V
17+ 0	6.2856	1.13				Q	V
17+ 5	6.2933	1.12				Q	V
17+10	6.3019	1.25				Q	V
17+15	6.3115	1.40				Q	V
17+20	6.3215	1.46				Q	V
17+25	6.3317	1.48				Q	V
17+30	6.3421	1.51				Q	V
17+35	6.3526	1.53				Q	V
17+40	6.3632	1.54				Q	V
17+45	6.3739	1.55				Q	V
17+50	6.3845	1.54				Q	V
17+55	6.3946	1.47				Q	V
18+ 0	6.4041	1.38				Q	V
18+ 5	6.4133	1.34				Q	V

18+10	6.4225	1.33	Q	V
18+15	6.4315	1.31	Q	V
18+20	6.4405	1.31	Q	V
18+25	6.4494	1.30	Q	V
18+30	6.4584	1.29	Q	V
18+35	6.4671	1.27	Q	V
18+40	6.4752	1.18	Q	V
18+45	6.4827	1.09	Q	V
18+50	6.4898	1.02	Q	V
18+55	6.4961	0.92	Q	V
19+ 0	6.5017	0.81	Q	V
19+ 5	6.5070	0.78	Q	V
19+10	6.5127	0.83	Q	V
19+15	6.5189	0.90	Q	V
19+20	6.5254	0.94	Q	V
19+25	6.5325	1.03	Q	V
19+30	6.5403	1.13	Q	V
19+35	6.5482	1.16	Q	V
19+40	6.5558	1.10	Q	V
19+45	6.5629	1.02	Q	V
19+50	6.5696	0.97	Q	V
19+55	6.5756	0.88	Q	V
20+ 0	6.5810	0.78	Q	V
20+ 5	6.5862	0.75	Q	V
20+10	6.5918	0.81	Q	V
20+15	6.5978	0.89	Q	V
20+20	6.6042	0.92	Q	V
20+25	6.6105	0.93	Q	V
20+30	6.6170	0.93	Q	V
20+35	6.6234	0.94	Q	V
20+40	6.6299	0.94	Q	V
20+45	6.6364	0.94	Q	V
20+50	6.6428	0.93	Q	V
20+55	6.6486	0.85	Q	V
21+ 0	6.6538	0.75	Q	V
21+ 5	6.6589	0.73	Q	V
21+10	6.6644	0.79	Q	V
21+15	6.6704	0.87	Q	V
21+20	6.6765	0.89	Q	V
21+25	6.6821	0.82	Q	V
21+30	6.6872	0.74	Q	V
21+35	6.6921	0.72	Q	V
21+40	6.6975	0.78	Q	V
21+45	6.7035	0.86	Q	V
21+50	6.7095	0.88	Q	V
21+55	6.7151	0.81	Q	V
22+ 0	6.7201	0.73	Q	V
22+ 5	6.7250	0.71	Q	V
22+10	6.7304	0.78	Q	V
22+15	6.7363	0.86	Q	V
22+20	6.7424	0.88	Q	V
22+25	6.7480	0.81	Q	V
22+30	6.7530	0.73	Q	V
22+35	6.7578	0.69	Q	V

22+40	6.7624	0.68	Q				V
22+45	6.7670	0.67	Q				V
22+50	6.7716	0.66	Q				V
22+55	6.7761	0.66	Q				V
23+ 0	6.7806	0.65	Q				V
23+ 5	6.7850	0.65	Q				V
23+10	6.7895	0.64	Q				V
23+15	6.7939	0.64	Q				V
23+20	6.7983	0.64	Q				V
23+25	6.8027	0.64	Q				V
23+30	6.8071	0.64	Q				V
23+35	6.8115	0.64	Q				V
23+40	6.8159	0.64	Q				V
23+45	6.8203	0.64	Q				V
23+50	6.8247	0.64	Q				V
23+55	6.8290	0.64	Q				V
24+ 0	6.8334	0.64	Q				V
24+ 5	6.8375	0.60	Q				V
24+10	6.8405	0.43	Q				V
24+15	6.8422	0.25	Q				V
24+20	6.8434	0.17	Q				V
24+25	6.8442	0.12	Q				V
24+30	6.8449	0.09	Q				V
24+35	6.8454	0.07	Q				V
24+40	6.8457	0.05	Q				V
24+45	6.8460	0.04	Q				V
24+50	6.8463	0.03	Q				V
24+55	6.8464	0.02	Q				V
25+ 0	6.8465	0.02	Q				V
25+ 5	6.8466	0.01	Q				V
25+10	6.8467	0.01	Q				V
25+15	6.8467	0.01	Q				V
25+20	6.8467	0.00	Q				V

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
130.90	0.58	75.92

100 YEAR Area rainfall data:

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

130.90

1.45

189.81

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)

Areal adjustment factor = 99.88 %

Adjusted average point rain = 0.937(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.006	0.002
69.0	69.0	0.373	0.500	0.205	0.016	0.003
75.0	75.0	0.303	0.500	0.167	0.152	0.025
81.0	81.0	0.233	0.000	0.233	0.826	0.192
Sum (F) =						0.222

Area averaged mean soil loss (F) (In/Hr) = 0.222

Minimum soil loss rate ((In/Hr)) = 0.111

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.829

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335

13	1.083	643.887	0.815	1.075
14	1.167	693.417	0.619	0.816
15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.495	0.222	(0.410)	0.272
2	0.17	4.50	0.506	0.222	(0.419)	0.283
3	0.25	5.40	0.607	0.222	(0.503)	0.385
4	0.33	5.40	0.607	0.222	(0.503)	0.385
5	0.42	5.70	0.641	0.222	(0.531)	0.418
6	0.50	6.40	0.719	0.222	(0.596)	0.497
7	0.58	7.90	0.888	0.222	(0.736)	0.666
8	0.67	9.10	1.023	0.222	(0.848)	0.801
9	0.75	12.80	1.439	0.222	(1.192)	1.217
10	0.83	25.60	2.878	0.222	(2.385)	2.655
11	0.92	7.90	0.888	0.222	(0.736)	0.666
12	1.00	4.90	0.551	0.222	(0.456)	0.328

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.6

Flood volume = Effective rainfall 0.71(In)

times area 130.9(Ac.)/[(In)/(Ft.)] = 7.8(Ac.Ft)

Total soil loss = 0.22(In)

Total soil loss = 2.426(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 339452.2 Cubic Feet

Total soil loss = 105690.1 Cubic Feet

Peak flow rate of this hydrograph = 170.191(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0149	2.17	Q				
0+10	0.0942	11.51	V Q				
0+15	0.2531	23.08	V Q				
0+20	0.4712	31.66	V Q				
0+25	0.7359	38.44	V Q				

0+30	1.0374	43.77	V	Q					
0+35	1.3907	51.29		V	Q				
0+40	1.8267	63.31			V	Q			
0+45	2.3811	80.50				V	Q		
0+50	3.1801	116.02					V		
0+55	4.3523	170.19						Q	
1+ 0	5.4907	165.29					V		
1+ 5	6.2240	106.48						V	
1+10	6.6745	65.42				Q			
1+15	6.9597	41.40			Q				
1+20	7.1612	29.27				Q			
1+25	7.3138	22.15					Q		
1+30	7.4296	16.82						V	
1+35	7.5209	13.26							V
1+40	7.5941	10.63							V
1+45	7.6511	8.28							V
1+50	7.6958	6.48							V
1+55	7.7297	4.93							V
2+ 0	7.7557	3.77							V
2+ 5	7.7761	2.96							V
2+10	7.7884	1.78							V
2+15	7.7918	0.50							V
2+20	7.7928	0.14							V

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2

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90(Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90(Ac.) = 0.205 Sq.Mi.
Length along longest watercourse = 4200.00(Ft.)
Length along longest watercourse measured to centroid = 2103.00(Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00(Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 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]
130.90	0.98	128.28

100 YEAR Area rainfall data:

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

130.90

2.48

324.63

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)

Areal adjustment factor = 99.94 %

Adjusted average point rain = 1.596(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.006	0.002
69.0	69.0	0.373	0.500	0.205	0.016	0.003
75.0	75.0	0.303	0.500	0.167	0.152	0.025
81.0	81.0	0.233	0.000	0.233	0.826	0.192
Sum (F) =						0.222

Area averaged mean soil loss (F) (In/Hr) = 0.222

Minimum soil loss rate ((In/Hr)) = 0.111

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.829

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	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335
13	1.083	643.887	1.075
14	1.167	693.417	0.816

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.222)	0.206	0.043
2	0.17	1.30	0.249	(0.222)	0.206	0.043
3	0.25	1.10	0.211	(0.222)	0.175	0.036
4	0.33	1.50	0.287	0.222	(0.238)	0.065
5	0.42	1.50	0.287	0.222	(0.238)	0.065
6	0.50	1.80	0.345	0.222	(0.286)	0.122
7	0.58	1.50	0.287	0.222	(0.238)	0.065
8	0.67	1.80	0.345	0.222	(0.286)	0.122
9	0.75	1.80	0.345	0.222	(0.286)	0.122
10	0.83	1.50	0.287	0.222	(0.238)	0.065
11	0.92	1.60	0.306	0.222	(0.254)	0.084
12	1.00	1.80	0.345	0.222	(0.286)	0.122
13	1.08	2.20	0.421	0.222	(0.349)	0.199
14	1.17	2.20	0.421	0.222	(0.349)	0.199
15	1.25	2.20	0.421	0.222	(0.349)	0.199
16	1.33	2.00	0.383	0.222	(0.317)	0.161
17	1.42	2.60	0.498	0.222	(0.413)	0.276
18	1.50	2.70	0.517	0.222	(0.429)	0.295
19	1.58	2.40	0.460	0.222	(0.381)	0.237
20	1.67	2.70	0.517	0.222	(0.429)	0.295
21	1.75	3.30	0.632	0.222	(0.524)	0.410
22	1.83	3.10	0.594	0.222	(0.492)	0.371
23	1.92	2.90	0.555	0.222	(0.460)	0.333
24	2.00	3.00	0.575	0.222	(0.476)	0.352
25	2.08	3.10	0.594	0.222	(0.492)	0.371
26	2.17	4.20	0.804	0.222	(0.667)	0.582
27	2.25	5.00	0.958	0.222	(0.794)	0.735
28	2.33	3.50	0.670	0.222	(0.555)	0.448
29	2.42	6.80	1.302	0.222	(1.079)	1.080
30	2.50	7.30	1.398	0.222	(1.159)	1.176
31	2.58	8.20	1.571	0.222	(1.301)	1.348
32	2.67	5.90	1.130	0.222	(0.936)	0.908
33	2.75	2.00	0.383	0.222	(0.317)	0.161
34	2.83	1.80	0.345	0.222	(0.286)	0.122
35	2.92	1.80	0.345	0.222	(0.286)	0.122
36	3.00	0.60	0.115	(0.222)	0.095	0.020

(Loss Rate Not Used)

Sum = 100.0 Sum = 11.4

Flood volume = Effective rainfall 0.95(In)
times area 130.9(Ac.) / [(In)/(Ft.)] = 10.3(Ac.Ft)

Total soil loss = 0.65(In)
 Total soil loss = 7.091(Ac.Ft)
 Total rainfall = 1.60(In)
 Flood volume = 449596.3 Cubic Feet
 Total soil loss = 308864.1 Cubic Feet

 Peak flow rate of this hydrograph = 132.899(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0023	0.34	Q				
0+10	0.0147	1.79	Q				
0+15	0.0379	3.37	Q				
0+20	0.0662	4.11	Q				
0+25	0.1021	5.22	VQ				
0+30	0.1499	6.93	VQ				
0+35	0.2123	9.06	VQ				
0+40	0.2820	10.12	VQ				
0+45	0.3587	11.14	VQ				
0+50	0.4454	12.59	VQ				
0+55	0.5266	11.78	Q				
1+ 0	0.6029	11.09	Q				
1+ 5	0.6933	13.13	Q				
1+10	0.8124	17.29	Q				
1+15	0.9564	20.91	VQ				
1+20	1.1102	22.32	Q				
1+25	1.2678	22.89	Q				
1+30	1.4480	26.16	Q				
1+35	1.6585	30.56	Q				
1+40	1.8775	31.81	QV				
1+45	2.1109	33.89	Q V				
1+50	2.3838	39.62	Q V				
1+55	2.6837	43.55	Q V				
2+ 0	2.9841	43.62	Q	V			
2+ 5	3.2859	43.81	Q	V			
2+10	3.6091	46.93	Q	V			
2+15	3.9991	56.64	Q	V			
2+20	4.4697	68.32	Q	V			
2+25	4.9761	73.53	Q	V			
2+30	5.5939	89.70	Q	V			
2+35	6.3956	116.42	QV				
2+40	7.3109	132.90	Q V				
2+45	8.1766	125.70	V				
2+50	8.8025	90.88	V				
2+55	9.2045	58.37	V				
3+ 0	9.5000	42.91	V				
3+ 5	9.7191	31.81	V				

3+10	9.8724	22.26		Q				V
3+15	9.9845	16.28		Q				V
3+20	10.0704	12.47		Q				V
3+25	10.1381	9.84		Q				V
3+30	10.1912	7.71		Q				V
3+35	10.2315	5.85		Q				V
3+40	10.2623	4.47	Q					V
3+45	10.2860	3.44	Q					V
3+50	10.3028	2.44	Q					V
3+55	10.3133	1.53	Q					V
4+ 0	10.3181	0.69	Q					V
4+ 5	10.3198	0.24	Q					V
4+10	10.3208	0.15	Q					V
4+15	10.3213	0.07	Q					V
4+20	10.3213	0.01	Q					V

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
130.90	1.38	180.64

100 YEAR Area rainfall data:

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

130.90

3.48

455.53

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 2.244 (In)

Areal adjustment factor = 99.96 %

Adjusted average point rain = 2.243 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.006	0.002
69.0	69.0	0.373	0.500	0.205	0.016	0.003
75.0	75.0	0.303	0.500	0.167	0.152	0.025
81.0	81.0	0.233	0.000	0.233	0.826	0.192
Sum (F) =						0.222

Area averaged mean soil loss (F) (In/Hr) = 0.222

Minimum soil loss rate ((In/Hr)) = 0.111

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.829

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	7.964
2	0.167	99.060	33.967
3	0.250	148.589	38.112
4	0.333	198.119	17.317
5	0.417	247.649	9.025
6	0.500	297.179	6.267
7	0.583	346.708	4.516
8	0.667	396.238	3.466
9	0.750	445.768	2.543
10	0.833	495.298	2.039
11	0.917	544.827	1.747
12	1.000	594.357	1.335
13	1.083	643.887	1.075
14	1.167	693.417	0.816

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.135	(0.222)	0.112	0.023
2	0.17	0.60	0.161	(0.222)	0.134	0.028
3	0.25	0.60	0.161	(0.222)	0.134	0.028
4	0.33	0.60	0.161	(0.222)	0.134	0.028
5	0.42	0.60	0.161	(0.222)	0.134	0.028
6	0.50	0.70	0.188	(0.222)	0.156	0.032
7	0.58	0.70	0.188	(0.222)	0.156	0.032
8	0.67	0.70	0.188	(0.222)	0.156	0.032
9	0.75	0.70	0.188	(0.222)	0.156	0.032
10	0.83	0.70	0.188	(0.222)	0.156	0.032
11	0.92	0.70	0.188	(0.222)	0.156	0.032
12	1.00	0.80	0.215	(0.222)	0.178	0.037
13	1.08	0.80	0.215	(0.222)	0.178	0.037
14	1.17	0.80	0.215	(0.222)	0.178	0.037
15	1.25	0.80	0.215	(0.222)	0.178	0.037
16	1.33	0.80	0.215	(0.222)	0.178	0.037
17	1.42	0.80	0.215	(0.222)	0.178	0.037
18	1.50	0.80	0.215	(0.222)	0.178	0.037
19	1.58	0.80	0.215	(0.222)	0.178	0.037
20	1.67	0.80	0.215	(0.222)	0.178	0.037
21	1.75	0.80	0.215	(0.222)	0.178	0.037
22	1.83	0.80	0.215	(0.222)	0.178	0.037
23	1.92	0.80	0.215	(0.222)	0.178	0.037
24	2.00	0.90	0.242	(0.222)	0.201	0.042
25	2.08	0.80	0.215	(0.222)	0.178	0.037
26	2.17	0.90	0.242	(0.222)	0.201	0.042
27	2.25	0.90	0.242	(0.222)	0.201	0.042
28	2.33	0.90	0.242	(0.222)	0.201	0.042
29	2.42	0.90	0.242	(0.222)	0.201	0.042
30	2.50	0.90	0.242	(0.222)	0.201	0.042
31	2.58	0.90	0.242	(0.222)	0.201	0.042
32	2.67	0.90	0.242	(0.222)	0.201	0.042
33	2.75	1.00	0.269	0.222	(0.223)	0.047
34	2.83	1.00	0.269	0.222	(0.223)	0.047
35	2.92	1.00	0.269	0.222	(0.223)	0.047
36	3.00	1.00	0.269	0.222	(0.223)	0.047
37	3.08	1.00	0.269	0.222	(0.223)	0.047
38	3.17	1.10	0.296	0.222	(0.245)	0.074
39	3.25	1.10	0.296	0.222	(0.245)	0.074
40	3.33	1.10	0.296	0.222	(0.245)	0.074

41	3.42	1.20	0.323	0.222	(0.268)	0.101
42	3.50	1.30	0.350	0.222	(0.290)	0.127
43	3.58	1.40	0.377	0.222	(0.312)	0.154
44	3.67	1.40	0.377	0.222	(0.312)	0.154
45	3.75	1.50	0.404	0.222	(0.335)	0.181
46	3.83	1.50	0.404	0.222	(0.335)	0.181
47	3.92	1.60	0.431	0.222	(0.357)	0.208
48	4.00	1.60	0.431	0.222	(0.357)	0.208
49	4.08	1.70	0.458	0.222	(0.379)	0.235
50	4.17	1.80	0.484	0.222	(0.401)	0.262
51	4.25	1.90	0.511	0.222	(0.424)	0.289
52	4.33	2.00	0.538	0.222	(0.446)	0.316
53	4.42	2.10	0.565	0.222	(0.468)	0.343
54	4.50	2.10	0.565	0.222	(0.468)	0.343
55	4.58	2.20	0.592	0.222	(0.491)	0.370
56	4.67	2.30	0.619	0.222	(0.513)	0.397
57	4.75	2.40	0.646	0.222	(0.535)	0.424
58	4.83	2.40	0.646	0.222	(0.535)	0.424
59	4.92	2.50	0.673	0.222	(0.558)	0.450
60	5.00	2.60	0.700	0.222	(0.580)	0.477
61	5.08	3.10	0.834	0.222	(0.691)	0.612
62	5.17	3.60	0.969	0.222	(0.803)	0.747
63	5.25	3.90	1.050	0.222	(0.870)	0.827
64	5.33	4.20	1.130	0.222	(0.937)	0.908
65	5.42	4.70	1.265	0.222	(1.048)	1.043
66	5.50	5.60	1.507	0.222	(1.249)	1.285
67	5.58	1.90	0.511	0.222	(0.424)	0.289
68	5.67	0.90	0.242	(0.222)	0.201	0.042
69	5.75	0.60	0.161	(0.222)	0.134	0.028
70	5.83	0.50	0.135	(0.222)	0.112	0.023
71	5.92	0.30	0.081	(0.222)	0.067	0.014
72	6.00	0.20	0.054	(0.222)	0.045	0.009

(Loss Rate Not Used)

Sum = 100.0

Sum = 13.1

Flood volume = Effective rainfall 1.09(In)
times area 130.9(Ac.)/[(In)/(Ft.)) = 11.9(Ac.Ft)

Total soil loss = 1.15(In)

Total soil loss = 12.591(Ac.Ft)

Total rainfall = 2.24(In)

Flood volume = 517308.3 Cubic Feet

Total soil loss = 548466.2 Cubic Feet

Peak flow rate of this hydrograph = 122.538(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0013	0.18	Q				

0+10	0.0082	1.00	Q				
0+15	0.0222	2.04	Q				
0+20	0.0403	2.62	Q				
0+25	0.0603	2.90	Q				
0+30	0.0818	3.13	Q				
0+35	0.1053	3.42	Q				
0+40	0.1308	3.69	Q				
0+45	0.1573	3.85	Q				
0+50	0.1845	3.95	Q				
0+55	0.2122	4.03	Q				
1+ 0	0.2406	4.12	Q				
1+ 5	0.2704	4.33	Q				
1+10	0.3017	4.54	QV				
1+15	0.3337	4.65	QV				
1+20	0.3662	4.72	QV				
1+25	0.3990	4.76	QV				
1+30	0.4320	4.79	QV				
1+35	0.4651	4.81	QV				
1+40	0.4984	4.83	QV				
1+45	0.5317	4.84	QV				
1+50	0.5651	4.85	QV				
1+55	0.5985	4.85	Q V				
2+ 0	0.6322	4.90	Q V				
2+ 5	0.6668	5.02	QV				
2+10	0.7018	5.08	QV				
2+15	0.7372	5.14	QV				
2+20	0.7736	5.28	QV				
2+25	0.8104	5.35	QV				
2+30	0.8475	5.38	QV				
2+35	0.8848	5.41	QV				
2+40	0.9221	5.42	Q V				
2+45	0.9598	5.48	Q V				
2+50	0.9989	5.67	Q V				
2+55	1.0393	5.87	Q V				
3+ 0	1.0804	5.97	Q V				
3+ 5	1.1219	6.02	Q V				
3+10	1.1651	6.27	Q V				
3+15	1.2148	7.21	Q V				
3+20	1.2717	8.26	Q V				
3+25	1.3334	8.96	Q V				
3+30	1.4046	10.34	Q V				
3+35	1.4919	12.67	Q V				
3+40	1.5966	15.21	Q V				
3+45	1.7155	17.26	Q V				
3+50	1.8472	19.12	Q V				
3+55	1.9915	20.96	Q V				
4+ 0	2.1484	22.77	Q V				
4+ 5	2.3176	24.58	Q V				
4+10	2.5008	26.59	Q V				
4+15	2.7026	29.30	Q V				
4+20	2.9253	32.34	Q V				
4+25	3.1699	35.52	Q V				
4+30	3.4357	38.59	Q V				
4+35	3.7182	41.01	Q V				

4+40	4.0170	43.39		Q		V			
4+45	4.3363	46.36		Q		V			
4+50	4.6762	49.36		Q		V			
4+55	5.0326	51.75		Q		V			
5+ 0	5.4052	54.10		Q		V			
5+ 5	5.8041	57.91		Q		V			
5+10	6.2561	65.64			Q		V		
5+15	6.7874	77.14			Q		V		
5+20	7.3986	88.75			Q		V		
5+25	8.0856	99.75			Q		V		
5+30	8.8653	113.21				Q		V	
5+35	9.7092	122.54				Q		V	
5+40	10.4037	100.84				Q		V	
5+45	10.8281	61.62			Q			V	
5+50	11.0957	38.86						V	
5+55	11.2889	28.05			Q			V	
6+ 0	11.4351	21.24			Q			V	
6+ 5	11.5471	16.26			Q			V	
6+10	11.6321	12.34			Q			V	
6+15	11.6975	9.49		Q				V	
6+20	11.7488	7.45		Q				V	
6+25	11.7882	5.73		Q				V	
6+30	11.8182	4.35	Q					V	
6+35	11.8403	3.21	Q					V	
6+40	11.8563	2.32	Q					V	
6+45	11.8674	1.61	Q					V	
6+50	11.8732	0.85	Q					V	
6+55	11.8747	0.21	Q					V	
7+ 0	11.8752	0.07	Q					V	
7+ 5	11.8755	0.04	Q					V	
7+10	11.8757	0.02	Q					V	
7+15	11.8757	0.01	Q					V	
7+20	11.8758	0.00	Q					V	

Unit Hydrograph Analysis

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Study date 05/01/14 File: 32786Bex2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "B" Existing Condition

Drainage Area = 130.90 (Ac.) = 0.205 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 130.90 (Ac.) = 0.205 Sq. Mi.
Length along longest watercourse = 4200.00 (Ft.)
Length along longest watercourse measured to centroid = 2103.00 (Ft.)
Length along longest watercourse = 0.795 Mi.
Length along longest watercourse measured to centroid = 0.398 Mi.
Difference in elevation = 168.00 (Ft.)
Slope along watercourse = 211.2000 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.168 Hr.
Lag time = 10.09 Min.
25% of lag time = 2.52 Min.
40% of lag time = 4.04 Min.
Unit time = 5.00 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]
130.90	2.48	324.63

100 YEAR Area rainfall data:

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

130.90

6.90

903.21

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480 (In)

Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 4.298 (In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 4.297 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
0.800	56.00	0.500
2.100	69.00	0.500
19.900	75.00	0.500
108.100	81.00	0.000
Total Area Entered = 130.90 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.006	0.002
69.0	69.0	0.373	0.500	0.205	0.016	0.003
75.0	75.0	0.303	0.500	0.167	0.152	0.025
81.0	81.0	0.233	0.000	0.233	0.826	0.192
Sum (F) =						0.222

Area averaged mean soil loss (F) (In/Hr) = 0.222

Minimum soil loss rate ((In/Hr)) = 0.111

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.829

Unit Hydrograph

VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	49.530	6.037
2	0.167	99.060	25.748
3	0.250	148.589	28.890
4	0.333	198.119	13.126
5	0.417	247.649	6.841
6	0.500	297.179	4.751
7	0.583	346.708	3.423
8	0.667	396.238	2.627
9	0.750	445.768	1.927
10	0.833	495.298	1.545
11	0.917	544.827	1.324
12	1.000	594.357	1.012
13	1.083	643.887	0.815
14	1.167	693.417	0.619

15	1.250	742.946	0.497	0.655
16	1.333	792.476	0.495	0.653
17	1.417	842.006	0.323	0.426
Sum = 100.000			Sum=	131.923

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.034	(0.394)	0.028	0.006
2	0.17	0.07	0.034	(0.393)	0.028	0.006
3	0.25	0.07	0.034	(0.391)	0.028	0.006
4	0.33	0.10	0.052	(0.390)	0.043	0.009
5	0.42	0.10	0.052	(0.388)	0.043	0.009
6	0.50	0.10	0.052	(0.387)	0.043	0.009
7	0.58	0.10	0.052	(0.385)	0.043	0.009
8	0.67	0.10	0.052	(0.384)	0.043	0.009
9	0.75	0.10	0.052	(0.382)	0.043	0.009
10	0.83	0.13	0.069	(0.381)	0.057	0.012
11	0.92	0.13	0.069	(0.379)	0.057	0.012
12	1.00	0.13	0.069	(0.378)	0.057	0.012
13	1.08	0.10	0.052	(0.376)	0.043	0.009
14	1.17	0.10	0.052	(0.375)	0.043	0.009
15	1.25	0.10	0.052	(0.373)	0.043	0.009
16	1.33	0.10	0.052	(0.372)	0.043	0.009
17	1.42	0.10	0.052	(0.370)	0.043	0.009
18	1.50	0.10	0.052	(0.369)	0.043	0.009
19	1.58	0.10	0.052	(0.367)	0.043	0.009
20	1.67	0.10	0.052	(0.366)	0.043	0.009
21	1.75	0.10	0.052	(0.364)	0.043	0.009
22	1.83	0.13	0.069	(0.363)	0.057	0.012
23	1.92	0.13	0.069	(0.361)	0.057	0.012
24	2.00	0.13	0.069	(0.360)	0.057	0.012
25	2.08	0.13	0.069	(0.359)	0.057	0.012
26	2.17	0.13	0.069	(0.357)	0.057	0.012
27	2.25	0.13	0.069	(0.356)	0.057	0.012
28	2.33	0.13	0.069	(0.354)	0.057	0.012
29	2.42	0.13	0.069	(0.353)	0.057	0.012
30	2.50	0.13	0.069	(0.351)	0.057	0.012
31	2.58	0.17	0.086	(0.350)	0.071	0.015
32	2.67	0.17	0.086	(0.348)	0.071	0.015
33	2.75	0.17	0.086	(0.347)	0.071	0.015
34	2.83	0.17	0.086	(0.346)	0.071	0.015
35	2.92	0.17	0.086	(0.344)	0.071	0.015
36	3.00	0.17	0.086	(0.343)	0.071	0.015
37	3.08	0.17	0.086	(0.341)	0.071	0.015
38	3.17	0.17	0.086	(0.340)	0.071	0.015
39	3.25	0.17	0.086	(0.338)	0.071	0.015
40	3.33	0.17	0.086	(0.337)	0.071	0.015

41	3.42	0.17	0.086	(0.336)	0.071	0.015
42	3.50	0.17	0.086	(0.334)	0.071	0.015
43	3.58	0.17	0.086	(0.333)	0.071	0.015
44	3.67	0.17	0.086	(0.331)	0.071	0.015
45	3.75	0.17	0.086	(0.330)	0.071	0.015
46	3.83	0.20	0.103	(0.329)	0.085	0.018
47	3.92	0.20	0.103	(0.327)	0.085	0.018
48	4.00	0.20	0.103	(0.326)	0.085	0.018
49	4.08	0.20	0.103	(0.324)	0.085	0.018
50	4.17	0.20	0.103	(0.323)	0.085	0.018
51	4.25	0.20	0.103	(0.322)	0.085	0.018
52	4.33	0.23	0.120	(0.320)	0.100	0.021
53	4.42	0.23	0.120	(0.319)	0.100	0.021
54	4.50	0.23	0.120	(0.318)	0.100	0.021
55	4.58	0.23	0.120	(0.316)	0.100	0.021
56	4.67	0.23	0.120	(0.315)	0.100	0.021
57	4.75	0.23	0.120	(0.314)	0.100	0.021
58	4.83	0.27	0.138	(0.312)	0.114	0.024
59	4.92	0.27	0.138	(0.311)	0.114	0.024
60	5.00	0.27	0.138	(0.310)	0.114	0.024
61	5.08	0.20	0.103	(0.308)	0.085	0.018
62	5.17	0.20	0.103	(0.307)	0.085	0.018
63	5.25	0.20	0.103	(0.305)	0.085	0.018
64	5.33	0.23	0.120	(0.304)	0.100	0.021
65	5.42	0.23	0.120	(0.303)	0.100	0.021
66	5.50	0.23	0.120	(0.301)	0.100	0.021
67	5.58	0.27	0.138	(0.300)	0.114	0.024
68	5.67	0.27	0.138	(0.299)	0.114	0.024
69	5.75	0.27	0.138	(0.298)	0.114	0.024
70	5.83	0.27	0.138	(0.296)	0.114	0.024
71	5.92	0.27	0.138	(0.295)	0.114	0.024
72	6.00	0.27	0.138	(0.294)	0.114	0.024
73	6.08	0.30	0.155	(0.292)	0.128	0.027
74	6.17	0.30	0.155	(0.291)	0.128	0.027
75	6.25	0.30	0.155	(0.290)	0.128	0.027
76	6.33	0.30	0.155	(0.288)	0.128	0.027
77	6.42	0.30	0.155	(0.287)	0.128	0.027
78	6.50	0.30	0.155	(0.286)	0.128	0.027
79	6.58	0.33	0.172	(0.285)	0.142	0.029
80	6.67	0.33	0.172	(0.283)	0.142	0.029
81	6.75	0.33	0.172	(0.282)	0.142	0.029
82	6.83	0.33	0.172	(0.281)	0.142	0.029
83	6.92	0.33	0.172	(0.279)	0.142	0.029
84	7.00	0.33	0.172	(0.278)	0.142	0.029
85	7.08	0.33	0.172	(0.277)	0.142	0.029
86	7.17	0.33	0.172	(0.276)	0.142	0.029
87	7.25	0.33	0.172	(0.274)	0.142	0.029
88	7.33	0.37	0.189	(0.273)	0.157	0.032
89	7.42	0.37	0.189	(0.272)	0.157	0.032
90	7.50	0.37	0.189	(0.271)	0.157	0.032
91	7.58	0.40	0.206	(0.269)	0.171	0.035
92	7.67	0.40	0.206	(0.268)	0.171	0.035
93	7.75	0.40	0.206	(0.267)	0.171	0.035
94	7.83	0.43	0.223	(0.266)	0.185	0.038

95	7.92	0.43	0.223	(0.264)	0.185	0.038
96	8.00	0.43	0.223	(0.263)	0.185	0.038
97	8.08	0.50	0.258	(0.262)	0.214	0.044
98	8.17	0.50	0.258	(0.261)	0.214	0.044
99	8.25	0.50	0.258	(0.260)	0.214	0.044
100	8.33	0.50	0.258	(0.258)	0.214	0.044
101	8.42	0.50	0.258	(0.257)	0.214	0.044
102	8.50	0.50	0.258	(0.256)	0.214	0.044
103	8.58	0.53	0.275	(0.255)	0.228	0.047
104	8.67	0.53	0.275	(0.254)	0.228	0.047
105	8.75	0.53	0.275	(0.252)	0.228	0.047
106	8.83	0.57	0.292	(0.251)	0.242	0.050
107	8.92	0.57	0.292	(0.250)	0.242	0.050
108	9.00	0.57	0.292	(0.249)	0.242	0.050
109	9.08	0.63	0.327	0.248	(0.271)	0.079
110	9.17	0.63	0.327	0.246	(0.271)	0.080
111	9.25	0.63	0.327	0.245	(0.271)	0.081
112	9.33	0.67	0.344	0.244	(0.285)	0.100
113	9.42	0.67	0.344	0.243	(0.285)	0.101
114	9.50	0.67	0.344	0.242	(0.285)	0.102
115	9.58	0.70	0.361	0.241	(0.299)	0.120
116	9.67	0.70	0.361	0.239	(0.299)	0.122
117	9.75	0.70	0.361	0.238	(0.299)	0.123
118	9.83	0.73	0.378	0.237	(0.313)	0.141
119	9.92	0.73	0.378	0.236	(0.313)	0.142
120	10.00	0.73	0.378	0.235	(0.313)	0.143
121	10.08	0.50	0.258	(0.234)	0.214	0.044
122	10.17	0.50	0.258	(0.233)	0.214	0.044
123	10.25	0.50	0.258	(0.231)	0.214	0.044
124	10.33	0.50	0.258	(0.230)	0.214	0.044
125	10.42	0.50	0.258	(0.229)	0.214	0.044
126	10.50	0.50	0.258	(0.228)	0.214	0.044
127	10.58	0.67	0.344	0.227	(0.285)	0.117
128	10.67	0.67	0.344	0.226	(0.285)	0.118
129	10.75	0.67	0.344	0.225	(0.285)	0.119
130	10.83	0.67	0.344	0.224	(0.285)	0.120
131	10.92	0.67	0.344	0.223	(0.285)	0.121
132	11.00	0.67	0.344	0.222	(0.285)	0.122
133	11.08	0.63	0.327	0.220	(0.271)	0.106
134	11.17	0.63	0.327	0.219	(0.271)	0.107
135	11.25	0.63	0.327	0.218	(0.271)	0.108
136	11.33	0.63	0.327	0.217	(0.271)	0.109
137	11.42	0.63	0.327	0.216	(0.271)	0.111
138	11.50	0.63	0.327	0.215	(0.271)	0.112
139	11.58	0.57	0.292	0.214	(0.242)	0.078
140	11.67	0.57	0.292	0.213	(0.242)	0.079
141	11.75	0.57	0.292	0.212	(0.242)	0.080
142	11.83	0.60	0.309	0.211	(0.256)	0.099
143	11.92	0.60	0.309	0.210	(0.256)	0.100
144	12.00	0.60	0.309	0.209	(0.256)	0.101
145	12.08	0.83	0.430	0.208	(0.356)	0.222
146	12.17	0.83	0.430	0.207	(0.356)	0.223
147	12.25	0.83	0.430	0.206	(0.356)	0.224
148	12.33	0.87	0.447	0.205	(0.370)	0.242

149	12.42	0.87	0.447	0.203	(0.370)	0.243
150	12.50	0.87	0.447	0.202	(0.370)	0.244
151	12.58	0.93	0.481	0.201	(0.399)	0.280
152	12.67	0.93	0.481	0.200	(0.399)	0.281
153	12.75	0.93	0.481	0.199	(0.399)	0.282
154	12.83	0.97	0.498	0.198	(0.413)	0.300
155	12.92	0.97	0.498	0.197	(0.413)	0.301
156	13.00	0.97	0.498	0.196	(0.413)	0.302
157	13.08	1.13	0.584	0.195	(0.484)	0.389
158	13.17	1.13	0.584	0.194	(0.484)	0.390
159	13.25	1.13	0.584	0.193	(0.484)	0.391
160	13.33	1.13	0.584	0.192	(0.484)	0.392
161	13.42	1.13	0.584	0.191	(0.484)	0.393
162	13.50	1.13	0.584	0.191	(0.484)	0.394
163	13.58	0.77	0.395	0.190	(0.328)	0.206
164	13.67	0.77	0.395	0.189	(0.328)	0.207
165	13.75	0.77	0.395	0.188	(0.328)	0.208
166	13.83	0.77	0.395	0.187	(0.328)	0.209
167	13.92	0.77	0.395	0.186	(0.328)	0.210
168	14.00	0.77	0.395	0.185	(0.328)	0.211
169	14.08	0.90	0.464	0.184	(0.385)	0.280
170	14.17	0.90	0.464	0.183	(0.385)	0.281
171	14.25	0.90	0.464	0.182	(0.385)	0.282
172	14.33	0.87	0.447	0.181	(0.370)	0.266
173	14.42	0.87	0.447	0.180	(0.370)	0.267
174	14.50	0.87	0.447	0.179	(0.370)	0.268
175	14.58	0.87	0.447	0.178	(0.370)	0.269
176	14.67	0.87	0.447	0.177	(0.370)	0.270
177	14.75	0.87	0.447	0.176	(0.370)	0.270
178	14.83	0.83	0.430	0.176	(0.356)	0.254
179	14.92	0.83	0.430	0.175	(0.356)	0.255
180	15.00	0.83	0.430	0.174	(0.356)	0.256
181	15.08	0.80	0.413	0.173	(0.342)	0.240
182	15.17	0.80	0.413	0.172	(0.342)	0.241
183	15.25	0.80	0.413	0.171	(0.342)	0.241
184	15.33	0.77	0.395	0.170	(0.328)	0.225
185	15.42	0.77	0.395	0.169	(0.328)	0.226
186	15.50	0.77	0.395	0.168	(0.328)	0.227
187	15.58	0.63	0.327	0.168	(0.271)	0.159
188	15.67	0.63	0.327	0.167	(0.271)	0.160
189	15.75	0.63	0.327	0.166	(0.271)	0.161
190	15.83	0.63	0.327	0.165	(0.271)	0.162
191	15.92	0.63	0.327	0.164	(0.271)	0.162
192	16.00	0.63	0.327	0.163	(0.271)	0.163
193	16.08	0.13	0.069	(0.163)	0.057	0.012
194	16.17	0.13	0.069	(0.162)	0.057	0.012
195	16.25	0.13	0.069	(0.161)	0.057	0.012
196	16.33	0.13	0.069	(0.160)	0.057	0.012
197	16.42	0.13	0.069	(0.159)	0.057	0.012
198	16.50	0.13	0.069	(0.158)	0.057	0.012
199	16.58	0.10	0.052	(0.158)	0.043	0.009
200	16.67	0.10	0.052	(0.157)	0.043	0.009
201	16.75	0.10	0.052	(0.156)	0.043	0.009
202	16.83	0.10	0.052	(0.155)	0.043	0.009

203	16.92	0.10	0.052	(0.154)	0.043	0.009
204	17.00	0.10	0.052	(0.154)	0.043	0.009
205	17.08	0.17	0.086	(0.153)	0.071	0.015
206	17.17	0.17	0.086	(0.152)	0.071	0.015
207	17.25	0.17	0.086	(0.151)	0.071	0.015
208	17.33	0.17	0.086	(0.151)	0.071	0.015
209	17.42	0.17	0.086	(0.150)	0.071	0.015
210	17.50	0.17	0.086	(0.149)	0.071	0.015
211	17.58	0.17	0.086	(0.148)	0.071	0.015
212	17.67	0.17	0.086	(0.148)	0.071	0.015
213	17.75	0.17	0.086	(0.147)	0.071	0.015
214	17.83	0.13	0.069	(0.146)	0.057	0.012
215	17.92	0.13	0.069	(0.145)	0.057	0.012
216	18.00	0.13	0.069	(0.145)	0.057	0.012
217	18.08	0.13	0.069	(0.144)	0.057	0.012
218	18.17	0.13	0.069	(0.143)	0.057	0.012
219	18.25	0.13	0.069	(0.143)	0.057	0.012
220	18.33	0.13	0.069	(0.142)	0.057	0.012
221	18.42	0.13	0.069	(0.141)	0.057	0.012
222	18.50	0.13	0.069	(0.140)	0.057	0.012
223	18.58	0.10	0.052	(0.140)	0.043	0.009
224	18.67	0.10	0.052	(0.139)	0.043	0.009
225	18.75	0.10	0.052	(0.138)	0.043	0.009
226	18.83	0.07	0.034	(0.138)	0.028	0.006
227	18.92	0.07	0.034	(0.137)	0.028	0.006
228	19.00	0.07	0.034	(0.136)	0.028	0.006
229	19.08	0.10	0.052	(0.136)	0.043	0.009
230	19.17	0.10	0.052	(0.135)	0.043	0.009
231	19.25	0.10	0.052	(0.135)	0.043	0.009
232	19.33	0.13	0.069	(0.134)	0.057	0.012
233	19.42	0.13	0.069	(0.133)	0.057	0.012
234	19.50	0.13	0.069	(0.133)	0.057	0.012
235	19.58	0.10	0.052	(0.132)	0.043	0.009
236	19.67	0.10	0.052	(0.132)	0.043	0.009
237	19.75	0.10	0.052	(0.131)	0.043	0.009
238	19.83	0.07	0.034	(0.130)	0.028	0.006
239	19.92	0.07	0.034	(0.130)	0.028	0.006
240	20.00	0.07	0.034	(0.129)	0.028	0.006
241	20.08	0.10	0.052	(0.129)	0.043	0.009
242	20.17	0.10	0.052	(0.128)	0.043	0.009
243	20.25	0.10	0.052	(0.127)	0.043	0.009
244	20.33	0.10	0.052	(0.127)	0.043	0.009
245	20.42	0.10	0.052	(0.126)	0.043	0.009
246	20.50	0.10	0.052	(0.126)	0.043	0.009
247	20.58	0.10	0.052	(0.125)	0.043	0.009
248	20.67	0.10	0.052	(0.125)	0.043	0.009
249	20.75	0.10	0.052	(0.124)	0.043	0.009
250	20.83	0.07	0.034	(0.124)	0.028	0.006
251	20.92	0.07	0.034	(0.123)	0.028	0.006
252	21.00	0.07	0.034	(0.123)	0.028	0.006
253	21.08	0.10	0.052	(0.122)	0.043	0.009
254	21.17	0.10	0.052	(0.122)	0.043	0.009
255	21.25	0.10	0.052	(0.121)	0.043	0.009
256	21.33	0.07	0.034	(0.121)	0.028	0.006

0+10	0.0020	0.25	Q
0+15	0.0053	0.47	Q
0+20	0.0094	0.60	Q
0+25	0.0146	0.75	Q
0+30	0.0208	0.90	Q
0+35	0.0275	0.98	Q
0+40	0.0346	1.02	Q
0+45	0.0418	1.06	Q
0+50	0.0495	1.11	Q
0+55	0.0579	1.23	Q
1+ 0	0.0673	1.36	VQ
1+ 5	0.0769	1.40	VQ
1+10	0.0860	1.33	VQ
1+15	0.0946	1.25	Q
1+20	0.1030	1.21	Q
1+25	0.1113	1.20	Q
1+30	0.1195	1.19	Q
1+35	0.1277	1.19	Q
1+40	0.1359	1.19	Q
1+45	0.1440	1.18	Q
1+50	0.1523	1.20	Q
1+55	0.1612	1.30	VQ
2+ 0	0.1709	1.41	VQ
2+ 5	0.1810	1.46	VQ
2+10	0.1912	1.49	VQ
2+15	0.2016	1.50	VQ
2+20	0.2120	1.51	VQ
2+25	0.2225	1.52	VQ
2+30	0.2330	1.53	VQ
2+35	0.2437	1.56	VQ
2+40	0.2552	1.66	VQ
2+45	0.2675	1.78	VQ
2+50	0.2801	1.83	VQ
2+55	0.2929	1.86	VQ
3+ 0	0.3059	1.88	VQ
3+ 5	0.3190	1.90	VQ
3+10	0.3322	1.91	VQ
3+15	0.3454	1.92	VQ
3+20	0.3586	1.92	VQ
3+25	0.3719	1.93	VQ
3+30	0.3852	1.93	VQ
3+35	0.3986	1.94	VQ
3+40	0.4119	1.94	VQ
3+45	0.4253	1.94	VQ
3+50	0.4389	1.97	Q
3+55	0.4531	2.07	Q
4+ 0	0.4681	2.18	Q
4+ 5	0.4835	2.23	Q
4+10	0.4990	2.26	Q
4+15	0.5147	2.28	Q
4+20	0.5306	2.31	Q
4+25	0.5473	2.42	Q
4+30	0.5648	2.54	VQ
4+35	0.5828	2.60	VQ

4+40	0.6009	2.63	VQ				
4+45	0.6192	2.65	VQ				
4+50	0.6377	2.69	VQ				
4+55	0.6571	2.81	VQ				
5+ 0	0.6772	2.93	VQ				
5+ 5	0.6975	2.94	VQ				
5+10	0.7166	2.77	VQ				
5+15	0.7343	2.57	VQ				
5+20	0.7516	2.51	VQ				
5+25	0.7693	2.57	VQ				
5+30	0.7876	2.65	VQ				
5+35	0.8062	2.71	VQ				
5+40	0.8257	2.82	VQ				
5+45	0.8459	2.94	VQ				
5+50	0.8666	3.00	Q				
5+55	0.8874	3.03	Q				
6+ 0	0.9084	3.05	Q				
6+ 5	0.9296	3.09	Q				
6+10	0.9517	3.20	Q				
6+15	0.9745	3.32	Q				
6+20	0.9977	3.37	Q				
6+25	1.0212	3.40	Q				
6+30	1.0448	3.43	Q				
6+35	1.0687	3.47	Q				
6+40	1.0934	3.59	Q				
6+45	1.1189	3.71	Q				
6+50	1.1449	3.77	VQ				
6+55	1.1710	3.80	VQ				
7+ 0	1.1973	3.82	VQ				
7+ 5	1.2238	3.84	VQ				
7+10	1.2503	3.85	VQ				
7+15	1.2769	3.86	VQ				
7+20	1.3037	3.89	Q				
7+25	1.3312	4.00	Q				
7+30	1.3595	4.11	Q				
7+35	1.3884	4.19	Q				
7+40	1.4182	4.32	Q				
7+45	1.4488	4.45	Q				
7+50	1.4801	4.54	Q				
7+55	1.5124	4.68	Q				
8+ 0	1.5456	4.82	Q				
8+ 5	1.5796	4.94	Q				
8+10	1.6152	5.18	VQ				
8+15	1.6527	5.43	VQ				
8+20	1.6909	5.56	VQ				
8+25	1.7297	5.63	VQ				
8+30	1.7688	5.68	Q				
8+35	1.8084	5.74	Q				
8+40	1.8488	5.87	Q				
8+45	1.8901	6.00	Q				
8+50	1.9321	6.10	Q				
8+55	1.9751	6.24	Q				
9+ 0	2.0190	6.38	VQ				
9+ 5	2.0650	6.68	VQ				

9+10	2.1181	7.71	V Q				
9+15	2.1794	8.89	V Q				
9+20	2.2458	9.65	V Q				
9+25	2.3190	10.63	V Q				
9+30	2.3989	11.60	V Q				
9+35	2.4836	12.30	V Q				
9+40	2.5751	13.29	V Q				
9+45	2.6734	14.27	V Q				
9+50	2.7767	14.99	V Q				
9+55	2.8868	15.99	V Q				
10+ 0	3.0037	16.98	V Q				
10+ 5	3.1192	16.77	V Q				
10+10	3.2141	13.77	V Q				
10+15	3.2846	10.25	VQ				
10+20	3.3447	8.72	QV				
10+25	3.3996	7.97	QV				
10+30	3.4509	7.45	Q V				
10+35	3.5036	7.66	Q V				
10+40	3.5715	9.86	QV				
10+45	3.6574	12.46	VQ				
10+50	3.7513	13.64	V Q				
10+55	3.8495	14.26	V Q				
11+ 0	3.9509	14.72	V Q				
11+ 5	4.0538	14.94	V Q				
11+10	4.1548	14.66	V Q				
11+15	4.2530	14.26	V Q				
11+20	4.3507	14.18	VQ				
11+25	4.4488	14.25	VQ				
11+30	4.5477	14.37	VQ				
11+35	4.6458	14.24	VQ				
11+40	4.7368	13.21	Q				
11+45	4.8197	12.04	Q V				
11+50	4.9005	11.73	Q V				
11+55	4.9842	12.15	Q V				
12+ 0	5.0717	12.70	QV				
12+ 5	5.1676	13.93	Q				
12+10	5.2928	18.18	V Q				
12+15	5.4506	22.91	V Q				
12+20	5.6246	25.27	V Q				
12+25	5.8110	27.07	V Q				
12+30	6.0081	28.61	V Q				
12+35	6.2137	29.86	V Q				
12+40	6.4323	31.74	V Q				
12+45	6.6637	33.60	V Q				
12+50	6.9033	34.79	V Q				
12+55	7.1518	36.09	V Q				
13+ 0	7.4087	37.31	V Q				
13+ 5	7.6756	38.75	V Q				
13+10	7.9664	42.22	V Q				
13+15	8.2826	45.92	V Q				
13+20	8.6117	47.79	V Q				
13+25	8.9484	48.88	V Q				
13+30	9.2903	49.65	V Q				
13+35	9.6260	48.74	V Q				

13+40	9.9208	42.81				V	Q
13+45	10.1687	35.99				V	
13+50	10.3964	33.06				V	Q
13+55	10.6145	31.66				VQ	
14+ 0	10.8261	30.73				QV	
14+ 5	11.0372	30.65				QV	
14+10	11.2612	32.53				Q	
14+15	11.5013	34.86				VQ	
14+20	11.7472	35.71				VQ	
14+25	11.9922	35.57				VQ	
14+30	12.2348	35.22				Q	
14+35	12.4769	35.15				Q	
14+40	12.7193	35.20				QV	
14+45	12.9622	35.27				QV	
14+50	13.2046	35.19				Q	V
14+55	13.4436	34.71				Q	V
15+ 0	13.6793	34.22				Q	V
15+ 5	13.9131	33.94				Q	V
15+10	14.1427	33.35				Q	V
15+15	14.3681	32.73				Q	V
15+20	14.5910	32.36				Q	V
15+25	14.8092	31.69				Q	V
15+30	15.0227	30.99				Q	V
15+35	15.2302	30.14				Q	V
15+40	15.4207	27.66				Q	V
15+45	15.5928	24.98				Q	V
15+50	15.7565	23.77				Q	V
15+55	15.9160	23.16				Q	V
16+ 0	16.0728	22.76				Q	V
16+ 5	16.2194	21.29				Q	V
16+10	16.3291	15.93				Q	V
16+15	16.3978	9.99				Q	V
16+20	16.4476	7.22				Q	V
16+25	16.4870	5.73				Q	V
16+30	16.5194	4.70				Q	V
16+35	16.5464	3.92				Q	V
16+40	16.5686	3.24				Q	V
16+45	16.5872	2.70				Q	V
16+50	16.6031	2.30	Q				V
16+55	16.6168	1.99	Q				V
17+ 0	16.6290	1.77	Q				V
17+ 5	16.6403	1.64	Q				V
17+10	16.6520	1.71	Q				V
17+15	16.6646	1.83	Q				V
17+20	16.6772	1.82	Q				V
17+25	16.6896	1.81	Q				V
17+30	16.7023	1.84	Q				V
17+35	16.7152	1.86	Q				V
17+40	16.7281	1.88	Q				V
17+45	16.7412	1.90	Q				V
17+50	16.7542	1.88	Q				V
17+55	16.7665	1.79	Q				V
18+ 0	16.7781	1.69	Q				V
18+ 5	16.7894	1.64	Q				V

18+10	16.8006	1.62	Q				V
18+15	16.8116	1.61	Q				V
18+20	16.8226	1.60	Q				V
18+25	16.8336	1.59	Q				V
18+30	16.8445	1.58	Q				V
18+35	16.8552	1.55	Q				V
18+40	16.8651	1.45	Q				V
18+45	16.8743	1.33	Q				V
18+50	16.8829	1.25	Q				V
18+55	16.8906	1.12	Q				V
19+ 0	16.8975	0.99	Q				V
19+ 5	16.9040	0.95	Q				V
19+10	16.9110	1.01	Q				V
19+15	16.9185	1.10	Q				V
19+20	16.9264	1.15	Q				V
19+25	16.9351	1.26	Q				V
19+30	16.9446	1.38	Q				V
19+35	16.9544	1.41	Q				V
19+40	16.9636	1.34	Q				V
19+45	16.9723	1.25	Q				V
19+50	16.9805	1.19	Q				V
19+55	16.9879	1.08	Q				V
20+ 0	16.9944	0.95	Q				V
20+ 5	17.0008	0.92	Q				V
20+10	17.0076	0.99	Q				V
20+15	17.0150	1.08	Q				V
20+20	17.0228	1.12	Q				V
20+25	17.0306	1.13	Q				V
20+30	17.0384	1.14	Q				V
20+35	17.0463	1.15	Q				V
20+40	17.0543	1.15	Q				V
20+45	17.0622	1.15	Q				V
20+50	17.0700	1.13	Q				V
20+55	17.0772	1.03	Q				V
21+ 0	17.0835	0.92	Q				V
21+ 5	17.0897	0.90	Q				V
21+10	17.0964	0.97	Q				V
21+15	17.1037	1.07	Q				V
21+20	17.1112	1.08	Q				V
21+25	17.1181	1.00	Q				V
21+30	17.1243	0.90	Q				V
21+35	17.1303	0.88	Q				V
21+40	17.1369	0.96	Q				V
21+45	17.1442	1.06	Q				V
21+50	17.1516	1.07	Q				V
21+55	17.1584	0.99	Q				V
22+ 0	17.1646	0.89	Q				V
22+ 5	17.1706	0.87	Q				V
22+10	17.1771	0.95	Q				V
22+15	17.1844	1.05	Q				V
22+20	17.1918	1.07	Q				V
22+25	17.1986	0.99	Q				V
22+30	17.2047	0.89	Q				V
22+35	17.2106	0.85	Q				V

22+40	17.2163	0.83	Q				V
22+45	17.2219	0.82	Q				V
22+50	17.2275	0.81	Q				V
22+55	17.2330	0.80	Q				V
23+ 0	17.2385	0.80	Q				V
23+ 5	17.2439	0.79	Q				V
23+10	17.2494	0.79	Q				V
23+15	17.2548	0.79	Q				V
23+20	17.2602	0.78	Q				V
23+25	17.2656	0.78	Q				V
23+30	17.2709	0.78	Q				V
23+35	17.2763	0.78	Q				V
23+40	17.2817	0.78	Q				V
23+45	17.2870	0.78	Q				V
23+50	17.2924	0.78	Q				V
23+55	17.2977	0.78	Q				V
24+ 0	17.3031	0.78	Q				V
24+ 5	17.3081	0.73	Q				V
24+10	17.3118	0.53	Q				V
24+15	17.3139	0.31	Q				V
24+20	17.3153	0.20	Q				V
24+25	17.3163	0.15	Q				V
24+30	17.3171	0.11	Q				V
24+35	17.3177	0.09	Q				V
24+40	17.3182	0.07	Q				V
24+45	17.3185	0.05	Q				V
24+50	17.3188	0.04	Q				V
24+55	17.3190	0.03	Q				V
25+ 0	17.3191	0.02	Q				V
25+ 5	17.3192	0.02	Q				V
25+10	17.3193	0.01	Q				V
25+15	17.3194	0.01	Q				V
25+20	17.3194	0.00	Q				V



MAYERS & ASSOCIATES
Civil Engineering, Inc.
PLANNING • ENGINEERING • SURVEYING

Preliminary Hydrology Analysis
VTTM 36557, 'Terracina'
City of Lake Elsinore / Riverside County

AREA "C" CALCULATION

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	0.58	9.98

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	1.45	24.94

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)
 Areal adjustment factor = 99.98 %
 Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

 Slope of intensity-duration curve for a 1 hour storm =0.4800

Unit Hydrograph
 VALLEY S-Curve

 Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	212.058	45.410
2	0.167	424.117	42.535
3	0.250	636.175	8.324
4	0.333	848.233	3.731
Sum = 100.000		Sum=	17.334

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	0.08	4.40	0.306 (0.329)	0.153
2	0.17	4.50	0.313 (0.329)	0.157
3	0.25	5.40	0.376 (0.329)	0.188
4	0.33	5.40	0.376 (0.329)	0.188
5	0.42	5.70	0.397 (0.329)	0.198
6	0.50	6.40	0.445 (0.329)	0.223
7	0.58	7.90	0.550 (0.329)	0.275
8	0.67	9.10	0.633 (0.329)	0.317
9	0.75	12.80	0.891 (0.445)	0.562

10	0.83	25.60	1.781	0.329	(0.891)	1.452
11	0.92	7.90	0.550	(0.329)	0.275	0.275
12	1.00	4.90	0.341	(0.329)	0.170	0.170

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.2

Flood volume = Effective rainfall 0.35(In)
times area 17.2(Ac.)/[(In)/(Ft.)) = 0.5(Ac.Ft)
Total soil loss = 0.23(In)
Total soil loss = 0.335(Ac.Ft)
Total rainfall = 0.58(In)
Flood volume = 21629.9 Cubic Feet
Total soil loss = 14577.4 Cubic Feet

Peak flow rate of this hydrograph = 16.215(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0083	1.21	V Q					
0+10	0.0246	2.36	V Q					
0+15	0.0442	2.86	V Q					
0+20	0.0662	3.19	VQ					
0+25	0.0891	3.32	QV					
0+30	0.1139	3.61	Q V					
0+35	0.1430	4.22	Q V					
0+40	0.1772	4.97	Q		V			
0+45	0.2275	7.30			Q	V		
0+50	0.3392	16.22					V	
0+55	0.4349	13.89					Q	V
1+ 0	0.4750	5.83			Q			V
1+ 5	0.4929	2.59		Q				V
1+10	0.4958	0.42	Q					V
1+15	0.4966	0.11	Q					V



Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20(Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20(Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00(Ft.)
Length along longest watercourse measured to centroid = 794.00(Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40(Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 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]
17.20	0.98	16.86

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
17.20	2.48	42.66

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 0.980(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 0.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329
 Minimum soil loss rate ((In/Hr)) = 0.165
 (for 24 hour storm duration)
 Soil loss rate (decimal) = 0.500

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	212.058	45.410	7.872
2 0.167	424.117	42.535	7.373
3 0.250	636.175	8.324	1.443
4 0.333	848.233	3.731	0.647
Sum = 100.000		Sum=	17.334

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 0.08	1.30	0.153	(0.329)	0.076
2 0.17	1.30	0.153	(0.329)	0.076
3 0.25	1.10	0.129	(0.329)	0.065
4 0.33	1.50	0.176	(0.329)	0.088
5 0.42	1.50	0.176	(0.329)	0.088
6 0.50	1.80	0.212	(0.329)	0.106
7 0.58	1.50	0.176	(0.329)	0.088
8 0.67	1.80	0.212	(0.329)	0.106
9 0.75	1.80	0.212	(0.329)	0.106
10 0.83	1.50	0.176	(0.329)	0.088
11 0.92	1.60	0.188	(0.329)	0.094

12	1.00	1.80	0.212	(0.329)	0.106	0.106
13	1.08	2.20	0.259	(0.329)	0.129	0.129
14	1.17	2.20	0.259	(0.329)	0.129	0.129
15	1.25	2.20	0.259	(0.329)	0.129	0.129
16	1.33	2.00	0.235	(0.329)	0.118	0.118
17	1.42	2.60	0.306	(0.329)	0.153	0.153
18	1.50	2.70	0.317	(0.329)	0.159	0.159
19	1.58	2.40	0.282	(0.329)	0.141	0.141
20	1.67	2.70	0.317	(0.329)	0.159	0.159
21	1.75	3.30	0.388	(0.329)	0.194	0.194
22	1.83	3.10	0.365	(0.329)	0.182	0.182
23	1.92	2.90	0.341	(0.329)	0.171	0.171
24	2.00	3.00	0.353	(0.329)	0.176	0.176
25	2.08	3.10	0.365	(0.329)	0.182	0.182
26	2.17	4.20	0.494	(0.329)	0.247	0.247
27	2.25	5.00	0.588	(0.329)	0.294	0.294
28	2.33	3.50	0.412	(0.329)	0.206	0.206
29	2.42	6.80	0.800	0.329 (0.400)	0.470	0.470
30	2.50	7.30	0.858	0.329 (0.429)	0.529	0.529
31	2.58	8.20	0.964	0.329 (0.482)	0.635	0.635
32	2.67	5.90	0.694	0.329 (0.347)	0.365	0.365
33	2.75	2.00	0.235	(0.329)	0.118	0.118
34	2.83	1.80	0.212	(0.329)	0.106	0.106
35	2.92	1.80	0.212	(0.329)	0.106	0.106
36	3.00	0.60	0.071	(0.329)	0.035	0.035

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.2

Flood volume = Effective rainfall 0.52(In)
times area 17.2(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 0.46(In)
Total soil loss = 0.662(Ac.Ft)
Total rainfall = 0.98(In)
Flood volume = 32367.0 Cubic Feet
Total soil loss = 28815.7 Cubic Feet

Peak flow rate of this hydrograph = 9.718(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0041	0.60	V Q				
0+10	0.0122	1.17	V Q				
0+15	0.0203	1.18	V Q				
0+20	0.0295	1.33	V Q				
0+25	0.0397	1.49	V Q				
0+30	0.0511	1.65	V Q				
0+35	0.0626	1.66	V Q				
0+40	0.0742	1.69	V Q				
0+45	0.0867	1.81	V Q				
0+50	0.0983	1.69	VQ				
0+55	0.1094	1.61	VQ				

1+ 0	0.1213	1.72		Q					
1+ 5	0.1350	1.99		Q					
1+10	0.1501	2.19		Q					
1+15	0.1654	2.23		Q					
1+20	0.1802	2.15		QV					
1+25	0.1963	2.34		QV					
1+30	0.2145	2.63		QV					
1+35	0.2322	2.58		Q	V				
1+40	0.2503	2.62		Q	V				
1+45	0.2710	3.01		Q	V				
1+50	0.2929	3.19		Q	V				
1+55	0.3141	3.07		Q	V				
2+ 0	0.3350	3.04		Q	V				
2+ 5	0.3563	3.10		Q	V				
2+10	0.3815	3.65		Q	V				
2+15	0.4126	4.51		Q	V				
2+20	0.4419	4.26		Q	V				
2+25	0.4819	5.81		Q	V				
2+30	0.5379	8.13		Q	V				
2+35	0.6048	9.72		Q	V				
2+40	0.6642	8.62		Q	V				
2+45	0.6978	4.88		Q	V				
2+50	0.7160	2.64		Q	V				
2+55	0.7299	2.02		Q	V				
3+ 0	0.7387	1.29		Q	V				
3+ 5	0.7421	0.48	Q						
3+10	0.7429	0.12	Q						
3+15	0.7430	0.02	Q						

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	1.38	23.74

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	3.48	59.86

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)
 Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	212.058	45.410	7.872
2 0.167	424.117	42.535	7.373
3 0.250	636.175	8.324	1.443
4 0.333	848.233	3.731	0.647
Sum = 100.000			Sum= 17.334

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)		Effective (In/Hr)
			Max	Low	
1 0.08	0.50	0.083	(0.329)	0.041	0.041
2 0.17	0.60	0.099	(0.329)	0.050	0.050
3 0.25	0.60	0.099	(0.329)	0.050	0.050
4 0.33	0.60	0.099	(0.329)	0.050	0.050
5 0.42	0.60	0.099	(0.329)	0.050	0.050
6 0.50	0.70	0.116	(0.329)	0.058	0.058
7 0.58	0.70	0.116	(0.329)	0.058	0.058
8 0.67	0.70	0.116	(0.329)	0.058	0.058
9 0.75	0.70	0.116	(0.329)	0.058	0.058
10 0.83	0.70	0.116	(0.329)	0.058	0.058
11 0.92	0.70	0.116	(0.329)	0.058	0.058

12	1.00	0.80	0.132	(0.329)	0.066	0.066
13	1.08	0.80	0.132	(0.329)	0.066	0.066
14	1.17	0.80	0.132	(0.329)	0.066	0.066
15	1.25	0.80	0.132	(0.329)	0.066	0.066
16	1.33	0.80	0.132	(0.329)	0.066	0.066
17	1.42	0.80	0.132	(0.329)	0.066	0.066
18	1.50	0.80	0.132	(0.329)	0.066	0.066
19	1.58	0.80	0.132	(0.329)	0.066	0.066
20	1.67	0.80	0.132	(0.329)	0.066	0.066
21	1.75	0.80	0.132	(0.329)	0.066	0.066
22	1.83	0.80	0.132	(0.329)	0.066	0.066
23	1.92	0.80	0.132	(0.329)	0.066	0.066
24	2.00	0.90	0.149	(0.329)	0.075	0.075
25	2.08	0.80	0.132	(0.329)	0.066	0.066
26	2.17	0.90	0.149	(0.329)	0.075	0.075
27	2.25	0.90	0.149	(0.329)	0.075	0.075
28	2.33	0.90	0.149	(0.329)	0.075	0.075
29	2.42	0.90	0.149	(0.329)	0.075	0.075
30	2.50	0.90	0.149	(0.329)	0.075	0.075
31	2.58	0.90	0.149	(0.329)	0.075	0.075
32	2.67	0.90	0.149	(0.329)	0.075	0.075
33	2.75	1.00	0.166	(0.329)	0.083	0.083
34	2.83	1.00	0.166	(0.329)	0.083	0.083
35	2.92	1.00	0.166	(0.329)	0.083	0.083
36	3.00	1.00	0.166	(0.329)	0.083	0.083
37	3.08	1.00	0.166	(0.329)	0.083	0.083
38	3.17	1.10	0.182	(0.329)	0.091	0.091
39	3.25	1.10	0.182	(0.329)	0.091	0.091
40	3.33	1.10	0.182	(0.329)	0.091	0.091
41	3.42	1.20	0.199	(0.329)	0.099	0.099
42	3.50	1.30	0.215	(0.329)	0.108	0.108
43	3.58	1.40	0.232	(0.329)	0.116	0.116
44	3.67	1.40	0.232	(0.329)	0.116	0.116
45	3.75	1.50	0.248	(0.329)	0.124	0.124
46	3.83	1.50	0.248	(0.329)	0.124	0.124
47	3.92	1.60	0.265	(0.329)	0.132	0.132
48	4.00	1.60	0.265	(0.329)	0.132	0.132
49	4.08	1.70	0.282	(0.329)	0.141	0.141
50	4.17	1.80	0.298	(0.329)	0.149	0.149
51	4.25	1.90	0.315	(0.329)	0.157	0.157
52	4.33	2.00	0.331	(0.329)	0.166	0.166
53	4.42	2.10	0.348	(0.329)	0.174	0.174
54	4.50	2.10	0.348	(0.329)	0.174	0.174
55	4.58	2.20	0.364	(0.329)	0.182	0.182
56	4.67	2.30	0.381	(0.329)	0.190	0.190
57	4.75	2.40	0.397	(0.329)	0.199	0.199
58	4.83	2.40	0.397	(0.329)	0.199	0.199
59	4.92	2.50	0.414	(0.329)	0.207	0.207
60	5.00	2.60	0.431	(0.329)	0.215	0.215
61	5.08	3.10	0.513	(0.329)	0.257	0.257
62	5.17	3.60	0.596	(0.329)	0.298	0.298
63	5.25	3.90	0.646	(0.329)	0.323	0.323
64	5.33	4.20	0.695	0.329 (0.348)	0.366	0.366
65	5.42	4.70	0.778	0.329 (0.389)	0.449	0.449
66	5.50	5.60	0.927	0.329 (0.464)	0.598	0.598
67	5.58	1.90	0.315	(0.329)	0.157	0.157
68	5.67	0.90	0.149	(0.329)	0.075	0.075

69	5.75	0.60	0.099	(0.329)	0.050	0.050
70	5.83	0.50	0.083	(0.329)	0.041	0.041
71	5.92	0.30	0.050	(0.329)	0.025	0.025
72	6.00	0.20	0.033	(0.329)	0.017	0.017

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.5

Flood volume = Effective rainfall 0.71(In)
times area 17.2(Ac.)/[(In)/(Ft.)) = 1.0(Ac.Ft)
Total soil loss = 0.67(In)
Total soil loss = 0.964(Ac.Ft)
Total rainfall = 1.38(In)
Flood volume = 44186.3 Cubic Feet
Total soil loss = 41970.3 Cubic Feet

Peak flow rate of this hydrograph = 8.761(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0022	0.33	VQ				
0+10	0.0070	0.70	V Q				
0+15	0.0127	0.82	V Q				
0+20	0.0186	0.86	V Q				
0+25	0.0245	0.86	V Q				
0+30	0.0309	0.93	V Q				
0+35	0.0377	0.99	V Q				
0+40	0.0446	1.00	V Q				
0+45	0.0515	1.01	V Q				
0+50	0.0584	1.01	V Q				
0+55	0.0653	1.01	V Q				
1+ 0	0.0727	1.07	V Q				
1+ 5	0.0805	1.13	VQ				
1+10	0.0884	1.14	VQ				
1+15	0.0963	1.15	VQ				
1+20	0.1042	1.15	Q				
1+25	0.1121	1.15	Q				
1+30	0.1200	1.15	Q				
1+35	0.1279	1.15	QV				
1+40	0.1359	1.15	QV				
1+45	0.1438	1.15	QV				
1+50	0.1517	1.15	QV				
1+55	0.1596	1.15	Q V				
2+ 0	0.1679	1.21	Q V				
2+ 5	0.1763	1.21	Q V				
2+10	0.1847	1.23	Q V				
2+15	0.1935	1.28	Q V				
2+20	0.2024	1.29	Q V				
2+25	0.2113	1.29	Q V				
2+30	0.2202	1.29	Q V				
2+35	0.2291	1.29	Q V				
2+40	0.2380	1.29	Q V				

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 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]
17.20	2.48	42.66

100 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	6.90	118.68

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 2.480(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329
 Minimum soil loss rate ((In/Hr)) = 0.165
 (for 24 hour storm duration)
 Soil loss rate (decimal) = 0.500

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	212.058	45.410
2	0.167	424.117	42.535
3	0.250	636.175	8.324
4	0.333	848.233	3.731
Sum =		100.000	Sum= 17.334

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	0.08	0.07	(0.584)	0.010
2	0.17	0.07	(0.581)	0.010
3	0.25	0.07	(0.579)	0.010
4	0.33	0.10	(0.577)	0.015
5	0.42	0.10	(0.575)	0.015
6	0.50	0.10	(0.572)	0.015
7	0.58	0.10	(0.570)	0.015
8	0.67	0.10	(0.568)	0.015
9	0.75	0.10	(0.566)	0.015
10	0.83	0.13	(0.563)	0.020
11	0.92	0.13	(0.561)	0.020

12	1.00	0.13	0.040	(0.559)	0.020	0.020
13	1.08	0.10	0.030	(0.557)	0.015	0.015
14	1.17	0.10	0.030	(0.555)	0.015	0.015
15	1.25	0.10	0.030	(0.552)	0.015	0.015
16	1.33	0.10	0.030	(0.550)	0.015	0.015
17	1.42	0.10	0.030	(0.548)	0.015	0.015
18	1.50	0.10	0.030	(0.546)	0.015	0.015
19	1.58	0.10	0.030	(0.544)	0.015	0.015
20	1.67	0.10	0.030	(0.541)	0.015	0.015
21	1.75	0.10	0.030	(0.539)	0.015	0.015
22	1.83	0.13	0.040	(0.537)	0.020	0.020
23	1.92	0.13	0.040	(0.535)	0.020	0.020
24	2.00	0.13	0.040	(0.533)	0.020	0.020
25	2.08	0.13	0.040	(0.531)	0.020	0.020
26	2.17	0.13	0.040	(0.528)	0.020	0.020
27	2.25	0.13	0.040	(0.526)	0.020	0.020
28	2.33	0.13	0.040	(0.524)	0.020	0.020
29	2.42	0.13	0.040	(0.522)	0.020	0.020
30	2.50	0.13	0.040	(0.520)	0.020	0.020
31	2.58	0.17	0.050	(0.518)	0.025	0.025
32	2.67	0.17	0.050	(0.516)	0.025	0.025
33	2.75	0.17	0.050	(0.514)	0.025	0.025
34	2.83	0.17	0.050	(0.511)	0.025	0.025
35	2.92	0.17	0.050	(0.509)	0.025	0.025
36	3.00	0.17	0.050	(0.507)	0.025	0.025
37	3.08	0.17	0.050	(0.505)	0.025	0.025
38	3.17	0.17	0.050	(0.503)	0.025	0.025
39	3.25	0.17	0.050	(0.501)	0.025	0.025
40	3.33	0.17	0.050	(0.499)	0.025	0.025
41	3.42	0.17	0.050	(0.497)	0.025	0.025
42	3.50	0.17	0.050	(0.495)	0.025	0.025
43	3.58	0.17	0.050	(0.493)	0.025	0.025
44	3.67	0.17	0.050	(0.491)	0.025	0.025
45	3.75	0.17	0.050	(0.488)	0.025	0.025
46	3.83	0.20	0.060	(0.486)	0.030	0.030
47	3.92	0.20	0.060	(0.484)	0.030	0.030
48	4.00	0.20	0.060	(0.482)	0.030	0.030
49	4.08	0.20	0.060	(0.480)	0.030	0.030
50	4.17	0.20	0.060	(0.478)	0.030	0.030
51	4.25	0.20	0.060	(0.476)	0.030	0.030
52	4.33	0.23	0.069	(0.474)	0.035	0.035
53	4.42	0.23	0.069	(0.472)	0.035	0.035
54	4.50	0.23	0.069	(0.470)	0.035	0.035
55	4.58	0.23	0.069	(0.468)	0.035	0.035
56	4.67	0.23	0.069	(0.466)	0.035	0.035
57	4.75	0.23	0.069	(0.464)	0.035	0.035
58	4.83	0.27	0.079	(0.462)	0.040	0.040
59	4.92	0.27	0.079	(0.460)	0.040	0.040
60	5.00	0.27	0.079	(0.458)	0.040	0.040
61	5.08	0.20	0.060	(0.456)	0.030	0.030
62	5.17	0.20	0.060	(0.454)	0.030	0.030
63	5.25	0.20	0.060	(0.452)	0.030	0.030
64	5.33	0.23	0.069	(0.450)	0.035	0.035
65	5.42	0.23	0.069	(0.448)	0.035	0.035
66	5.50	0.23	0.069	(0.446)	0.035	0.035
67	5.58	0.27	0.079	(0.444)	0.040	0.040
68	5.67	0.27	0.079	(0.442)	0.040	0.040

69	5.75	0.27	0.079	(0.440)	0.040	0.040
70	5.83	0.27	0.079	(0.438)	0.040	0.040
71	5.92	0.27	0.079	(0.436)	0.040	0.040
72	6.00	0.27	0.079	(0.435)	0.040	0.040
73	6.08	0.30	0.089	(0.433)	0.045	0.045
74	6.17	0.30	0.089	(0.431)	0.045	0.045
75	6.25	0.30	0.089	(0.429)	0.045	0.045
76	6.33	0.30	0.089	(0.427)	0.045	0.045
77	6.42	0.30	0.089	(0.425)	0.045	0.045
78	6.50	0.30	0.089	(0.423)	0.045	0.045
79	6.58	0.33	0.099	(0.421)	0.050	0.050
80	6.67	0.33	0.099	(0.419)	0.050	0.050
81	6.75	0.33	0.099	(0.417)	0.050	0.050
82	6.83	0.33	0.099	(0.415)	0.050	0.050
83	6.92	0.33	0.099	(0.414)	0.050	0.050
84	7.00	0.33	0.099	(0.412)	0.050	0.050
85	7.08	0.33	0.099	(0.410)	0.050	0.050
86	7.17	0.33	0.099	(0.408)	0.050	0.050
87	7.25	0.33	0.099	(0.406)	0.050	0.050
88	7.33	0.37	0.109	(0.404)	0.055	0.055
89	7.42	0.37	0.109	(0.402)	0.055	0.055
90	7.50	0.37	0.109	(0.401)	0.055	0.055
91	7.58	0.40	0.119	(0.399)	0.060	0.060
92	7.67	0.40	0.119	(0.397)	0.060	0.060
93	7.75	0.40	0.119	(0.395)	0.060	0.060
94	7.83	0.43	0.129	(0.393)	0.064	0.064
95	7.92	0.43	0.129	(0.391)	0.064	0.064
96	8.00	0.43	0.129	(0.390)	0.064	0.064
97	8.08	0.50	0.149	(0.388)	0.074	0.074
98	8.17	0.50	0.149	(0.386)	0.074	0.074
99	8.25	0.50	0.149	(0.384)	0.074	0.074
100	8.33	0.50	0.149	(0.382)	0.074	0.074
101	8.42	0.50	0.149	(0.381)	0.074	0.074
102	8.50	0.50	0.149	(0.379)	0.074	0.074
103	8.58	0.53	0.159	(0.377)	0.079	0.079
104	8.67	0.53	0.159	(0.375)	0.079	0.079
105	8.75	0.53	0.159	(0.373)	0.079	0.079
106	8.83	0.57	0.169	(0.372)	0.084	0.084
107	8.92	0.57	0.169	(0.370)	0.084	0.084
108	9.00	0.57	0.169	(0.368)	0.084	0.084
109	9.08	0.63	0.188	(0.366)	0.094	0.094
110	9.17	0.63	0.188	(0.365)	0.094	0.094
111	9.25	0.63	0.188	(0.363)	0.094	0.094
112	9.33	0.67	0.198	(0.361)	0.099	0.099
113	9.42	0.67	0.198	(0.360)	0.099	0.099
114	9.50	0.67	0.198	(0.358)	0.099	0.099
115	9.58	0.70	0.208	(0.356)	0.104	0.104
116	9.67	0.70	0.208	(0.354)	0.104	0.104
117	9.75	0.70	0.208	(0.353)	0.104	0.104
118	9.83	0.73	0.218	(0.351)	0.109	0.109
119	9.92	0.73	0.218	(0.349)	0.109	0.109
120	10.00	0.73	0.218	(0.348)	0.109	0.109
121	10.08	0.50	0.149	(0.346)	0.074	0.074
122	10.17	0.50	0.149	(0.344)	0.074	0.074
123	10.25	0.50	0.149	(0.343)	0.074	0.074
124	10.33	0.50	0.149	(0.341)	0.074	0.074
125	10.42	0.50	0.149	(0.339)	0.074	0.074

126	10.50	0.50	0.149	(0.338)	0.074	0.074
127	10.58	0.67	0.198	(0.336)	0.099	0.099
128	10.67	0.67	0.198	(0.334)	0.099	0.099
129	10.75	0.67	0.198	(0.333)	0.099	0.099
130	10.83	0.67	0.198	(0.331)	0.099	0.099
131	10.92	0.67	0.198	(0.329)	0.099	0.099
132	11.00	0.67	0.198	(0.328)	0.099	0.099
133	11.08	0.63	0.188	(0.326)	0.094	0.094
134	11.17	0.63	0.188	(0.325)	0.094	0.094
135	11.25	0.63	0.188	(0.323)	0.094	0.094
136	11.33	0.63	0.188	(0.321)	0.094	0.094
137	11.42	0.63	0.188	(0.320)	0.094	0.094
138	11.50	0.63	0.188	(0.318)	0.094	0.094
139	11.58	0.57	0.169	(0.317)	0.084	0.084
140	11.67	0.57	0.169	(0.315)	0.084	0.084
141	11.75	0.57	0.169	(0.314)	0.084	0.084
142	11.83	0.60	0.179	(0.312)	0.089	0.089
143	11.92	0.60	0.179	(0.310)	0.089	0.089
144	12.00	0.60	0.179	(0.309)	0.089	0.089
145	12.08	0.83	0.248	(0.307)	0.124	0.124
146	12.17	0.83	0.248	(0.306)	0.124	0.124
147	12.25	0.83	0.248	(0.304)	0.124	0.124
148	12.33	0.87	0.258	(0.303)	0.129	0.129
149	12.42	0.87	0.258	(0.301)	0.129	0.129
150	12.50	0.87	0.258	(0.300)	0.129	0.129
151	12.58	0.93	0.278	(0.298)	0.139	0.139
152	12.67	0.93	0.278	(0.297)	0.139	0.139
153	12.75	0.93	0.278	(0.295)	0.139	0.139
154	12.83	0.97	0.288	(0.294)	0.144	0.144
155	12.92	0.97	0.288	(0.292)	0.144	0.144
156	13.00	0.97	0.288	(0.291)	0.144	0.144
157	13.08	1.13	0.337	(0.289)	0.169	0.169
158	13.17	1.13	0.337	(0.288)	0.169	0.169
159	13.25	1.13	0.337	(0.286)	0.169	0.169
160	13.33	1.13	0.337	(0.285)	0.169	0.169
161	13.42	1.13	0.337	(0.283)	0.169	0.169
162	13.50	1.13	0.337	(0.282)	0.169	0.169
163	13.58	0.77	0.228	(0.281)	0.114	0.114
164	13.67	0.77	0.228	(0.279)	0.114	0.114
165	13.75	0.77	0.228	(0.278)	0.114	0.114
166	13.83	0.77	0.228	(0.276)	0.114	0.114
167	13.92	0.77	0.228	(0.275)	0.114	0.114
168	14.00	0.77	0.228	(0.273)	0.114	0.114
169	14.08	0.90	0.268	(0.272)	0.134	0.134
170	14.17	0.90	0.268	(0.271)	0.134	0.134
171	14.25	0.90	0.268	(0.269)	0.134	0.134
172	14.33	0.87	0.258	(0.268)	0.129	0.129
173	14.42	0.87	0.258	(0.267)	0.129	0.129
174	14.50	0.87	0.258	(0.265)	0.129	0.129
175	14.58	0.87	0.258	(0.264)	0.129	0.129
176	14.67	0.87	0.258	(0.262)	0.129	0.129
177	14.75	0.87	0.258	(0.261)	0.129	0.129
178	14.83	0.83	0.248	(0.260)	0.124	0.124
179	14.92	0.83	0.248	(0.258)	0.124	0.124
180	15.00	0.83	0.248	(0.257)	0.124	0.124
181	15.08	0.80	0.238	(0.256)	0.119	0.119
182	15.17	0.80	0.238	(0.254)	0.119	0.119

183	15.25	0.80	0.238	(0.253)	0.119	0.119
184	15.33	0.77	0.228	(0.252)	0.114	0.114
185	15.42	0.77	0.228	(0.251)	0.114	0.114
186	15.50	0.77	0.228	(0.249)	0.114	0.114
187	15.58	0.63	0.188	(0.248)	0.094	0.094
188	15.67	0.63	0.188	(0.247)	0.094	0.094
189	15.75	0.63	0.188	(0.245)	0.094	0.094
190	15.83	0.63	0.188	(0.244)	0.094	0.094
191	15.92	0.63	0.188	(0.243)	0.094	0.094
192	16.00	0.63	0.188	(0.242)	0.094	0.094
193	16.08	0.13	0.040	(0.241)	0.020	0.020
194	16.17	0.13	0.040	(0.239)	0.020	0.020
195	16.25	0.13	0.040	(0.238)	0.020	0.020
196	16.33	0.13	0.040	(0.237)	0.020	0.020
197	16.42	0.13	0.040	(0.236)	0.020	0.020
198	16.50	0.13	0.040	(0.234)	0.020	0.020
199	16.58	0.10	0.030	(0.233)	0.015	0.015
200	16.67	0.10	0.030	(0.232)	0.015	0.015
201	16.75	0.10	0.030	(0.231)	0.015	0.015
202	16.83	0.10	0.030	(0.230)	0.015	0.015
203	16.92	0.10	0.030	(0.229)	0.015	0.015
204	17.00	0.10	0.030	(0.227)	0.015	0.015
205	17.08	0.17	0.050	(0.226)	0.025	0.025
206	17.17	0.17	0.050	(0.225)	0.025	0.025
207	17.25	0.17	0.050	(0.224)	0.025	0.025
208	17.33	0.17	0.050	(0.223)	0.025	0.025
209	17.42	0.17	0.050	(0.222)	0.025	0.025
210	17.50	0.17	0.050	(0.221)	0.025	0.025
211	17.58	0.17	0.050	(0.220)	0.025	0.025
212	17.67	0.17	0.050	(0.218)	0.025	0.025
213	17.75	0.17	0.050	(0.217)	0.025	0.025
214	17.83	0.13	0.040	(0.216)	0.020	0.020
215	17.92	0.13	0.040	(0.215)	0.020	0.020
216	18.00	0.13	0.040	(0.214)	0.020	0.020
217	18.08	0.13	0.040	(0.213)	0.020	0.020
218	18.17	0.13	0.040	(0.212)	0.020	0.020
219	18.25	0.13	0.040	(0.211)	0.020	0.020
220	18.33	0.13	0.040	(0.210)	0.020	0.020
221	18.42	0.13	0.040	(0.209)	0.020	0.020
222	18.50	0.13	0.040	(0.208)	0.020	0.020
223	18.58	0.10	0.030	(0.207)	0.015	0.015
224	18.67	0.10	0.030	(0.206)	0.015	0.015
225	18.75	0.10	0.030	(0.205)	0.015	0.015
226	18.83	0.07	0.020	(0.204)	0.010	0.010
227	18.92	0.07	0.020	(0.203)	0.010	0.010
228	19.00	0.07	0.020	(0.202)	0.010	0.010
229	19.08	0.10	0.030	(0.201)	0.015	0.015
230	19.17	0.10	0.030	(0.200)	0.015	0.015
231	19.25	0.10	0.030	(0.199)	0.015	0.015
232	19.33	0.13	0.040	(0.198)	0.020	0.020
233	19.42	0.13	0.040	(0.197)	0.020	0.020
234	19.50	0.13	0.040	(0.196)	0.020	0.020
235	19.58	0.10	0.030	(0.196)	0.015	0.015
236	19.67	0.10	0.030	(0.195)	0.015	0.015
237	19.75	0.10	0.030	(0.194)	0.015	0.015
238	19.83	0.07	0.020	(0.193)	0.010	0.010
239	19.92	0.07	0.020	(0.192)	0.010	0.010

240	20.00	0.07	0.020	(0.191)	0.010	0.010
241	20.08	0.10	0.030	(0.190)	0.015	0.015
242	20.17	0.10	0.030	(0.189)	0.015	0.015
243	20.25	0.10	0.030	(0.189)	0.015	0.015
244	20.33	0.10	0.030	(0.188)	0.015	0.015
245	20.42	0.10	0.030	(0.187)	0.015	0.015
246	20.50	0.10	0.030	(0.186)	0.015	0.015
247	20.58	0.10	0.030	(0.185)	0.015	0.015
248	20.67	0.10	0.030	(0.185)	0.015	0.015
249	20.75	0.10	0.030	(0.184)	0.015	0.015
250	20.83	0.07	0.020	(0.183)	0.010	0.010
251	20.92	0.07	0.020	(0.182)	0.010	0.010
252	21.00	0.07	0.020	(0.182)	0.010	0.010
253	21.08	0.10	0.030	(0.181)	0.015	0.015
254	21.17	0.10	0.030	(0.180)	0.015	0.015
255	21.25	0.10	0.030	(0.180)	0.015	0.015
256	21.33	0.07	0.020	(0.179)	0.010	0.010
257	21.42	0.07	0.020	(0.178)	0.010	0.010
258	21.50	0.07	0.020	(0.178)	0.010	0.010
259	21.58	0.10	0.030	(0.177)	0.015	0.015
260	21.67	0.10	0.030	(0.176)	0.015	0.015
261	21.75	0.10	0.030	(0.176)	0.015	0.015
262	21.83	0.07	0.020	(0.175)	0.010	0.010
263	21.92	0.07	0.020	(0.174)	0.010	0.010
264	22.00	0.07	0.020	(0.174)	0.010	0.010
265	22.08	0.10	0.030	(0.173)	0.015	0.015
266	22.17	0.10	0.030	(0.173)	0.015	0.015
267	22.25	0.10	0.030	(0.172)	0.015	0.015
268	22.33	0.07	0.020	(0.172)	0.010	0.010
269	22.42	0.07	0.020	(0.171)	0.010	0.010
270	22.50	0.07	0.020	(0.171)	0.010	0.010
271	22.58	0.07	0.020	(0.170)	0.010	0.010
272	22.67	0.07	0.020	(0.170)	0.010	0.010
273	22.75	0.07	0.020	(0.169)	0.010	0.010
274	22.83	0.07	0.020	(0.169)	0.010	0.010
275	22.92	0.07	0.020	(0.168)	0.010	0.010
276	23.00	0.07	0.020	(0.168)	0.010	0.010
277	23.08	0.07	0.020	(0.167)	0.010	0.010
278	23.17	0.07	0.020	(0.167)	0.010	0.010
279	23.25	0.07	0.020	(0.167)	0.010	0.010
280	23.33	0.07	0.020	(0.166)	0.010	0.010
281	23.42	0.07	0.020	(0.166)	0.010	0.010
282	23.50	0.07	0.020	(0.166)	0.010	0.010
283	23.58	0.07	0.020	(0.166)	0.010	0.010
284	23.67	0.07	0.020	(0.165)	0.010	0.010
285	23.75	0.07	0.020	(0.165)	0.010	0.010
286	23.83	0.07	0.020	(0.165)	0.010	0.010
287	23.92	0.07	0.020	(0.165)	0.010	0.010
288	24.00	0.07	0.020	(0.165)	0.010	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 14.9

Flood volume = Effective rainfall 1.24(In)

times area 17.2(Ac.)/[(In)/(Ft.)] = 1.8(Ac.Ft)

Total soil loss = 1.24(In)

Total soil loss = 1.777(Ac.Ft)

Total rainfall = 2.48(In)

Flood volume = 77418.0 Cubic Feet

Total soil loss = 77418.0 Cubic Feet

Peak flow rate of this hydrograph = 2.925 (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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0005	0.08	Q				
0+10	0.0016	0.15	Q				
0+15	0.0027	0.17	Q				
0+20	0.0042	0.21	Q				
0+25	0.0059	0.25	Q				
0+30	0.0076	0.25	VQ				
0+35	0.0094	0.26	VQ				
0+40	0.0112	0.26	VQ				
0+45	0.0130	0.26	VQ				
0+50	0.0150	0.30	VQ				
0+55	0.0173	0.33	VQ				
1+ 0	0.0197	0.34	VQ				
1+ 5	0.0218	0.31	VQ				
1+10	0.0236	0.27	VQ				
1+15	0.0254	0.26	VQ				
1+20	0.0272	0.26	VQ				
1+25	0.0290	0.26	VQ				
1+30	0.0307	0.26	VQ				
1+35	0.0325	0.26	VQ				
1+40	0.0343	0.26	VQ				
1+45	0.0361	0.26	VQ				
1+50	0.0381	0.30	VQ				
1+55	0.0404	0.33	VQ				
2+ 0	0.0428	0.34	VQ				
2+ 5	0.0451	0.34	Q				
2+10	0.0475	0.34	Q				
2+15	0.0499	0.34	Q				
2+20	0.0522	0.34	Q				
2+25	0.0546	0.34	Q				
2+30	0.0570	0.34	Q				
2+35	0.0596	0.38	Q				
2+40	0.0625	0.42	Q				
2+45	0.0655	0.43	Q				
2+50	0.0684	0.43	Q				
2+55	0.0714	0.43	Q				
3+ 0	0.0743	0.43	Q				
3+ 5	0.0773	0.43	Q				
3+10	0.0803	0.43	Q				
3+15	0.0832	0.43	Q				
3+20	0.0862	0.43	Q				
3+25	0.0891	0.43	QV				
3+30	0.0921	0.43	QV				
3+35	0.0951	0.43	QV				
3+40	0.0980	0.43	QV				

3+45	0.1010	0.43	QV				
3+50	0.1042	0.47	QV				
3+55	0.1077	0.51	Q				
4+ 0	0.1112	0.51	Q				
4+ 5	0.1148	0.52	Q				
4+10	0.1184	0.52	Q				
4+15	0.1219	0.52	Q				
4+20	0.1257	0.56	Q				
4+25	0.1298	0.59	Q				
4+30	0.1339	0.60	QV				
4+35	0.1381	0.60	QV				
4+40	0.1422	0.60	QV				
4+45	0.1464	0.60	QV				
4+50	0.1508	0.64	QV				
4+55	0.1555	0.68	QV				
5+ 0	0.1602	0.68	QV				
5+ 5	0.1644	0.61	QV				
5+10	0.1681	0.54	QV				
5+15	0.1717	0.52	QV				
5+20	0.1755	0.56	QV				
5+25	0.1796	0.59	Q V				
5+30	0.1837	0.60	Q V				
5+35	0.1881	0.64	Q V				
5+40	0.1928	0.68	Q V				
5+45	0.1975	0.68	Q V				
5+50	0.2022	0.69	Q V				
5+55	0.2070	0.69	Q V				
6+ 0	0.2117	0.69	Q V				
6+ 5	0.2167	0.73	Q V				
6+10	0.2220	0.76	QV				
6+15	0.2273	0.77	Q V				
6+20	0.2326	0.77	Q V				
6+25	0.2380	0.77	Q V				
6+30	0.2433	0.77	Q V				
6+35	0.2489	0.81	Q V				
6+40	0.2547	0.85	Q V				
6+45	0.2606	0.86	Q V				
6+50	0.2666	0.86	Q V				
6+55	0.2725	0.86	Q V				
7+ 0	0.2784	0.86	Q V				
7+ 5	0.2843	0.86	Q V				
7+10	0.2903	0.86	Q V				
7+15	0.2962	0.86	Q V				
7+20	0.3024	0.90	Q V				
7+25	0.3088	0.94	Q V				
7+30	0.3153	0.94	Q V				
7+35	0.3221	0.99	Q V				
7+40	0.3291	1.02	Q V				
7+45	0.3362	1.03	Q V				
7+50	0.3436	1.07	Q V				
7+55	0.3512	1.11	Q V				
8+ 0	0.3589	1.12	Q V				
8+ 5	0.3672	1.20	Q V				
8+10	0.3759	1.27	Q V				
8+15	0.3847	1.28	Q V				
8+20	0.3936	1.29	Q V				
8+25	0.4025	1.29	Q V				

8+30	0.4114	1.29	Q	V			
8+35	0.4206	1.33	Q	V			
8+40	0.4300	1.37	Q	V			
8+45	0.4394	1.37	Q	V			
8+50	0.4492	1.42	Q	V			
8+55	0.4592	1.45	Q	V			
9+ 0	0.4692	1.46	Q	V			
9+ 5	0.4798	1.54	Q	V			
9+10	0.4909	1.61	Q	V			
9+15	0.5022	1.63	Q	V			
9+20	0.5137	1.67	Q	V			
9+25	0.5255	1.71	Q	V			
9+30	0.5373	1.72	Q	V			
9+35	0.5494	1.76	Q	V			
9+40	0.5618	1.80	Q	V			
9+45	0.5742	1.80	Q	V			
9+50	0.5869	1.85	Q	V			
9+55	0.5999	1.88	Q	V			
10+ 0	0.6129	1.89	Q	V			
10+ 5	0.6240	1.62	Q	V			
10+10	0.6334	1.36	Q	V			
10+15	0.6425	1.31	Q	V			
10+20	0.6513	1.29	Q	V			
10+25	0.6602	1.29	Q	V			
10+30	0.6691	1.29	Q	V			
10+35	0.6793	1.49	Q	V			
10+40	0.6908	1.67	Q	V			
10+45	0.7026	1.70	Q	V			
10+50	0.7144	1.72	Q	V			
10+55	0.7263	1.72	Q	V			
11+ 0	0.7381	1.72	Q	V			
11+ 5	0.7497	1.68	Q	V			
11+10	0.7610	1.64	Q	V			
11+15	0.7723	1.64	Q	V			
11+20	0.7836	1.63	Q	V			
11+25	0.7948	1.63	Q	V			
11+30	0.8061	1.63	Q	V			
11+35	0.8168	1.56	Q	V			
11+40	0.8270	1.48	Q	V			
11+45	0.8371	1.47	Q	V			
11+50	0.8475	1.50	Q	V			
11+55	0.8580	1.54	Q	V			
12+ 0	0.8687	1.55	Q	V			
12+ 5	0.8812	1.82	Q	V			
12+10	0.8955	2.08	Q	V			
12+15	0.9102	2.13	Q	V			
12+20	0.9253	2.19	Q	V			
12+25	0.9406	2.23	Q	V			
12+30	0.9560	2.23	Q	V			
12+35	0.9719	2.31	Q	V			
12+40	0.9884	2.39	Q	V			
12+45	1.0049	2.40	Q	V			
12+50	1.0218	2.45	Q	V			
12+55	1.0389	2.48	Q	V			
13+ 0	1.0561	2.49	Q	V			
13+ 5	1.0746	2.69	Q	V			
13+10	1.0944	2.87	Q	V			

13+15	1.1144	2.91		Q	V
13+20	1.1345	2.92		Q	V
13+25	1.1547	2.92		Q	V
13+30	1.1748	2.92		Q	V
13+35	1.1920	2.50		Q	V
13+40	1.2064	2.09		Q	V
13+45	1.2203	2.01		Q	V
13+50	1.2339	1.98		Q	V
13+55	1.2475	1.98		Q	V
14+ 0	1.2612	1.98		Q	V
14+ 5	1.2759	2.13		Q	V
14+10	1.2916	2.28		Q	V
14+15	1.3075	2.31		Q	V
14+20	1.3232	2.28		Q	V
14+25	1.3387	2.25		Q	V
14+30	1.3541	2.24		Q	V
14+35	1.3695	2.24		Q	V
14+40	1.3849	2.24		Q	V
14+45	1.4003	2.24		Q	V
14+50	1.4154	2.20		Q	V
14+55	1.4303	2.16		Q	V
15+ 0	1.4452	2.15		Q	V
15+ 5	1.4597	2.11		Q	V
15+10	1.4740	2.07		Q	V
15+15	1.4882	2.07		Q	V
15+20	1.5022	2.03		Q	V
15+25	1.5159	1.99		Q	V
15+30	1.5295	1.98		Q	V
15+35	1.5421	1.82		Q	V
15+40	1.5536	1.68		Q	V
15+45	1.5650	1.65		Q	V
15+50	1.5762	1.63		Q	V
15+55	1.5875	1.63		Q	V
16+ 0	1.5987	1.63		Q	V
16+ 5	1.6060	1.05	Q		V
16+10	1.6094	0.50	Q		V
16+15	1.6121	0.39	Q		V
16+20	1.6145	0.34	Q		V
16+25	1.6168	0.34	Q		V
16+30	1.6192	0.34	Q		V
16+35	1.6213	0.31	Q		V
16+40	1.6232	0.27	Q		V
16+45	1.6250	0.26	Q		V
16+50	1.6267	0.26	Q		V
16+55	1.6285	0.26	Q		V
17+ 0	1.6303	0.26	Q		V
17+ 5	1.6326	0.34	Q		V
17+10	1.6354	0.41	Q		V
17+15	1.6383	0.42	Q		V
17+20	1.6413	0.43	Q		V
17+25	1.6443	0.43	Q		V
17+30	1.6472	0.43	Q		V
17+35	1.6502	0.43	Q		V
17+40	1.6531	0.43	Q		V
17+45	1.6561	0.43	Q		V
17+50	1.6588	0.39	Q		V
17+55	1.6612	0.35	Q		V

18+ 0	1.6636	0.35	Q				V
18+ 5	1.6660	0.34	Q				V
18+10	1.6684	0.34	Q				V
18+15	1.6707	0.34	Q				V
18+20	1.6731	0.34	Q				V
18+25	1.6755	0.34	Q				V
18+30	1.6779	0.34	Q				V
18+35	1.6800	0.31	Q				V
18+40	1.6818	0.27	Q				V
18+45	1.6836	0.26	Q				V
18+50	1.6851	0.22	Q				V
18+55	1.6864	0.18	Q				V
19+ 0	1.6876	0.18	Q				V
19+ 5	1.6890	0.21	Q				V
19+10	1.6907	0.25	Q				V
19+15	1.6925	0.25	Q				V
19+20	1.6945	0.30	Q				V
19+25	1.6968	0.33	Q				V
19+30	1.6992	0.34	Q				V
19+35	1.7013	0.31	Q				V
19+40	1.7031	0.27	Q				V
19+45	1.7049	0.26	Q				V
19+50	1.7064	0.22	Q				V
19+55	1.7077	0.18	Q				V
20+ 0	1.7089	0.18	Q				V
20+ 5	1.7104	0.21	Q				V
20+10	1.7121	0.25	Q				V
20+15	1.7138	0.25	Q				V
20+20	1.7156	0.26	Q				V
20+25	1.7174	0.26	Q				V
20+30	1.7192	0.26	Q				V
20+35	1.7209	0.26	Q				V
20+40	1.7227	0.26	Q				V
20+45	1.7245	0.26	Q				V
20+50	1.7260	0.22	Q				V
20+55	1.7272	0.18	Q				V
21+ 0	1.7285	0.18	Q				V
21+ 5	1.7299	0.21	Q				V
21+10	1.7316	0.25	Q				V
21+15	1.7334	0.25	Q				V
21+20	1.7349	0.22	Q				V
21+25	1.7361	0.18	Q				V
21+30	1.7373	0.18	Q				V
21+35	1.7388	0.21	Q				V
21+40	1.7405	0.25	Q				V
21+45	1.7423	0.25	Q				V
21+50	1.7438	0.22	Q				V
21+55	1.7450	0.18	Q				V
22+ 0	1.7462	0.18	Q				V
22+ 5	1.7477	0.21	Q				V
22+10	1.7494	0.25	Q				V
22+15	1.7511	0.25	Q				V
22+20	1.7526	0.22	Q				V
22+25	1.7539	0.18	Q				V
22+30	1.7551	0.18	Q				V
22+35	1.7563	0.17	Q				V
22+40	1.7575	0.17	Q				V

22+45	1.7587	0.17	Q				V
22+50	1.7599	0.17	Q				V
22+55	1.7610	0.17	Q				V
23+ 0	1.7622	0.17	Q				V
23+ 5	1.7634	0.17	Q				V
23+10	1.7646	0.17	Q				V
23+15	1.7658	0.17	Q				V
23+20	1.7670	0.17	Q				V
23+25	1.7681	0.17	Q				V
23+30	1.7693	0.17	Q				V
23+35	1.7705	0.17	Q				V
23+40	1.7717	0.17	Q				V
23+45	1.7729	0.17	Q				V
23+50	1.7741	0.17	Q				V
23+55	1.7753	0.17	Q				V
24+ 0	1.7764	0.17	Q				V
24+ 5	1.7771	0.09	Q				V
24+10	1.7772	0.02	Q				V
24+15	1.7773	0.01	Q				V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "C" (Subarea 1)

Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	0.58	9.98

100 YEAR Area rainfall data:

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

17.20

1.45

24.94

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)
 Areal adjustment factor = 99.98 %
 Adjusted average point rain = 0.784(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

 Slope of intensity-duration curve for a 1 hour storm =0.4800

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	0.083	212.058	45.410
2	0.167	424.117	42.535
3	0.250	636.175	8.324
4	0.333	848.233	3.731
Sum =		100.000	Sum= 17.334

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	0.08	4.40	(0.329)	0.207
				0.207

2	0.17	4.50	0.423	(0.329)	0.212	0.212
3	0.25	5.40	0.508	(0.329)	0.254	0.254
4	0.33	5.40	0.508	(0.329)	0.254	0.254
5	0.42	5.70	0.536	(0.329)	0.268	0.268
6	0.50	6.40	0.602	(0.329)	0.301	0.301
7	0.58	7.90	0.743	0.329	(0.371)	0.414
8	0.67	9.10	0.856	0.329	(0.428)	0.527
9	0.75	12.80	1.204	0.329	(0.602)	0.875
10	0.83	25.60	2.407	0.329	(1.204)	2.078
11	0.92	7.90	0.743	0.329	(0.371)	0.414
12	1.00	4.90	0.461	(0.329)	0.230	0.230

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.0

Flood volume = Effective rainfall 0.50(In)

times area 17.2(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)

Total soil loss = 0.28(In)

Total soil loss = 0.403(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 31386.0 Cubic Feet

Total soil loss = 17542.2 Cubic Feet

Peak flow rate of this hydrograph = 23.846(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0112	1.63	V Q					
0+10	0.0332	3.19	V Q					
0+15	0.0598	3.86	V Q					
0+20	0.0895	4.31	VQ					
0+25	0.1204	4.49	QV					
0+30	0.1540	4.88	Q V					
0+35	0.1955	6.03	Q V					
0+40	0.2493	7.81	Q V					
0+45	0.3289	11.56			Q V			
0+50	0.4931	23.85					V Q	
0+55	0.6322	20.19				Q		V
1+ 0	0.6903	8.43			Q			V
1+ 5	0.7154	3.64		Q				V
1+10	0.7195	0.60	Q					V
1+15	0.7205	0.15	Q					V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 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]
17.20	0.98	16.86

100 YEAR Area rainfall data:

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

17.20

2.48

42.66

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	212.058	45.410	7.872
2 0.167	424.117	42.535	7.373
3 0.250	636.175	8.324	1.443
4 0.333	848.233	3.731	0.647
Sum = 100.000		Sum=	17.334

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 0.08	1.30	0.208	(0.329)	0.104
2 0.17	1.30	0.208	(0.329)	0.104
3 0.25	1.10	0.176	(0.329)	0.088

4	0.33	1.50	0.240	(0.329)	0.120	0.120
5	0.42	1.50	0.240	(0.329)	0.120	0.120
6	0.50	1.80	0.288	(0.329)	0.144	0.144
7	0.58	1.50	0.240	(0.329)	0.120	0.120
8	0.67	1.80	0.288	(0.329)	0.144	0.144
9	0.75	1.80	0.288	(0.329)	0.144	0.144
10	0.83	1.50	0.240	(0.329)	0.120	0.120
11	0.92	1.60	0.256	(0.329)	0.128	0.128
12	1.00	1.80	0.288	(0.329)	0.144	0.144
13	1.08	2.20	0.351	(0.329)	0.176	0.176
14	1.17	2.20	0.351	(0.329)	0.176	0.176
15	1.25	2.20	0.351	(0.329)	0.176	0.176
16	1.33	2.00	0.319	(0.329)	0.160	0.160
17	1.42	2.60	0.415	(0.329)	0.208	0.208
18	1.50	2.70	0.431	(0.329)	0.216	0.216
19	1.58	2.40	0.383	(0.329)	0.192	0.192
20	1.67	2.70	0.431	(0.329)	0.216	0.216
21	1.75	3.30	0.527	(0.329)	0.264	0.264
22	1.83	3.10	0.495	(0.329)	0.248	0.248
23	1.92	2.90	0.463	(0.329)	0.232	0.232
24	2.00	3.00	0.479	(0.329)	0.240	0.240
25	2.08	3.10	0.495	(0.329)	0.248	0.248
26	2.17	4.20	0.671	0.329 (0.335)	0.342	0.342
27	2.25	5.00	0.799	0.329 (0.399)	0.470	0.470
28	2.33	3.50	0.559	(0.329) 0.280	0.280	0.280
29	2.42	6.80	1.086	0.329 (0.543)	0.757	0.757
30	2.50	7.30	1.166	0.329 (0.583)	0.837	0.837
31	2.58	8.20	1.310	0.329 (0.655)	0.981	0.981
32	2.67	5.90	0.943	0.329 (0.471)	0.613	0.613
33	2.75	2.00	0.319	(0.329) 0.160	0.160	0.160
34	2.83	1.80	0.288	(0.329) 0.144	0.144	0.144
35	2.92	1.80	0.288	(0.329) 0.144	0.144	0.144
36	3.00	0.60	0.096	(0.329) 0.048	0.048	0.048

(Loss Rate Not Used)

Sum = 100.0

Sum = 9.0

Flood volume = Effective rainfall 0.75(In)

times area 17.2(Ac.)/[(In)/(Ft.)) = 1.1(Ac.Ft)

Total soil loss = 0.58(In)

Total soil loss = 0.833(Ac.Ft)

Total rainfall = 1.33(In)

Flood volume = 46824.8 Cubic Feet

Total soil loss = 36292.3 Cubic Feet

Peak flow rate of this hydrograph = 15.172(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m) Volume Ac.Ft Q(CFS) 0 5.0 10.0 15.0 20.0

Time	Distance	Speed	Direction
0+ 5	0.0056	0.82	VQ
0+10	0.0165	1.58	V Q
0+15	0.0276	1.61	V Q
0+20	0.0401	1.81	V Q
0+25	0.0540	2.02	V Q
0+30	0.0695	2.25	V Q
0+35	0.0850	2.25	VQ
0+40	0.1008	2.30	VQ
0+45	0.1178	2.46	Q
0+50	0.1335	2.29	Q
0+55	0.1486	2.19	QV
1+ 0	0.1648	2.34	Q V
1+ 5	0.1834	2.71	QV
1+10	0.2038	2.97	Q V
1+15	0.2247	3.03	Q V
1+20	0.2448	2.92	Q V
1+25	0.2667	3.18	Q V
1+30	0.2913	3.57	Q V
1+35	0.3155	3.50	Q V
1+40	0.3400	3.56	Q V
1+45	0.3681	4.08	Q V
1+50	0.3979	4.33	Q V
1+55	0.4267	4.17	Q V
2+ 0	0.4551	4.12	Q V
2+ 5	0.4841	4.21	Q V
2+10	0.5186	5.01	Q V
2+15	0.5650	6.73	Q V
2+20	0.6085	6.32	Q V
2+25	0.6699	8.92	Q V
2+30	0.7587	12.88	Q V
2+35	0.8632	15.17	Q V
2+40	0.9580	13.76	Q V
2+45	1.0113	7.74	Q V
2+50	1.0376	3.83	Q V
2+55	1.0571	2.82	Q V
3+ 0	1.0691	1.75	Q V
3+ 5	1.0736	0.65	Q V
3+10	1.0747	0.16	Q V
3+15	1.0749	0.03	Q V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	1.38	23.74

100 YEAR Area rainfall data:

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

17.20

3.48

59.86

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380 (In)

Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 1.872 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.872 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20 (Ac.)		

RI	RI	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
AMC2	AMC-1					
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	212.058	45.410	7.872
2 0.167	424.117	42.535	7.373
3 0.250	636.175	8.324	1.443
4 0.333	848.233	3.731	0.647
Sum = 100.000		Sum=	17.334

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 0.08	0.50	0.112	(0.329)	0.056
2 0.17	0.60	0.135	(0.329)	0.067
3 0.25	0.60	0.135	(0.329)	0.067

4	0.33	0.60	0.135	(0.329)	0.067	0.067
5	0.42	0.60	0.135	(0.329)	0.067	0.067
6	0.50	0.70	0.157	(0.329)	0.079	0.079
7	0.58	0.70	0.157	(0.329)	0.079	0.079
8	0.67	0.70	0.157	(0.329)	0.079	0.079
9	0.75	0.70	0.157	(0.329)	0.079	0.079
10	0.83	0.70	0.157	(0.329)	0.079	0.079
11	0.92	0.70	0.157	(0.329)	0.079	0.079
12	1.00	0.80	0.180	(0.329)	0.090	0.090
13	1.08	0.80	0.180	(0.329)	0.090	0.090
14	1.17	0.80	0.180	(0.329)	0.090	0.090
15	1.25	0.80	0.180	(0.329)	0.090	0.090
16	1.33	0.80	0.180	(0.329)	0.090	0.090
17	1.42	0.80	0.180	(0.329)	0.090	0.090
18	1.50	0.80	0.180	(0.329)	0.090	0.090
19	1.58	0.80	0.180	(0.329)	0.090	0.090
20	1.67	0.80	0.180	(0.329)	0.090	0.090
21	1.75	0.80	0.180	(0.329)	0.090	0.090
22	1.83	0.80	0.180	(0.329)	0.090	0.090
23	1.92	0.80	0.180	(0.329)	0.090	0.090
24	2.00	0.90	0.202	(0.329)	0.101	0.101
25	2.08	0.80	0.180	(0.329)	0.090	0.090
26	2.17	0.90	0.202	(0.329)	0.101	0.101
27	2.25	0.90	0.202	(0.329)	0.101	0.101
28	2.33	0.90	0.202	(0.329)	0.101	0.101
29	2.42	0.90	0.202	(0.329)	0.101	0.101
30	2.50	0.90	0.202	(0.329)	0.101	0.101
31	2.58	0.90	0.202	(0.329)	0.101	0.101
32	2.67	0.90	0.202	(0.329)	0.101	0.101
33	2.75	1.00	0.225	(0.329)	0.112	0.112
34	2.83	1.00	0.225	(0.329)	0.112	0.112
35	2.92	1.00	0.225	(0.329)	0.112	0.112
36	3.00	1.00	0.225	(0.329)	0.112	0.112
37	3.08	1.00	0.225	(0.329)	0.112	0.112
38	3.17	1.10	0.247	(0.329)	0.124	0.124
39	3.25	1.10	0.247	(0.329)	0.124	0.124
40	3.33	1.10	0.247	(0.329)	0.124	0.124
41	3.42	1.20	0.270	(0.329)	0.135	0.135
42	3.50	1.30	0.292	(0.329)	0.146	0.146
43	3.58	1.40	0.314	(0.329)	0.157	0.157
44	3.67	1.40	0.314	(0.329)	0.157	0.157
45	3.75	1.50	0.337	(0.329)	0.168	0.168
46	3.83	1.50	0.337	(0.329)	0.168	0.168
47	3.92	1.60	0.359	(0.329)	0.180	0.180
48	4.00	1.60	0.359	(0.329)	0.180	0.180
49	4.08	1.70	0.382	(0.329)	0.191	0.191
50	4.17	1.80	0.404	(0.329)	0.202	0.202
51	4.25	1.90	0.427	(0.329)	0.213	0.213
52	4.33	2.00	0.449	(0.329)	0.225	0.225
53	4.42	2.10	0.472	(0.329)	0.236	0.236
54	4.50	2.10	0.472	(0.329)	0.236	0.236
55	4.58	2.20	0.494	(0.329)	0.247	0.247
56	4.67	2.30	0.517	(0.329)	0.258	0.258
57	4.75	2.40	0.539	(0.329)	0.270	0.270

58	4.83	2.40	0.539	(0.329)	0.270	0.270
59	4.92	2.50	0.562	(0.329)	0.281	0.281
60	5.00	2.60	0.584	(0.329)	0.292	0.292
61	5.08	3.10	0.696	0.329	(0.348)	0.367
62	5.17	3.60	0.809	0.329	(0.404)	0.479
63	5.25	3.90	0.876	0.329	(0.438)	0.547
64	5.33	4.20	0.943	0.329	(0.472)	0.614
65	5.42	4.70	1.056	0.329	(0.528)	0.726
66	5.50	5.60	1.258	0.329	(0.629)	0.929
67	5.58	1.90	0.427	(0.329)	0.213	0.213
68	5.67	0.90	0.202	(0.329)	0.101	0.101
69	5.75	0.60	0.135	(0.329)	0.067	0.067
70	5.83	0.50	0.112	(0.329)	0.056	0.056
71	5.92	0.30	0.067	(0.329)	0.034	0.034
72	6.00	0.20	0.045	(0.329)	0.022	0.022

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.1

Flood volume = Effective rainfall 1.01(In)
times area 17.2(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 0.87(In)
Total soil loss = 1.241(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 62822.6 Cubic Feet
Total soil loss = 54042.7 Cubic Feet

Peak flow rate of this hydrograph = 13.913(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0030	0.44	Q					
0+10	0.0096	0.94	VQ					
0+15	0.0172	1.11	V Q					
0+20	0.0252	1.16	V Q					
0+25	0.0332	1.17	V Q					
0+30	0.0419	1.26	VQ					
0+35	0.0511	1.34	VQ					
0+40	0.0605	1.36	VQ					
0+45	0.0699	1.36	VQ					
0+50	0.0792	1.36	Q					
0+55	0.0886	1.36	Q					
1+ 0	0.0986	1.45	Q					
1+ 5	0.1092	1.53	Q					
1+10	0.1199	1.55	Q					
1+15	0.1306	1.56	Q					
1+20	0.1413	1.56	Q					
1+25	0.1521	1.56	QV					
1+30	0.1628	1.56	QV					

1+35	0.1735	1.56	QV						
1+40	0.1843	1.56	Q V						
1+45	0.1950	1.56	Q V						
1+50	0.2057	1.56	Q V						
1+55	0.2165	1.56	Q V						
2+ 0	0.2278	1.65	Q V						
2+ 5	0.2391	1.64	Q V						
2+10	0.2506	1.66	Q V						
2+15	0.2625	1.74	Q V						
2+20	0.2745	1.75	Q V						
2+25	0.2866	1.75	Q V						
2+30	0.2987	1.75	Q V						
2+35	0.3108	1.75	Q V						
2+40	0.3228	1.75	Q V						
2+45	0.3355	1.84	Q V						
2+50	0.3488	1.92	Q V						
2+55	0.3621	1.94	Q V						
3+ 0	0.3755	1.95	Q V						
3+ 5	0.3890	1.95	Q V						
3+10	0.4030	2.04	Q V						
3+15	0.4176	2.12	Q V						
3+20	0.4323	2.14	Q V						
3+25	0.4477	2.23	Q V						
3+30	0.4642	2.40	Q V						
3+35	0.4820	2.59	Q V						
3+40	0.5006	2.70	Q V						
3+45	0.5199	2.81	Q V						
3+50	0.5399	2.90	Q V						
3+55	0.5606	3.00	Q V						
4+ 0	0.5819	3.09	Q V						
4+ 5	0.6039	3.20	Q V						
4+10	0.6272	3.38	Q V						
4+15	0.6517	3.56	Q V						
4+20	0.6776	3.76	Q V						
4+25	0.7048	3.95	Q V						
4+30	0.7328	4.06	Q V						
4+35	0.7615	4.17	Q V						
4+40	0.7915	4.35	Q V						
4+45	0.8227	4.54	Q V						
4+50	0.8547	4.64	Q V						
4+55	0.8874	4.76	Q V						
5+ 0	0.9214	4.93	Q V						
5+ 5	0.9602	5.62	Q						
5+10	1.0090	7.09	Q						
5+15	1.0679	8.56	Q						
5+20	1.1354	9.80	Q						
5+25	1.2136	11.35	Q						
5+30	1.3094	13.91	Q						
5+35	1.3781	9.98	Q						
5+40	1.4069	4.18	Q						
5+45	1.4220	2.19	Q						
5+50	1.4304	1.22	Q						
5+55	1.4362	0.84	Q						
6+ 0	1.4400	0.55	Q						

100 90 80 70 60 50 40 30 20 10 0

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 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]
17.20	2.48	42.66

100 YEAR Area rainfall data:

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

17.20

6.90

118.68

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329

Minimum soil loss rate ((In/Hr)) = 0.165

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	212.058	7.872
2	0.167	424.117	7.373
3	0.250	636.175	1.443
4	0.333	848.233	0.647
Sum = 100.000		Sum=	17.334

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	0.08	0.07	(0.584)	0.014
2	0.17	0.07	(0.581)	0.014
3	0.25	0.07	(0.579)	0.014

4	0.33	0.10	0.042	(0.577)	0.021	0.021
5	0.42	0.10	0.042	(0.575)	0.021	0.021
6	0.50	0.10	0.042	(0.572)	0.021	0.021
7	0.58	0.10	0.042	(0.570)	0.021	0.021
8	0.67	0.10	0.042	(0.568)	0.021	0.021
9	0.75	0.10	0.042	(0.566)	0.021	0.021
10	0.83	0.13	0.056	(0.563)	0.028	0.028
11	0.92	0.13	0.056	(0.561)	0.028	0.028
12	1.00	0.13	0.056	(0.559)	0.028	0.028
13	1.08	0.10	0.042	(0.557)	0.021	0.021
14	1.17	0.10	0.042	(0.555)	0.021	0.021
15	1.25	0.10	0.042	(0.552)	0.021	0.021
16	1.33	0.10	0.042	(0.550)	0.021	0.021
17	1.42	0.10	0.042	(0.548)	0.021	0.021
18	1.50	0.10	0.042	(0.546)	0.021	0.021
19	1.58	0.10	0.042	(0.544)	0.021	0.021
20	1.67	0.10	0.042	(0.541)	0.021	0.021
21	1.75	0.10	0.042	(0.539)	0.021	0.021
22	1.83	0.13	0.056	(0.537)	0.028	0.028
23	1.92	0.13	0.056	(0.535)	0.028	0.028
24	2.00	0.13	0.056	(0.533)	0.028	0.028
25	2.08	0.13	0.056	(0.531)	0.028	0.028
26	2.17	0.13	0.056	(0.528)	0.028	0.028
27	2.25	0.13	0.056	(0.526)	0.028	0.028
28	2.33	0.13	0.056	(0.524)	0.028	0.028
29	2.42	0.13	0.056	(0.522)	0.028	0.028
30	2.50	0.13	0.056	(0.520)	0.028	0.028
31	2.58	0.17	0.070	(0.518)	0.035	0.035
32	2.67	0.17	0.070	(0.516)	0.035	0.035
33	2.75	0.17	0.070	(0.514)	0.035	0.035
34	2.83	0.17	0.070	(0.511)	0.035	0.035
35	2.92	0.17	0.070	(0.509)	0.035	0.035
36	3.00	0.17	0.070	(0.507)	0.035	0.035
37	3.08	0.17	0.070	(0.505)	0.035	0.035
38	3.17	0.17	0.070	(0.503)	0.035	0.035
39	3.25	0.17	0.070	(0.501)	0.035	0.035
40	3.33	0.17	0.070	(0.499)	0.035	0.035
41	3.42	0.17	0.070	(0.497)	0.035	0.035
42	3.50	0.17	0.070	(0.495)	0.035	0.035
43	3.58	0.17	0.070	(0.493)	0.035	0.035
44	3.67	0.17	0.070	(0.491)	0.035	0.035
45	3.75	0.17	0.070	(0.488)	0.035	0.035
46	3.83	0.20	0.084	(0.486)	0.042	0.042
47	3.92	0.20	0.084	(0.484)	0.042	0.042
48	4.00	0.20	0.084	(0.482)	0.042	0.042
49	4.08	0.20	0.084	(0.480)	0.042	0.042
50	4.17	0.20	0.084	(0.478)	0.042	0.042
51	4.25	0.20	0.084	(0.476)	0.042	0.042
52	4.33	0.23	0.098	(0.474)	0.049	0.049
53	4.42	0.23	0.098	(0.472)	0.049	0.049
54	4.50	0.23	0.098	(0.470)	0.049	0.049
55	4.58	0.23	0.098	(0.468)	0.049	0.049
56	4.67	0.23	0.098	(0.466)	0.049	0.049
57	4.75	0.23	0.098	(0.464)	0.049	0.049

58	4.83	0.27	0.112	(0.462)	0.056	0.056
59	4.92	0.27	0.112	(0.460)	0.056	0.056
60	5.00	0.27	0.112	(0.458)	0.056	0.056
61	5.08	0.20	0.084	(0.456)	0.042	0.042
62	5.17	0.20	0.084	(0.454)	0.042	0.042
63	5.25	0.20	0.084	(0.452)	0.042	0.042
64	5.33	0.23	0.098	(0.450)	0.049	0.049
65	5.42	0.23	0.098	(0.448)	0.049	0.049
66	5.50	0.23	0.098	(0.446)	0.049	0.049
67	5.58	0.27	0.112	(0.444)	0.056	0.056
68	5.67	0.27	0.112	(0.442)	0.056	0.056
69	5.75	0.27	0.112	(0.440)	0.056	0.056
70	5.83	0.27	0.112	(0.438)	0.056	0.056
71	5.92	0.27	0.112	(0.436)	0.056	0.056
72	6.00	0.27	0.112	(0.435)	0.056	0.056
73	6.08	0.30	0.127	(0.433)	0.063	0.063
74	6.17	0.30	0.127	(0.431)	0.063	0.063
75	6.25	0.30	0.127	(0.429)	0.063	0.063
76	6.33	0.30	0.127	(0.427)	0.063	0.063
77	6.42	0.30	0.127	(0.425)	0.063	0.063
78	6.50	0.30	0.127	(0.423)	0.063	0.063
79	6.58	0.33	0.141	(0.421)	0.070	0.070
80	6.67	0.33	0.141	(0.419)	0.070	0.070
81	6.75	0.33	0.141	(0.417)	0.070	0.070
82	6.83	0.33	0.141	(0.415)	0.070	0.070
83	6.92	0.33	0.141	(0.414)	0.070	0.070
84	7.00	0.33	0.141	(0.412)	0.070	0.070
85	7.08	0.33	0.141	(0.410)	0.070	0.070
86	7.17	0.33	0.141	(0.408)	0.070	0.070
87	7.25	0.33	0.141	(0.406)	0.070	0.070
88	7.33	0.37	0.155	(0.404)	0.077	0.077
89	7.42	0.37	0.155	(0.402)	0.077	0.077
90	7.50	0.37	0.155	(0.401)	0.077	0.077
91	7.58	0.40	0.169	(0.399)	0.084	0.084
92	7.67	0.40	0.169	(0.397)	0.084	0.084
93	7.75	0.40	0.169	(0.395)	0.084	0.084
94	7.83	0.43	0.183	(0.393)	0.091	0.091
95	7.92	0.43	0.183	(0.391)	0.091	0.091
96	8.00	0.43	0.183	(0.390)	0.091	0.091
97	8.08	0.50	0.211	(0.388)	0.105	0.105
98	8.17	0.50	0.211	(0.386)	0.105	0.105
99	8.25	0.50	0.211	(0.384)	0.105	0.105
100	8.33	0.50	0.211	(0.382)	0.105	0.105
101	8.42	0.50	0.211	(0.381)	0.105	0.105
102	8.50	0.50	0.211	(0.379)	0.105	0.105
103	8.58	0.53	0.225	(0.377)	0.112	0.112
104	8.67	0.53	0.225	(0.375)	0.112	0.112
105	8.75	0.53	0.225	(0.373)	0.112	0.112
106	8.83	0.57	0.239	(0.372)	0.120	0.120
107	8.92	0.57	0.239	(0.370)	0.120	0.120
108	9.00	0.57	0.239	(0.368)	0.120	0.120
109	9.08	0.63	0.267	(0.366)	0.134	0.134
110	9.17	0.63	0.267	(0.365)	0.134	0.134
111	9.25	0.63	0.267	(0.363)	0.134	0.134

112	9.33	0.67	0.281	(0.361)	0.141	0.141
113	9.42	0.67	0.281	(0.360)	0.141	0.141
114	9.50	0.67	0.281	(0.358)	0.141	0.141
115	9.58	0.70	0.295	(0.356)	0.148	0.148
116	9.67	0.70	0.295	(0.354)	0.148	0.148
117	9.75	0.70	0.295	(0.353)	0.148	0.148
118	9.83	0.73	0.309	(0.351)	0.155	0.155
119	9.92	0.73	0.309	(0.349)	0.155	0.155
120	10.00	0.73	0.309	(0.348)	0.155	0.155
121	10.08	0.50	0.211	(0.346)	0.105	0.105
122	10.17	0.50	0.211	(0.344)	0.105	0.105
123	10.25	0.50	0.211	(0.343)	0.105	0.105
124	10.33	0.50	0.211	(0.341)	0.105	0.105
125	10.42	0.50	0.211	(0.339)	0.105	0.105
126	10.50	0.50	0.211	(0.338)	0.105	0.105
127	10.58	0.67	0.281	(0.336)	0.141	0.141
128	10.67	0.67	0.281	(0.334)	0.141	0.141
129	10.75	0.67	0.281	(0.333)	0.141	0.141
130	10.83	0.67	0.281	(0.331)	0.141	0.141
131	10.92	0.67	0.281	(0.329)	0.141	0.141
132	11.00	0.67	0.281	(0.328)	0.141	0.141
133	11.08	0.63	0.267	(0.326)	0.134	0.134
134	11.17	0.63	0.267	(0.325)	0.134	0.134
135	11.25	0.63	0.267	(0.323)	0.134	0.134
136	11.33	0.63	0.267	(0.321)	0.134	0.134
137	11.42	0.63	0.267	(0.320)	0.134	0.134
138	11.50	0.63	0.267	(0.318)	0.134	0.134
139	11.58	0.57	0.239	(0.317)	0.120	0.120
140	11.67	0.57	0.239	(0.315)	0.120	0.120
141	11.75	0.57	0.239	(0.314)	0.120	0.120
142	11.83	0.60	0.253	(0.312)	0.127	0.127
143	11.92	0.60	0.253	(0.310)	0.127	0.127
144	12.00	0.60	0.253	(0.309)	0.127	0.127
145	12.08	0.83	0.352	(0.307)	0.176	0.176
146	12.17	0.83	0.352	(0.306)	0.176	0.176
147	12.25	0.83	0.352	(0.304)	0.176	0.176
148	12.33	0.87	0.366	(0.303)	0.183	0.183
149	12.42	0.87	0.366	(0.301)	0.183	0.183
150	12.50	0.87	0.366	(0.300)	0.183	0.183
151	12.58	0.93	0.394	(0.298)	0.197	0.197
152	12.67	0.93	0.394	(0.297)	0.197	0.197
153	12.75	0.93	0.394	(0.295)	0.197	0.197
154	12.83	0.97	0.408	(0.294)	0.204	0.204
155	12.92	0.97	0.408	(0.292)	0.204	0.204
156	13.00	0.97	0.408	(0.291)	0.204	0.204
157	13.08	1.13	0.478	(0.289)	0.239	0.239
158	13.17	1.13	0.478	(0.288)	0.239	0.239
159	13.25	1.13	0.478	(0.286)	0.239	0.239
160	13.33	1.13	0.478	(0.285)	0.239	0.239
161	13.42	1.13	0.478	(0.283)	0.239	0.239
162	13.50	1.13	0.478	(0.282)	0.239	0.239
163	13.58	0.77	0.323	(0.281)	0.162	0.162
164	13.67	0.77	0.323	(0.279)	0.162	0.162
165	13.75	0.77	0.323	(0.278)	0.162	0.162

166	13.83	0.77	0.323	(0.276)	0.162	0.162
167	13.92	0.77	0.323	(0.275)	0.162	0.162
168	14.00	0.77	0.323	(0.273)	0.162	0.162
169	14.08	0.90	0.380	(0.272)	0.190	0.190
170	14.17	0.90	0.380	(0.271)	0.190	0.190
171	14.25	0.90	0.380	(0.269)	0.190	0.190
172	14.33	0.87	0.366	(0.268)	0.183	0.183
173	14.42	0.87	0.366	(0.267)	0.183	0.183
174	14.50	0.87	0.366	(0.265)	0.183	0.183
175	14.58	0.87	0.366	(0.264)	0.183	0.183
176	14.67	0.87	0.366	(0.262)	0.183	0.183
177	14.75	0.87	0.366	(0.261)	0.183	0.183
178	14.83	0.83	0.352	(0.260)	0.176	0.176
179	14.92	0.83	0.352	(0.258)	0.176	0.176
180	15.00	0.83	0.352	(0.257)	0.176	0.176
181	15.08	0.80	0.337	(0.256)	0.169	0.169
182	15.17	0.80	0.337	(0.254)	0.169	0.169
183	15.25	0.80	0.337	(0.253)	0.169	0.169
184	15.33	0.77	0.323	(0.252)	0.162	0.162
185	15.42	0.77	0.323	(0.251)	0.162	0.162
186	15.50	0.77	0.323	(0.249)	0.162	0.162
187	15.58	0.63	0.267	(0.248)	0.134	0.134
188	15.67	0.63	0.267	(0.247)	0.134	0.134
189	15.75	0.63	0.267	(0.245)	0.134	0.134
190	15.83	0.63	0.267	(0.244)	0.134	0.134
191	15.92	0.63	0.267	(0.243)	0.134	0.134
192	16.00	0.63	0.267	(0.242)	0.134	0.134
193	16.08	0.13	0.056	(0.241)	0.028	0.028
194	16.17	0.13	0.056	(0.239)	0.028	0.028
195	16.25	0.13	0.056	(0.238)	0.028	0.028
196	16.33	0.13	0.056	(0.237)	0.028	0.028
197	16.42	0.13	0.056	(0.236)	0.028	0.028
198	16.50	0.13	0.056	(0.234)	0.028	0.028
199	16.58	0.10	0.042	(0.233)	0.021	0.021
200	16.67	0.10	0.042	(0.232)	0.021	0.021
201	16.75	0.10	0.042	(0.231)	0.021	0.021
202	16.83	0.10	0.042	(0.230)	0.021	0.021
203	16.92	0.10	0.042	(0.229)	0.021	0.021
204	17.00	0.10	0.042	(0.227)	0.021	0.021
205	17.08	0.17	0.070	(0.226)	0.035	0.035
206	17.17	0.17	0.070	(0.225)	0.035	0.035
207	17.25	0.17	0.070	(0.224)	0.035	0.035
208	17.33	0.17	0.070	(0.223)	0.035	0.035
209	17.42	0.17	0.070	(0.222)	0.035	0.035
210	17.50	0.17	0.070	(0.221)	0.035	0.035
211	17.58	0.17	0.070	(0.220)	0.035	0.035
212	17.67	0.17	0.070	(0.218)	0.035	0.035
213	17.75	0.17	0.070	(0.217)	0.035	0.035
214	17.83	0.13	0.056	(0.216)	0.028	0.028
215	17.92	0.13	0.056	(0.215)	0.028	0.028
216	18.00	0.13	0.056	(0.214)	0.028	0.028
217	18.08	0.13	0.056	(0.213)	0.028	0.028
218	18.17	0.13	0.056	(0.212)	0.028	0.028
219	18.25	0.13	0.056	(0.211)	0.028	0.028

220	18.33	0.13	0.056	(0.210)	0.028	0.028
221	18.42	0.13	0.056	(0.209)	0.028	0.028
222	18.50	0.13	0.056	(0.208)	0.028	0.028
223	18.58	0.10	0.042	(0.207)	0.021	0.021
224	18.67	0.10	0.042	(0.206)	0.021	0.021
225	18.75	0.10	0.042	(0.205)	0.021	0.021
226	18.83	0.07	0.028	(0.204)	0.014	0.014
227	18.92	0.07	0.028	(0.203)	0.014	0.014
228	19.00	0.07	0.028	(0.202)	0.014	0.014
229	19.08	0.10	0.042	(0.201)	0.021	0.021
230	19.17	0.10	0.042	(0.200)	0.021	0.021
231	19.25	0.10	0.042	(0.199)	0.021	0.021
232	19.33	0.13	0.056	(0.198)	0.028	0.028
233	19.42	0.13	0.056	(0.197)	0.028	0.028
234	19.50	0.13	0.056	(0.196)	0.028	0.028
235	19.58	0.10	0.042	(0.196)	0.021	0.021
236	19.67	0.10	0.042	(0.195)	0.021	0.021
237	19.75	0.10	0.042	(0.194)	0.021	0.021
238	19.83	0.07	0.028	(0.193)	0.014	0.014
239	19.92	0.07	0.028	(0.192)	0.014	0.014
240	20.00	0.07	0.028	(0.191)	0.014	0.014
241	20.08	0.10	0.042	(0.190)	0.021	0.021
242	20.17	0.10	0.042	(0.189)	0.021	0.021
243	20.25	0.10	0.042	(0.189)	0.021	0.021
244	20.33	0.10	0.042	(0.188)	0.021	0.021
245	20.42	0.10	0.042	(0.187)	0.021	0.021
246	20.50	0.10	0.042	(0.186)	0.021	0.021
247	20.58	0.10	0.042	(0.185)	0.021	0.021
248	20.67	0.10	0.042	(0.185)	0.021	0.021
249	20.75	0.10	0.042	(0.184)	0.021	0.021
250	20.83	0.07	0.028	(0.183)	0.014	0.014
251	20.92	0.07	0.028	(0.182)	0.014	0.014
252	21.00	0.07	0.028	(0.182)	0.014	0.014
253	21.08	0.10	0.042	(0.181)	0.021	0.021
254	21.17	0.10	0.042	(0.180)	0.021	0.021
255	21.25	0.10	0.042	(0.180)	0.021	0.021
256	21.33	0.07	0.028	(0.179)	0.014	0.014
257	21.42	0.07	0.028	(0.178)	0.014	0.014
258	21.50	0.07	0.028	(0.178)	0.014	0.014
259	21.58	0.10	0.042	(0.177)	0.021	0.021
260	21.67	0.10	0.042	(0.176)	0.021	0.021
261	21.75	0.10	0.042	(0.176)	0.021	0.021
262	21.83	0.07	0.028	(0.175)	0.014	0.014
263	21.92	0.07	0.028	(0.174)	0.014	0.014
264	22.00	0.07	0.028	(0.174)	0.014	0.014
265	22.08	0.10	0.042	(0.173)	0.021	0.021
266	22.17	0.10	0.042	(0.173)	0.021	0.021
267	22.25	0.10	0.042	(0.172)	0.021	0.021
268	22.33	0.07	0.028	(0.172)	0.014	0.014
269	22.42	0.07	0.028	(0.171)	0.014	0.014
270	22.50	0.07	0.028	(0.171)	0.014	0.014
271	22.58	0.07	0.028	(0.170)	0.014	0.014
272	22.67	0.07	0.028	(0.170)	0.014	0.014
273	22.75	0.07	0.028	(0.169)	0.014	0.014

274	22.83	0.07	0.028	(0.169)	0.014	0.014
275	22.92	0.07	0.028	(0.168)	0.014	0.014
276	23.00	0.07	0.028	(0.168)	0.014	0.014
277	23.08	0.07	0.028	(0.167)	0.014	0.014
278	23.17	0.07	0.028	(0.167)	0.014	0.014
279	23.25	0.07	0.028	(0.167)	0.014	0.014
280	23.33	0.07	0.028	(0.166)	0.014	0.014
281	23.42	0.07	0.028	(0.166)	0.014	0.014
282	23.50	0.07	0.028	(0.166)	0.014	0.014
283	23.58	0.07	0.028	(0.166)	0.014	0.014
284	23.67	0.07	0.028	(0.165)	0.014	0.014
285	23.75	0.07	0.028	(0.165)	0.014	0.014
286	23.83	0.07	0.028	(0.165)	0.014	0.014
287	23.92	0.07	0.028	(0.165)	0.014	0.014
288	24.00	0.07	0.028	(0.165)	0.014	0.014

(Loss Rate Not Used)

Sum = 100.0

Sum = 21.1

Flood volume = Effective rainfall 1.76(In)
times area 17.2(Ac.)/[(In)/(Ft.)] = 2.5(Ac.Ft)
Total soil loss = 1.76(In)
Total soil loss = 2.519(Ac.Ft)
Total rainfall = 3.52(In)
Flood volume = 109736.1 Cubic Feet
Total soil loss = 109736.1 Cubic Feet

Peak flow rate of this hydrograph = 4.146(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0008	0.11	Q				
0+10	0.0022	0.21	Q				
0+15	0.0039	0.23	Q				
0+20	0.0059	0.30	VQ				
0+25	0.0083	0.35	VQ				
0+30	0.0108	0.36	VQ				
0+35	0.0133	0.37	VQ				
0+40	0.0159	0.37	VQ				
0+45	0.0184	0.37	VQ				
0+50	0.0213	0.42	VQ				
0+55	0.0245	0.47	VQ				
1+ 0	0.0279	0.48	VQ				
1+ 5	0.0308	0.43	VQ				
1+10	0.0335	0.38	VQ				
1+15	0.0360	0.37	VQ				
1+20	0.0385	0.37	VQ				
1+25	0.0411	0.37	VQ				
1+30	0.0436	0.37	VQ				

1+35	0.0461	0.37	VQ
1+40	0.0486	0.37	VQ
1+45	0.0511	0.37	VQ
1+50	0.0540	0.42	VQ
1+55	0.0573	0.47	VQ
2+ 0	0.0606	0.48	VQ
2+ 5	0.0640	0.49	Q
2+10	0.0673	0.49	Q
2+15	0.0707	0.49	Q
2+20	0.0741	0.49	Q
2+25	0.0774	0.49	Q
2+30	0.0808	0.49	Q
2+35	0.0845	0.54	VQ
2+40	0.0886	0.59	VQ
2+45	0.0928	0.61	VQ
2+50	0.0970	0.61	VQ
2+55	0.1012	0.61	VQ
3+ 0	0.1054	0.61	VQ
3+ 5	0.1096	0.61	VQ
3+10	0.1138	0.61	VQ
3+15	0.1180	0.61	VQ
3+20	0.1222	0.61	VQ
3+25	0.1264	0.61	Q
3+30	0.1306	0.61	Q
3+35	0.1348	0.61	Q
3+40	0.1390	0.61	Q
3+45	0.1432	0.61	Q
3+50	0.1477	0.67	Q
3+55	0.1527	0.72	Q
4+ 0	0.1577	0.73	Q
4+ 5	0.1627	0.73	Q
4+10	0.1678	0.73	Q
4+15	0.1728	0.73	Q
4+20	0.1782	0.79	VQ
4+25	0.1840	0.84	VQ
4+30	0.1898	0.85	Q
4+35	0.1957	0.85	Q
4+40	0.2016	0.85	Q
4+45	0.2075	0.85	Q
4+50	0.2137	0.91	Q
4+55	0.2204	0.96	Q
5+ 0	0.2270	0.97	Q
5+ 5	0.2330	0.86	Q
5+10	0.2382	0.76	Q
5+15	0.2433	0.74	QV
5+20	0.2488	0.79	Q
5+25	0.2545	0.84	QV
5+30	0.2604	0.85	QV
5+35	0.2666	0.91	QV
5+40	0.2733	0.96	QV
5+45	0.2799	0.97	QV
5+50	0.2867	0.98	QV
5+55	0.2934	0.98	QV
6+ 0	0.3001	0.98	QV

6+ 5	0.3072	1.03	Q				
6+10	0.3147	1.08	Q				
6+15	0.3222	1.09	QV				
6+20	0.3297	1.10	QV				
6+25	0.3373	1.10	QV				
6+30	0.3448	1.10	QV				
6+35	0.3528	1.15	QV				
6+40	0.3611	1.20	QV				
6+45	0.3695	1.21	QV				
6+50	0.3778	1.22	QV				
6+55	0.3862	1.22	Q V				
7+ 0	0.3946	1.22	Q V				
7+ 5	0.4030	1.22	Q V				
7+10	0.4114	1.22	Q V				
7+15	0.4198	1.22	Q V				
7+20	0.4286	1.27	QV				
7+25	0.4377	1.33	QV				
7+30	0.4470	1.34	Q V				
7+35	0.4566	1.40	Q V				
7+40	0.4665	1.45	Q V				
7+45	0.4766	1.46	Q V				
7+50	0.4871	1.52	QV				
7+55	0.4979	1.57	QV				
8+ 0	0.5088	1.58	Q V				
8+ 5	0.5204	1.70	Q V				
8+10	0.5328	1.80	QV				
8+15	0.5454	1.82	QV				
8+20	0.5580	1.83	QV				
8+25	0.5705	1.83	Q V				
8+30	0.5831	1.83	Q V				
8+35	0.5961	1.88	Q V				
8+40	0.6095	1.94	Q V				
8+45	0.6229	1.95	Q V				
8+50	0.6367	2.01	Q V				
8+55	0.6509	2.06	Q V				
9+ 0	0.6651	2.07	Q V				
9+ 5	0.6801	2.18	Q V				
9+10	0.6959	2.29	Q V				
9+15	0.7118	2.31	Q V				
9+20	0.7281	2.37	Q V				
9+25	0.7448	2.42	Q V				
9+30	0.7616	2.43	Q V				
9+35	0.7787	2.49	Q V				
9+40	0.7963	2.55	Q V				
9+45	0.8139	2.56	Q V				
9+50	0.8319	2.62	Q V				
9+55	0.8503	2.67	Q V				
10+ 0	0.8687	2.68	Q V				
10+ 5	0.8845	2.29	Q V				
10+10	0.8978	1.93	Q V				
10+15	0.9106	1.86	Q V				
10+20	0.9232	1.83	Q V				
10+25	0.9358	1.83	Q V				
10+30	0.9484	1.83	Q V				

10+35	0.9629	2.11	Q	V		
10+40	0.9792	2.37	Q	V		
10+45	0.9959	2.42	Q	V		
10+50	1.0127	2.44	Q	V		
10+55	1.0294	2.44	Q	V		
11+ 0	1.0462	2.44	Q	V		
11+ 5	1.0627	2.38	Q	V		
11+10	1.0787	2.33	Q	V		
11+15	1.0947	2.32	Q	V		
11+20	1.1107	2.32	Q	V		
11+25	1.1266	2.32	Q	V		
11+30	1.1426	2.32	Q	V		
11+35	1.1578	2.21	Q	V		
11+40	1.1722	2.10	Q	V		
11+45	1.1866	2.08	Q	V		
11+50	1.2012	2.13	Q	V		
11+55	1.2162	2.18	Q	V		
12+ 0	1.2313	2.19	Q	V		
12+ 5	1.2491	2.58	Q	V		
12+10	1.2694	2.95	Q	V		
12+15	1.2902	3.02	Q	V		
12+20	1.3115	3.10	Q	V		
12+25	1.3333	3.16	Q	V		
12+30	1.3551	3.17	Q	V		
12+35	1.3777	3.28	Q	V		
12+40	1.4010	3.38	Q	V		
12+45	1.4244	3.40	Q	V		
12+50	1.4483	3.47	Q	V		
12+55	1.4726	3.52	Q	V		
13+ 0	1.4969	3.53	Q	V		
13+ 5	1.5232	3.81	Q	V		
13+10	1.5512	4.07	Q	V		
13+15	1.5796	4.12	Q	V		
13+20	1.6081	4.15	Q	V		
13+25	1.6367	4.15	Q	V		
13+30	1.6652	4.15	Q	V		
13+35	1.6896	3.54	Q	V		
13+40	1.7100	2.97	Q	V		
13+45	1.7297	2.85	Q	V		
13+50	1.7490	2.80	Q	V		
13+55	1.7683	2.80	Q	V		
14+ 0	1.7876	2.80	Q	V		
14+ 5	1.8085	3.03	Q	V		
14+10	1.8307	3.23	Q	V		
14+15	1.8533	3.27	Q	V		
14+20	1.8756	3.24	Q	V		
14+25	1.8975	3.18	Q	V		
14+30	1.9194	3.17	Q	V		
14+35	1.9412	3.17	Q	V		
14+40	1.9630	3.17	Q	V		
14+45	1.9849	3.17	Q	V		
14+50	2.0063	3.11	Q	V		
14+55	2.0274	3.06	Q	V		
15+ 0	2.0484	3.05	Q	V		

15+ 5	2.0691	2.99			Q		V
15+10	2.0893	2.94			Q		V
15+15	2.1095	2.93			Q		V
15+20	2.1293	2.87			Q		V
15+25	2.1487	2.82			Q		V
15+30	2.1680	2.81			Q		V
15+35	2.1858	2.58			Q		V
15+40	2.2022	2.38			Q		V
15+45	2.2183	2.33			Q		V
15+50	2.2342	2.32			Q		V
15+55	2.2502	2.32			Q		V
16+ 0	2.2661	2.32			Q		V
16+ 5	2.2764	1.49		Q			V
16+10	2.2812	0.71	Q				V
16+15	2.2851	0.56	Q				V
16+20	2.2884	0.49	Q				V
16+25	2.2918	0.49	Q				V
16+30	2.2951	0.49	Q				V
16+35	2.2981	0.43	Q				V
16+40	2.3007	0.38	Q				V
16+45	2.3033	0.37	Q				V
16+50	2.3058	0.37	Q				V
16+55	2.3083	0.37	Q				V
17+ 0	2.3108	0.37	Q				V
17+ 5	2.3141	0.48	Q				V
17+10	2.3181	0.58	Q				V
17+15	2.3223	0.60	Q				V
17+20	2.3265	0.61	Q				V
17+25	2.3307	0.61	Q				V
17+30	2.3349	0.61	Q				V
17+35	2.3391	0.61	Q				V
17+40	2.3433	0.61	Q				V
17+45	2.3475	0.61	Q				V
17+50	2.3513	0.55	Q				V
17+55	2.3547	0.50	Q				V
18+ 0	2.3581	0.49	Q				V
18+ 5	2.3615	0.49	Q				V
18+10	2.3648	0.49	Q				V
18+15	2.3682	0.49	Q				V
18+20	2.3716	0.49	Q				V
18+25	2.3749	0.49	Q				V
18+30	2.3783	0.49	Q				V
18+35	2.3813	0.43	Q				V
18+40	2.3839	0.38	Q				V
18+45	2.3864	0.37	Q				V
18+50	2.3886	0.31	Q				V
18+55	2.3903	0.26	Q				V
19+ 0	2.3921	0.25	Q				V
19+ 5	2.3941	0.30	Q				V
19+10	2.3965	0.35	Q				V
19+15	2.3990	0.36	Q				V
19+20	2.4019	0.42	Q				V
19+25	2.4052	0.47	Q				V
19+30	2.4085	0.48	Q				V

19+35	2.4115	0.43	Q				V
19+40	2.4141	0.38	Q				V
19+45	2.4167	0.37	Q				V
19+50	2.4188	0.31	Q				V
19+55	2.4206	0.26	Q				V
20+ 0	2.4223	0.25	Q				V
20+ 5	2.4243	0.30	Q				V
20+10	2.4268	0.35	Q				V
20+15	2.4292	0.36	Q				V
20+20	2.4318	0.37	Q				V
20+25	2.4343	0.37	Q				V
20+30	2.4368	0.37	Q				V
20+35	2.4393	0.37	Q				V
20+40	2.4418	0.37	Q				V
20+45	2.4444	0.37	Q				V
20+50	2.4465	0.31	Q				V
20+55	2.4483	0.26	Q				V
21+ 0	2.4500	0.25	Q				V
21+ 5	2.4521	0.30	Q				V
21+10	2.4545	0.35	Q				V
21+15	2.4570	0.36	Q				V
21+20	2.4591	0.31	Q				V
21+25	2.4609	0.26	Q				V
21+30	2.4626	0.25	Q				V
21+35	2.4646	0.30	Q				V
21+40	2.4671	0.35	Q				V
21+45	2.4696	0.36	Q				V
21+50	2.4717	0.31	Q				V
21+55	2.4735	0.26	Q				V
22+ 0	2.4752	0.25	Q				V
22+ 5	2.4772	0.30	Q				V
22+10	2.4797	0.35	Q				V
22+15	2.4822	0.36	Q				V
22+20	2.4843	0.31	Q				V
22+25	2.4861	0.26	Q				V
22+30	2.4878	0.25	Q				V
22+35	2.4895	0.24	Q				V
22+40	2.4911	0.24	Q				V
22+45	2.4928	0.24	Q				V
22+50	2.4945	0.24	Q				V
22+55	2.4962	0.24	Q				V
23+ 0	2.4979	0.24	Q				V
23+ 5	2.4995	0.24	Q				V
23+10	2.5012	0.24	Q				V
23+15	2.5029	0.24	Q				V
23+20	2.5046	0.24	Q				V
23+25	2.5063	0.24	Q				V
23+30	2.5079	0.24	Q				V
23+35	2.5096	0.24	Q				V
23+40	2.5113	0.24	Q				V
23+45	2.5130	0.24	Q				V
23+50	2.5147	0.24	Q				V
23+55	2.5163	0.24	Q				V
24+ 0	2.5180	0.24	Q				V

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Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786cdEV110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	0.58	9.98

100 YEAR Area rainfall data:

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

17.20

1.45

24.94

STORM EVENT (YEAR) = 10.00
 Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)
 Areal adjustment factor = 99.98 %
 Adjusted average point rain = 0.938(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.186	0.052
69.0	69.0	0.373	0.500	0.205	0.814	0.167
Sum (F) =						0.219

Area averaged mean soil loss (F) (In/Hr) = 0.219

Minimum soil loss rate ((In/Hr)) = 0.110

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

 Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
 VALLEY S-Curve

 Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	212.058	7.872
2	0.167	424.117	7.373
3	0.250	636.175	1.443
4	0.333	848.233	0.647
Sum = 100.000		Sum=	17.334

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	0.08	4.40	0.495	0.219 (0.248)	0.276

2	0.17	4.50	0.506	0.219	(0.253)	0.287
3	0.25	5.40	0.608	0.219	(0.304)	0.389
4	0.33	5.40	0.608	0.219	(0.304)	0.389
5	0.42	5.70	0.641	0.219	(0.321)	0.422
6	0.50	6.40	0.720	0.219	(0.360)	0.501
7	0.58	7.90	0.889	0.219	(0.445)	0.670
8	0.67	9.10	1.024	0.219	(0.512)	0.805
9	0.75	12.80	1.440	0.219	(0.720)	1.221
10	0.83	25.60	2.881	0.219	(1.440)	2.662
11	0.92	7.90	0.889	0.219	(0.445)	0.670
12	1.00	4.90	0.551	0.219	(0.276)	0.332

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.6

Flood volume = Effective rainfall 0.72(In)

times area 17.2(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)

Total soil loss = 0.22(In)

Total soil loss = 0.314(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 44867.6 Cubic Feet

Total soil loss = 13683.5 Cubic Feet

Peak flow rate of this hydrograph = 31.567(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0150	2.17	V Q					
0+10	0.0446	4.30	V Q					
0+15	0.0830	5.58	V Q					
0+20	0.1279	6.52	V Q					
0+25	0.1757	6.94	Q					
0+30	0.2299	7.87	QV					
0+35	0.2976	9.83	Q V					
0+40	0.3822	12.28	Q V					
0+45	0.4982	16.85	Q V					
0+50	0.7156	31.57					V	Q
0+55	0.9029	27.19					Q	V
1+ 0	0.9868	12.19			Q			V
1+ 5	1.0222	5.14	Q					V
1+10	1.0285	0.91	Q					V
1+15	1.0300	0.21	Q					V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786cdEV310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 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]
17.20	0.98	16.86

100 YEAR Area rainfall data:

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

17.20

2.48

42.66

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.597(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.186	0.052
69.0	69.0	0.373	0.500	0.205	0.814	0.167
Sum (F) =						0.219

Area averaged mean soil loss (F) (In/Hr) = 0.219

Minimum soil loss rate ((In/Hr)) = 0.110

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.500

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	212.058	45.410	7.872
2 0.167	424.117	42.535	7.373
3 0.250	636.175	8.324	1.443
4 0.333	848.233	3.731	0.647
Sum = 100.000		Sum=	17.334

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 0.08	1.30	0.249	(0.219)	0.125
2 0.17	1.30	0.249	(0.219)	0.125
3 0.25	1.10	0.211	(0.219)	0.105

4	0.33	1.50	0.287	(0.219)	0.144	0.144
5	0.42	1.50	0.287	(0.219)	0.144	0.144
6	0.50	1.80	0.345	(0.219)	0.172	0.172
7	0.58	1.50	0.287	(0.219)	0.144	0.144
8	0.67	1.80	0.345	(0.219)	0.172	0.172
9	0.75	1.80	0.345	(0.219)	0.172	0.172
10	0.83	1.50	0.287	(0.219)	0.144	0.144
11	0.92	1.60	0.307	(0.219)	0.153	0.153
12	1.00	1.80	0.345	(0.219)	0.172	0.172
13	1.08	2.20	0.422	(0.219)	0.211	0.211
14	1.17	2.20	0.422	(0.219)	0.211	0.211
15	1.25	2.20	0.422	(0.219)	0.211	0.211
16	1.33	2.00	0.383	(0.219)	0.192	0.192
17	1.42	2.60	0.498	0.219 (0.249)		0.279
18	1.50	2.70	0.517	0.219 (0.259)		0.298
19	1.58	2.40	0.460	0.219 (0.230)		0.241
20	1.67	2.70	0.517	0.219 (0.259)		0.298
21	1.75	3.30	0.632	0.219 (0.316)		0.413
22	1.83	3.10	0.594	0.219 (0.297)		0.375
23	1.92	2.90	0.556	0.219 (0.278)		0.337
24	2.00	3.00	0.575	0.219 (0.287)		0.356
25	2.08	3.10	0.594	0.219 (0.297)		0.375
26	2.17	4.20	0.805	0.219 (0.402)		0.586
27	2.25	5.00	0.958	0.219 (0.479)		0.739
28	2.33	3.50	0.671	0.219 (0.335)		0.452
29	2.42	6.80	1.303	0.219 (0.652)		1.084
30	2.50	7.30	1.399	0.219 (0.699)		1.180
31	2.58	8.20	1.571	0.219 (0.786)		1.352
32	2.67	5.90	1.131	0.219 (0.565)		0.912
33	2.75	2.00	0.383	(0.219)	0.192	0.192
34	2.83	1.80	0.345	(0.219)	0.172	0.172
35	2.92	1.80	0.345	(0.219)	0.172	0.172
36	3.00	0.60	0.115	(0.219)	0.057	0.057

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.5

Flood volume = Effective rainfall 1.04(In)

times area 17.2(Ac.)/[(In)/(Ft.)) = 1.5(Ac.Ft)

Total soil loss = 0.56(In)

Total soil loss = 0.800(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 64863.4 Cubic Feet

Total soil loss = 34846.4 Cubic Feet

Peak flow rate of this hydrograph = 21.211(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m) Volume Ac.Ft Q(CFS) 0 7.5 15.0 22.5 30.0

2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890	1889	1888	1887	1886	1885	1884	1883	1882	1881	1880	1879	1878	1877	1876	1875	1874	1873	1872	1871	1870	1869	1868	1867	1866	1865	1864	1863	1862	1861	1860	1859	1858	1857	1856	1855	1854	1853	1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598	1597	1596	1595	1594	1593	1592	1591	1590	1589	1588	1587	1586	1585	1584	1583	1582	1581	1580	1579	1578	1577	1576	1575	1574	1573	1572	1571	1570	1569	1568	1567	1566	1565	1564	1563	1562	1561	1560	1559	1558	1557	1556	1555	1554	1553	1552	1551	1550	1549	1548	1547	1546	1545	1544	1543	1542	1541	1540	1539	1538	1537	1536	1535	1534	1533	1532	1531	1530	1529	1528	1527	1526	1525	1524	1523	1522	1521	1520	1519	1518	1517	1516	1515	1514	1513	1512	1511	1510	1509	1508	1507	1506	1505	1504	1503	1502	1501	1500	1499	1498	1497	1496	1495	1494	1493	1492	1491	1490	1489	1488	1487	1486	1485	1484	1483	1482	1481	1480	1479	1478	1477	1476	1475	1474	1473	1472	1471	1470	1469	1468	1467	1466	1465	1464	1463	1462	1461	1460	1459	1458	1457	1456	1455	1454	1453	1452	1451	1450	1449	1448	1447	1446	1445	1444	1443	1442	1441	1440	1439	1438	1437	1436	1435	1434	1433	1432	1431	1430	1429	1428	1427	1426	1425	1424	1423	1422	1421	1420	1419	1418	1417	1416	1415	1414	1413	1412	1411	1410	1409	1408	1407	1406	1405	1404	1403	1402	1401	1400	1399	1398	1397	1396	1395	1394	1393	1392	1391	1390	1389	1388	1387	1386	1385	1384	1383	1382	1381	1380	1379	1378	1377	1376	1375	1374	1373	1372	1371	1370	1369	1368	1367	1366	1365	1364	1363	1362	1361	1360	1359	1358	1357	1356	1355	1354	1353	1352	1351	1350	1349	1348	1347	1346	1345	1344	1343	1342	1341	1340	1339	1338	1337	1336	1335	1334	1333	1332	1331	1330	1329	1328	1327	1326	1325	1324	1323	1322	1321	1320	1319	1318	1317	1316	1315	1314	1313	1312	1311	1310	1309	1308	1307	1306	1305	1304	1303	1302	1301	1300	1299	1298	1297	1296	1295	1294	1293	1292	1291	1290	1289	1288	1287	1286	1285	1284	1283	1282	1281	1280	1279	1278	1277	1276	1275	1274	1273	1272	1271	1270	1269	1268	1267	1266	1265	1264	1263	1262	1261	1260	1259	1258	1257	1256	1255	1254	1253	1252	1251	1250	1249	1248	1247	1246	1245	1244	1243	1242	1241	1240	1239	1238	1237	1236	1235	1234	1233	1232	1231	1230	1229	1228	1227	1226	1225	1224	1223	1222	1221	1220	1219	1218	1217	1216	1215	1214	1213	1212	1211	1210	1209	1208	1207	1206	1205	1204	1203	1202	1201	1200	1199	1198	1197	1196	1195	1194	1193	1192	1191	1190	1189	1188	1187	1186	1185	1184	1183	1182	1181	1180	1179	1178	1177	1176	1175	1174	1173	1172	1171	1170	1169	1168	1167	1166	1165	1164	1163	1162	1161	1160	1159	1158	1157	1156	1155	1154	1153	1152	1151	1150	1149	1148	1147	1146	1145	1144	1143	1142	1141	1140	1139	1138	1137	1136	1135	1134	1133	1132	1131	1130	1129	1128	1127	1126	1125	1124	1123	1122	1121	1120	1119	1118	1117	1116	1115	1114	1113	1112	1111	1110	1109	1108	1107	1106	1105	1104	1103	1102	1101	1100	1099	1098	1097	1096	1095	1094	1093	1092	1091	1090	1089	1088	1087	1086	1085	1084	1083	1082	1081	1080	1079	1078	1077	1076	1075	1074	1073	1072	1071	1070	1069	1068	1067	1066	1065	1064	1063	1062	1061	1060	1059	1058	1057	1056	1055	1054	1053	1052	1051	1050	1049	1048	1047	1046	1045	1044	1043	1042	1041	1040	1039	1038	1037	1036	1035	1034	1033	1032	1031	1030	1029	1028	1027	1026	1025	1024	1023	1022	1021	1020	1019	1018	1017	1016	1015	1014	1013	1012	1011	1010	1009	1008	1007	1006	1005	1004	1003	1002	1001	1000	999	998	997	996	995	994	993	992	991	990	989	988	987	986	985	984	983	982	981	980	979	978	977	976	975	974	973	972	971	970	969	968	967	966	965	964	963	962	961	960	959	958	957	956	955	954	953	952	951	950	949	948	947	946	945	944	943	942	941	940	939	938	937	936	935	934	933	932	931	930	929	928	927	926	925	924	923	922	921	920	919	918	917	916	915	914	913	912	911	910	909	908	907	906	905	904	903	902	901	900	899	898	897	896	895	894	893	892	891	890	889	888	887	886	885	884	883	882	881	880	879	878	877	876	875	874	873	872	871	870	869	868	867	866	865	864	863	862	861	860	859	858	857	856	855	854	853	852	851	850	849	848	847	846	845	844	843	842	841	840	839	838	837	836	835	834	833	832	831	830	829	828	827	826	825	824	823	822	821	820	819	818	817	816	815	814	813	812	811	810	809	808	807	806	805	804	803	802	801	800	799	798	797	796	795	794	793	792	791	790	789	788	787	786	785	784	783	782	781	780	779	778	777	776	775	774	773	772	771	770	769	768	767	766	765	764	763	762	761	760	759	758	757	756	755	754	753	752	751	750	749	748	747	746	745	744	743	742	741	740	739	738	737	736	735	734	733	732	731	730	729	728	727	726	725	724	723	722	721	720	719	718	717	716	715	714	713	712	711	710	709	708	707	706	705	704	703	702	701	700	699	698	697	696	695	694	693	692	691	690	689	688	687	686	685	684	683	682	681	680	679	678	677	676	675	674	673	672	671	670	669	668	667	666	665	664	663	662	661	660	659	658	657	656	655	654	653	652	651	650	649	648	647	646	645	644	643	642	641	640	639	638	637	636	635	634	633	632	631	630	629	628	627	626	625	624	623	622	621	620	619	618	617	616	615	614	613	612	611	610	609	608	607	606	605	604	603	602	601	600	599	598	597	5

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786cdEV610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	1.38	23.74

100 YEAR Area rainfall data:

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

17.20

3.48

59.86

STORM EVENT (YEAR) = 10.00
 Area Averaged 2-Year Rainfall = 1.380 (In)
 Area Averaged 100-Year Rainfall = 3.480 (In)

Point rain (area averaged) = 2.244 (In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 2.244 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.186	0.052
69.0	69.0	0.373	0.500	0.205	0.814	0.167
Sum (F) =						0.219

Area averaged mean soil loss (F) (In/Hr) = 0.219

Minimum soil loss rate ((In/Hr)) = 0.110

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.500

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	212.058	45.410	7.872
2 0.167	424.117	42.535	7.373
3 0.250	636.175	8.324	1.443
4 0.333	848.233	3.731	0.647
Sum = 100.000		Sum=	17.334

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 0.08	0.50	0.135	(0.219)	0.067
2 0.17	0.60	0.162	(0.219)	0.081
3 0.25	0.60	0.162	(0.219)	0.081

4	0.33	0.60	0.162	(0.219)	0.081	0.081
5	0.42	0.60	0.162	(0.219)	0.081	0.081
6	0.50	0.70	0.188	(0.219)	0.094	0.094
7	0.58	0.70	0.188	(0.219)	0.094	0.094
8	0.67	0.70	0.188	(0.219)	0.094	0.094
9	0.75	0.70	0.188	(0.219)	0.094	0.094
10	0.83	0.70	0.188	(0.219)	0.094	0.094
11	0.92	0.70	0.188	(0.219)	0.094	0.094
12	1.00	0.80	0.215	(0.219)	0.108	0.108
13	1.08	0.80	0.215	(0.219)	0.108	0.108
14	1.17	0.80	0.215	(0.219)	0.108	0.108
15	1.25	0.80	0.215	(0.219)	0.108	0.108
16	1.33	0.80	0.215	(0.219)	0.108	0.108
17	1.42	0.80	0.215	(0.219)	0.108	0.108
18	1.50	0.80	0.215	(0.219)	0.108	0.108
19	1.58	0.80	0.215	(0.219)	0.108	0.108
20	1.67	0.80	0.215	(0.219)	0.108	0.108
21	1.75	0.80	0.215	(0.219)	0.108	0.108
22	1.83	0.80	0.215	(0.219)	0.108	0.108
23	1.92	0.80	0.215	(0.219)	0.108	0.108
24	2.00	0.90	0.242	(0.219)	0.121	0.121
25	2.08	0.80	0.215	(0.219)	0.108	0.108
26	2.17	0.90	0.242	(0.219)	0.121	0.121
27	2.25	0.90	0.242	(0.219)	0.121	0.121
28	2.33	0.90	0.242	(0.219)	0.121	0.121
29	2.42	0.90	0.242	(0.219)	0.121	0.121
30	2.50	0.90	0.242	(0.219)	0.121	0.121
31	2.58	0.90	0.242	(0.219)	0.121	0.121
32	2.67	0.90	0.242	(0.219)	0.121	0.121
33	2.75	1.00	0.269	(0.219)	0.135	0.135
34	2.83	1.00	0.269	(0.219)	0.135	0.135
35	2.92	1.00	0.269	(0.219)	0.135	0.135
36	3.00	1.00	0.269	(0.219)	0.135	0.135
37	3.08	1.00	0.269	(0.219)	0.135	0.135
38	3.17	1.10	0.296	(0.219)	0.148	0.148
39	3.25	1.10	0.296	(0.219)	0.148	0.148
40	3.33	1.10	0.296	(0.219)	0.148	0.148
41	3.42	1.20	0.323	(0.219)	0.162	0.162
42	3.50	1.30	0.350	(0.219)	0.175	0.175
43	3.58	1.40	0.377	(0.219)	0.188	0.188
44	3.67	1.40	0.377	(0.219)	0.188	0.188
45	3.75	1.50	0.404	(0.219)	0.202	0.202
46	3.83	1.50	0.404	(0.219)	0.202	0.202
47	3.92	1.60	0.431	(0.219)	0.215	0.215
48	4.00	1.60	0.431	(0.219)	0.215	0.215
49	4.08	1.70	0.458	0.219	(0.229)	0.239
50	4.17	1.80	0.485	0.219	(0.242)	0.266
51	4.25	1.90	0.512	0.219	(0.256)	0.292
52	4.33	2.00	0.539	0.219	(0.269)	0.319
53	4.42	2.10	0.565	0.219	(0.283)	0.346
54	4.50	2.10	0.565	0.219	(0.283)	0.346
55	4.58	2.20	0.592	0.219	(0.296)	0.373
56	4.67	2.30	0.619	0.219	(0.310)	0.400
57	4.75	2.40	0.646	0.219	(0.323)	0.427

58	4.83	2.40	0.646	0.219	(0.323)	0.427
59	4.92	2.50	0.673	0.219	(0.337)	0.454
60	5.00	2.60	0.700	0.219	(0.350)	0.481
61	5.08	3.10	0.835	0.219	(0.417)	0.616
62	5.17	3.60	0.969	0.219	(0.485)	0.750
63	5.25	3.90	1.050	0.219	(0.525)	0.831
64	5.33	4.20	1.131	0.219	(0.565)	0.912
65	5.42	4.70	1.266	0.219	(0.633)	1.046
66	5.50	5.60	1.508	0.219	(0.754)	1.289
67	5.58	1.90	0.512	0.219	(0.256)	0.292
68	5.67	0.90	0.242	(0.219)	0.121	0.121
69	5.75	0.60	0.162	(0.219)	0.081	0.081
70	5.83	0.50	0.135	(0.219)	0.067	0.067
71	5.92	0.30	0.081	(0.219)	0.040	0.040
72	6.00	0.20	0.054	(0.219)	0.027	0.027

(Loss Rate Not Used)

Sum = 100.0

Sum = 16.4

Flood volume = Effective rainfall 1.37(In)
times area 17.2(Ac.)/[(In)/(Ft.)) = 2.0(Ac.Ft)
Total soil loss = 0.87(In)
Total soil loss = 1.253(Ac.Ft)
Total rainfall = 2.24(In)
Flood volume = 85507.4 Cubic Feet
Total soil loss = 54588.0 Cubic Feet

Peak flow rate of this hydrograph = 19.722(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0037	0.53	VQ				
0+10	0.0115	1.13	V Q				
0+15	0.0206	1.33	V Q				
0+20	0.0302	1.39	V Q				
0+25	0.0398	1.40	V Q				
0+30	0.0502	1.51	V Q				
0+35	0.0613	1.61	V Q				
0+40	0.0725	1.63	V Q				
0+45	0.0837	1.63	V Q				
0+50	0.0950	1.63	V Q				
0+55	0.1063	1.63	VQ				
1+ 0	0.1182	1.74	VQ				
1+ 5	0.1309	1.84	VQ				
1+10	0.1437	1.86	VQ				
1+15	0.1566	1.87	Q				
1+20	0.1694	1.87	Q				
1+25	0.1823	1.87	Q				
1+30	0.1952	1.87	Q				

1+35	0.2080	1.87	QV						
1+40	0.2209	1.87	QV						
1+45	0.2338	1.87	QV						
1+50	0.2466	1.87	Q V						
1+55	0.2595	1.87	Q V						
2+ 0	0.2731	1.97	Q V						
2+ 5	0.2866	1.97	Q V						
2+10	0.3004	1.99	Q V						
2+15	0.3147	2.08	Q V						
2+20	0.3291	2.09	Q V						
2+25	0.3436	2.10	Q V						
2+30	0.3581	2.10	Q V						
2+35	0.3725	2.10	Q V						
2+40	0.3870	2.10	Q V						
2+45	0.4022	2.21	Q V						
2+50	0.4181	2.31	Q V						
2+55	0.4341	2.33	Q V						
3+ 0	0.4502	2.33	Q V						
3+ 5	0.4663	2.33	Q V						
3+10	0.4831	2.44	Q V						
3+15	0.5006	2.54	Q V						
3+20	0.5182	2.56	Q V						
3+25	0.5366	2.67	Q V						
3+30	0.5565	2.88	Q V						
3+35	0.5778	3.10	Q V						
3+40	0.6001	3.23	Q V						
3+45	0.6233	3.37	Q V						
3+50	0.6472	3.47	Q V						
3+55	0.6720	3.60	Q V						
4+ 0	0.6975	3.71	Q V						
4+ 5	0.7245	3.91	Q V						
4+10	0.7541	4.30	Q V						
4+15	0.7868	4.75	Q V						
4+20	0.8227	5.21	Q V						
4+25	0.8618	5.68	Q V						
4+30	0.9026	5.93	Q V						
4+35	0.9453	6.20	Q V						
4+40	0.9910	6.63	Q V						
4+45	1.0397	7.08	Q V						
4+50	1.0902	7.33	Q V						
4+55	1.1426	7.60	Q V						
5+ 0	1.1979	8.03	Q V						
5+ 5	1.2621	9.33	Q V						
5+10	1.3409	11.44	Q V						
5+15	1.4323	13.28	Q V						
5+20	1.5342	14.79	Q V						
5+25	1.6489	16.65	Q V						
5+30	1.7847	19.72	Q V						
5+35	1.8805	13.91	Q V						
5+40	1.9194	5.65	Q V						
5+45	1.9386	2.79	Q V						
5+50	1.9488	1.49	Q V						
5+55	1.9558	1.01	Q V						
6+ 0	1.9603	0.66	Q V						

6+ 5	1.9624	0.30	Q				v
6+10	1.9629	0.07	Q				v
6+15	1.9630	0.02	Q				v

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786cdEV2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 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]
17.20	2.48	42.66

100 YEAR Area rainfall data:

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

17.20

6.90

118.68

STORM EVENT (YEAR) = 10.00
 Area Averaged 2-Year Rainfall = 2.480 (In)
 Area Averaged 100-Year Rainfall = 6.900 (In)

Point rain (area averaged) = 4.298 (In)
 Areal adjustment factor = 100.00 %
 Adjusted average point rain = 4.298 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	0.500	0.281	0.186	0.052
69.0	69.0	0.373	0.500	0.205	0.814	0.167
Sum (F) =						0.219

Area averaged mean soil loss (F) (In/Hr) = 0.219
 Minimum soil loss rate ((In/Hr)) = 0.110
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.500

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	212.058	7.872
2	0.167	424.117	7.373
3	0.250	636.175	1.443
4	0.333	848.233	0.647
Sum =		100.000	Sum= 17.334

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	0.08	0.07	(0.389) 0.017	0.017
2	0.17	0.07	(0.387) 0.017	0.017
3	0.25	0.07	(0.386) 0.017	0.017

4	0.33	0.10	0.052	(0.384)	0.026	0.026
5	0.42	0.10	0.052	(0.383)	0.026	0.026
6	0.50	0.10	0.052	(0.381)	0.026	0.026
7	0.58	0.10	0.052	(0.380)	0.026	0.026
8	0.67	0.10	0.052	(0.378)	0.026	0.026
9	0.75	0.10	0.052	(0.377)	0.026	0.026
10	0.83	0.13	0.069	(0.375)	0.034	0.034
11	0.92	0.13	0.069	(0.374)	0.034	0.034
12	1.00	0.13	0.069	(0.372)	0.034	0.034
13	1.08	0.10	0.052	(0.371)	0.026	0.026
14	1.17	0.10	0.052	(0.369)	0.026	0.026
15	1.25	0.10	0.052	(0.368)	0.026	0.026
16	1.33	0.10	0.052	(0.366)	0.026	0.026
17	1.42	0.10	0.052	(0.365)	0.026	0.026
18	1.50	0.10	0.052	(0.363)	0.026	0.026
19	1.58	0.10	0.052	(0.362)	0.026	0.026
20	1.67	0.10	0.052	(0.360)	0.026	0.026
21	1.75	0.10	0.052	(0.359)	0.026	0.026
22	1.83	0.13	0.069	(0.358)	0.034	0.034
23	1.92	0.13	0.069	(0.356)	0.034	0.034
24	2.00	0.13	0.069	(0.355)	0.034	0.034
25	2.08	0.13	0.069	(0.353)	0.034	0.034
26	2.17	0.13	0.069	(0.352)	0.034	0.034
27	2.25	0.13	0.069	(0.350)	0.034	0.034
28	2.33	0.13	0.069	(0.349)	0.034	0.034
29	2.42	0.13	0.069	(0.348)	0.034	0.034
30	2.50	0.13	0.069	(0.346)	0.034	0.034
31	2.58	0.17	0.086	(0.345)	0.043	0.043
32	2.67	0.17	0.086	(0.343)	0.043	0.043
33	2.75	0.17	0.086	(0.342)	0.043	0.043
34	2.83	0.17	0.086	(0.340)	0.043	0.043
35	2.92	0.17	0.086	(0.339)	0.043	0.043
36	3.00	0.17	0.086	(0.338)	0.043	0.043
37	3.08	0.17	0.086	(0.336)	0.043	0.043
38	3.17	0.17	0.086	(0.335)	0.043	0.043
39	3.25	0.17	0.086	(0.333)	0.043	0.043
40	3.33	0.17	0.086	(0.332)	0.043	0.043
41	3.42	0.17	0.086	(0.331)	0.043	0.043
42	3.50	0.17	0.086	(0.329)	0.043	0.043
43	3.58	0.17	0.086	(0.328)	0.043	0.043
44	3.67	0.17	0.086	(0.327)	0.043	0.043
45	3.75	0.17	0.086	(0.325)	0.043	0.043
46	3.83	0.20	0.103	(0.324)	0.052	0.052
47	3.92	0.20	0.103	(0.322)	0.052	0.052
48	4.00	0.20	0.103	(0.321)	0.052	0.052
49	4.08	0.20	0.103	(0.320)	0.052	0.052
50	4.17	0.20	0.103	(0.318)	0.052	0.052
51	4.25	0.20	0.103	(0.317)	0.052	0.052
52	4.33	0.23	0.120	(0.316)	0.060	0.060
53	4.42	0.23	0.120	(0.314)	0.060	0.060
54	4.50	0.23	0.120	(0.313)	0.060	0.060
55	4.58	0.23	0.120	(0.312)	0.060	0.060
56	4.67	0.23	0.120	(0.310)	0.060	0.060
57	4.75	0.23	0.120	(0.309)	0.060	0.060

58	4.83	0.27	0.138	(0.308)	0.069	0.069
59	4.92	0.27	0.138	(0.306)	0.069	0.069
60	5.00	0.27	0.138	(0.305)	0.069	0.069
61	5.08	0.20	0.103	(0.304)	0.052	0.052
62	5.17	0.20	0.103	(0.302)	0.052	0.052
63	5.25	0.20	0.103	(0.301)	0.052	0.052
64	5.33	0.23	0.120	(0.300)	0.060	0.060
65	5.42	0.23	0.120	(0.298)	0.060	0.060
66	5.50	0.23	0.120	(0.297)	0.060	0.060
67	5.58	0.27	0.138	(0.296)	0.069	0.069
68	5.67	0.27	0.138	(0.294)	0.069	0.069
69	5.75	0.27	0.138	(0.293)	0.069	0.069
70	5.83	0.27	0.138	(0.292)	0.069	0.069
71	5.92	0.27	0.138	(0.291)	0.069	0.069
72	6.00	0.27	0.138	(0.289)	0.069	0.069
73	6.08	0.30	0.155	(0.288)	0.077	0.077
74	6.17	0.30	0.155	(0.287)	0.077	0.077
75	6.25	0.30	0.155	(0.285)	0.077	0.077
76	6.33	0.30	0.155	(0.284)	0.077	0.077
77	6.42	0.30	0.155	(0.283)	0.077	0.077
78	6.50	0.30	0.155	(0.282)	0.077	0.077
79	6.58	0.33	0.172	(0.280)	0.086	0.086
80	6.67	0.33	0.172	(0.279)	0.086	0.086
81	6.75	0.33	0.172	(0.278)	0.086	0.086
82	6.83	0.33	0.172	(0.277)	0.086	0.086
83	6.92	0.33	0.172	(0.275)	0.086	0.086
84	7.00	0.33	0.172	(0.274)	0.086	0.086
85	7.08	0.33	0.172	(0.273)	0.086	0.086
86	7.17	0.33	0.172	(0.272)	0.086	0.086
87	7.25	0.33	0.172	(0.270)	0.086	0.086
88	7.33	0.37	0.189	(0.269)	0.095	0.095
89	7.42	0.37	0.189	(0.268)	0.095	0.095
90	7.50	0.37	0.189	(0.267)	0.095	0.095
91	7.58	0.40	0.206	(0.265)	0.103	0.103
92	7.67	0.40	0.206	(0.264)	0.103	0.103
93	7.75	0.40	0.206	(0.263)	0.103	0.103
94	7.83	0.43	0.224	(0.262)	0.112	0.112
95	7.92	0.43	0.224	(0.261)	0.112	0.112
96	8.00	0.43	0.224	(0.259)	0.112	0.112
97	8.08	0.50	0.258	(0.258)	0.129	0.129
98	8.17	0.50	0.258	(0.257)	0.129	0.129
99	8.25	0.50	0.258	(0.256)	0.129	0.129
100	8.33	0.50	0.258	(0.255)	0.129	0.129
101	8.42	0.50	0.258	(0.253)	0.129	0.129
102	8.50	0.50	0.258	(0.252)	0.129	0.129
103	8.58	0.53	0.275	(0.251)	0.138	0.138
104	8.67	0.53	0.275	(0.250)	0.138	0.138
105	8.75	0.53	0.275	(0.249)	0.138	0.138
106	8.83	0.57	0.292	(0.247)	0.146	0.146
107	8.92	0.57	0.292	(0.246)	0.146	0.146
108	9.00	0.57	0.292	(0.245)	0.146	0.146
109	9.08	0.63	0.327	(0.244)	0.163	0.163
110	9.17	0.63	0.327	(0.243)	0.163	0.163
111	9.25	0.63	0.327	(0.242)	0.163	0.163

112	9.33	0.67	0.344	(0.241)	0.172	0.172
113	9.42	0.67	0.344	(0.239)	0.172	0.172
114	9.50	0.67	0.344	(0.238)	0.172	0.172
115	9.58	0.70	0.361	(0.237)	0.181	0.181
116	9.67	0.70	0.361	(0.236)	0.181	0.181
117	9.75	0.70	0.361	(0.235)	0.181	0.181
118	9.83	0.73	0.378	(0.234)	0.189	0.189
119	9.92	0.73	0.378	(0.233)	0.189	0.189
120	10.00	0.73	0.378	(0.231)	0.189	0.189
121	10.08	0.50	0.258	(0.230)	0.129	0.129
122	10.17	0.50	0.258	(0.229)	0.129	0.129
123	10.25	0.50	0.258	(0.228)	0.129	0.129
124	10.33	0.50	0.258	(0.227)	0.129	0.129
125	10.42	0.50	0.258	(0.226)	0.129	0.129
126	10.50	0.50	0.258	(0.225)	0.129	0.129
127	10.58	0.67	0.344	(0.224)	0.172	0.172
128	10.67	0.67	0.344	(0.223)	0.172	0.172
129	10.75	0.67	0.344	(0.221)	0.172	0.172
130	10.83	0.67	0.344	(0.220)	0.172	0.172
131	10.92	0.67	0.344	(0.219)	0.172	0.172
132	11.00	0.67	0.344	(0.218)	0.172	0.172
133	11.08	0.63	0.327	(0.217)	0.163	0.163
134	11.17	0.63	0.327	(0.216)	0.163	0.163
135	11.25	0.63	0.327	(0.215)	0.163	0.163
136	11.33	0.63	0.327	(0.214)	0.163	0.163
137	11.42	0.63	0.327	(0.213)	0.163	0.163
138	11.50	0.63	0.327	(0.212)	0.163	0.163
139	11.58	0.57	0.292	(0.211)	0.146	0.146
140	11.67	0.57	0.292	(0.210)	0.146	0.146
141	11.75	0.57	0.292	(0.209)	0.146	0.146
142	11.83	0.60	0.309	(0.208)	0.155	0.155
143	11.92	0.60	0.309	(0.207)	0.155	0.155
144	12.00	0.60	0.309	(0.206)	0.155	0.155
145	12.08	0.83	0.430	0.205	(0.215)	0.225
146	12.17	0.83	0.430	0.204	(0.215)	0.226
147	12.25	0.83	0.430	0.203	(0.215)	0.227
148	12.33	0.87	0.447	0.202	(0.224)	0.246
149	12.42	0.87	0.447	0.201	(0.224)	0.247
150	12.50	0.87	0.447	0.200	(0.224)	0.248
151	12.58	0.93	0.481	0.198	(0.241)	0.283
152	12.67	0.93	0.481	0.197	(0.241)	0.284
153	12.75	0.93	0.481	0.196	(0.241)	0.285
154	12.83	0.97	0.499	0.196	(0.249)	0.303
155	12.92	0.97	0.499	0.195	(0.249)	0.304
156	13.00	0.97	0.499	0.194	(0.249)	0.305
157	13.08	1.13	0.585	0.193	(0.292)	0.392
158	13.17	1.13	0.585	0.192	(0.292)	0.393
159	13.25	1.13	0.585	0.191	(0.292)	0.394
160	13.33	1.13	0.585	0.190	(0.292)	0.395
161	13.42	1.13	0.585	0.189	(0.292)	0.396
162	13.50	1.13	0.585	0.188	(0.292)	0.397
163	13.58	0.77	0.395	0.187	(0.198)	0.209
164	13.67	0.77	0.395	0.186	(0.198)	0.210
165	13.75	0.77	0.395	0.185	(0.198)	0.211

166	13.83	0.77	0.395	0.184	(0.198)	0.212
167	13.92	0.77	0.395	0.183	(0.198)	0.212
168	14.00	0.77	0.395	0.182	(0.198)	0.213
169	14.08	0.90	0.464	0.181	(0.232)	0.283
170	14.17	0.90	0.464	0.180	(0.232)	0.284
171	14.25	0.90	0.464	0.179	(0.232)	0.285
172	14.33	0.87	0.447	0.178	(0.224)	0.269
173	14.42	0.87	0.447	0.177	(0.224)	0.270
174	14.50	0.87	0.447	0.177	(0.224)	0.270
175	14.58	0.87	0.447	0.176	(0.224)	0.271
176	14.67	0.87	0.447	0.175	(0.224)	0.272
177	14.75	0.87	0.447	0.174	(0.224)	0.273
178	14.83	0.83	0.430	0.173	(0.215)	0.257
179	14.92	0.83	0.430	0.172	(0.215)	0.258
180	15.00	0.83	0.430	0.171	(0.215)	0.259
181	15.08	0.80	0.413	0.170	(0.206)	0.242
182	15.17	0.80	0.413	0.169	(0.206)	0.243
183	15.25	0.80	0.413	0.169	(0.206)	0.244
184	15.33	0.77	0.395	0.168	(0.198)	0.228
185	15.42	0.77	0.395	0.167	(0.198)	0.229
186	15.50	0.77	0.395	0.166	(0.198)	0.229
187	15.58	0.63	0.327	(0.165)	0.163	0.163
188	15.67	0.63	0.327	(0.164)	0.163	0.163
189	15.75	0.63	0.327	(0.163)	0.163	0.163
190	15.83	0.63	0.327	0.163	(0.163)	0.164
191	15.92	0.63	0.327	0.162	(0.163)	0.165
192	16.00	0.63	0.327	0.161	(0.163)	0.166
193	16.08	0.13	0.069	(0.160)	0.034	0.034
194	16.17	0.13	0.069	(0.159)	0.034	0.034
195	16.25	0.13	0.069	(0.158)	0.034	0.034
196	16.33	0.13	0.069	(0.158)	0.034	0.034
197	16.42	0.13	0.069	(0.157)	0.034	0.034
198	16.50	0.13	0.069	(0.156)	0.034	0.034
199	16.58	0.10	0.052	(0.155)	0.026	0.026
200	16.67	0.10	0.052	(0.154)	0.026	0.026
201	16.75	0.10	0.052	(0.154)	0.026	0.026
202	16.83	0.10	0.052	(0.153)	0.026	0.026
203	16.92	0.10	0.052	(0.152)	0.026	0.026
204	17.00	0.10	0.052	(0.151)	0.026	0.026
205	17.08	0.17	0.086	(0.151)	0.043	0.043
206	17.17	0.17	0.086	(0.150)	0.043	0.043
207	17.25	0.17	0.086	(0.149)	0.043	0.043
208	17.33	0.17	0.086	(0.148)	0.043	0.043
209	17.42	0.17	0.086	(0.148)	0.043	0.043
210	17.50	0.17	0.086	(0.147)	0.043	0.043
211	17.58	0.17	0.086	(0.146)	0.043	0.043
212	17.67	0.17	0.086	(0.145)	0.043	0.043
213	17.75	0.17	0.086	(0.145)	0.043	0.043
214	17.83	0.13	0.069	(0.144)	0.034	0.034
215	17.92	0.13	0.069	(0.143)	0.034	0.034
216	18.00	0.13	0.069	(0.143)	0.034	0.034
217	18.08	0.13	0.069	(0.142)	0.034	0.034
218	18.17	0.13	0.069	(0.141)	0.034	0.034
219	18.25	0.13	0.069	(0.140)	0.034	0.034

220	18.33	0.13	0.069	(0.140)	0.034	0.034
221	18.42	0.13	0.069	(0.139)	0.034	0.034
222	18.50	0.13	0.069	(0.138)	0.034	0.034
223	18.58	0.10	0.052	(0.138)	0.026	0.026
224	18.67	0.10	0.052	(0.137)	0.026	0.026
225	18.75	0.10	0.052	(0.136)	0.026	0.026
226	18.83	0.07	0.034	(0.136)	0.017	0.017
227	18.92	0.07	0.034	(0.135)	0.017	0.017
228	19.00	0.07	0.034	(0.134)	0.017	0.017
229	19.08	0.10	0.052	(0.134)	0.026	0.026
230	19.17	0.10	0.052	(0.133)	0.026	0.026
231	19.25	0.10	0.052	(0.133)	0.026	0.026
232	19.33	0.13	0.069	(0.132)	0.034	0.034
233	19.42	0.13	0.069	(0.131)	0.034	0.034
234	19.50	0.13	0.069	(0.131)	0.034	0.034
235	19.58	0.10	0.052	(0.130)	0.026	0.026
236	19.67	0.10	0.052	(0.130)	0.026	0.026
237	19.75	0.10	0.052	(0.129)	0.026	0.026
238	19.83	0.07	0.034	(0.128)	0.017	0.017
239	19.92	0.07	0.034	(0.128)	0.017	0.017
240	20.00	0.07	0.034	(0.127)	0.017	0.017
241	20.08	0.10	0.052	(0.127)	0.026	0.026
242	20.17	0.10	0.052	(0.126)	0.026	0.026
243	20.25	0.10	0.052	(0.126)	0.026	0.026
244	20.33	0.10	0.052	(0.125)	0.026	0.026
245	20.42	0.10	0.052	(0.125)	0.026	0.026
246	20.50	0.10	0.052	(0.124)	0.026	0.026
247	20.58	0.10	0.052	(0.123)	0.026	0.026
248	20.67	0.10	0.052	(0.123)	0.026	0.026
249	20.75	0.10	0.052	(0.122)	0.026	0.026
250	20.83	0.07	0.034	(0.122)	0.017	0.017
251	20.92	0.07	0.034	(0.121)	0.017	0.017
252	21.00	0.07	0.034	(0.121)	0.017	0.017
253	21.08	0.10	0.052	(0.120)	0.026	0.026
254	21.17	0.10	0.052	(0.120)	0.026	0.026
255	21.25	0.10	0.052	(0.120)	0.026	0.026
256	21.33	0.07	0.034	(0.119)	0.017	0.017
257	21.42	0.07	0.034	(0.119)	0.017	0.017
258	21.50	0.07	0.034	(0.118)	0.017	0.017
259	21.58	0.10	0.052	(0.118)	0.026	0.026
260	21.67	0.10	0.052	(0.117)	0.026	0.026
261	21.75	0.10	0.052	(0.117)	0.026	0.026
262	21.83	0.07	0.034	(0.117)	0.017	0.017
263	21.92	0.07	0.034	(0.116)	0.017	0.017
264	22.00	0.07	0.034	(0.116)	0.017	0.017
265	22.08	0.10	0.052	(0.115)	0.026	0.026
266	22.17	0.10	0.052	(0.115)	0.026	0.026
267	22.25	0.10	0.052	(0.115)	0.026	0.026
268	22.33	0.07	0.034	(0.114)	0.017	0.017
269	22.42	0.07	0.034	(0.114)	0.017	0.017
270	22.50	0.07	0.034	(0.114)	0.017	0.017
271	22.58	0.07	0.034	(0.113)	0.017	0.017
272	22.67	0.07	0.034	(0.113)	0.017	0.017
273	22.75	0.07	0.034	(0.113)	0.017	0.017

274	22.83	0.07	0.034	(0.112)	0.017	0.017
275	22.92	0.07	0.034	(0.112)	0.017	0.017
276	23.00	0.07	0.034	(0.112)	0.017	0.017
277	23.08	0.07	0.034	(0.111)	0.017	0.017
278	23.17	0.07	0.034	(0.111)	0.017	0.017
279	23.25	0.07	0.034	(0.111)	0.017	0.017
280	23.33	0.07	0.034	(0.111)	0.017	0.017
281	23.42	0.07	0.034	(0.111)	0.017	0.017
282	23.50	0.07	0.034	(0.110)	0.017	0.017
283	23.58	0.07	0.034	(0.110)	0.017	0.017
284	23.67	0.07	0.034	(0.110)	0.017	0.017
285	23.75	0.07	0.034	(0.110)	0.017	0.017
286	23.83	0.07	0.034	(0.110)	0.017	0.017
287	23.92	0.07	0.034	(0.110)	0.017	0.017
288	24.00	0.07	0.034	(0.110)	0.017	0.017

(Loss Rate Not Used)

Sum = 100.0

Sum = 27.7

Flood volume = Effective rainfall 2.30(In)

times area 17.2(Ac.)/[(In)/(Ft.)] = 3.3(Ac.Ft)

Total soil loss = 1.99(In)

Total soil loss = 2.857(Ac.Ft)

Total rainfall = 4.30(In)

Flood volume = 143896.7 Cubic Feet

Total soil loss = 124470.6 Cubic Feet

Peak flow rate of this hydrograph = 6.871(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0009	0.14	Q				
0+10	0.0027	0.26	VQ				
0+15	0.0047	0.29	VQ				
0+20	0.0072	0.37	VQ				
0+25	0.0102	0.43	VQ				
0+30	0.0132	0.44	VQ				
0+35	0.0163	0.45	VQ				
0+40	0.0194	0.45	VQ				
0+45	0.0225	0.45	VQ				
0+50	0.0260	0.51	V Q				
0+55	0.0300	0.58	V Q				
1+ 0	0.0341	0.59	V Q				
1+ 5	0.0377	0.53	V Q				
1+10	0.0409	0.47	VQ				
1+15	0.0440	0.45	VQ				
1+20	0.0471	0.45	VQ				
1+25	0.0502	0.45	VQ				
1+30	0.0533	0.45	VQ				

1+35	0.0564	0.45	VQ
1+40	0.0594	0.45	VQ
1+45	0.0625	0.45	VQ
1+50	0.0661	0.51	V Q
1+55	0.0701	0.58	V Q
2+ 0	0.0741	0.59	V Q
2+ 5	0.0782	0.60	V Q
2+10	0.0823	0.60	V Q
2+15	0.0864	0.60	VQ
2+20	0.0905	0.60	VQ
2+25	0.0947	0.60	VQ
2+30	0.0988	0.60	VQ
2+35	0.1033	0.66	VQ
2+40	0.1083	0.73	VQ
2+45	0.1134	0.74	VQ
2+50	0.1186	0.75	VQ
2+55	0.1237	0.75	VQ
3+ 0	0.1288	0.75	VQ
3+ 5	0.1340	0.75	VQ
3+10	0.1391	0.75	VQ
3+15	0.1442	0.75	VQ
3+20	0.1494	0.75	VQ
3+25	0.1545	0.75	VQ
3+30	0.1596	0.75	VQ
3+35	0.1648	0.75	VQ
3+40	0.1699	0.75	Q
3+45	0.1751	0.75	Q
3+50	0.1807	0.81	VQ
3+55	0.1867	0.88	VQ
4+ 0	0.1928	0.89	VQ
4+ 5	0.1990	0.89	VQ
4+10	0.2051	0.89	VQ
4+15	0.2113	0.89	VQ
4+20	0.2179	0.96	VQ
4+25	0.2250	1.03	V Q
4+30	0.2321	1.04	V Q
4+35	0.2393	1.04	V Q
4+40	0.2465	1.04	V Q
4+45	0.2537	1.04	VQ
4+50	0.2614	1.11	VQ
4+55	0.2694	1.17	VQ
5+ 0	0.2776	1.19	VQ
5+ 5	0.2849	1.06	VQ
5+10	0.2913	0.93	Q
5+15	0.2975	0.91	Q
5+20	0.3042	0.96	Q
5+25	0.3112	1.03	VQ
5+30	0.3184	1.04	VQ
5+35	0.3260	1.11	VQ
5+40	0.3341	1.17	Q
5+45	0.3423	1.19	Q
5+50	0.3505	1.19	Q
5+55	0.3587	1.19	Q
6+ 0	0.3670	1.19	Q

6+ 5	0.3756	1.26	VQ			
6+10	0.3847	1.32	VQ			
6+15	0.3940	1.34	VQ			
6+20	0.4032	1.34	VQ			
6+25	0.4124	1.34	VQ			
6+30	0.4217	1.34	Q			
6+35	0.4314	1.41	Q			
6+40	0.4415	1.47	Q			
6+45	0.4518	1.49	Q			
6+50	0.4620	1.49	Q			
6+55	0.4723	1.49	Q			
7+ 0	0.4826	1.49	Q			
7+ 5	0.4928	1.49	Q			
7+10	0.5031	1.49	QV			
7+15	0.5134	1.49	QV			
7+20	0.5241	1.56	Q			
7+25	0.5353	1.62	Q			
7+30	0.5465	1.63	Q			
7+35	0.5583	1.71	Q			
7+40	0.5705	1.77	VQ			
7+45	0.5828	1.78	Q			
7+50	0.5956	1.86	Q			
7+55	0.6088	1.92	Q			
8+ 0	0.6221	1.93	Q			
8+ 5	0.6364	2.07	VQ			
8+10	0.6515	2.20	VQ			
8+15	0.6669	2.23	Q			
8+20	0.6823	2.24	Q			
8+25	0.6977	2.24	Q			
8+30	0.7131	2.24	Q			
8+35	0.7289	2.30	VQ			
8+40	0.7452	2.37	Q			
8+45	0.7616	2.38	Q			
8+50	0.7785	2.45	Q			
8+55	0.7959	2.52	VQ			
9+ 0	0.8133	2.53	VQ			
9+ 5	0.8317	2.67	Q			
9+10	0.8509	2.80	VQ			
9+15	0.8704	2.82	VQ			
9+20	0.8903	2.90	VQ			
9+25	0.9107	2.96	Q			
9+30	0.9312	2.98	Q			
9+35	0.9522	3.05	VQ			
9+40	0.9737	3.11	VQ			
9+45	0.9952	3.13	Q			
9+50	1.0172	3.20	Q			
9+55	1.0397	3.26	VQ			
10+ 0	1.0623	3.27	VQ			
10+ 5	1.0816	2.81	Q V			
10+10	1.0978	2.36	Q V			
10+15	1.1135	2.28	Q V			
10+20	1.1289	2.24	Q V			
10+25	1.1443	2.24	Q V			
10+30	1.1597	2.24	Q V			

10+35	1.1775	2.57	Q	V				
10+40	1.1974	2.89	Q	V				
10+45	1.2177	2.95	Q	V				
10+50	1.2383	2.98	Q	V				
10+55	1.2588	2.98	Q	V				
11+ 0	1.2793	2.98	Q	V				
11+ 5	1.2994	2.91	Q	V				
11+10	1.3190	2.85	Q	V				
11+15	1.3386	2.84	Q	V				
11+20	1.3581	2.83	Q	V				
11+25	1.3776	2.83	Q	V				
11+30	1.3971	2.83	Q	V				
11+35	1.4157	2.70	Q	V				
11+40	1.4334	2.57	Q	V				
11+45	1.4509	2.55	Q	V				
11+50	1.4688	2.60	Q	V				
11+55	1.4872	2.67	Q	V				
12+ 0	1.5056	2.68	Q	V				
12+ 5	1.5280	3.24	Q	V				
12+10	1.5539	3.77		Q	V			
12+15	1.5807	3.88		Q	V			
12+20	1.6088	4.08		Q	V			
12+25	1.6379	4.23		Q	V			
12+30	1.6673	4.27		Q	V			
12+35	1.6987	4.57		Q	V			
12+40	1.7321	4.84		Q	V			
12+45	1.7659	4.91		Q	V			
12+50	1.8009	5.08		Q	V			
12+55	1.8369	5.23		Q	V			
13+ 0	1.8731	5.27		Q	V			
13+ 5	1.9143	5.97			Q			
13+10	1.9599	6.62			V	Q		
13+15	2.0065	6.77			V	Q		
13+20	2.0536	6.84			V	Q		
13+25	2.1008	6.85			V	Q		
13+30	2.1481	6.87			V	Q		
13+35	2.1853	5.40			V			
13+40	2.2130	4.02		Q				
13+45	2.2389	3.76		Q				
13+50	2.2641	3.66		Q				
13+55	2.2894	3.67		Q				
14+ 0	2.3148	3.69		Q				
14+ 5	2.3440	4.25		Q				
14+10	2.3769	4.77			Q			
14+15	2.4105	4.89			Q			
14+20	2.4437	4.81			Q			
14+25	2.4760	4.70			Q			
14+30	2.5083	4.69			Q			
14+35	2.5407	4.70			Q			
14+40	2.5731	4.71			Q			
14+45	2.6057	4.73			Q			
14+50	2.6374	4.61			Q			
14+55	2.6684	4.50		Q				
15+ 0	2.6993	4.49		Q				

19+35	3.1717	0.53	Q				V
19+40	3.1749	0.47	Q				V
19+45	3.1780	0.45	Q				V
19+50	3.1806	0.38	Q				V
19+55	3.1828	0.32	Q				V
20+ 0	3.1849	0.30	Q				V
20+ 5	3.1874	0.37	Q				V
20+10	3.1904	0.43	Q				V
20+15	3.1934	0.44	Q				V
20+20	3.1965	0.45	Q				V
20+25	3.1996	0.45	Q				V
20+30	3.2027	0.45	Q				V
20+35	3.2058	0.45	Q				V
20+40	3.2088	0.45	Q				V
20+45	3.2119	0.45	Q				V
20+50	3.2145	0.38	Q				V
20+55	3.2167	0.32	Q				V
21+ 0	3.2188	0.30	Q				V
21+ 5	3.2213	0.37	Q				V
21+10	3.2243	0.43	Q				V
21+15	3.2273	0.44	Q				V
21+20	3.2299	0.38	Q				V
21+25	3.2321	0.32	Q				V
21+30	3.2342	0.30	Q				V
21+35	3.2367	0.37	Q				V
21+40	3.2397	0.43	Q				V
21+45	3.2427	0.44	Q				V
21+50	3.2453	0.38	Q				V
21+55	3.2475	0.32	Q				V
22+ 0	3.2496	0.30	Q				V
22+ 5	3.2521	0.37	Q				V
22+10	3.2551	0.43	Q				V
22+15	3.2581	0.44	Q				V
22+20	3.2607	0.38	Q				V
22+25	3.2629	0.32	Q				V
22+30	3.2650	0.30	Q				V
22+35	3.2671	0.30	Q				V
22+40	3.2691	0.30	Q				V
22+45	3.2712	0.30	Q				V
22+50	3.2732	0.30	Q				V
22+55	3.2753	0.30	Q				V
23+ 0	3.2773	0.30	Q				V
23+ 5	3.2794	0.30	Q				V
23+10	3.2814	0.30	Q				V
23+15	3.2835	0.30	Q				V
23+20	3.2855	0.30	Q				V
23+25	3.2876	0.30	Q				V
23+30	3.2896	0.30	Q				V
23+35	3.2917	0.30	Q				V
23+40	3.2938	0.30	Q				V
23+45	3.2958	0.30	Q				V
23+50	3.2979	0.30	Q				V
23+55	3.2999	0.30	Q				V
24+ 0	3.3020	0.30	Q				V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CNat12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "C" (Subarea 2) Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
14.00	0.58	8.12

100 YEAR Area rainfall data:

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

14.00

1.45

20.30

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
Sum (F) =						0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.519

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	156.692	4.904
2	0.167	313.385	6.563
3	0.250	470.077	1.525
4	0.333	626.769	0.660
5	0.417	783.462	0.323
6	0.500	940.154	0.135
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.303)	0.159	0.147
2	0.17	4.50	0.313	(0.303)	0.162	0.151
3	0.25	5.40	0.376	(0.303)	0.195	0.181
4	0.33	5.40	0.376	(0.303)	0.195	0.181
5	0.42	5.70	0.397	(0.303)	0.206	0.191
6	0.50	6.40	0.445	(0.303)	0.231	0.214
7	0.58	7.90	0.550	(0.303)	0.285	0.265
8	0.67	9.10	0.633	0.303	(0.328)	0.331
9	0.75	12.80	0.891	0.303	(0.462)	0.588
10	0.83	25.60	1.782	0.303	(0.924)	1.479
11	0.92	7.90	0.550	(0.303)	0.285	0.265
12	1.00	4.90	0.341	(0.303)	0.177	0.164

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.2

Flood volume = Effective rainfall 0.35(In)
times area 14.0(Ac.)/[(In)/(Ft.)) = 0.4(Ac.Ft)
Total soil loss = 0.23(In)
Total soil loss = 0.272(Ac.Ft)
Total rainfall = 0.58(In)
Flood volume = 17602.4 Cubic Feet
Total soil loss = 11869.4 Cubic Feet

Peak flow rate of this hydrograph = 12.239(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0050	0.72	VQ				
0+10	0.0167	1.71	V Q				
0+15	0.0312	2.10	VQ				
0+20	0.0478	2.40	Q				
0+25	0.0653	2.55	QV				
0+30	0.0844	2.77	Q V				
0+35	0.1064	3.20	Q	V			
0+40	0.1332	3.90	Q	V			
0+45	0.1724	5.69		Q	V		
0+50	0.2543	11.89			Q V		
0+55	0.3386	12.24			Q	V	
1+ 0	0.3753	5.33		Q			V
1+ 5	0.3939	2.69	Q				V
1+10	0.4006	0.98	Q				V

1+15	0.4033	0.39	Q				v
1+20	0.4039	0.09	Q				v
1+25	0.4041	0.02	Q				v

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CNat32.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "C" (Subarea 2) Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 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]
14.00	0.98	13.72

100 YEAR Area rainfall data:

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

14.00

2.48

34.72

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 0.980(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 0.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
Sum (F) =						0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

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	0.083	156.692	4.904
2	0.167	313.385	6.563
3	0.250	470.077	1.525
4	0.333	626.769	0.660
5	0.417	783.462	0.323
6	0.500	940.154	0.135
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.303)	0.079	0.074
2	0.17	1.30	0.153	(0.303)	0.079	0.074
3	0.25	1.10	0.129	(0.303)	0.067	0.062
4	0.33	1.50	0.176	(0.303)	0.091	0.085
5	0.42	1.50	0.176	(0.303)	0.091	0.085
6	0.50	1.80	0.212	(0.303)	0.110	0.102
7	0.58	1.50	0.176	(0.303)	0.091	0.085
8	0.67	1.80	0.212	(0.303)	0.110	0.102
9	0.75	1.80	0.212	(0.303)	0.110	0.102
10	0.83	1.50	0.176	(0.303)	0.091	0.085
11	0.92	1.60	0.188	(0.303)	0.098	0.091
12	1.00	1.80	0.212	(0.303)	0.110	0.102
13	1.08	2.20	0.259	(0.303)	0.134	0.125
14	1.17	2.20	0.259	(0.303)	0.134	0.125
15	1.25	2.20	0.259	(0.303)	0.134	0.125
16	1.33	2.00	0.235	(0.303)	0.122	0.113
17	1.42	2.60	0.306	(0.303)	0.159	0.147
18	1.50	2.70	0.318	(0.303)	0.165	0.153
19	1.58	2.40	0.282	(0.303)	0.146	0.136
20	1.67	2.70	0.318	(0.303)	0.165	0.153
21	1.75	3.30	0.388	(0.303)	0.201	0.187
22	1.83	3.10	0.365	(0.303)	0.189	0.175
23	1.92	2.90	0.341	(0.303)	0.177	0.164
24	2.00	3.00	0.353	(0.303)	0.183	0.170
25	2.08	3.10	0.365	(0.303)	0.189	0.175
26	2.17	4.20	0.494	(0.303)	0.256	0.238
27	2.25	5.00	0.588	0.303	(0.305)	0.285
28	2.33	3.50	0.412	(0.303)	0.213	0.198
29	2.42	6.80	0.800	0.303	(0.415)	0.497
30	2.50	7.30	0.858	0.303	(0.445)	0.556
31	2.58	8.20	0.964	0.303	(0.500)	0.662
32	2.67	5.90	0.694	0.303	(0.360)	0.391
33	2.75	2.00	0.235	(0.303)	0.122	0.113
34	2.83	1.80	0.212	(0.303)	0.110	0.102
35	2.92	1.80	0.212	(0.303)	0.110	0.102
36	3.00	0.60	0.071	(0.303)	0.037	0.034

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.2

Flood volume = Effective rainfall 0.51(In)

times area 14.0(Ac.)/[(In)/(Ft.)] = 0.6(Ac.Ft)

Total soil loss = 0.47(In)

Total soil loss = 0.543(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 26139.6 Cubic Feet

Total soil loss = 23661.0 Cubic Feet

Peak flow rate of this hydrograph = 7.909(CFS)

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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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0025	0.36	VQ					
0+10	0.0083	0.84	V Q					
0+15	0.0145	0.90	V Q					
0+20	0.0213	0.99	V Q					
0+25	0.0292	1.14	V Q					
0+30	0.0379	1.26	V Q					
0+35	0.0468	1.30	V Q					
0+40	0.0558	1.30	V Q					
0+45	0.0655	1.40	VQ					
0+50	0.0747	1.34	VQ					
0+55	0.0834	1.27	Q					
1+ 0	0.0926	1.34	QV					
1+ 5	0.1031	1.52	Q					
1+10	0.1147	1.69	QV					
1+15	0.1266	1.73	Q V					
1+20	0.1383	1.69	Q V					
1+25	0.1506	1.79	Q V					
1+30	0.1646	2.03	Q V					
1+35	0.1785	2.03	Q V					
1+40	0.1925	2.03	Q V					
1+45	0.2083	2.29	Q V					
1+50	0.2253	2.48	Q V					
1+55	0.2419	2.41	Q V					
2+ 0	0.2582	2.37	Q V					
2+ 5	0.2749	2.42	Q V					
2+10	0.2940	2.77	Q V					
2+15	0.3175	3.42	Q V					
2+20	0.3410	3.40	Q V					
2+25	0.3713	4.41	Q V					
2+30	0.4167	6.58	QV					
2+35	0.4711	7.91	Q					
2+40	0.5231	7.54	Q					
2+45	0.5554	4.69	Q					
2+50	0.5727	2.52	Q					
2+55	0.5857	1.89	Q					
3+ 0	0.5946	1.28	Q					
3+ 5	0.5983	0.54	Q					
3+10	0.5994	0.17	Q					
3+15	0.5999	0.07	Q					
3+20	0.6001	0.02	Q					
3+25	0.6001	0.00	Q					

Unit Hydrograph Analysis

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 Study date 08/22/13 File: 32786CNat62.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "C" (Subarea 2) Existing Natural Condition

 Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
 Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
 Length along longest watercourse = 1792.00 (Ft.)
 Length along longest watercourse measured to centroid = 821.00 (Ft.)
 Length along longest watercourse = 0.339 Mi.
 Length along longest watercourse measured to centroid = 0.155 Mi.
 Difference in elevation = 101.00 (Ft.)
 Slope along watercourse = 297.5893 Ft./Mi.
 Average Manning's 'N' = 0.020
 Lag time = 0.053 Hr.
 Lag time = 3.19 Min.
 25% of lag time = 0.80 Min.
 40% of lag time = 1.28 Min.
 Unit time = 5.00 Min.
 Duration of storm = 6 Hour(s)
 User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
14.00	1.38	19.32

100 YEAR Area rainfall data:

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

14.00

3.48

48.72

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
Sum (F) =						0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.519

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	156.692	4.904
2	0.167	313.385	6.563
3	0.250	470.077	1.525
4	0.333	626.769	0.660
5	0.417	783.462	0.323
6	0.500	940.154	0.135
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.083	(0.303)	0.043	0.040
2	0.17	0.60	0.099	(0.303)	0.052	0.048
3	0.25	0.60	0.099	(0.303)	0.052	0.048
4	0.33	0.60	0.099	(0.303)	0.052	0.048
5	0.42	0.60	0.099	(0.303)	0.052	0.048
6	0.50	0.70	0.116	(0.303)	0.060	0.056
7	0.58	0.70	0.116	(0.303)	0.060	0.056
8	0.67	0.70	0.116	(0.303)	0.060	0.056
9	0.75	0.70	0.116	(0.303)	0.060	0.056
10	0.83	0.70	0.116	(0.303)	0.060	0.056
11	0.92	0.70	0.116	(0.303)	0.060	0.056
12	1.00	0.80	0.132	(0.303)	0.069	0.064
13	1.08	0.80	0.132	(0.303)	0.069	0.064
14	1.17	0.80	0.132	(0.303)	0.069	0.064
15	1.25	0.80	0.132	(0.303)	0.069	0.064
16	1.33	0.80	0.132	(0.303)	0.069	0.064
17	1.42	0.80	0.132	(0.303)	0.069	0.064
18	1.50	0.80	0.132	(0.303)	0.069	0.064
19	1.58	0.80	0.132	(0.303)	0.069	0.064
20	1.67	0.80	0.132	(0.303)	0.069	0.064
21	1.75	0.80	0.132	(0.303)	0.069	0.064
22	1.83	0.80	0.132	(0.303)	0.069	0.064
23	1.92	0.80	0.132	(0.303)	0.069	0.064
24	2.00	0.90	0.149	(0.303)	0.077	0.072
25	2.08	0.80	0.132	(0.303)	0.069	0.064
26	2.17	0.90	0.149	(0.303)	0.077	0.072
27	2.25	0.90	0.149	(0.303)	0.077	0.072
28	2.33	0.90	0.149	(0.303)	0.077	0.072
29	2.42	0.90	0.149	(0.303)	0.077	0.072
30	2.50	0.90	0.149	(0.303)	0.077	0.072
31	2.58	0.90	0.149	(0.303)	0.077	0.072
32	2.67	0.90	0.149	(0.303)	0.077	0.072
33	2.75	1.00	0.166	(0.303)	0.086	0.080
34	2.83	1.00	0.166	(0.303)	0.086	0.080
35	2.92	1.00	0.166	(0.303)	0.086	0.080
36	3.00	1.00	0.166	(0.303)	0.086	0.080
37	3.08	1.00	0.166	(0.303)	0.086	0.080
38	3.17	1.10	0.182	(0.303)	0.094	0.088
39	3.25	1.10	0.182	(0.303)	0.094	0.088
40	3.33	1.10	0.182	(0.303)	0.094	0.088
41	3.42	1.20	0.199	(0.303)	0.103	0.096
42	3.50	1.30	0.215	(0.303)	0.112	0.104
43	3.58	1.40	0.232	(0.303)	0.120	0.112
44	3.67	1.40	0.232	(0.303)	0.120	0.112
45	3.75	1.50	0.248	(0.303)	0.129	0.120
46	3.83	1.50	0.248	(0.303)	0.129	0.120
47	3.92	1.60	0.265	(0.303)	0.137	0.128
48	4.00	1.60	0.265	(0.303)	0.137	0.128
49	4.08	1.70	0.282	(0.303)	0.146	0.136

50	4.17	1.80	0.298	(0.303)	0.155	0.143
51	4.25	1.90	0.315	(0.303)	0.163	0.151
52	4.33	2.00	0.331	(0.303)	0.172	0.159
53	4.42	2.10	0.348	(0.303)	0.180	0.167
54	4.50	2.10	0.348	(0.303)	0.180	0.167
55	4.58	2.20	0.364	(0.303)	0.189	0.175
56	4.67	2.30	0.381	(0.303)	0.198	0.183
57	4.75	2.40	0.397	(0.303)	0.206	0.191
58	4.83	2.40	0.397	(0.303)	0.206	0.191
59	4.92	2.50	0.414	(0.303)	0.215	0.199
60	5.00	2.60	0.431	(0.303)	0.223	0.207
61	5.08	3.10	0.513	(0.303)	0.266	0.247
62	5.17	3.60	0.596	0.303 (0.309)		0.293
63	5.25	3.90	0.646	0.303 (0.335)		0.343
64	5.33	4.20	0.695	0.303 (0.361)		0.393
65	5.42	4.70	0.778	0.303 (0.404)		0.476
66	5.50	5.60	0.927	0.303 (0.481)		0.625
67	5.58	1.90	0.315	(0.303)	0.163	0.151
68	5.67	0.90	0.149	(0.303)	0.077	0.072
69	5.75	0.60	0.099	(0.303)	0.052	0.048
70	5.83	0.50	0.083	(0.303)	0.043	0.040
71	5.92	0.30	0.050	(0.303)	0.026	0.024
72	6.00	0.20	0.033	(0.303)	0.017	0.016

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.3

Flood volume = Effective rainfall 0.70(In)
times area 14.0(Ac.)/[(In)/(Ft.)) = 0.8(Ac.Ft)
Total soil loss = 0.68(In)
Total soil loss = 0.798(Ac.Ft)
Total rainfall = 1.38(In)
Flood volume = 35352.0 Cubic Feet
Total soil loss = 34776.2 Cubic Feet

Peak flow rate of this hydrograph = 7.142(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0013	0.20	Q				
0+10	0.0048	0.50	VQ				
0+15	0.0090	0.61	V Q				
0+20	0.0134	0.65	V Q				
0+25	0.0180	0.67	V Q				
0+30	0.0229	0.71	VQ				
0+35	0.0282	0.77	V Q				
0+40	0.0336	0.78	V Q				
0+45	0.0390	0.78	V Q				
0+50	0.0444	0.79	VQ				

0+55	0.0498	0.79	VQ						
1+ 0	0.0555	0.83	VQ						
1+ 5	0.0616	0.88	Q						
1+10	0.0677	0.89	Q						
1+15	0.0739	0.90	Q						
1+20	0.0801	0.90	Q						
1+25	0.0863	0.90	QV						
1+30	0.0925	0.90	QV						
1+35	0.0987	0.90	QV						
1+40	0.1049	0.90	Q V						
1+45	0.1111	0.90	Q V						
1+50	0.1173	0.90	Q V						
1+55	0.1235	0.90	Q V						
2+ 0	0.1299	0.94	Q V						
2+ 5	0.1365	0.95	Q V						
2+10	0.1431	0.95	Q V						
2+15	0.1499	1.00	Q V						
2+20	0.1569	1.01	Q V						
2+25	0.1638	1.01	Q V						
2+30	0.1708	1.01	Q V						
2+35	0.1778	1.01	Q V						
2+40	0.1847	1.01	Q V						
2+45	0.1920	1.05	Q V						
2+50	0.1996	1.10	Q V						
2+55	0.2073	1.12	Q V						
3+ 0	0.2150	1.12	Q V						
3+ 5	0.2227	1.12	Q V						
3+10	0.2308	1.16	Q V						
3+15	0.2391	1.22	Q V						
3+20	0.2476	1.23	Q V						
3+25	0.2564	1.27	Q V						
3+30	0.2658	1.37	Q V						
3+35	0.2759	1.47	Q V						
3+40	0.2865	1.54	Q V						
3+45	0.2976	1.60	Q V						
3+50	0.3090	1.66	Q V						
3+55	0.3208	1.72	Q V						
4+ 0	0.3331	1.78	Q V						
4+ 5	0.3457	1.83	Q V						
4+10	0.3589	1.93	Q V						
4+15	0.3729	2.03	Q V						
4+20	0.3877	2.14	Q V						
4+25	0.4032	2.26	Q V						
4+30	0.4193	2.33	Q V						
4+35	0.4357	2.39	Q V						
4+40	0.4529	2.49	Q V						
4+45	0.4708	2.60	Q V						
4+50	0.4891	2.67	Q V						
4+55	0.5079	2.73	Q V						
5+ 0	0.5274	2.83	Q V						
5+ 5	0.5486	3.09	Q V						
5+10	0.5734	3.60	Q V						
5+15	0.6025	4.21	Q V						
5+20	0.6361	4.89	Q V						

5+25	0.6756	5.74				Q		V	
5+30	0.7248	7.14					Q	V	
5+35	0.7660	5.98				Q			V
5+40	0.7852	2.79			Q				V
5+45	0.7959	1.56							V
5+50	0.8027	0.98		Q					V
5+55	0.8070	0.63		Q					V
6+ 0	0.8096	0.37	Q						V
6+ 5	0.8109	0.19	Q						V
6+10	0.8113	0.06	Q						V
6+15	0.8115	0.02	Q						V
6+20	0.8116	0.01	Q						V
6+25	0.8116	0.00	Q						V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CNat242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "C" (Subarea 2) Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 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]
14.00	2.48	34.72

100 YEAR Area rainfall data:

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

14.00

6.90

96.60

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.480(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
						Sum (F) = 0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.519

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	156.692	34.756	4.904
2 0.167	313.385	46.515	6.563
3 0.250	470.077	10.806	1.525
4 0.333	626.769	4.681	0.660
5 0.417	783.462	2.286	0.323
6 0.500	940.154	0.956	0.135
Sum = 100.000		Sum=	14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.020	(0.537)	0.010	0.010
2	0.17	0.07	0.020	(0.534)	0.010	0.010
3	0.25	0.07	0.020	(0.532)	0.010	0.010
4	0.33	0.10	0.030	(0.530)	0.015	0.014
5	0.42	0.10	0.030	(0.528)	0.015	0.014
6	0.50	0.10	0.030	(0.526)	0.015	0.014
7	0.58	0.10	0.030	(0.524)	0.015	0.014
8	0.67	0.10	0.030	(0.522)	0.015	0.014
9	0.75	0.10	0.030	(0.520)	0.015	0.014
10	0.83	0.13	0.040	(0.518)	0.021	0.019
11	0.92	0.13	0.040	(0.516)	0.021	0.019
12	1.00	0.13	0.040	(0.514)	0.021	0.019
13	1.08	0.10	0.030	(0.512)	0.015	0.014
14	1.17	0.10	0.030	(0.510)	0.015	0.014
15	1.25	0.10	0.030	(0.508)	0.015	0.014
16	1.33	0.10	0.030	(0.506)	0.015	0.014
17	1.42	0.10	0.030	(0.504)	0.015	0.014
18	1.50	0.10	0.030	(0.502)	0.015	0.014
19	1.58	0.10	0.030	(0.500)	0.015	0.014
20	1.67	0.10	0.030	(0.498)	0.015	0.014
21	1.75	0.10	0.030	(0.496)	0.015	0.014
22	1.83	0.13	0.040	(0.494)	0.021	0.019
23	1.92	0.13	0.040	(0.492)	0.021	0.019
24	2.00	0.13	0.040	(0.490)	0.021	0.019
25	2.08	0.13	0.040	(0.488)	0.021	0.019
26	2.17	0.13	0.040	(0.486)	0.021	0.019
27	2.25	0.13	0.040	(0.484)	0.021	0.019
28	2.33	0.13	0.040	(0.482)	0.021	0.019
29	2.42	0.13	0.040	(0.480)	0.021	0.019
30	2.50	0.13	0.040	(0.478)	0.021	0.019
31	2.58	0.17	0.050	(0.476)	0.026	0.024
32	2.67	0.17	0.050	(0.474)	0.026	0.024
33	2.75	0.17	0.050	(0.472)	0.026	0.024
34	2.83	0.17	0.050	(0.470)	0.026	0.024
35	2.92	0.17	0.050	(0.468)	0.026	0.024
36	3.00	0.17	0.050	(0.466)	0.026	0.024
37	3.08	0.17	0.050	(0.464)	0.026	0.024
38	3.17	0.17	0.050	(0.462)	0.026	0.024
39	3.25	0.17	0.050	(0.461)	0.026	0.024
40	3.33	0.17	0.050	(0.459)	0.026	0.024
41	3.42	0.17	0.050	(0.457)	0.026	0.024
42	3.50	0.17	0.050	(0.455)	0.026	0.024
43	3.58	0.17	0.050	(0.453)	0.026	0.024
44	3.67	0.17	0.050	(0.451)	0.026	0.024
45	3.75	0.17	0.050	(0.449)	0.026	0.024
46	3.83	0.20	0.060	(0.447)	0.031	0.029
47	3.92	0.20	0.060	(0.445)	0.031	0.029
48	4.00	0.20	0.060	(0.443)	0.031	0.029
49	4.08	0.20	0.060	(0.442)	0.031	0.029

50	4.17	0.20	0.060	(0.440)	0.031	0.029
51	4.25	0.20	0.060	(0.438)	0.031	0.029
52	4.33	0.23	0.069	(0.436)	0.036	0.033
53	4.42	0.23	0.069	(0.434)	0.036	0.033
54	4.50	0.23	0.069	(0.432)	0.036	0.033
55	4.58	0.23	0.069	(0.430)	0.036	0.033
56	4.67	0.23	0.069	(0.429)	0.036	0.033
57	4.75	0.23	0.069	(0.427)	0.036	0.033
58	4.83	0.27	0.079	(0.425)	0.041	0.038
59	4.92	0.27	0.079	(0.423)	0.041	0.038
60	5.00	0.27	0.079	(0.421)	0.041	0.038
61	5.08	0.20	0.060	(0.419)	0.031	0.029
62	5.17	0.20	0.060	(0.417)	0.031	0.029
63	5.25	0.20	0.060	(0.416)	0.031	0.029
64	5.33	0.23	0.069	(0.414)	0.036	0.033
65	5.42	0.23	0.069	(0.412)	0.036	0.033
66	5.50	0.23	0.069	(0.410)	0.036	0.033
67	5.58	0.27	0.079	(0.408)	0.041	0.038
68	5.67	0.27	0.079	(0.407)	0.041	0.038
69	5.75	0.27	0.079	(0.405)	0.041	0.038
70	5.83	0.27	0.079	(0.403)	0.041	0.038
71	5.92	0.27	0.079	(0.401)	0.041	0.038
72	6.00	0.27	0.079	(0.400)	0.041	0.038
73	6.08	0.30	0.089	(0.398)	0.046	0.043
74	6.17	0.30	0.089	(0.396)	0.046	0.043
75	6.25	0.30	0.089	(0.394)	0.046	0.043
76	6.33	0.30	0.089	(0.392)	0.046	0.043
77	6.42	0.30	0.089	(0.391)	0.046	0.043
78	6.50	0.30	0.089	(0.389)	0.046	0.043
79	6.58	0.33	0.099	(0.387)	0.051	0.048
80	6.67	0.33	0.099	(0.385)	0.051	0.048
81	6.75	0.33	0.099	(0.384)	0.051	0.048
82	6.83	0.33	0.099	(0.382)	0.051	0.048
83	6.92	0.33	0.099	(0.380)	0.051	0.048
84	7.00	0.33	0.099	(0.379)	0.051	0.048
85	7.08	0.33	0.099	(0.377)	0.051	0.048
86	7.17	0.33	0.099	(0.375)	0.051	0.048
87	7.25	0.33	0.099	(0.373)	0.051	0.048
88	7.33	0.37	0.109	(0.372)	0.057	0.053
89	7.42	0.37	0.109	(0.370)	0.057	0.053
90	7.50	0.37	0.109	(0.368)	0.057	0.053
91	7.58	0.40	0.119	(0.367)	0.062	0.057
92	7.67	0.40	0.119	(0.365)	0.062	0.057
93	7.75	0.40	0.119	(0.363)	0.062	0.057
94	7.83	0.43	0.129	(0.362)	0.067	0.062
95	7.92	0.43	0.129	(0.360)	0.067	0.062
96	8.00	0.43	0.129	(0.358)	0.067	0.062
97	8.08	0.50	0.149	(0.357)	0.077	0.072
98	8.17	0.50	0.149	(0.355)	0.077	0.072
99	8.25	0.50	0.149	(0.353)	0.077	0.072
100	8.33	0.50	0.149	(0.352)	0.077	0.072
101	8.42	0.50	0.149	(0.350)	0.077	0.072
102	8.50	0.50	0.149	(0.348)	0.077	0.072
103	8.58	0.53	0.159	(0.347)	0.082	0.076

104	8.67	0.53	0.159	(0.345)	0.082	0.076
105	8.75	0.53	0.159	(0.343)	0.082	0.076
106	8.83	0.57	0.169	(0.342)	0.087	0.081
107	8.92	0.57	0.169	(0.340)	0.087	0.081
108	9.00	0.57	0.169	(0.339)	0.087	0.081
109	9.08	0.63	0.188	(0.337)	0.098	0.091
110	9.17	0.63	0.188	(0.335)	0.098	0.091
111	9.25	0.63	0.188	(0.334)	0.098	0.091
112	9.33	0.67	0.198	(0.332)	0.103	0.096
113	9.42	0.67	0.198	(0.331)	0.103	0.096
114	9.50	0.67	0.198	(0.329)	0.103	0.096
115	9.58	0.70	0.208	(0.327)	0.108	0.100
116	9.67	0.70	0.208	(0.326)	0.108	0.100
117	9.75	0.70	0.208	(0.324)	0.108	0.100
118	9.83	0.73	0.218	(0.323)	0.113	0.105
119	9.92	0.73	0.218	(0.321)	0.113	0.105
120	10.00	0.73	0.218	(0.320)	0.113	0.105
121	10.08	0.50	0.149	(0.318)	0.077	0.072
122	10.17	0.50	0.149	(0.317)	0.077	0.072
123	10.25	0.50	0.149	(0.315)	0.077	0.072
124	10.33	0.50	0.149	(0.313)	0.077	0.072
125	10.42	0.50	0.149	(0.312)	0.077	0.072
126	10.50	0.50	0.149	(0.310)	0.077	0.072
127	10.58	0.67	0.198	(0.309)	0.103	0.096
128	10.67	0.67	0.198	(0.307)	0.103	0.096
129	10.75	0.67	0.198	(0.306)	0.103	0.096
130	10.83	0.67	0.198	(0.304)	0.103	0.096
131	10.92	0.67	0.198	(0.303)	0.103	0.096
132	11.00	0.67	0.198	(0.301)	0.103	0.096
133	11.08	0.63	0.188	(0.300)	0.098	0.091
134	11.17	0.63	0.188	(0.298)	0.098	0.091
135	11.25	0.63	0.188	(0.297)	0.098	0.091
136	11.33	0.63	0.188	(0.295)	0.098	0.091
137	11.42	0.63	0.188	(0.294)	0.098	0.091
138	11.50	0.63	0.188	(0.293)	0.098	0.091
139	11.58	0.57	0.169	(0.291)	0.087	0.081
140	11.67	0.57	0.169	(0.290)	0.087	0.081
141	11.75	0.57	0.169	(0.288)	0.087	0.081
142	11.83	0.60	0.179	(0.287)	0.093	0.086
143	11.92	0.60	0.179	(0.285)	0.093	0.086
144	12.00	0.60	0.179	(0.284)	0.093	0.086
145	12.08	0.83	0.248	(0.283)	0.129	0.119
146	12.17	0.83	0.248	(0.281)	0.129	0.119
147	12.25	0.83	0.248	(0.280)	0.129	0.119
148	12.33	0.87	0.258	(0.278)	0.134	0.124
149	12.42	0.87	0.258	(0.277)	0.134	0.124
150	12.50	0.87	0.258	(0.276)	0.134	0.124
151	12.58	0.93	0.278	(0.274)	0.144	0.134
152	12.67	0.93	0.278	(0.273)	0.144	0.134
153	12.75	0.93	0.278	(0.271)	0.144	0.134
154	12.83	0.97	0.288	(0.270)	0.149	0.138
155	12.92	0.97	0.288	(0.269)	0.149	0.138
156	13.00	0.97	0.288	(0.267)	0.149	0.138
157	13.08	1.13	0.337	(0.266)	0.175	0.162

158	13.17	1.13	0.337	(0.265)	0.175	0.162
159	13.25	1.13	0.337	(0.263)	0.175	0.162
160	13.33	1.13	0.337	(0.262)	0.175	0.162
161	13.42	1.13	0.337	(0.261)	0.175	0.162
162	13.50	1.13	0.337	(0.259)	0.175	0.162
163	13.58	0.77	0.228	(0.258)	0.118	0.110
164	13.67	0.77	0.228	(0.257)	0.118	0.110
165	13.75	0.77	0.228	(0.255)	0.118	0.110
166	13.83	0.77	0.228	(0.254)	0.118	0.110
167	13.92	0.77	0.228	(0.253)	0.118	0.110
168	14.00	0.77	0.228	(0.251)	0.118	0.110
169	14.08	0.90	0.268	(0.250)	0.139	0.129
170	14.17	0.90	0.268	(0.249)	0.139	0.129
171	14.25	0.90	0.268	(0.248)	0.139	0.129
172	14.33	0.87	0.258	(0.246)	0.134	0.124
173	14.42	0.87	0.258	(0.245)	0.134	0.124
174	14.50	0.87	0.258	(0.244)	0.134	0.124
175	14.58	0.87	0.258	(0.243)	0.134	0.124
176	14.67	0.87	0.258	(0.241)	0.134	0.124
177	14.75	0.87	0.258	(0.240)	0.134	0.124
178	14.83	0.83	0.248	(0.239)	0.129	0.119
179	14.92	0.83	0.248	(0.238)	0.129	0.119
180	15.00	0.83	0.248	(0.236)	0.129	0.119
181	15.08	0.80	0.238	(0.235)	0.123	0.115
182	15.17	0.80	0.238	(0.234)	0.123	0.115
183	15.25	0.80	0.238	(0.233)	0.123	0.115
184	15.33	0.77	0.228	(0.232)	0.118	0.110
185	15.42	0.77	0.228	(0.230)	0.118	0.110
186	15.50	0.77	0.228	(0.229)	0.118	0.110
187	15.58	0.63	0.188	(0.228)	0.098	0.091
188	15.67	0.63	0.188	(0.227)	0.098	0.091
189	15.75	0.63	0.188	(0.226)	0.098	0.091
190	15.83	0.63	0.188	(0.225)	0.098	0.091
191	15.92	0.63	0.188	(0.223)	0.098	0.091
192	16.00	0.63	0.188	(0.222)	0.098	0.091
193	16.08	0.13	0.040	(0.221)	0.021	0.019
194	16.17	0.13	0.040	(0.220)	0.021	0.019
195	16.25	0.13	0.040	(0.219)	0.021	0.019
196	16.33	0.13	0.040	(0.218)	0.021	0.019
197	16.42	0.13	0.040	(0.217)	0.021	0.019
198	16.50	0.13	0.040	(0.216)	0.021	0.019
199	16.58	0.10	0.030	(0.214)	0.015	0.014
200	16.67	0.10	0.030	(0.213)	0.015	0.014
201	16.75	0.10	0.030	(0.212)	0.015	0.014
202	16.83	0.10	0.030	(0.211)	0.015	0.014
203	16.92	0.10	0.030	(0.210)	0.015	0.014
204	17.00	0.10	0.030	(0.209)	0.015	0.014
205	17.08	0.17	0.050	(0.208)	0.026	0.024
206	17.17	0.17	0.050	(0.207)	0.026	0.024
207	17.25	0.17	0.050	(0.206)	0.026	0.024
208	17.33	0.17	0.050	(0.205)	0.026	0.024
209	17.42	0.17	0.050	(0.204)	0.026	0.024
210	17.50	0.17	0.050	(0.203)	0.026	0.024
211	17.58	0.17	0.050	(0.202)	0.026	0.024

212	17.67	0.17	0.050	(0.201)	0.026	0.024
213	17.75	0.17	0.050	(0.200)	0.026	0.024
214	17.83	0.13	0.040	(0.199)	0.021	0.019
215	17.92	0.13	0.040	(0.198)	0.021	0.019
216	18.00	0.13	0.040	(0.197)	0.021	0.019
217	18.08	0.13	0.040	(0.196)	0.021	0.019
218	18.17	0.13	0.040	(0.195)	0.021	0.019
219	18.25	0.13	0.040	(0.194)	0.021	0.019
220	18.33	0.13	0.040	(0.193)	0.021	0.019
221	18.42	0.13	0.040	(0.192)	0.021	0.019
222	18.50	0.13	0.040	(0.191)	0.021	0.019
223	18.58	0.10	0.030	(0.190)	0.015	0.014
224	18.67	0.10	0.030	(0.189)	0.015	0.014
225	18.75	0.10	0.030	(0.188)	0.015	0.014
226	18.83	0.07	0.020	(0.188)	0.010	0.010
227	18.92	0.07	0.020	(0.187)	0.010	0.010
228	19.00	0.07	0.020	(0.186)	0.010	0.010
229	19.08	0.10	0.030	(0.185)	0.015	0.014
230	19.17	0.10	0.030	(0.184)	0.015	0.014
231	19.25	0.10	0.030	(0.183)	0.015	0.014
232	19.33	0.13	0.040	(0.182)	0.021	0.019
233	19.42	0.13	0.040	(0.181)	0.021	0.019
234	19.50	0.13	0.040	(0.181)	0.021	0.019
235	19.58	0.10	0.030	(0.180)	0.015	0.014
236	19.67	0.10	0.030	(0.179)	0.015	0.014
237	19.75	0.10	0.030	(0.178)	0.015	0.014
238	19.83	0.07	0.020	(0.177)	0.010	0.010
239	19.92	0.07	0.020	(0.177)	0.010	0.010
240	20.00	0.07	0.020	(0.176)	0.010	0.010
241	20.08	0.10	0.030	(0.175)	0.015	0.014
242	20.17	0.10	0.030	(0.174)	0.015	0.014
243	20.25	0.10	0.030	(0.173)	0.015	0.014
244	20.33	0.10	0.030	(0.173)	0.015	0.014
245	20.42	0.10	0.030	(0.172)	0.015	0.014
246	20.50	0.10	0.030	(0.171)	0.015	0.014
247	20.58	0.10	0.030	(0.171)	0.015	0.014
248	20.67	0.10	0.030	(0.170)	0.015	0.014
249	20.75	0.10	0.030	(0.169)	0.015	0.014
250	20.83	0.07	0.020	(0.168)	0.010	0.010
251	20.92	0.07	0.020	(0.168)	0.010	0.010
252	21.00	0.07	0.020	(0.167)	0.010	0.010
253	21.08	0.10	0.030	(0.166)	0.015	0.014
254	21.17	0.10	0.030	(0.166)	0.015	0.014
255	21.25	0.10	0.030	(0.165)	0.015	0.014
256	21.33	0.07	0.020	(0.164)	0.010	0.010
257	21.42	0.07	0.020	(0.164)	0.010	0.010
258	21.50	0.07	0.020	(0.163)	0.010	0.010
259	21.58	0.10	0.030	(0.163)	0.015	0.014
260	21.67	0.10	0.030	(0.162)	0.015	0.014
261	21.75	0.10	0.030	(0.161)	0.015	0.014
262	21.83	0.07	0.020	(0.161)	0.010	0.010
263	21.92	0.07	0.020	(0.160)	0.010	0.010
264	22.00	0.07	0.020	(0.160)	0.010	0.010
265	22.08	0.10	0.030	(0.159)	0.015	0.014

266	22.17	0.10	0.030	(0.159)	0.015	0.014
267	22.25	0.10	0.030	(0.158)	0.015	0.014
268	22.33	0.07	0.020	(0.158)	0.010	0.010
269	22.42	0.07	0.020	(0.157)	0.010	0.010
270	22.50	0.07	0.020	(0.157)	0.010	0.010
271	22.58	0.07	0.020	(0.156)	0.010	0.010
272	22.67	0.07	0.020	(0.156)	0.010	0.010
273	22.75	0.07	0.020	(0.155)	0.010	0.010
274	22.83	0.07	0.020	(0.155)	0.010	0.010
275	22.92	0.07	0.020	(0.155)	0.010	0.010
276	23.00	0.07	0.020	(0.154)	0.010	0.010
277	23.08	0.07	0.020	(0.154)	0.010	0.010
278	23.17	0.07	0.020	(0.154)	0.010	0.010
279	23.25	0.07	0.020	(0.153)	0.010	0.010
280	23.33	0.07	0.020	(0.153)	0.010	0.010
281	23.42	0.07	0.020	(0.153)	0.010	0.010
282	23.50	0.07	0.020	(0.152)	0.010	0.010
283	23.58	0.07	0.020	(0.152)	0.010	0.010
284	23.67	0.07	0.020	(0.152)	0.010	0.010
285	23.75	0.07	0.020	(0.152)	0.010	0.010
286	23.83	0.07	0.020	(0.152)	0.010	0.010
287	23.92	0.07	0.020	(0.151)	0.010	0.010
288	24.00	0.07	0.020	(0.151)	0.010	0.010

(Loss Rate Not Used)

Sum = 100.0

Sum = 14.3

Flood volume = Effective rainfall 1.19(In)
times area 14.0(Ac.)/[(In)/(Ft.)] = 1.4(Ac.Ft)
Total soil loss = 1.29(In)
Total soil loss = 1.500(Ac.Ft)
Total rainfall = 2.48(In)
Flood volume = 60670.9 Cubic Feet
Total soil loss = 65359.2 Cubic Feet

Peak flow rate of this hydrograph = 2.292(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0003	0.05	Q				
0+10	0.0011	0.11	Q				
0+15	0.0019	0.12	Q				
0+20	0.0030	0.15	Q				
0+25	0.0043	0.19	Q				
0+30	0.0056	0.20	Q				
0+35	0.0070	0.20	Q				
0+40	0.0084	0.20	Q				
0+45	0.0098	0.20	Q				
0+50	0.0114	0.23	Q				

0+55	0.0131	0.26	VQ
1+ 0	0.0149	0.26	VQ
1+ 5	0.0166	0.24	Q
1+10	0.0181	0.21	Q
1+15	0.0195	0.21	Q
1+20	0.0209	0.20	Q
1+25	0.0223	0.20	Q
1+30	0.0237	0.20	Q
1+35	0.0251	0.20	Q
1+40	0.0265	0.20	Q
1+45	0.0279	0.20	Q
1+50	0.0295	0.23	Q
1+55	0.0312	0.26	VQ
2+ 0	0.0331	0.26	VQ
2+ 5	0.0349	0.27	Q
2+10	0.0367	0.27	Q
2+15	0.0386	0.27	Q
2+20	0.0405	0.27	Q
2+25	0.0423	0.27	Q
2+30	0.0442	0.27	Q
2+35	0.0462	0.29	Q
2+40	0.0484	0.32	Q
2+45	0.0507	0.33	Q
2+50	0.0530	0.33	Q
2+55	0.0553	0.34	Q
3+ 0	0.0577	0.34	Q
3+ 5	0.0600	0.34	Q
3+10	0.0623	0.34	Q
3+15	0.0646	0.34	Q
3+20	0.0669	0.34	Q
3+25	0.0693	0.34	Q
3+30	0.0716	0.34	QV
3+35	0.0739	0.34	QV
3+40	0.0762	0.34	QV
3+45	0.0786	0.34	QV
3+50	0.0810	0.36	QV
3+55	0.0837	0.39	QV
4+ 0	0.0865	0.40	QV
4+ 5	0.0893	0.40	QV
4+10	0.0920	0.40	QV
4+15	0.0948	0.40	QV
4+20	0.0978	0.43	QV
4+25	0.1009	0.46	QV
4+30	0.1041	0.47	QV
4+35	0.1074	0.47	Q V
4+40	0.1106	0.47	Q V
4+45	0.1139	0.47	Q V
4+50	0.1173	0.50	Q V
4+55	0.1209	0.53	QV
5+ 0	0.1246	0.53	QV
5+ 5	0.1280	0.49	Q V
5+10	0.1309	0.43	Q V
5+15	0.1338	0.42	Q V
5+20	0.1368	0.43	Q V

5+25	0.1399	0.46	Q	V				
5+30	0.1431	0.47	Q	V				
5+35	0.1465	0.49	Q	V				
5+40	0.1502	0.53	Q	V				
5+45	0.1538	0.53	Q	V				
5+50	0.1575	0.54	Q	V				
5+55	0.1612	0.54	Q	V				
6+ 0	0.1650	0.54	Q	V				
6+ 5	0.1688	0.56	Q	V				
6+10	0.1729	0.59	Q	V				
6+15	0.1771	0.60	Q	V				
6+20	0.1812	0.60	Q	V				
6+25	0.1854	0.61	Q	V				
6+30	0.1896	0.61	Q	V				
6+35	0.1939	0.63	Q	V				
6+40	0.1985	0.66	Q	V				
6+45	0.2031	0.67	Q	V				
6+50	0.2077	0.67	Q	V				
6+55	0.2124	0.67	Q	V				
7+ 0	0.2170	0.67	Q	V				
7+ 5	0.2216	0.67	Q	V				
7+10	0.2263	0.67	Q	V				
7+15	0.2309	0.67	Q	V				
7+20	0.2357	0.70	Q	V				
7+25	0.2407	0.73	Q	V				
7+30	0.2458	0.74	Q	V				
7+35	0.2511	0.76	Q	V				
7+40	0.2566	0.80	Q	V				
7+45	0.2621	0.80	Q	V				
7+50	0.2678	0.83	Q	V				
7+55	0.2737	0.86	Q	V				
8+ 0	0.2797	0.87	Q	V				
8+ 5	0.2861	0.92	Q	V				
8+10	0.2929	0.99	Q	V				
8+15	0.2998	1.00	Q	V				
8+20	0.3067	1.01	Q	V				
8+25	0.3137	1.01	Q	V				
8+30	0.3206	1.01	Q	V				
8+35	0.3277	1.03	Q	V				
8+40	0.3351	1.07	Q	V				
8+45	0.3425	1.07	Q	V				
8+50	0.3501	1.10	Q	V				
8+55	0.3579	1.13	Q	V				
9+ 0	0.3657	1.14	Q	V				
9+ 5	0.3739	1.19	Q	V				
9+10	0.3826	1.25	Q	V				
9+15	0.3913	1.27	Q	V				
9+20	0.4003	1.30	Q	V				
9+25	0.4094	1.33	Q	V				
9+30	0.4187	1.34	Q	V				
9+35	0.4281	1.37	Q	V				
9+40	0.4378	1.40	Q	V				
9+45	0.4475	1.41	Q	V				
9+50	0.4574	1.44	Q	V				

9+55	0.4675	1.47	Q	V				
10+ 0	0.4777	1.48	Q	V				
10+ 5	0.4868	1.32	Q	V				
10+10	0.4943	1.10	Q	V				
10+15	0.5015	1.05	Q	V				
10+20	0.5086	1.03	Q	V				
10+25	0.5156	1.02	Q	V				
10+30	0.5226	1.01	Q	V				
10+35	0.5303	1.13	Q	V				
10+40	0.5392	1.29	Q	V				
10+45	0.5483	1.32	Q	V				
10+50	0.5575	1.34	Q	V				
10+55	0.5668	1.35	Q	V				
11+ 0	0.5761	1.35	Q	V				
11+ 5	0.5852	1.32	Q	V				
11+10	0.5941	1.29	Q	V				
11+15	0.6029	1.29	Q	V				
11+20	0.6118	1.28	Q	V				
11+25	0.6206	1.28	Q	V				
11+30	0.6294	1.28	Q	V				
11+35	0.6379	1.23	Q	V				
11+40	0.6460	1.17	Q	V				
11+45	0.6540	1.16	Q	V				
11+50	0.6620	1.17	Q	V				
11+55	0.6703	1.20	Q	V				
12+ 0	0.6786	1.21	Q	V				
12+ 5	0.6881	1.38	Q	V				
12+10	0.6991	1.60	Q	V				
12+15	0.7105	1.65	Q	V				
12+20	0.7221	1.69	Q	V				
12+25	0.7341	1.74	Q	V				
12+30	0.7461	1.75	Q	V				
12+35	0.7585	1.80	Q	V				
12+40	0.7713	1.86	Q	V				
12+45	0.7842	1.88	Q	V				
12+50	0.7974	1.91	Q	V				
12+55	0.8107	1.94	Q	V				
13+ 0	0.8242	1.95	Q	V				
13+ 5	0.8384	2.07	Q	V				
13+10	0.8538	2.23	Q	V				
13+15	0.8694	2.27	Q	V				
13+20	0.8851	2.28	Q	V				
13+25	0.9008	2.29	Q	V				
13+30	0.9166	2.29	Q	V				
13+35	0.9306	2.03	Q	V				
13+40	0.9423	1.69	Q	V				
13+45	0.9534	1.61	Q	V				
13+50	0.9642	1.57	Q	V				
13+55	0.9749	1.56	Q	V				
14+ 0	0.9856	1.55	Q	V				
14+ 5	0.9969	1.64	Q	V				
14+10	1.0091	1.77	Q	V				
14+15	1.0215	1.80	Q	V				
14+20	1.0338	1.79	Q	V				

14+25	1.0460	1.76		Q		V
14+30	1.0581	1.76		Q		V
14+35	1.0701	1.75		Q		V
14+40	1.0822	1.75		Q		V
14+45	1.0943	1.75		Q		V
14+50	1.1062	1.73		Q		V
14+55	1.1179	1.70		Q		V
15+ 0	1.1295	1.69		Q		V
15+ 5	1.1410	1.66		Q		V
15+10	1.1522	1.63		Q		V
15+15	1.1634	1.62		Q		V
15+20	1.1744	1.60		Q		V
15+25	1.1852	1.56		Q		V
15+30	1.1959	1.56		Q		V
15+35	1.2059	1.46		Q		V
15+40	1.2151	1.33		Q		V
15+45	1.2241	1.30		Q		V
15+50	1.2330	1.29		Q		V
15+55	1.2418	1.28		Q		V
16+ 0	1.2506	1.28		Q		V
16+ 5	1.2570	0.93	Q			V
16+10	1.2602	0.46	Q			V
16+15	1.2626	0.35	Q			V
16+20	1.2647	0.30	Q			V
16+25	1.2666	0.28	Q			V
16+30	1.2685	0.27	Q			V
16+35	1.2702	0.25	Q			V
16+40	1.2716	0.21	Q			V
16+45	1.2731	0.21	Q			V
16+50	1.2745	0.20	Q			V
16+55	1.2759	0.20	Q			V
17+ 0	1.2773	0.20	Q			V
17+ 5	1.2790	0.25	Q			V
17+10	1.2811	0.31	Q			V
17+15	1.2834	0.33	Q			V
17+20	1.2857	0.33	Q			V
17+25	1.2880	0.34	Q			V
17+30	1.2903	0.34	Q			V
17+35	1.2926	0.34	Q			V
17+40	1.2949	0.34	Q			V
17+45	1.2973	0.34	Q			V
17+50	1.2994	0.31	Q			V
17+55	1.3014	0.28	Q			V
18+ 0	1.3033	0.27	Q			V
18+ 5	1.3051	0.27	Q			V
18+10	1.3070	0.27	Q			V
18+15	1.3089	0.27	Q			V
18+20	1.3107	0.27	Q			V
18+25	1.3126	0.27	Q			V
18+30	1.3144	0.27	Q			V
18+35	1.3161	0.25	Q			V
18+40	1.3176	0.21	Q			V
18+45	1.3190	0.21	Q			V
18+50	1.3203	0.18	Q			V

18+55	1.3213	0.15	Q				V
19+ 0	1.3223	0.14	Q				V
19+ 5	1.3234	0.16	Q				V
19+10	1.3247	0.19	Q				V
19+15	1.3260	0.20	Q				V
19+20	1.3276	0.22	Q				V
19+25	1.3293	0.26	Q				V
19+30	1.3312	0.26	Q				V
19+35	1.3328	0.24	Q				V
19+40	1.3343	0.21	Q				V
19+45	1.3357	0.21	Q				V
19+50	1.3370	0.18	Q				V
19+55	1.3380	0.15	Q				V
20+ 0	1.3390	0.14	Q				V
20+ 5	1.3401	0.16	Q				V
20+10	1.3414	0.19	Q				V
20+15	1.3427	0.20	Q				V
20+20	1.3441	0.20	Q				V
20+25	1.3455	0.20	Q				V
20+30	1.3469	0.20	Q				V
20+35	1.3483	0.20	Q				V
20+40	1.3497	0.20	Q				V
20+45	1.3511	0.20	Q				V
20+50	1.3523	0.18	Q				V
20+55	1.3533	0.15	Q				V
21+ 0	1.3543	0.14	Q				V
21+ 5	1.3554	0.16	Q				V
21+10	1.3567	0.19	Q				V
21+15	1.3581	0.20	Q				V
21+20	1.3593	0.18	Q				V
21+25	1.3603	0.15	Q				V
21+30	1.3613	0.14	Q				V
21+35	1.3624	0.16	Q				V
21+40	1.3637	0.19	Q				V
21+45	1.3650	0.20	Q				V
21+50	1.3662	0.18	Q				V
21+55	1.3673	0.15	Q				V
22+ 0	1.3682	0.14	Q				V
22+ 5	1.3693	0.16	Q				V
22+10	1.3706	0.19	Q				V
22+15	1.3720	0.20	Q				V
22+20	1.3732	0.18	Q				V
22+25	1.3742	0.15	Q				V
22+30	1.3752	0.14	Q				V
22+35	1.3761	0.14	Q				V
22+40	1.3771	0.14	Q				V
22+45	1.3780	0.13	Q				V
22+50	1.3789	0.13	Q				V
22+55	1.3798	0.13	Q				V
23+ 0	1.3808	0.13	Q				V
23+ 5	1.3817	0.13	Q				V
23+10	1.3826	0.13	Q				V
23+15	1.3836	0.13	Q				V
23+20	1.3845	0.13	Q				V

23+25	1.3854	0.13	Q				V
23+30	1.3863	0.13	Q				V
23+35	1.3873	0.13	Q				V
23+40	1.3882	0.13	Q				V
23+45	1.3891	0.13	Q				V
23+50	1.3901	0.13	Q				V
23+55	1.3910	0.13	Q				V
24+ 0	1.3919	0.13	Q				V
24+ 5	1.3925	0.09	Q				V
24+10	1.3927	0.03	Q				V
24+15	1.3928	0.01	Q				V
24+20	1.3928	0.00	Q				V
24+25	1.3928	0.00	Q				V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CNat15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "C" (Subarea 2)

Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
14.00	0.58	8.12

100 YEAR Area rainfall data:

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

14.00

1.45

20.30

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 0.784(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
Sum (F) =						0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	156.692	4.904
2	0.167	313.385	6.563
3	0.250	470.077	1.525
4	0.333	626.769	0.660
5	0.417	783.462	0.323
6	0.500	940.154	0.135
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.414	(0.303)	0.215	0.199
2	0.17	4.50	0.423	(0.303)	0.219	0.204
3	0.25	5.40	0.508	(0.303)	0.263	0.244
4	0.33	5.40	0.508	(0.303)	0.263	0.244
5	0.42	5.70	0.536	(0.303)	0.278	0.258
6	0.50	6.40	0.602	0.303	(0.312)	0.299
7	0.58	7.90	0.743	0.303	(0.385)	0.440
8	0.67	9.10	0.856	0.303	(0.444)	0.553
9	0.75	12.80	1.204	0.303	(0.624)	0.901
10	0.83	25.60	2.407	0.303	(1.249)	2.105
11	0.92	7.90	0.743	0.303	(0.385)	0.440
12	1.00	4.90	0.461	(0.303)	0.239	0.222

(Loss Rate Not Used)

Sum = 100.0 Sum = 6.1

Flood volume = Effective rainfall 0.51(In)
times area 14.0(Ac.)/[(In)/(Ft.)] = 0.6(Ac.Ft)

Total soil loss = 0.27(In)

Total soil loss = 0.320(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 25877.7 Cubic Feet

Total soil loss = 13948.7 Cubic Feet

Peak flow rate of this hydrograph = 17.903(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0067	0.98	VQ				
0+10	0.0226	2.31	V Q				
0+15	0.0422	2.84	V Q				
0+20	0.0646	3.25	V Q				
0+25	0.0883	3.44	VQ				
0+30	0.1144	3.79	Q				
0+35	0.1473	4.79	Q				
0+40	0.1910	6.34	Q				
0+45	0.2533	9.04		Q			
0+50	0.3739	17.51		VQ			
0+55	0.4972	17.90			V		
1+ 0	0.5524	8.02		Q		Q	
1+ 5	0.5792	3.88		Q		V Q	
1+10	0.5890	1.43	Q			V	V

1+15	0.5930	0.57	Q				V
1+20	0.5939	0.13	Q				V
1+25	0.5941	0.03	Q				V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CNat35.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "C" (Subarea 2)

Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 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]
14.00	0.98	13.72

100 YEAR Area rainfall data:

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

14.00

2.48

34.72

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00(Ac.)		

RI	RI	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
AMC2	AMC-1					
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
Sum (F) =						0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	156.692	34.756
2	0.167	313.385	46.515
3	0.250	470.077	10.806
4	0.333	626.769	4.681
5	0.417	783.462	2.286
6	0.500	940.154	0.956
Sum =		100.000	Sum= 14.109

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	0.08	1.30	0.208	(0.303)	0.108	0.100
2	0.17	1.30	0.208	(0.303)	0.108	0.100
3	0.25	1.10	0.176	(0.303)	0.091	0.085
4	0.33	1.50	0.240	(0.303)	0.124	0.115
5	0.42	1.50	0.240	(0.303)	0.124	0.115
6	0.50	1.80	0.288	(0.303)	0.149	0.138
7	0.58	1.50	0.240	(0.303)	0.124	0.115
8	0.67	1.80	0.288	(0.303)	0.149	0.138
9	0.75	1.80	0.288	(0.303)	0.149	0.138
10	0.83	1.50	0.240	(0.303)	0.124	0.115
11	0.92	1.60	0.256	(0.303)	0.133	0.123
12	1.00	1.80	0.288	(0.303)	0.149	0.138
13	1.08	2.20	0.351	(0.303)	0.182	0.169
14	1.17	2.20	0.351	(0.303)	0.182	0.169
15	1.25	2.20	0.351	(0.303)	0.182	0.169
16	1.33	2.00	0.320	(0.303)	0.166	0.154
17	1.42	2.60	0.415	(0.303)	0.215	0.200
18	1.50	2.70	0.431	(0.303)	0.224	0.208
19	1.58	2.40	0.383	(0.303)	0.199	0.185
20	1.67	2.70	0.431	(0.303)	0.224	0.208
21	1.75	3.30	0.527	(0.303)	0.273	0.254
22	1.83	3.10	0.495	(0.303)	0.257	0.238
23	1.92	2.90	0.463	(0.303)	0.240	0.223
24	2.00	3.00	0.479	(0.303)	0.249	0.231
25	2.08	3.10	0.495	(0.303)	0.257	0.238
26	2.17	4.20	0.671	0.303 (0.348)		0.368
27	2.25	5.00	0.799	0.303 (0.414)		0.496
28	2.33	3.50	0.559	(0.303)	0.290	0.269
29	2.42	6.80	1.086	0.303 (0.563)		0.784
30	2.50	7.30	1.166	0.303 (0.605)		0.864
31	2.58	8.20	1.310	0.303 (0.679)		1.007
32	2.67	5.90	0.943	0.303 (0.489)		0.640
33	2.75	2.00	0.320	(0.303)	0.166	0.154
34	2.83	1.80	0.288	(0.303)	0.149	0.138
35	2.92	1.80	0.288	(0.303)	0.149	0.138
36	3.00	0.60	0.096	(0.303)	0.050	0.046

(Loss Rate Not Used)

Sum = 100.0 Sum = 9.0

$$\text{Flood volume} = \frac{\text{Effective rainfall}}{\text{times area}} = \frac{0.75 (\text{In})}{14.0 (\text{Ac.}) / [(\text{In}) / (\text{Ft.})]} = 0.9 (\text{Ac. Ft})$$

Total soil loss = 0.58 (In)

Total soil loss = 0.681 (Ac.Ft)

Total rainfall = 1.33 (In)

Flood volume = 38000.2 Cubic Feet

Total soil loss = 29654.1 Cubic Feet

Peak flow rate of this hydrograph = 12.195 (CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0034	0.49	Q					
0+10	0.0113	1.15	V Q					
0+15	0.0197	1.22	V Q					
0+20	0.0289	1.34	VQ					
0+25	0.0396	1.55	V Q					
0+30	0.0514	1.71	VQ					
0+35	0.0636	1.77	VQ					
0+40	0.0758	1.77	Q					
0+45	0.0890	1.91	QV					
0+50	0.1015	1.82	QV					
0+55	0.1133	1.72	Q V					
1+ 0	0.1258	1.81	Q V					
1+ 5	0.1401	2.07	Q V					
1+10	0.1558	2.29	Q V					
1+15	0.1720	2.35	Q V					
1+20	0.1878	2.30	Q V					
1+25	0.2046	2.43	Q V					
1+30	0.2236	2.76	Q V					
1+35	0.2425	2.75	Q V					
1+40	0.2615	2.75	Q V					
1+45	0.2829	3.11	Q V					
1+50	0.3061	3.37	Q V					
1+55	0.3286	3.27	Q V					
2+ 0	0.3508	3.22	Q V					
2+ 5	0.3735	3.29	Q V					
2+10	0.4009	3.98	Q V					
2+15	0.4386	5.47	Q V					
2+20	0.4758	5.40	Q V					
2+25	0.5221	6.72	Q V					
2+30	0.5928	10.27	Q V					
2+35	0.6768	12.20	Q V					
2+40	0.7577	11.74	Q V					
2+45	0.8083	7.35	Q V					
2+50	0.8339	3.72	Q V					
2+55	0.8524	2.69	Q V					
3+ 0	0.8648	1.79	Q V					
3+ 5	0.8699	0.74	Q V					
3+10	0.8714	0.23	Q V					
3+15	0.8721	0.09	Q V					
3+20	0.8723	0.03	Q V					
3+25	0.8724	0.01	Q V					

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CNat65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "C" (Subarea 2) Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
14.00	1.38	19.32

100 YEAR Area rainfall data:

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

14.00

3.48

48.72

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.872(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 1.872(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
		(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
AMC2	AMC-1					
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
Sum (F) =						0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	156.692	34.756
2	0.167	313.385	46.515
3	0.250	470.077	10.806
4	0.333	626.769	4.681
5	0.417	783.462	2.286
6	0.500	940.154	0.956
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.112	(0.303)	0.058	0.054
2	0.17	0.60	0.135	(0.303)	0.070	0.065
3	0.25	0.60	0.135	(0.303)	0.070	0.065
4	0.33	0.60	0.135	(0.303)	0.070	0.065
5	0.42	0.60	0.135	(0.303)	0.070	0.065
6	0.50	0.70	0.157	(0.303)	0.082	0.076
7	0.58	0.70	0.157	(0.303)	0.082	0.076
8	0.67	0.70	0.157	(0.303)	0.082	0.076
9	0.75	0.70	0.157	(0.303)	0.082	0.076
10	0.83	0.70	0.157	(0.303)	0.082	0.076
11	0.92	0.70	0.157	(0.303)	0.082	0.076
12	1.00	0.80	0.180	(0.303)	0.093	0.087
13	1.08	0.80	0.180	(0.303)	0.093	0.087
14	1.17	0.80	0.180	(0.303)	0.093	0.087
15	1.25	0.80	0.180	(0.303)	0.093	0.087
16	1.33	0.80	0.180	(0.303)	0.093	0.087
17	1.42	0.80	0.180	(0.303)	0.093	0.087
18	1.50	0.80	0.180	(0.303)	0.093	0.087
19	1.58	0.80	0.180	(0.303)	0.093	0.087
20	1.67	0.80	0.180	(0.303)	0.093	0.087
21	1.75	0.80	0.180	(0.303)	0.093	0.087
22	1.83	0.80	0.180	(0.303)	0.093	0.087
23	1.92	0.80	0.180	(0.303)	0.093	0.087
24	2.00	0.90	0.202	(0.303)	0.105	0.097
25	2.08	0.80	0.180	(0.303)	0.093	0.087
26	2.17	0.90	0.202	(0.303)	0.105	0.097
27	2.25	0.90	0.202	(0.303)	0.105	0.097
28	2.33	0.90	0.202	(0.303)	0.105	0.097
29	2.42	0.90	0.202	(0.303)	0.105	0.097
30	2.50	0.90	0.202	(0.303)	0.105	0.097
31	2.58	0.90	0.202	(0.303)	0.105	0.097
32	2.67	0.90	0.202	(0.303)	0.105	0.097
33	2.75	1.00	0.225	(0.303)	0.116	0.108
34	2.83	1.00	0.225	(0.303)	0.116	0.108
35	2.92	1.00	0.225	(0.303)	0.116	0.108
36	3.00	1.00	0.225	(0.303)	0.116	0.108
37	3.08	1.00	0.225	(0.303)	0.116	0.108
38	3.17	1.10	0.247	(0.303)	0.128	0.119
39	3.25	1.10	0.247	(0.303)	0.128	0.119
40	3.33	1.10	0.247	(0.303)	0.128	0.119
41	3.42	1.20	0.270	(0.303)	0.140	0.130
42	3.50	1.30	0.292	(0.303)	0.151	0.141
43	3.58	1.40	0.314	(0.303)	0.163	0.151
44	3.67	1.40	0.314	(0.303)	0.163	0.151
45	3.75	1.50	0.337	(0.303)	0.175	0.162
46	3.83	1.50	0.337	(0.303)	0.175	0.162
47	3.92	1.60	0.359	(0.303)	0.186	0.173
48	4.00	1.60	0.359	(0.303)	0.186	0.173
49	4.08	1.70	0.382	(0.303)	0.198	0.184

50	4.17	1.80	0.404	(0.303)	0.210	0.195
51	4.25	1.90	0.427	(0.303)	0.221	0.205
52	4.33	2.00	0.449	(0.303)	0.233	0.216
53	4.42	2.10	0.472	(0.303)	0.245	0.227
54	4.50	2.10	0.472	(0.303)	0.245	0.227
55	4.58	2.20	0.494	(0.303)	0.256	0.238
56	4.67	2.30	0.517	(0.303)	0.268	0.249
57	4.75	2.40	0.539	(0.303)	0.280	0.260
58	4.83	2.40	0.539	(0.303)	0.280	0.260
59	4.92	2.50	0.562	(0.303)	0.291	0.270
60	5.00	2.60	0.584	0.303 (0.303)		0.281
61	5.08	3.10	0.696	0.303 (0.361)		0.394
62	5.17	3.60	0.809	0.303 (0.419)		0.506
63	5.25	3.90	0.876	0.303 (0.454)		0.573
64	5.33	4.20	0.943	0.303 (0.489)		0.641
65	5.42	4.70	1.056	0.303 (0.547)		0.753
66	5.50	5.60	1.258	0.303 (0.652)		0.955
67	5.58	1.90	0.427	(0.303)	0.221	0.205
68	5.67	0.90	0.202	(0.303)	0.105	0.097
69	5.75	0.60	0.135	(0.303)	0.070	0.065
70	5.83	0.50	0.112	(0.303)	0.058	0.054
71	5.92	0.30	0.067	(0.303)	0.035	0.032
72	6.00	0.20	0.045	(0.303)	0.023	0.022

(Loss Rate Not Used)

Sum = 100.0

Sum = 11.9

Flood volume = Effective rainfall 0.99(In)
times area 14.0(Ac.)/[(In)/(Ft.)) = 1.2(Ac.Ft)
Total soil loss = 0.88(In)
Total soil loss = 1.025(Ac.Ft)
Total rainfall = 1.87(In)
Flood volume = 50485.1 Cubic Feet
Total soil loss = 44638.8 Cubic Feet

Peak flow rate of this hydrograph = 11.204(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0018	0.27	Q				
0+10	0.0065	0.67	VQ				
0+15	0.0122	0.83	VQ				
0+20	0.0182	0.88	VQ				
0+25	0.0244	0.90	VQ				
0+30	0.0311	0.97	Q				
0+35	0.0383	1.04	VQ				
0+40	0.0455	1.06	VQ				
0+45	0.0529	1.06	VQ				
0+50	0.0602	1.07	Q				

0+55	0.0676	1.07	Q						
1+ 0	0.0753	1.12	Q						
1+ 5	0.0835	1.19	Q						
1+10	0.0918	1.21	QV						
1+15	0.1002	1.22	QV						
1+20	0.1086	1.22	QV						
1+25	0.1170	1.22	Q V						
1+30	0.1254	1.22	Q V						
1+35	0.1338	1.22	Q V						
1+40	0.1422	1.22	Q V						
1+45	0.1507	1.22	Q V						
1+50	0.1591	1.22	Q V						
1+55	0.1675	1.22	Q V						
2+ 0	0.1763	1.27	Q V						
2+ 5	0.1852	1.29	Q V						
2+10	0.1940	1.29	Q V						
2+15	0.2034	1.35	Q V						
2+20	0.2128	1.37	Q V						
2+25	0.2222	1.37	Q V						
2+30	0.2316	1.37	Q V						
2+35	0.2411	1.37	Q V						
2+40	0.2506	1.37	Q V						
2+45	0.2604	1.43	Q V						
2+50	0.2707	1.50	Q V						
2+55	0.2811	1.51	Q V						
3+ 0	0.2916	1.52	Q V						
3+ 5	0.3021	1.52	Q V						
3+10	0.3130	1.58	Q V						
3+15	0.3244	1.65	Q V						
3+20	0.3358	1.67	Q V						
3+25	0.3477	1.73	Q V						
3+30	0.3605	1.85	Q V						
3+35	0.3743	2.00	Q V						
3+40	0.3887	2.09	Q V						
3+45	0.4036	2.17	Q V						
3+50	0.4192	2.25	Q V						
3+55	0.4352	2.33	Q V						
4+ 0	0.4518	2.41	Q V						
4+ 5	0.4689	2.48	Q V						
4+10	0.4869	2.61	Q V						
4+15	0.5059	2.76	Q V						
4+20	0.5259	2.91	Q V						
4+25	0.5470	3.06	Q V						
4+30	0.5687	3.16	Q V						
4+35	0.5910	3.24	Q V						
4+40	0.6143	3.38	Q V						
4+45	0.6385	3.52	Q V						
4+50	0.6635	3.62	Q V						
4+55	0.6889	3.70	Q V						
5+ 0	0.7153	3.84	Q V						
5+ 5	0.7462	4.48	Q V						
5+10	0.7861	5.79	Q V						
5+15	0.8346	7.04	Q V						
5+20	0.8902	8.07	Q V						

5+25	0.9540	9.28				Q		V	
5+30	1.0312	11.20						V	
5+35	1.0939	9.11				Q			
5+40	1.1219	4.07			Q				V
5+45	1.1373	2.23		Q					V
5+50	1.1468	1.39		Q					V
5+55	1.1528	0.87		Q					V
6+ 0	1.1563	0.50		Q					V
6+ 5	1.1581	0.26		Q					V
6+10	1.1587	0.08		Q					V
6+15	1.1589	0.03		Q					V
6+20	1.1590	0.01		Q					V
6+25	1.1590	0.00		Q					V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CNat245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "C" (Subarea 2)

Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 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]
14.00	2.48	34.72

100 YEAR Area rainfall data:

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

14.00

6.90

96.60

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.143	0.010
69.0	49.8	0.574	1.000	0.057	0.314	0.018
56.0	36.0	0.706	0.500	0.388	0.064	0.025
63.0	43.0	0.641	0.000	0.641	0.071	0.046
75.0	57.0	0.501	0.000	0.501	0.407	0.204
						Sum (F) = 0.303

Area averaged mean soil loss (F) (In/Hr) = 0.303

Minimum soil loss rate ((In/Hr)) = 0.151

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

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	0.083	156.692	4.904
2	0.167	313.385	6.563
3	0.250	470.077	1.525
4	0.333	626.769	0.660
5	0.417	783.462	0.323
6	0.500	940.154	0.135
		Sum = 100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.028	(0.537)	0.015	0.014
2	0.17	0.07	0.028	(0.534)	0.015	0.014
3	0.25	0.07	0.028	(0.532)	0.015	0.014
4	0.33	0.10	0.042	(0.530)	0.022	0.020
5	0.42	0.10	0.042	(0.528)	0.022	0.020
6	0.50	0.10	0.042	(0.526)	0.022	0.020
7	0.58	0.10	0.042	(0.524)	0.022	0.020
8	0.67	0.10	0.042	(0.522)	0.022	0.020
9	0.75	0.10	0.042	(0.520)	0.022	0.020
10	0.83	0.13	0.056	(0.518)	0.029	0.027
11	0.92	0.13	0.056	(0.516)	0.029	0.027
12	1.00	0.13	0.056	(0.514)	0.029	0.027
13	1.08	0.10	0.042	(0.512)	0.022	0.020
14	1.17	0.10	0.042	(0.510)	0.022	0.020
15	1.25	0.10	0.042	(0.508)	0.022	0.020
16	1.33	0.10	0.042	(0.506)	0.022	0.020
17	1.42	0.10	0.042	(0.504)	0.022	0.020
18	1.50	0.10	0.042	(0.502)	0.022	0.020
19	1.58	0.10	0.042	(0.500)	0.022	0.020
20	1.67	0.10	0.042	(0.498)	0.022	0.020
21	1.75	0.10	0.042	(0.496)	0.022	0.020
22	1.83	0.13	0.056	(0.494)	0.029	0.027
23	1.92	0.13	0.056	(0.492)	0.029	0.027
24	2.00	0.13	0.056	(0.490)	0.029	0.027
25	2.08	0.13	0.056	(0.488)	0.029	0.027
26	2.17	0.13	0.056	(0.486)	0.029	0.027
27	2.25	0.13	0.056	(0.484)	0.029	0.027
28	2.33	0.13	0.056	(0.482)	0.029	0.027
29	2.42	0.13	0.056	(0.480)	0.029	0.027
30	2.50	0.13	0.056	(0.478)	0.029	0.027
31	2.58	0.17	0.070	(0.476)	0.036	0.034
32	2.67	0.17	0.070	(0.474)	0.036	0.034
33	2.75	0.17	0.070	(0.472)	0.036	0.034
34	2.83	0.17	0.070	(0.470)	0.036	0.034
35	2.92	0.17	0.070	(0.468)	0.036	0.034
36	3.00	0.17	0.070	(0.466)	0.036	0.034
37	3.08	0.17	0.070	(0.464)	0.036	0.034
38	3.17	0.17	0.070	(0.462)	0.036	0.034
39	3.25	0.17	0.070	(0.461)	0.036	0.034
40	3.33	0.17	0.070	(0.459)	0.036	0.034
41	3.42	0.17	0.070	(0.457)	0.036	0.034
42	3.50	0.17	0.070	(0.455)	0.036	0.034
43	3.58	0.17	0.070	(0.453)	0.036	0.034
44	3.67	0.17	0.070	(0.451)	0.036	0.034
45	3.75	0.17	0.070	(0.449)	0.036	0.034
46	3.83	0.20	0.084	(0.447)	0.044	0.041
47	3.92	0.20	0.084	(0.445)	0.044	0.041
48	4.00	0.20	0.084	(0.443)	0.044	0.041
49	4.08	0.20	0.084	(0.442)	0.044	0.041

50	4.17	0.20	0.084	(0.440)	0.044	0.041
51	4.25	0.20	0.084	(0.438)	0.044	0.041
52	4.33	0.23	0.098	(0.436)	0.051	0.047
53	4.42	0.23	0.098	(0.434)	0.051	0.047
54	4.50	0.23	0.098	(0.432)	0.051	0.047
55	4.58	0.23	0.098	(0.430)	0.051	0.047
56	4.67	0.23	0.098	(0.429)	0.051	0.047
57	4.75	0.23	0.098	(0.427)	0.051	0.047
58	4.83	0.27	0.112	(0.425)	0.058	0.054
59	4.92	0.27	0.112	(0.423)	0.058	0.054
60	5.00	0.27	0.112	(0.421)	0.058	0.054
61	5.08	0.20	0.084	(0.419)	0.044	0.041
62	5.17	0.20	0.084	(0.417)	0.044	0.041
63	5.25	0.20	0.084	(0.416)	0.044	0.041
64	5.33	0.23	0.098	(0.414)	0.051	0.047
65	5.42	0.23	0.098	(0.412)	0.051	0.047
66	5.50	0.23	0.098	(0.410)	0.051	0.047
67	5.58	0.27	0.112	(0.408)	0.058	0.054
68	5.67	0.27	0.112	(0.407)	0.058	0.054
69	5.75	0.27	0.112	(0.405)	0.058	0.054
70	5.83	0.27	0.112	(0.403)	0.058	0.054
71	5.92	0.27	0.112	(0.401)	0.058	0.054
72	6.00	0.27	0.112	(0.400)	0.058	0.054
73	6.08	0.30	0.127	(0.398)	0.066	0.061
74	6.17	0.30	0.127	(0.396)	0.066	0.061
75	6.25	0.30	0.127	(0.394)	0.066	0.061
76	6.33	0.30	0.127	(0.392)	0.066	0.061
77	6.42	0.30	0.127	(0.391)	0.066	0.061
78	6.50	0.30	0.127	(0.389)	0.066	0.061
79	6.58	0.33	0.141	(0.387)	0.073	0.068
80	6.67	0.33	0.141	(0.385)	0.073	0.068
81	6.75	0.33	0.141	(0.384)	0.073	0.068
82	6.83	0.33	0.141	(0.382)	0.073	0.068
83	6.92	0.33	0.141	(0.380)	0.073	0.068
84	7.00	0.33	0.141	(0.379)	0.073	0.068
85	7.08	0.33	0.141	(0.377)	0.073	0.068
86	7.17	0.33	0.141	(0.375)	0.073	0.068
87	7.25	0.33	0.141	(0.373)	0.073	0.068
88	7.33	0.37	0.155	(0.372)	0.080	0.074
89	7.42	0.37	0.155	(0.370)	0.080	0.074
90	7.50	0.37	0.155	(0.368)	0.080	0.074
91	7.58	0.40	0.169	(0.367)	0.088	0.081
92	7.67	0.40	0.169	(0.365)	0.088	0.081
93	7.75	0.40	0.169	(0.363)	0.088	0.081
94	7.83	0.43	0.183	(0.362)	0.095	0.088
95	7.92	0.43	0.183	(0.360)	0.095	0.088
96	8.00	0.43	0.183	(0.358)	0.095	0.088
97	8.08	0.50	0.211	(0.357)	0.109	0.102
98	8.17	0.50	0.211	(0.355)	0.109	0.102
99	8.25	0.50	0.211	(0.353)	0.109	0.102
100	8.33	0.50	0.211	(0.352)	0.109	0.102
101	8.42	0.50	0.211	(0.350)	0.109	0.102
102	8.50	0.50	0.211	(0.348)	0.109	0.102
103	8.58	0.53	0.225	(0.347)	0.117	0.108

104	8.67	0.53	0.225	(0.345)	0.117	0.108
105	8.75	0.53	0.225	(0.343)	0.117	0.108
106	8.83	0.57	0.239	(0.342)	0.124	0.115
107	8.92	0.57	0.239	(0.340)	0.124	0.115
108	9.00	0.57	0.239	(0.339)	0.124	0.115
109	9.08	0.63	0.267	(0.337)	0.139	0.129
110	9.17	0.63	0.267	(0.335)	0.139	0.129
111	9.25	0.63	0.267	(0.334)	0.139	0.129
112	9.33	0.67	0.281	(0.332)	0.146	0.135
113	9.42	0.67	0.281	(0.331)	0.146	0.135
114	9.50	0.67	0.281	(0.329)	0.146	0.135
115	9.58	0.70	0.295	(0.327)	0.153	0.142
116	9.67	0.70	0.295	(0.326)	0.153	0.142
117	9.75	0.70	0.295	(0.324)	0.153	0.142
118	9.83	0.73	0.309	(0.323)	0.160	0.149
119	9.92	0.73	0.309	(0.321)	0.160	0.149
120	10.00	0.73	0.309	(0.320)	0.160	0.149
121	10.08	0.50	0.211	(0.318)	0.109	0.102
122	10.17	0.50	0.211	(0.317)	0.109	0.102
123	10.25	0.50	0.211	(0.315)	0.109	0.102
124	10.33	0.50	0.211	(0.313)	0.109	0.102
125	10.42	0.50	0.211	(0.312)	0.109	0.102
126	10.50	0.50	0.211	(0.310)	0.109	0.102
127	10.58	0.67	0.281	(0.309)	0.146	0.135
128	10.67	0.67	0.281	(0.307)	0.146	0.135
129	10.75	0.67	0.281	(0.306)	0.146	0.135
130	10.83	0.67	0.281	(0.304)	0.146	0.135
131	10.92	0.67	0.281	(0.303)	0.146	0.135
132	11.00	0.67	0.281	(0.301)	0.146	0.135
133	11.08	0.63	0.267	(0.300)	0.139	0.129
134	11.17	0.63	0.267	(0.298)	0.139	0.129
135	11.25	0.63	0.267	(0.297)	0.139	0.129
136	11.33	0.63	0.267	(0.295)	0.139	0.129
137	11.42	0.63	0.267	(0.294)	0.139	0.129
138	11.50	0.63	0.267	(0.293)	0.139	0.129
139	11.58	0.57	0.239	(0.291)	0.124	0.115
140	11.67	0.57	0.239	(0.290)	0.124	0.115
141	11.75	0.57	0.239	(0.288)	0.124	0.115
142	11.83	0.60	0.253	(0.287)	0.131	0.122
143	11.92	0.60	0.253	(0.285)	0.131	0.122
144	12.00	0.60	0.253	(0.284)	0.131	0.122
145	12.08	0.83	0.352	(0.283)	0.182	0.169
146	12.17	0.83	0.352	(0.281)	0.182	0.169
147	12.25	0.83	0.352	(0.280)	0.182	0.169
148	12.33	0.87	0.366	(0.278)	0.190	0.176
149	12.42	0.87	0.366	(0.277)	0.190	0.176
150	12.50	0.87	0.366	(0.276)	0.190	0.176
151	12.58	0.93	0.394	(0.274)	0.204	0.190
152	12.67	0.93	0.394	(0.273)	0.204	0.190
153	12.75	0.93	0.394	(0.271)	0.204	0.190
154	12.83	0.97	0.408	(0.270)	0.211	0.196
155	12.92	0.97	0.408	(0.269)	0.211	0.196
156	13.00	0.97	0.408	(0.267)	0.211	0.196
157	13.08	1.13	0.478	(0.266)	0.248	0.230

158	13.17	1.13	0.478	(0.265)	0.248	0.230
159	13.25	1.13	0.478	(0.263)	0.248	0.230
160	13.33	1.13	0.478	(0.262)	0.248	0.230
161	13.42	1.13	0.478	(0.261)	0.248	0.230
162	13.50	1.13	0.478	(0.259)	0.248	0.230
163	13.58	0.77	0.323	(0.258)	0.168	0.156
164	13.67	0.77	0.323	(0.257)	0.168	0.156
165	13.75	0.77	0.323	(0.255)	0.168	0.156
166	13.83	0.77	0.323	(0.254)	0.168	0.156
167	13.92	0.77	0.323	(0.253)	0.168	0.156
168	14.00	0.77	0.323	(0.251)	0.168	0.156
169	14.08	0.90	0.380	(0.250)	0.197	0.183
170	14.17	0.90	0.380	(0.249)	0.197	0.183
171	14.25	0.90	0.380	(0.248)	0.197	0.183
172	14.33	0.87	0.366	(0.246)	0.190	0.176
173	14.42	0.87	0.366	(0.245)	0.190	0.176
174	14.50	0.87	0.366	(0.244)	0.190	0.176
175	14.58	0.87	0.366	(0.243)	0.190	0.176
176	14.67	0.87	0.366	(0.241)	0.190	0.176
177	14.75	0.87	0.366	(0.240)	0.190	0.176
178	14.83	0.83	0.352	(0.239)	0.182	0.169
179	14.92	0.83	0.352	(0.238)	0.182	0.169
180	15.00	0.83	0.352	(0.236)	0.182	0.169
181	15.08	0.80	0.337	(0.235)	0.175	0.162
182	15.17	0.80	0.337	(0.234)	0.175	0.162
183	15.25	0.80	0.337	(0.233)	0.175	0.162
184	15.33	0.77	0.323	(0.232)	0.168	0.156
185	15.42	0.77	0.323	(0.230)	0.168	0.156
186	15.50	0.77	0.323	(0.229)	0.168	0.156
187	15.58	0.63	0.267	(0.228)	0.139	0.129
188	15.67	0.63	0.267	(0.227)	0.139	0.129
189	15.75	0.63	0.267	(0.226)	0.139	0.129
190	15.83	0.63	0.267	(0.225)	0.139	0.129
191	15.92	0.63	0.267	(0.223)	0.139	0.129
192	16.00	0.63	0.267	(0.222)	0.139	0.129
193	16.08	0.13	0.056	(0.221)	0.029	0.027
194	16.17	0.13	0.056	(0.220)	0.029	0.027
195	16.25	0.13	0.056	(0.219)	0.029	0.027
196	16.33	0.13	0.056	(0.218)	0.029	0.027
197	16.42	0.13	0.056	(0.217)	0.029	0.027
198	16.50	0.13	0.056	(0.216)	0.029	0.027
199	16.58	0.10	0.042	(0.214)	0.022	0.020
200	16.67	0.10	0.042	(0.213)	0.022	0.020
201	16.75	0.10	0.042	(0.212)	0.022	0.020
202	16.83	0.10	0.042	(0.211)	0.022	0.020
203	16.92	0.10	0.042	(0.210)	0.022	0.020
204	17.00	0.10	0.042	(0.209)	0.022	0.020
205	17.08	0.17	0.070	(0.208)	0.036	0.034
206	17.17	0.17	0.070	(0.207)	0.036	0.034
207	17.25	0.17	0.070	(0.206)	0.036	0.034
208	17.33	0.17	0.070	(0.205)	0.036	0.034
209	17.42	0.17	0.070	(0.204)	0.036	0.034
210	17.50	0.17	0.070	(0.203)	0.036	0.034
211	17.58	0.17	0.070	(0.202)	0.036	0.034

212	17.67	0.17	0.070	(0.201)	0.036	0.034
213	17.75	0.17	0.070	(0.200)	0.036	0.034
214	17.83	0.13	0.056	(0.199)	0.029	0.027
215	17.92	0.13	0.056	(0.198)	0.029	0.027
216	18.00	0.13	0.056	(0.197)	0.029	0.027
217	18.08	0.13	0.056	(0.196)	0.029	0.027
218	18.17	0.13	0.056	(0.195)	0.029	0.027
219	18.25	0.13	0.056	(0.194)	0.029	0.027
220	18.33	0.13	0.056	(0.193)	0.029	0.027
221	18.42	0.13	0.056	(0.192)	0.029	0.027
222	18.50	0.13	0.056	(0.191)	0.029	0.027
223	18.58	0.10	0.042	(0.190)	0.022	0.020
224	18.67	0.10	0.042	(0.189)	0.022	0.020
225	18.75	0.10	0.042	(0.188)	0.022	0.020
226	18.83	0.07	0.028	(0.188)	0.015	0.014
227	18.92	0.07	0.028	(0.187)	0.015	0.014
228	19.00	0.07	0.028	(0.186)	0.015	0.014
229	19.08	0.10	0.042	(0.185)	0.022	0.020
230	19.17	0.10	0.042	(0.184)	0.022	0.020
231	19.25	0.10	0.042	(0.183)	0.022	0.020
232	19.33	0.13	0.056	(0.182)	0.029	0.027
233	19.42	0.13	0.056	(0.181)	0.029	0.027
234	19.50	0.13	0.056	(0.181)	0.029	0.027
235	19.58	0.10	0.042	(0.180)	0.022	0.020
236	19.67	0.10	0.042	(0.179)	0.022	0.020
237	19.75	0.10	0.042	(0.178)	0.022	0.020
238	19.83	0.07	0.028	(0.177)	0.015	0.014
239	19.92	0.07	0.028	(0.177)	0.015	0.014
240	20.00	0.07	0.028	(0.176)	0.015	0.014
241	20.08	0.10	0.042	(0.175)	0.022	0.020
242	20.17	0.10	0.042	(0.174)	0.022	0.020
243	20.25	0.10	0.042	(0.173)	0.022	0.020
244	20.33	0.10	0.042	(0.173)	0.022	0.020
245	20.42	0.10	0.042	(0.172)	0.022	0.020
246	20.50	0.10	0.042	(0.171)	0.022	0.020
247	20.58	0.10	0.042	(0.171)	0.022	0.020
248	20.67	0.10	0.042	(0.170)	0.022	0.020
249	20.75	0.10	0.042	(0.169)	0.022	0.020
250	20.83	0.07	0.028	(0.168)	0.015	0.014
251	20.92	0.07	0.028	(0.168)	0.015	0.014
252	21.00	0.07	0.028	(0.167)	0.015	0.014
253	21.08	0.10	0.042	(0.166)	0.022	0.020
254	21.17	0.10	0.042	(0.166)	0.022	0.020
255	21.25	0.10	0.042	(0.165)	0.022	0.020
256	21.33	0.07	0.028	(0.164)	0.015	0.014
257	21.42	0.07	0.028	(0.164)	0.015	0.014
258	21.50	0.07	0.028	(0.163)	0.015	0.014
259	21.58	0.10	0.042	(0.163)	0.022	0.020
260	21.67	0.10	0.042	(0.162)	0.022	0.020
261	21.75	0.10	0.042	(0.161)	0.022	0.020
262	21.83	0.07	0.028	(0.161)	0.015	0.014
263	21.92	0.07	0.028	(0.160)	0.015	0.014
264	22.00	0.07	0.028	(0.160)	0.015	0.014
265	22.08	0.10	0.042	(0.159)	0.022	0.020

266	22.17	0.10	0.042	(0.159)	0.022	0.020
267	22.25	0.10	0.042	(0.158)	0.022	0.020
268	22.33	0.07	0.028	(0.158)	0.015	0.014
269	22.42	0.07	0.028	(0.157)	0.015	0.014
270	22.50	0.07	0.028	(0.157)	0.015	0.014
271	22.58	0.07	0.028	(0.156)	0.015	0.014
272	22.67	0.07	0.028	(0.156)	0.015	0.014
273	22.75	0.07	0.028	(0.155)	0.015	0.014
274	22.83	0.07	0.028	(0.155)	0.015	0.014
275	22.92	0.07	0.028	(0.155)	0.015	0.014
276	23.00	0.07	0.028	(0.154)	0.015	0.014
277	23.08	0.07	0.028	(0.154)	0.015	0.014
278	23.17	0.07	0.028	(0.154)	0.015	0.014
279	23.25	0.07	0.028	(0.153)	0.015	0.014
280	23.33	0.07	0.028	(0.153)	0.015	0.014
281	23.42	0.07	0.028	(0.153)	0.015	0.014
282	23.50	0.07	0.028	(0.152)	0.015	0.014
283	23.58	0.07	0.028	(0.152)	0.015	0.014
284	23.67	0.07	0.028	(0.152)	0.015	0.014
285	23.75	0.07	0.028	(0.152)	0.015	0.014
286	23.83	0.07	0.028	(0.152)	0.015	0.014
287	23.92	0.07	0.028	(0.151)	0.015	0.014
288	24.00	0.07	0.028	(0.151)	0.015	0.014

(Loss Rate Not Used)

Sum = 100.0

Sum = 20.3

Flood volume = Effective rainfall 1.69(In)
times area 14.0(Ac.)/[(In)/(Ft.)] = 2.0(Ac.Ft)
Total soil loss = 1.82(In)
Total soil loss = 2.127(Ac.Ft)
Total rainfall = 3.52(In)
Flood volume = 85997.9 Cubic Feet
Total soil loss = 92643.3 Cubic Feet

Peak flow rate of this hydrograph = 3.249(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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0005	0.07	Q				
0+10	0.0015	0.16	Q				
0+15	0.0027	0.18	Q				
0+20	0.0042	0.22	Q				
0+25	0.0061	0.27	VQ				
0+30	0.0080	0.28	VQ				
0+35	0.0100	0.28	VQ				
0+40	0.0119	0.29	VQ				
0+45	0.0139	0.29	VQ				
0+50	0.0161	0.32	VQ				

0+55	0.0186	0.36	VQ
1+ 0	0.0212	0.37	VQ
1+ 5	0.0236	0.35	VQ
1+10	0.0257	0.30	VQ
1+15	0.0277	0.29	VQ
1+20	0.0297	0.29	VQ
1+25	0.0317	0.29	VQ
1+30	0.0336	0.29	VQ
1+35	0.0356	0.29	VQ
1+40	0.0376	0.29	VQ
1+45	0.0396	0.29	VQ
1+50	0.0418	0.32	VQ
1+55	0.0443	0.36	VQ
2+ 0	0.0469	0.37	VQ
2+ 5	0.0495	0.38	Q
2+10	0.0521	0.38	Q
2+15	0.0547	0.38	Q
2+20	0.0574	0.38	Q
2+25	0.0600	0.38	Q
2+30	0.0626	0.38	Q
2+35	0.0655	0.42	Q
2+40	0.0686	0.46	Q
2+45	0.0719	0.47	Q
2+50	0.0752	0.47	Q
2+55	0.0784	0.48	Q
3+ 0	0.0817	0.48	Q
3+ 5	0.0850	0.48	Q
3+10	0.0883	0.48	Q
3+15	0.0916	0.48	Q
3+20	0.0949	0.48	Q
3+25	0.0982	0.48	Q
3+30	0.1015	0.48	QV
3+35	0.1048	0.48	QV
3+40	0.1081	0.48	QV
3+45	0.1113	0.48	QV
3+50	0.1149	0.51	Q
3+55	0.1187	0.56	Q
4+ 0	0.1226	0.57	Q
4+ 5	0.1265	0.57	Q
4+10	0.1305	0.57	Q
4+15	0.1344	0.57	Q
4+20	0.1386	0.61	Q
4+25	0.1431	0.65	Q
4+30	0.1476	0.66	Q
4+35	0.1522	0.67	QV
4+40	0.1568	0.67	QV
4+45	0.1614	0.67	QV
4+50	0.1662	0.70	QV
4+55	0.1714	0.75	QV
5+ 0	0.1766	0.76	Q
5+ 5	0.1814	0.69	QV
5+10	0.1856	0.61	QV
5+15	0.1896	0.59	QV
5+20	0.1938	0.61	QV

5+25	0.1983	0.65	Q V			
5+30	0.2029	0.66	Q V			
5+35	0.2077	0.70	Q V			
5+40	0.2128	0.75	Q V			
5+45	0.2181	0.76	QV			
5+50	0.2233	0.76	QV			
5+55	0.2286	0.76	QV			
6+ 0	0.2338	0.76	QV			
6+ 5	0.2393	0.80	QV			
6+10	0.2451	0.84	QV			
6+15	0.2510	0.85	Q V			
6+20	0.2569	0.86	Q V			
6+25	0.2628	0.86	Q V			
6+30	0.2687	0.86	Q V			
6+35	0.2749	0.89	Q V			
6+40	0.2813	0.94	Q V			
6+45	0.2879	0.95	Q V			
6+50	0.2944	0.95	Q V			
6+55	0.3010	0.95	Q V			
7+ 0	0.3076	0.96	Q V			
7+ 5	0.3142	0.96	Q V			
7+10	0.3207	0.96	Q V			
7+15	0.3273	0.96	Q V			
7+20	0.3341	0.99	Q V			
7+25	0.3412	1.03	Q V			
7+30	0.3484	1.04	Q V			
7+35	0.3559	1.08	Q V			
7+40	0.3636	1.13	Q V			
7+45	0.3715	1.14	Q V			
7+50	0.3796	1.18	Q V			
7+55	0.3880	1.22	Q V			
8+ 0	0.3965	1.23	Q V			
8+ 5	0.4055	1.31	Q V			
8+10	0.4151	1.40	Q V			
8+15	0.4249	1.42	Q V			
8+20	0.4347	1.43	Q V			
8+25	0.4446	1.43	Q V			
8+30	0.4545	1.43	Q V			
8+35	0.4646	1.47	Q V			
8+40	0.4750	1.51	Q V			
8+45	0.4854	1.52	Q V			
8+50	0.4962	1.56	Q V			
8+55	0.5072	1.61	Q V			
9+ 0	0.5184	1.62	Q V			
9+ 5	0.5300	1.69	Q V			
9+10	0.5422	1.78	Q V			
9+15	0.5546	1.80	Q V			
9+20	0.5673	1.84	Q V			
9+25	0.5804	1.89	Q V			
9+30	0.5935	1.90	Q V			
9+35	0.6068	1.94	Q V			
9+40	0.6205	1.99	Q V			
9+45	0.6343	2.00	Q V			
9+50	0.6483	2.04	Q V			

9+55	0.6627	2.08		Q	V			
10+ 0	0.6771	2.09		Q	V			
10+ 5	0.6900	1.87		Q	V			
10+10	0.7007	1.56		Q	V			
10+15	0.7109	1.49	Q		V			
10+20	0.7209	1.45	Q		V			
10+25	0.7309	1.44	Q		V			
10+30	0.7407	1.43	Q		V			
10+35	0.7517	1.60	Q		V			
10+40	0.7643	1.82	Q		V			
10+45	0.7772	1.87	Q		V			
10+50	0.7902	1.90	Q		V			
10+55	0.8034	1.91	Q		V			
11+ 0	0.8165	1.91	Q		V			
11+ 5	0.8295	1.88	Q		V			
11+10	0.8421	1.83	Q		V			
11+15	0.8546	1.82	Q		V			
11+20	0.8672	1.82	Q		V			
11+25	0.8797	1.82	Q		V			
11+30	0.8922	1.82	Q		V			
11+35	0.9042	1.75	Q		V			
11+40	0.9157	1.66	Q		V			
11+45	0.9270	1.64	Q		V			
11+50	0.9384	1.66	Q		V			
11+55	0.9502	1.70	Q		V			
12+ 0	0.9619	1.71	Q		V			
12+ 5	0.9754	1.95	Q		V			
12+10	0.9910	2.26	Q		V			
12+15	1.0070	2.34	Q		V			
12+20	1.0236	2.40	Q		V			
12+25	1.0405	2.46	Q		V			
12+30	1.0576	2.48	Q		V			
12+35	1.0751	2.55	Q		V			
12+40	1.0933	2.64	Q		V			
12+45	1.1116	2.66	Q		V			
12+50	1.1302	2.70	Q		V			
12+55	1.1492	2.75	Q		V			
13+ 0	1.1682	2.76	Q		V			
13+ 5	1.1884	2.93	Q		V			
13+10	1.2102	3.16	Q		V			
13+15	1.2323	3.21	Q		V			
13+20	1.2545	3.23	Q		V			
13+25	1.2769	3.24	Q		V			
13+30	1.2993	3.25	Q		V			
13+35	1.3191	2.88	Q		V			
13+40	1.3356	2.39	Q		V			
13+45	1.3513	2.28	Q		V			
13+50	1.3667	2.23	Q		V			
13+55	1.3819	2.21	Q		V			
14+ 0	1.3970	2.20	Q		V			
14+ 5	1.4131	2.33	Q		V			
14+10	1.4304	2.51	Q		V			
14+15	1.4479	2.55	Q		V			
14+20	1.4654	2.53	Q		V			

14+25	1.4826	2.50			Q			V
14+30	1.4997	2.49			Q			V
14+35	1.5169	2.49			Q			V
14+40	1.5340	2.49			Q			V
14+45	1.5511	2.48			Q			V
14+50	1.5680	2.45			Q			V
14+55	1.5846	2.41			Q			V
15+ 0	1.6011	2.40			Q			V
15+ 5	1.6173	2.36			Q			V
15+10	1.6332	2.31			Q			V
15+15	1.6491	2.30			Q			V
15+20	1.6647	2.26			Q			V
15+25	1.6799	2.22			Q			V
15+30	1.6951	2.21			Q			V
15+35	1.7094	2.07			Q			V
15+40	1.7224	1.89			Q			V
15+45	1.7351	1.85			Q			V
15+50	1.7477	1.83			Q			V
15+55	1.7602	1.82			Q			V
16+ 0	1.7727	1.82			Q			V
16+ 5	1.7818	1.32		Q				V
16+10	1.7863	0.65	Q					V
16+15	1.7897	0.50	Q					V
16+20	1.7926	0.43	Q					V
16+25	1.7953	0.40	Q					V
16+30	1.7980	0.38	Q					V
16+35	1.8004	0.35	Q					V
16+40	1.8025	0.30	Q					V
16+45	1.8045	0.29	Q					V
16+50	1.8065	0.29	Q					V
16+55	1.8085	0.29	Q					V
17+ 0	1.8105	0.29	Q					V
17+ 5	1.8129	0.35	Q					V
17+10	1.8159	0.44	Q					V
17+15	1.8191	0.46	Q					V
17+20	1.8224	0.47	Q					V
17+25	1.8256	0.48	Q					V
17+30	1.8289	0.48	Q					V
17+35	1.8322	0.48	Q					V
17+40	1.8355	0.48	Q					V
17+45	1.8388	0.48	Q					V
17+50	1.8419	0.44	Q					V
17+55	1.8446	0.40	Q					V
18+ 0	1.8473	0.39	Q					V
18+ 5	1.8500	0.39	Q					V
18+10	1.8526	0.38	Q					V
18+15	1.8552	0.38	Q					V
18+20	1.8579	0.38	Q					V
18+25	1.8605	0.38	Q					V
18+30	1.8631	0.38	Q					V
18+35	1.8655	0.35	Q					V
18+40	1.8676	0.30	Q					V
18+45	1.8697	0.29	Q					V
18+50	1.8714	0.26	Q					V

18+55	1.8729	0.21	Q				V
19+ 0	1.8742	0.20	Q				V
19+ 5	1.8758	0.23	Q				V
19+10	1.8777	0.27	Q				V
19+15	1.8796	0.28	Q				V
19+20	1.8818	0.32	Q				V
19+25	1.8843	0.36	Q				V
19+30	1.8868	0.37	Q				V
19+35	1.8892	0.35	Q				V
19+40	1.8913	0.30	Q				V
19+45	1.8933	0.29	Q				V
19+50	1.8951	0.26	Q				V
19+55	1.8966	0.21	Q				V
20+ 0	1.8979	0.20	Q				V
20+ 5	1.8995	0.23	Q				V
20+10	1.9013	0.27	Q				V
20+15	1.9033	0.28	Q				V
20+20	1.9052	0.28	Q				V
20+25	1.9072	0.29	Q				V
20+30	1.9092	0.29	Q				V
20+35	1.9111	0.29	Q				V
20+40	1.9131	0.29	Q				V
20+45	1.9151	0.29	Q				V
20+50	1.9168	0.25	Q				V
20+55	1.9183	0.21	Q				V
21+ 0	1.9196	0.20	Q				V
21+ 5	1.9212	0.23	Q				V
21+10	1.9231	0.27	Q				V
21+15	1.9250	0.28	Q				V
21+20	1.9267	0.25	Q				V
21+25	1.9281	0.21	Q				V
21+30	1.9295	0.20	Q				V
21+35	1.9311	0.23	Q				V
21+40	1.9329	0.27	Q				V
21+45	1.9349	0.28	Q				V
21+50	1.9366	0.25	Q				V
21+55	1.9380	0.21	Q				V
22+ 0	1.9394	0.20	Q				V
22+ 5	1.9410	0.23	Q				V
22+10	1.9428	0.27	Q				V
22+15	1.9447	0.28	Q				V
22+20	1.9465	0.25	Q				V
22+25	1.9479	0.21	Q				V
22+30	1.9493	0.20	Q				V
22+35	1.9506	0.19	Q				V
22+40	1.9519	0.19	Q				V
22+45	1.9532	0.19	Q				V
22+50	1.9545	0.19	Q				V
22+55	1.9559	0.19	Q				V
23+ 0	1.9572	0.19	Q				V
23+ 5	1.9585	0.19	Q				V
23+10	1.9598	0.19	Q				V
23+15	1.9611	0.19	Q				V
23+20	1.9624	0.19	Q				V

23+25	1.9638	0.19	Q				V
23+30	1.9651	0.19	Q				V
23+35	1.9664	0.19	Q				V
23+40	1.9677	0.19	Q				V
23+45	1.9690	0.19	Q				V
23+50	1.9703	0.19	Q				V
23+55	1.9717	0.19	Q				V
24+ 0	1.9730	0.19	Q				V
24+ 5	1.9738	0.12	Q				V
24+10	1.9741	0.04	Q				V
24+15	1.9742	0.02	Q				V
24+20	1.9742	0.01	Q				V
24+25	1.9742	0.00	Q				V

Unit Hydrograph Analysis

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Study date 10/28/13 File: 32786CNat110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "C" (Subarea 2) Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
14.00	0.58	8.12

100 YEAR Area rainfall data:

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

14.00

1.45

20.30

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580 (In)

Area Averaged 100-Year Rainfall = 1.450 (In)

Point rain (area averaged) = 0.938 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 0.938 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	1.000	0.051	0.143	0.007
69.0	69.0	0.373	1.000	0.037	0.314	0.012
56.0	56.0	0.511	0.500	0.281	0.064	0.018
63.0	63.0	0.438	0.000	0.438	0.071	0.031
75.0	75.0	0.303	0.000	0.303	0.407	0.123
Sum (F) =						0.192

Area averaged mean soil loss (F) (In/Hr) = 0.192

Minimum soil loss rate ((In/Hr)) = 0.096

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

Slope of intensity-duration curve for a 1 hour storm = 0.4800

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	0.083	156.692	4.904
2	0.167	313.385	6.563
3	0.250	470.077	1.525
4	0.333	626.769	0.660
5	0.417	783.462	0.323
6	0.500	940.154	0.135
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.495	0.192	(0.257)	0.303
2	0.17	4.50	0.506	0.192	(0.263)	0.315
3	0.25	5.40	0.608	0.192	(0.315)	0.416
4	0.33	5.40	0.608	0.192	(0.315)	0.416
5	0.42	5.70	0.641	0.192	(0.333)	0.450
6	0.50	6.40	0.720	0.192	(0.374)	0.529
7	0.58	7.90	0.889	0.192	(0.461)	0.697
8	0.67	9.10	1.024	0.192	(0.531)	0.832
9	0.75	12.80	1.440	0.192	(0.747)	1.249
10	0.83	25.60	2.881	0.192	(1.494)	2.689
11	0.92	7.90	0.889	0.192	(0.461)	0.697
12	1.00	4.90	0.551	0.192	(0.286)	0.360

(Loss Rate Not Used)

Sum = 100.0

Sum = 9.0

Flood volume = Effective rainfall 0.75(In)

times area 14.0(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)

Total soil loss = 0.19(In)

Total soil loss = 0.224(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 37917.3 Cubic Feet

Total soil loss = 9742.0 Cubic Feet

Peak flow rate of this hydrograph = 23.831(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0103	1.49	VQ					
0+10	0.0346	3.54	V Q					
0+15	0.0661	4.57	V Q					
0+20	0.1036	5.45	V Q					
0+25	0.1441	5.88	VQ					
0+30	0.1896	6.60	Q					
0+35	0.2449	8.03	QV					
0+40	0.3135	9.96	QV					
0+45	0.4044	13.21	QV					
0+50	0.5653	23.36	V					
0+55	0.7294	23.83	Q V					
1+ 0	0.8095	11.63	Q					
1+ 5	0.8489	5.72	Q					
1+10	0.8630	2.05	Q					

1+15	0.8687	0.83	Q				v
1+20	0.8701	0.21	Q				v
1+25	0.8705	0.05	Q				v

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "C" (Subarea 2) Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 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]
14.00	0.98	13.72

100 YEAR Area rainfall data:

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

14.00

2.48

34.72

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980 (In)

Area Averaged 100-Year Rainfall = 2.480 (In)

Point rain (area averaged) = 1.597 (In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.597 (In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	1.000	0.051	0.143	0.007
69.0	69.0	0.373	1.000	0.037	0.314	0.012
56.0	56.0	0.511	0.500	0.281	0.064	0.018
63.0	63.0	0.438	0.000	0.438	0.071	0.031
75.0	75.0	0.303	0.000	0.303	0.407	0.123
Sum (F) =						0.192

Area averaged mean soil loss (F) (In/Hr) = 0.192

Minimum soil loss rate ((In/Hr)) = 0.096

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	156.692	34.756	4.904
2 0.167	313.385	46.515	6.563
3 0.250	470.077	10.806	1.525
4 0.333	626.769	4.681	0.660
5 0.417	783.462	2.286	0.323
6 0.500	940.154	0.956	0.135
Sum = 100.000		Sum=	14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.192)	0.129	0.120
2	0.17	1.30	0.249	(0.192)	0.129	0.120
3	0.25	1.10	0.211	(0.192)	0.109	0.101
4	0.33	1.50	0.287	(0.192)	0.149	0.138
5	0.42	1.50	0.287	(0.192)	0.149	0.138
6	0.50	1.80	0.345	(0.192)	0.179	0.166
7	0.58	1.50	0.287	(0.192)	0.149	0.138
8	0.67	1.80	0.345	(0.192)	0.179	0.166
9	0.75	1.80	0.345	(0.192)	0.179	0.166
10	0.83	1.50	0.287	(0.192)	0.149	0.138
11	0.92	1.60	0.307	(0.192)	0.159	0.148
12	1.00	1.80	0.345	(0.192)	0.179	0.166
13	1.08	2.20	0.422	0.192	(0.219)	0.230
14	1.17	2.20	0.422	0.192	(0.219)	0.230
15	1.25	2.20	0.422	0.192	(0.219)	0.230
16	1.33	2.00	0.383	0.192	(0.199)	0.192
17	1.42	2.60	0.498	0.192	(0.258)	0.307
18	1.50	2.70	0.517	0.192	(0.268)	0.326
19	1.58	2.40	0.460	0.192	(0.239)	0.268
20	1.67	2.70	0.517	0.192	(0.268)	0.326
21	1.75	3.30	0.632	0.192	(0.328)	0.441
22	1.83	3.10	0.594	0.192	(0.308)	0.402
23	1.92	2.90	0.556	0.192	(0.288)	0.364
24	2.00	3.00	0.575	0.192	(0.298)	0.383
25	2.08	3.10	0.594	0.192	(0.308)	0.402
26	2.17	4.20	0.805	0.192	(0.417)	0.613
27	2.25	5.00	0.958	0.192	(0.497)	0.767
28	2.33	3.50	0.671	0.192	(0.348)	0.479
29	2.42	6.80	1.303	0.192	(0.676)	1.111
30	2.50	7.30	1.399	0.192	(0.726)	1.207
31	2.58	8.20	1.571	0.192	(0.815)	1.380
32	2.67	5.90	1.131	0.192	(0.586)	0.939
33	2.75	2.00	0.383	0.192	(0.199)	0.192
34	2.83	1.80	0.345	(0.192)	0.179	0.166
35	2.92	1.80	0.345	(0.192)	0.179	0.166
36	3.00	0.60	0.115	(0.192)	0.060	0.055

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.9

Flood volume = Effective rainfall 1.07(In)

times area 14.0(Ac.)/[(In)/(Ft.)] = 1.3(Ac.Ft)

Total soil loss = 0.52(In)

Total soil loss = 0.611(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 54557.5 Cubic Feet

Total soil loss = 26602.8 Cubic Feet

Peak flow rate of this hydrograph = 17.039(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0041		0.59	VQ				
0+10	0.0135		1.38	V Q				
0+15	0.0236		1.47	V Q				
0+20	0.0347		1.61	V Q				
0+25	0.0475		1.86	V Q				
0+30	0.0617		2.06	V Q				
0+35	0.0763		2.12	V Q				
0+40	0.0909		2.13	V Q				
0+45	0.1067		2.29	VQ				
0+50	0.1218		2.19	VQ				
0+55	0.1360		2.06	Q				
1+ 0	0.1510		2.18	Q				
1+ 5	0.1690		2.61	Q				
1+10	0.1900		3.06	Q				
1+15	0.2118		3.16	Q				
1+20	0.2326		3.03	QV				
1+25	0.2558		3.36	Q V				
1+30	0.2844		4.16	QV				
1+35	0.3130		4.15	QV				
1+40	0.3416		4.15	Q V				
1+45	0.3764		5.05	Q V				
1+50	0.4156		5.69	Q V				
1+55	0.4531		5.45	Q V				
2+ 0	0.4897		5.32	Q V				
2+ 5	0.5276		5.50	Q V				
2+10	0.5735		6.67	Q V				
2+15	0.6343		8.83	Q V				
2+20	0.6946		8.76	Q V				
2+25	0.7659		10.35	Q V				
2+30	0.8672		14.71	Q V				
2+35	0.9846		17.04	Q V				
2+40	1.0982		16.50	Q V				
2+45	1.1701		10.43	Q V				
2+50	1.2042		4.96	Q				
2+55	1.2278		3.43	Q				
3+ 0	1.2432		2.23	Q				
3+ 5	1.2495		0.92	Q				
3+10	1.2514		0.27	Q				
3+15	1.2521		0.11	Q				
3+20	1.2524		0.04	Q				
3+25	1.2525		0.01	Q				

Unit Hydrograph Analysis

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Study date 10/28/13 File: 32786CNat610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "C" (Subarea 2)

Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
14.00	1.38	19.32

100 YEAR Area rainfall data:

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

14.00

3.48

48.72

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 2.244(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 2.244(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00(Ac.)		

RI	RI	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
AMC2	AMC-2					
56.0	56.0	0.511	1.000	0.051	0.143	0.007
69.0	69.0	0.373	1.000	0.037	0.314	0.012
56.0	56.0	0.511	0.500	0.281	0.064	0.018
63.0	63.0	0.438	0.000	0.438	0.071	0.031
75.0	75.0	0.303	0.000	0.303	0.407	0.123
Sum (F) =						0.192

Area averaged mean soil loss (F) (In/Hr) = 0.192

Minimum soil loss rate ((In/Hr)) = 0.096

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	156.692	4.904
2	0.167	313.385	6.563
3	0.250	470.077	1.525
4	0.333	626.769	0.660
5	0.417	783.462	0.323
6	0.500	940.154	0.135
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.135	(0.192)	0.070	0.065
2	0.17	0.60	0.162	(0.192)	0.084	0.078
3	0.25	0.60	0.162	(0.192)	0.084	0.078
4	0.33	0.60	0.162	(0.192)	0.084	0.078
5	0.42	0.60	0.162	(0.192)	0.084	0.078
6	0.50	0.70	0.188	(0.192)	0.098	0.091
7	0.58	0.70	0.188	(0.192)	0.098	0.091
8	0.67	0.70	0.188	(0.192)	0.098	0.091
9	0.75	0.70	0.188	(0.192)	0.098	0.091
10	0.83	0.70	0.188	(0.192)	0.098	0.091
11	0.92	0.70	0.188	(0.192)	0.098	0.091
12	1.00	0.80	0.215	(0.192)	0.112	0.104
13	1.08	0.80	0.215	(0.192)	0.112	0.104
14	1.17	0.80	0.215	(0.192)	0.112	0.104
15	1.25	0.80	0.215	(0.192)	0.112	0.104
16	1.33	0.80	0.215	(0.192)	0.112	0.104
17	1.42	0.80	0.215	(0.192)	0.112	0.104
18	1.50	0.80	0.215	(0.192)	0.112	0.104
19	1.58	0.80	0.215	(0.192)	0.112	0.104
20	1.67	0.80	0.215	(0.192)	0.112	0.104
21	1.75	0.80	0.215	(0.192)	0.112	0.104
22	1.83	0.80	0.215	(0.192)	0.112	0.104
23	1.92	0.80	0.215	(0.192)	0.112	0.104
24	2.00	0.90	0.242	(0.192)	0.126	0.117
25	2.08	0.80	0.215	(0.192)	0.112	0.104
26	2.17	0.90	0.242	(0.192)	0.126	0.117
27	2.25	0.90	0.242	(0.192)	0.126	0.117
28	2.33	0.90	0.242	(0.192)	0.126	0.117
29	2.42	0.90	0.242	(0.192)	0.126	0.117
30	2.50	0.90	0.242	(0.192)	0.126	0.117
31	2.58	0.90	0.242	(0.192)	0.126	0.117
32	2.67	0.90	0.242	(0.192)	0.126	0.117
33	2.75	1.00	0.269	(0.192)	0.140	0.130
34	2.83	1.00	0.269	(0.192)	0.140	0.130
35	2.92	1.00	0.269	(0.192)	0.140	0.130
36	3.00	1.00	0.269	(0.192)	0.140	0.130
37	3.08	1.00	0.269	(0.192)	0.140	0.130
38	3.17	1.10	0.296	(0.192)	0.154	0.143
39	3.25	1.10	0.296	(0.192)	0.154	0.143
40	3.33	1.10	0.296	(0.192)	0.154	0.143
41	3.42	1.20	0.323	(0.192)	0.168	0.156
42	3.50	1.30	0.350	(0.192)	0.182	0.169
43	3.58	1.40	0.377	0.192	(0.195)	0.185
44	3.67	1.40	0.377	0.192	(0.195)	0.185
45	3.75	1.50	0.404	0.192	(0.209)	0.212
46	3.83	1.50	0.404	0.192	(0.209)	0.212
47	3.92	1.60	0.431	0.192	(0.223)	0.239
48	4.00	1.60	0.431	0.192	(0.223)	0.239
49	4.08	1.70	0.458	0.192	(0.237)	0.266

50	4.17	1.80	0.485	0.192	(0.251)	0.293
51	4.25	1.90	0.512	0.192	(0.265)	0.320
52	4.33	2.00	0.539	0.192	(0.279)	0.347
53	4.42	2.10	0.565	0.192	(0.293)	0.374
54	4.50	2.10	0.565	0.192	(0.293)	0.374
55	4.58	2.20	0.592	0.192	(0.307)	0.401
56	4.67	2.30	0.619	0.192	(0.321)	0.428
57	4.75	2.40	0.646	0.192	(0.335)	0.455
58	4.83	2.40	0.646	0.192	(0.335)	0.455
59	4.92	2.50	0.673	0.192	(0.349)	0.481
60	5.00	2.60	0.700	0.192	(0.363)	0.508
61	5.08	3.10	0.835	0.192	(0.433)	0.643
62	5.17	3.60	0.969	0.192	(0.503)	0.778
63	5.25	3.90	1.050	0.192	(0.545)	0.858
64	5.33	4.20	1.131	0.192	(0.586)	0.939
65	5.42	4.70	1.266	0.192	(0.656)	1.074
66	5.50	5.60	1.508	0.192	(0.782)	1.316
67	5.58	1.90	0.512	0.192	(0.265)	0.320
68	5.67	0.90	0.242	(0.192)	0.126	0.117
69	5.75	0.60	0.162	(0.192)	0.084	0.078
70	5.83	0.50	0.135	(0.192)	0.070	0.065
71	5.92	0.30	0.081	(0.192)	0.042	0.039
72	6.00	0.20	0.054	(0.192)	0.028	0.026

(Loss Rate Not Used)

Sum = 100.0

Sum = 16.8

Flood volume = Effective rainfall 1.40(In)
times area 14.0(Ac.)/[(In)/(Ft.)] = 1.6(Ac.Ft)
Total soil loss = 0.84(In)
Total soil loss = 0.982(Ac.Ft)
Total rainfall = 2.24(In)
Flood volume = 71264.5 Cubic Feet
Total soil loss = 42767.9 Cubic Feet

Peak flow rate of this hydrograph = 15.847(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0022	0.32	Q				
0+10	0.0077	0.81	VQ				
0+15	0.0146	0.99	VQ				
0+20	0.0218	1.05	V Q				
0+25	0.0293	1.08	V Q				
0+30	0.0373	1.16	V Q				
0+35	0.0459	1.25	VQ				
0+40	0.0546	1.27	VQ				
0+45	0.0634	1.27	VQ				
0+50	0.0722	1.28	VQ				

0+55	0.0810	1.28	VQ						
1+ 0	0.0903	1.34	Q						
1+ 5	0.1001	1.43	Q						
1+10	0.1101	1.45	Q						
1+15	0.1201	1.46	Q						
1+20	0.1302	1.46	QV						
1+25	0.1403	1.46	QV						
1+30	0.1504	1.46	QV						
1+35	0.1604	1.46	QV						
1+40	0.1705	1.46	Q V						
1+45	0.1806	1.46	Q V						
1+50	0.1907	1.46	Q V						
1+55	0.2008	1.46	Q V						
2+ 0	0.2113	1.53	Q V						
2+ 5	0.2220	1.55	Q V						
2+10	0.2326	1.55	Q V						
2+15	0.2438	1.62	Q V						
2+20	0.2550	1.64	Q V						
2+25	0.2664	1.64	Q V						
2+30	0.2777	1.65	Q V						
2+35	0.2890	1.65	Q V						
2+40	0.3004	1.65	Q V						
2+45	0.3122	1.71	Q V						
2+50	0.3245	1.80	Q V						
2+55	0.3370	1.82	Q V						
3+ 0	0.3496	1.82	Q V						
3+ 5	0.3622	1.83	Q V						
3+10	0.3752	1.89	Q V						
3+15	0.3888	1.98	Q V						
3+20	0.4026	2.00	Q V						
3+25	0.4169	2.07	Q V						
3+30	0.4322	2.22	Q V						
3+35	0.4488	2.41	Q V						
3+40	0.4664	2.55	Q V						
3+45	0.4851	2.72	Q V						
3+50	0.5052	2.91	Q V						
3+55	0.5265	3.10	Q V						
4+ 0	0.5492	3.29	Q V						
4+ 5	0.5731	3.47	Q V						
4+10	0.5993	3.80	Q V						
4+15	0.6280	4.16	Q V						
4+20	0.6592	4.53	Q V						
4+25	0.6930	4.91	Q V						
4+30	0.7285	5.16	Q V						
4+35	0.7655	5.36	Q V						
4+40	0.8047	5.70	Q V						
4+45	0.8465	6.06	Q V						
4+50	0.8899	6.30	Q V						
4+55	0.9347	6.50	Q V						
5+ 0	0.9818	6.84	Q V						
5+ 5	1.0351	7.73	Q V						
5+10	1.0994	9.34	Q V						
5+15	1.1741	10.85	Q V						
5+20	1.2573	12.09	Q V						

5+25	1.3506	13.54				Q	V	
5+30	1.4597	15.85					Q	V
5+35	1.5482	12.85				Q		V
5+40	1.5882	5.81		Q				V
5+45	1.6087	2.98						V
5+50	1.6210	1.79	Q					V
5+55	1.6286	1.09	Q					V
6+ 0	1.6328	0.61	Q					V
6+ 5	1.6350	0.31	Q					V
6+10	1.6356	0.10	Q					V
6+15	1.6359	0.04	Q					V
6+20	1.6360	0.01	Q					V
6+25	1.6360	0.00	Q					V

Unit Hydrograph Analysis

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Study date 10/28/13 File: 32786CNat2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "C" (Subarea 2)

Existing Natural Condition

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1792.00 (Ft.)
Length along longest watercourse measured to centroid = 821.00 (Ft.)
Length along longest watercourse = 0.339 Mi.
Length along longest watercourse measured to centroid = 0.155 Mi.
Difference in elevation = 101.00 (Ft.)
Slope along watercourse = 297.5893 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.053 Hr.
Lag time = 3.19 Min.
25% of lag time = 0.80 Min.
40% of lag time = 1.28 Min.
Unit time = 5.00 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]
14.00	2.48	34.72

100 YEAR Area rainfall data:

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

14.00

6.90

96.60

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 4.298(In)

Areal adjustment factor = 100.00 %

Adjusted average point rain = 4.298(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
0.900	56.00	0.500
1.000	63.00	0.000
5.700	75.00	0.000
Total Area Entered = 14.00 (Ac.)		

RI	RI	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
AMC2	AMC-2					
56.0	56.0	0.511	1.000	0.051	0.143	0.007
69.0	69.0	0.373	1.000	0.037	0.314	0.012
56.0	56.0	0.511	0.500	0.281	0.064	0.018
63.0	63.0	0.438	0.000	0.438	0.071	0.031
75.0	75.0	0.303	0.000	0.303	0.407	0.123
Sum (F) =						0.192

Area averaged mean soil loss (F) (In/Hr) = 0.192

Minimum soil loss rate ((In/Hr)) = 0.096

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.519

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	156.692	34.756
2	0.167	313.385	46.515
3	0.250	470.077	10.806
4	0.333	626.769	4.681
5	0.417	783.462	2.286
6	0.500	940.154	0.956
Sum =		100.000	Sum= 14.109

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.034	(0.340)	0.018	0.017
2	0.17	0.07	0.034	(0.339)	0.018	0.017
3	0.25	0.07	0.034	(0.337)	0.018	0.017
4	0.33	0.10	0.052	(0.336)	0.027	0.025
5	0.42	0.10	0.052	(0.335)	0.027	0.025
6	0.50	0.10	0.052	(0.333)	0.027	0.025
7	0.58	0.10	0.052	(0.332)	0.027	0.025
8	0.67	0.10	0.052	(0.331)	0.027	0.025
9	0.75	0.10	0.052	(0.329)	0.027	0.025
10	0.83	0.13	0.069	(0.328)	0.036	0.033
11	0.92	0.13	0.069	(0.327)	0.036	0.033
12	1.00	0.13	0.069	(0.326)	0.036	0.033
13	1.08	0.10	0.052	(0.324)	0.027	0.025
14	1.17	0.10	0.052	(0.323)	0.027	0.025
15	1.25	0.10	0.052	(0.322)	0.027	0.025
16	1.33	0.10	0.052	(0.320)	0.027	0.025
17	1.42	0.10	0.052	(0.319)	0.027	0.025
18	1.50	0.10	0.052	(0.318)	0.027	0.025
19	1.58	0.10	0.052	(0.317)	0.027	0.025
20	1.67	0.10	0.052	(0.315)	0.027	0.025
21	1.75	0.10	0.052	(0.314)	0.027	0.025
22	1.83	0.13	0.069	(0.313)	0.036	0.033
23	1.92	0.13	0.069	(0.312)	0.036	0.033
24	2.00	0.13	0.069	(0.310)	0.036	0.033
25	2.08	0.13	0.069	(0.309)	0.036	0.033
26	2.17	0.13	0.069	(0.308)	0.036	0.033
27	2.25	0.13	0.069	(0.306)	0.036	0.033
28	2.33	0.13	0.069	(0.305)	0.036	0.033
29	2.42	0.13	0.069	(0.304)	0.036	0.033
30	2.50	0.13	0.069	(0.303)	0.036	0.033
31	2.58	0.17	0.086	(0.302)	0.045	0.041
32	2.67	0.17	0.086	(0.300)	0.045	0.041
33	2.75	0.17	0.086	(0.299)	0.045	0.041
34	2.83	0.17	0.086	(0.298)	0.045	0.041
35	2.92	0.17	0.086	(0.297)	0.045	0.041
36	3.00	0.17	0.086	(0.295)	0.045	0.041
37	3.08	0.17	0.086	(0.294)	0.045	0.041
38	3.17	0.17	0.086	(0.293)	0.045	0.041
39	3.25	0.17	0.086	(0.292)	0.045	0.041
40	3.33	0.17	0.086	(0.290)	0.045	0.041
41	3.42	0.17	0.086	(0.289)	0.045	0.041
42	3.50	0.17	0.086	(0.288)	0.045	0.041
43	3.58	0.17	0.086	(0.287)	0.045	0.041
44	3.67	0.17	0.086	(0.286)	0.045	0.041
45	3.75	0.17	0.086	(0.284)	0.045	0.041
46	3.83	0.20	0.103	(0.283)	0.053	0.050
47	3.92	0.20	0.103	(0.282)	0.053	0.050
48	4.00	0.20	0.103	(0.281)	0.053	0.050
49	4.08	0.20	0.103	(0.280)	0.053	0.050

50	4.17	0.20	0.103	(0.278)	0.053	0.050
51	4.25	0.20	0.103	(0.277)	0.053	0.050
52	4.33	0.23	0.120	(0.276)	0.062	0.058
53	4.42	0.23	0.120	(0.275)	0.062	0.058
54	4.50	0.23	0.120	(0.274)	0.062	0.058
55	4.58	0.23	0.120	(0.273)	0.062	0.058
56	4.67	0.23	0.120	(0.271)	0.062	0.058
57	4.75	0.23	0.120	(0.270)	0.062	0.058
58	4.83	0.27	0.138	(0.269)	0.071	0.066
59	4.92	0.27	0.138	(0.268)	0.071	0.066
60	5.00	0.27	0.138	(0.267)	0.071	0.066
61	5.08	0.20	0.103	(0.266)	0.053	0.050
62	5.17	0.20	0.103	(0.264)	0.053	0.050
63	5.25	0.20	0.103	(0.263)	0.053	0.050
64	5.33	0.23	0.120	(0.262)	0.062	0.058
65	5.42	0.23	0.120	(0.261)	0.062	0.058
66	5.50	0.23	0.120	(0.260)	0.062	0.058
67	5.58	0.27	0.138	(0.259)	0.071	0.066
68	5.67	0.27	0.138	(0.258)	0.071	0.066
69	5.75	0.27	0.138	(0.256)	0.071	0.066
70	5.83	0.27	0.138	(0.255)	0.071	0.066
71	5.92	0.27	0.138	(0.254)	0.071	0.066
72	6.00	0.27	0.138	(0.253)	0.071	0.066
73	6.08	0.30	0.155	(0.252)	0.080	0.074
74	6.17	0.30	0.155	(0.251)	0.080	0.074
75	6.25	0.30	0.155	(0.250)	0.080	0.074
76	6.33	0.30	0.155	(0.249)	0.080	0.074
77	6.42	0.30	0.155	(0.247)	0.080	0.074
78	6.50	0.30	0.155	(0.246)	0.080	0.074
79	6.58	0.33	0.172	(0.245)	0.089	0.083
80	6.67	0.33	0.172	(0.244)	0.089	0.083
81	6.75	0.33	0.172	(0.243)	0.089	0.083
82	6.83	0.33	0.172	(0.242)	0.089	0.083
83	6.92	0.33	0.172	(0.241)	0.089	0.083
84	7.00	0.33	0.172	(0.240)	0.089	0.083
85	7.08	0.33	0.172	(0.239)	0.089	0.083
86	7.17	0.33	0.172	(0.238)	0.089	0.083
87	7.25	0.33	0.172	(0.236)	0.089	0.083
88	7.33	0.37	0.189	(0.235)	0.098	0.091
89	7.42	0.37	0.189	(0.234)	0.098	0.091
90	7.50	0.37	0.189	(0.233)	0.098	0.091
91	7.58	0.40	0.206	(0.232)	0.107	0.099
92	7.67	0.40	0.206	(0.231)	0.107	0.099
93	7.75	0.40	0.206	(0.230)	0.107	0.099
94	7.83	0.43	0.224	(0.229)	0.116	0.108
95	7.92	0.43	0.224	(0.228)	0.116	0.108
96	8.00	0.43	0.224	(0.227)	0.116	0.108
97	8.08	0.50	0.258	(0.226)	0.134	0.124
98	8.17	0.50	0.258	(0.225)	0.134	0.124
99	8.25	0.50	0.258	(0.224)	0.134	0.124
100	8.33	0.50	0.258	(0.223)	0.134	0.124
101	8.42	0.50	0.258	(0.222)	0.134	0.124
102	8.50	0.50	0.258	(0.221)	0.134	0.124
103	8.58	0.53	0.275	(0.220)	0.143	0.132

104	8.67	0.53	0.275	(0.219)	0.143	0.132
105	8.75	0.53	0.275	(0.217)	0.143	0.132
106	8.83	0.57	0.292	(0.216)	0.152	0.141
107	8.92	0.57	0.292	(0.215)	0.152	0.141
108	9.00	0.57	0.292	(0.214)	0.152	0.141
109	9.08	0.63	0.327	(0.213)	0.169	0.157
110	9.17	0.63	0.327	(0.212)	0.169	0.157
111	9.25	0.63	0.327	(0.211)	0.169	0.157
112	9.33	0.67	0.344	(0.210)	0.178	0.166
113	9.42	0.67	0.344	(0.209)	0.178	0.166
114	9.50	0.67	0.344	(0.208)	0.178	0.166
115	9.58	0.70	0.361	(0.207)	0.187	0.174
116	9.67	0.70	0.361	(0.206)	0.187	0.174
117	9.75	0.70	0.361	(0.205)	0.187	0.174
118	9.83	0.73	0.378	(0.204)	0.196	0.182
119	9.92	0.73	0.378	(0.203)	0.196	0.182
120	10.00	0.73	0.378	(0.202)	0.196	0.182
121	10.08	0.50	0.258	(0.201)	0.134	0.124
122	10.17	0.50	0.258	(0.200)	0.134	0.124
123	10.25	0.50	0.258	(0.200)	0.134	0.124
124	10.33	0.50	0.258	(0.199)	0.134	0.124
125	10.42	0.50	0.258	(0.198)	0.134	0.124
126	10.50	0.50	0.258	(0.197)	0.134	0.124
127	10.58	0.67	0.344	(0.196)	0.178	0.166
128	10.67	0.67	0.344	(0.195)	0.178	0.166
129	10.75	0.67	0.344	(0.194)	0.178	0.166
130	10.83	0.67	0.344	(0.193)	0.178	0.166
131	10.92	0.67	0.344	(0.192)	0.178	0.166
132	11.00	0.67	0.344	(0.191)	0.178	0.166
133	11.08	0.63	0.327	(0.190)	0.169	0.157
134	11.17	0.63	0.327	(0.189)	0.169	0.157
135	11.25	0.63	0.327	(0.188)	0.169	0.157
136	11.33	0.63	0.327	(0.187)	0.169	0.157
137	11.42	0.63	0.327	(0.186)	0.169	0.157
138	11.50	0.63	0.327	(0.185)	0.169	0.157
139	11.58	0.57	0.292	(0.184)	0.152	0.141
140	11.67	0.57	0.292	(0.183)	0.152	0.141
141	11.75	0.57	0.292	(0.183)	0.152	0.141
142	11.83	0.60	0.309	(0.182)	0.160	0.149
143	11.92	0.60	0.309	(0.181)	0.160	0.149
144	12.00	0.60	0.309	(0.180)	0.160	0.149
145	12.08	0.83	0.430	0.179	(0.223)	0.251
146	12.17	0.83	0.430	0.178	(0.223)	0.252
147	12.25	0.83	0.430	0.177	(0.223)	0.253
148	12.33	0.87	0.447	0.176	(0.232)	0.271
149	12.42	0.87	0.447	0.175	(0.232)	0.272
150	12.50	0.87	0.447	0.174	(0.232)	0.273
151	12.58	0.93	0.481	0.174	(0.250)	0.308
152	12.67	0.93	0.481	0.173	(0.250)	0.309
153	12.75	0.93	0.481	0.172	(0.250)	0.310
154	12.83	0.97	0.499	0.171	(0.259)	0.328
155	12.92	0.97	0.499	0.170	(0.259)	0.328
156	13.00	0.97	0.499	0.169	(0.259)	0.329
157	13.08	1.13	0.585	0.168	(0.303)	0.416

158	13.17	1.13	0.585	0.168	(0.303)	0.417
159	13.25	1.13	0.585	0.167	(0.303)	0.418
160	13.33	1.13	0.585	0.166	(0.303)	0.419
161	13.42	1.13	0.585	0.165	(0.303)	0.420
162	13.50	1.13	0.585	0.164	(0.303)	0.420
163	13.58	0.77	0.395	0.163	(0.205)	0.232
164	13.67	0.77	0.395	0.163	(0.205)	0.233
165	13.75	0.77	0.395	0.162	(0.205)	0.234
166	13.83	0.77	0.395	0.161	(0.205)	0.235
167	13.92	0.77	0.395	0.160	(0.205)	0.235
168	14.00	0.77	0.395	0.159	(0.205)	0.236
169	14.08	0.90	0.464	0.158	(0.241)	0.306
170	14.17	0.90	0.464	0.158	(0.241)	0.307
171	14.25	0.90	0.464	0.157	(0.241)	0.307
172	14.33	0.87	0.447	0.156	(0.232)	0.291
173	14.42	0.87	0.447	0.155	(0.232)	0.292
174	14.50	0.87	0.447	0.154	(0.232)	0.293
175	14.58	0.87	0.447	0.154	(0.232)	0.293
176	14.67	0.87	0.447	0.153	(0.232)	0.294
177	14.75	0.87	0.447	0.152	(0.232)	0.295
178	14.83	0.83	0.430	0.151	(0.223)	0.279
179	14.92	0.83	0.430	0.150	(0.223)	0.279
180	15.00	0.83	0.430	0.150	(0.223)	0.280
181	15.08	0.80	0.413	0.149	(0.214)	0.264
182	15.17	0.80	0.413	0.148	(0.214)	0.264
183	15.25	0.80	0.413	0.147	(0.214)	0.265
184	15.33	0.77	0.395	0.147	(0.205)	0.249
185	15.42	0.77	0.395	0.146	(0.205)	0.250
186	15.50	0.77	0.395	0.145	(0.205)	0.250
187	15.58	0.63	0.327	0.144	(0.169)	0.182
188	15.67	0.63	0.327	0.144	(0.169)	0.183
189	15.75	0.63	0.327	0.143	(0.169)	0.184
190	15.83	0.63	0.327	0.142	(0.169)	0.184
191	15.92	0.63	0.327	0.141	(0.169)	0.185
192	16.00	0.63	0.327	0.141	(0.169)	0.186
193	16.08	0.13	0.069	(0.140)	0.036	0.033
194	16.17	0.13	0.069	(0.139)	0.036	0.033
195	16.25	0.13	0.069	(0.139)	0.036	0.033
196	16.33	0.13	0.069	(0.138)	0.036	0.033
197	16.42	0.13	0.069	(0.137)	0.036	0.033
198	16.50	0.13	0.069	(0.137)	0.036	0.033
199	16.58	0.10	0.052	(0.136)	0.027	0.025
200	16.67	0.10	0.052	(0.135)	0.027	0.025
201	16.75	0.10	0.052	(0.134)	0.027	0.025
202	16.83	0.10	0.052	(0.134)	0.027	0.025
203	16.92	0.10	0.052	(0.133)	0.027	0.025
204	17.00	0.10	0.052	(0.132)	0.027	0.025
205	17.08	0.17	0.086	(0.132)	0.045	0.041
206	17.17	0.17	0.086	(0.131)	0.045	0.041
207	17.25	0.17	0.086	(0.130)	0.045	0.041
208	17.33	0.17	0.086	(0.130)	0.045	0.041
209	17.42	0.17	0.086	(0.129)	0.045	0.041
210	17.50	0.17	0.086	(0.128)	0.045	0.041
211	17.58	0.17	0.086	(0.128)	0.045	0.041

212	17.67	0.17	0.086	(0.127)	0.045	0.041
213	17.75	0.17	0.086	(0.127)	0.045	0.041
214	17.83	0.13	0.069	(0.126)	0.036	0.033
215	17.92	0.13	0.069	(0.125)	0.036	0.033
216	18.00	0.13	0.069	(0.125)	0.036	0.033
217	18.08	0.13	0.069	(0.124)	0.036	0.033
218	18.17	0.13	0.069	(0.123)	0.036	0.033
219	18.25	0.13	0.069	(0.123)	0.036	0.033
220	18.33	0.13	0.069	(0.122)	0.036	0.033
221	18.42	0.13	0.069	(0.122)	0.036	0.033
222	18.50	0.13	0.069	(0.121)	0.036	0.033
223	18.58	0.10	0.052	(0.120)	0.027	0.025
224	18.67	0.10	0.052	(0.120)	0.027	0.025
225	18.75	0.10	0.052	(0.119)	0.027	0.025
226	18.83	0.07	0.034	(0.119)	0.018	0.017
227	18.92	0.07	0.034	(0.118)	0.018	0.017
228	19.00	0.07	0.034	(0.118)	0.018	0.017
229	19.08	0.10	0.052	(0.117)	0.027	0.025
230	19.17	0.10	0.052	(0.117)	0.027	0.025
231	19.25	0.10	0.052	(0.116)	0.027	0.025
232	19.33	0.13	0.069	(0.115)	0.036	0.033
233	19.42	0.13	0.069	(0.115)	0.036	0.033
234	19.50	0.13	0.069	(0.114)	0.036	0.033
235	19.58	0.10	0.052	(0.114)	0.027	0.025
236	19.67	0.10	0.052	(0.113)	0.027	0.025
237	19.75	0.10	0.052	(0.113)	0.027	0.025
238	19.83	0.07	0.034	(0.112)	0.018	0.017
239	19.92	0.07	0.034	(0.112)	0.018	0.017
240	20.00	0.07	0.034	(0.111)	0.018	0.017
241	20.08	0.10	0.052	(0.111)	0.027	0.025
242	20.17	0.10	0.052	(0.110)	0.027	0.025
243	20.25	0.10	0.052	(0.110)	0.027	0.025
244	20.33	0.10	0.052	(0.109)	0.027	0.025
245	20.42	0.10	0.052	(0.109)	0.027	0.025
246	20.50	0.10	0.052	(0.108)	0.027	0.025
247	20.58	0.10	0.052	(0.108)	0.027	0.025
248	20.67	0.10	0.052	(0.108)	0.027	0.025
249	20.75	0.10	0.052	(0.107)	0.027	0.025
250	20.83	0.07	0.034	(0.107)	0.018	0.017
251	20.92	0.07	0.034	(0.106)	0.018	0.017
252	21.00	0.07	0.034	(0.106)	0.018	0.017
253	21.08	0.10	0.052	(0.105)	0.027	0.025
254	21.17	0.10	0.052	(0.105)	0.027	0.025
255	21.25	0.10	0.052	(0.105)	0.027	0.025
256	21.33	0.07	0.034	(0.104)	0.018	0.017
257	21.42	0.07	0.034	(0.104)	0.018	0.017
258	21.50	0.07	0.034	(0.103)	0.018	0.017
259	21.58	0.10	0.052	(0.103)	0.027	0.025
260	21.67	0.10	0.052	(0.103)	0.027	0.025
261	21.75	0.10	0.052	(0.102)	0.027	0.025
262	21.83	0.07	0.034	(0.102)	0.018	0.017
263	21.92	0.07	0.034	(0.102)	0.018	0.017
264	22.00	0.07	0.034	(0.101)	0.018	0.017
265	22.08	0.10	0.052	(0.101)	0.027	0.025

266	22.17	0.10	0.052	(0.101)	0.027	0.025
267	22.25	0.10	0.052	(0.100)	0.027	0.025
268	22.33	0.07	0.034	(0.100)	0.018	0.017
269	22.42	0.07	0.034	(0.100)	0.018	0.017
270	22.50	0.07	0.034	(0.099)	0.018	0.017
271	22.58	0.07	0.034	(0.099)	0.018	0.017
272	22.67	0.07	0.034	(0.099)	0.018	0.017
273	22.75	0.07	0.034	(0.098)	0.018	0.017
274	22.83	0.07	0.034	(0.098)	0.018	0.017
275	22.92	0.07	0.034	(0.098)	0.018	0.017
276	23.00	0.07	0.034	(0.098)	0.018	0.017
277	23.08	0.07	0.034	(0.098)	0.018	0.017
278	23.17	0.07	0.034	(0.097)	0.018	0.017
279	23.25	0.07	0.034	(0.097)	0.018	0.017
280	23.33	0.07	0.034	(0.097)	0.018	0.017
281	23.42	0.07	0.034	(0.097)	0.018	0.017
282	23.50	0.07	0.034	(0.097)	0.018	0.017
283	23.58	0.07	0.034	(0.096)	0.018	0.017
284	23.67	0.07	0.034	(0.096)	0.018	0.017
285	23.75	0.07	0.034	(0.096)	0.018	0.017
286	23.83	0.07	0.034	(0.096)	0.018	0.017
287	23.92	0.07	0.034	(0.096)	0.018	0.017
288	24.00	0.07	0.034	(0.096)	0.018	0.017

(Loss Rate Not Used)

Sum = 100.0

Sum = 28.2

Flood volume = Effective rainfall 2.35(In)

times area 14.0(Ac.)/[(In)/(Ft.)] = 2.7(Ac.Ft)

Total soil loss = 1.95(In)

Total soil loss = 2.275(Ac.Ft)

Total rainfall = 4.30(In)

Flood volume = 119357.4 Cubic Feet

Total soil loss = 99082.6 Cubic Feet

Peak flow rate of this hydrograph = 5.923(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0006	0.08	Q				
0+10	0.0019	0.19	Q				
0+15	0.0033	0.22	Q				
0+20	0.0052	0.27	VQ				
0+25	0.0074	0.33	VQ				
0+30	0.0098	0.34	VQ				
0+35	0.0122	0.35	VQ				
0+40	0.0146	0.35	VQ				
0+45	0.0170	0.35	VQ				
0+50	0.0197	0.39	VQ				

0+55	0.0228	0.45	VQ
1+ 0	0.0259	0.46	VQ
1+ 5	0.0288	0.42	VQ
1+10	0.0314	0.37	VQ
1+15	0.0339	0.36	VQ
1+20	0.0363	0.35	VQ
1+25	0.0387	0.35	VQ
1+30	0.0411	0.35	VQ
1+35	0.0435	0.35	VQ
1+40	0.0460	0.35	VQ
1+45	0.0484	0.35	VQ
1+50	0.0511	0.39	VQ
1+55	0.0541	0.45	VQ
2+ 0	0.0573	0.46	VQ
2+ 5	0.0605	0.46	VQ
2+10	0.0637	0.47	VQ
2+15	0.0669	0.47	VQ
2+20	0.0701	0.47	Q
2+25	0.0734	0.47	Q
2+30	0.0766	0.47	Q
2+35	0.0801	0.51	VQ
2+40	0.0839	0.56	VQ
2+45	0.0879	0.57	VQ
2+50	0.0919	0.58	VQ
2+55	0.0959	0.58	VQ
3+ 0	0.0999	0.58	VQ
3+ 5	0.1040	0.58	VQ
3+10	0.1080	0.58	VQ
3+15	0.1120	0.58	VQ
3+20	0.1160	0.58	VQ
3+25	0.1201	0.58	VQ
3+30	0.1241	0.58	VQ
3+35	0.1281	0.58	VQ
3+40	0.1321	0.58	VQ
3+45	0.1361	0.58	VQ
3+50	0.1405	0.62	Q
3+55	0.1451	0.68	Q
4+ 0	0.1499	0.69	Q
4+ 5	0.1547	0.70	Q
4+10	0.1595	0.70	Q
4+15	0.1643	0.70	Q
4+20	0.1695	0.74	Q
4+25	0.1749	0.80	VQ
4+30	0.1805	0.81	VQ
4+35	0.1861	0.81	VQ
4+40	0.1917	0.82	VQ
4+45	0.1974	0.82	VQ
4+50	0.2033	0.86	VQ
4+55	0.2096	0.91	Q
5+ 0	0.2159	0.93	Q
5+ 5	0.2218	0.85	Q
5+10	0.2269	0.74	QV
5+15	0.2319	0.72	QV
5+20	0.2370	0.75	QV

5+25	0.2425	0.80	Q			
5+30	0.2481	0.81	Q			
5+35	0.2540	0.85	Q			
5+40	0.2603	0.91	Q			
5+45	0.2666	0.93	Q			
5+50	0.2730	0.93	Q			
5+55	0.2795	0.93	QV			
6+ 0	0.2859	0.93	QV			
6+ 5	0.2926	0.98	QV			
6+10	0.2997	1.03	Q			
6+15	0.3069	1.04	Q			
6+20	0.3141	1.05	Q			
6+25	0.3214	1.05	Q			
6+30	0.3286	1.05	Q			
6+35	0.3361	1.09	Q			
6+40	0.3440	1.15	QV			
6+45	0.3520	1.16	QV			
6+50	0.3600	1.16	QV			
6+55	0.3681	1.17	QV			
7+ 0	0.3761	1.17	QV			
7+ 5	0.3842	1.17	QV			
7+10	0.3922	1.17	QV			
7+15	0.4002	1.17	QV			
7+20	0.4086	1.21	QV			
7+25	0.4173	1.26	QV			
7+30	0.4261	1.28	QV			
7+35	0.4352	1.32	QV			
7+40	0.4447	1.38	QV			
7+45	0.4543	1.39	QV			
7+50	0.4642	1.44	QV			
7+55	0.4745	1.50	QV			
8+ 0	0.4849	1.51	QV			
8+ 5	0.4959	1.60	QV			
8+10	0.5076	1.71	QV			
8+15	0.5196	1.73	QV			
8+20	0.5316	1.75	QV			
8+25	0.5436	1.75	Q			
8+30	0.5557	1.75	QV			
8+35	0.5681	1.79	QV			
8+40	0.5808	1.85	QV			
8+45	0.5936	1.86	QV			
8+50	0.6067	1.91	QV			
8+55	0.6202	1.96	Q V			
9+ 0	0.6339	1.98	Q V			
9+ 5	0.6481	2.06	QV			
9+10	0.6631	2.18	QV			
9+15	0.6782	2.20	QV			
9+20	0.6937	2.25	QV			
9+25	0.7097	2.31	QV			
9+30	0.7257	2.33	QV			
9+35	0.7420	2.37	QV			
9+40	0.7588	2.43	Q V			
9+45	0.7756	2.44	Q V			
9+50	0.7928	2.49	Q V			

14+25	2.0279	4.14			Q		V
14+30	2.0564	4.14			Q		V
14+35	2.0849	4.14			Q		V
14+40	2.1134	4.14			Q		V
14+45	2.1420	4.15			Q		V
14+50	2.1701	4.08			Q		V
14+55	2.1975	3.98			Q		V
15+ 0	2.2248	3.96			Q		V
15+ 5	2.2515	3.88			Q		V
15+10	2.2775	3.77			Q		V
15+15	2.3034	3.75			Q		V
15+20	2.3286	3.67			Q		V
15+25	2.3531	3.56			Q		V
15+30	2.3775	3.54			Q		V
15+35	2.3996	3.20			Q		V
15+40	2.4186	2.76			Q		V
15+45	2.4369	2.66			Q		V
15+50	2.4550	2.63			Q		V
15+55	2.4730	2.61			Q		V
16+ 0	2.4910	2.61			Q		V
16+ 5	2.5039	1.87		Q			V
16+10	2.5099	0.87		Q			V
16+15	2.5143	0.64	Q				V
16+20	2.5180	0.54	Q				V
16+25	2.5213	0.49	Q				V
16+30	2.5245	0.47	Q				V
16+35	2.5275	0.43	Q				V
16+40	2.5300	0.37	Q				V
16+45	2.5325	0.36	Q				V
16+50	2.5350	0.35	Q				V
16+55	2.5374	0.35	Q				V
17+ 0	2.5398	0.35	Q				V
17+ 5	2.5428	0.43	Q				V
17+10	2.5465	0.54	Q				V
17+15	2.5504	0.57	Q				V
17+20	2.5544	0.58	Q				V
17+25	2.5584	0.58	Q				V
17+30	2.5624	0.58	Q				V
17+35	2.5664	0.58	Q				V
17+40	2.5704	0.58	Q				V
17+45	2.5745	0.58	Q				V
17+50	2.5782	0.54	Q				V
17+55	2.5816	0.49	Q				V
18+ 0	2.5849	0.48	Q				V
18+ 5	2.5881	0.47	Q				V
18+10	2.5913	0.47	Q				V
18+15	2.5945	0.47	Q				V
18+20	2.5978	0.47	Q				V
18+25	2.6010	0.47	Q				V
18+30	2.6042	0.47	Q				V
18+35	2.6071	0.43	Q				V
18+40	2.6097	0.37	Q				V
18+45	2.6122	0.36	Q				V
18+50	2.6143	0.31	Q				V

18+55	2.6161	0.26	Q				V
19+ 0	2.6178	0.24	Q				V
19+ 5	2.6197	0.28	Q				V
19+10	2.6220	0.33	Q				V
19+15	2.6243	0.34	Q				V
19+20	2.6270	0.39	Q				V
19+25	2.6300	0.44	Q				V
19+30	2.6332	0.46	Q				V
19+35	2.6361	0.42	Q				V
19+40	2.6387	0.37	Q				V
19+45	2.6412	0.36	Q				V
19+50	2.6433	0.31	Q				V
19+55	2.6451	0.26	Q				V
20+ 0	2.6468	0.24	Q				V
20+ 5	2.6487	0.28	Q				V
20+10	2.6509	0.33	Q				V
20+15	2.6533	0.34	Q				V
20+20	2.6557	0.35	Q				V
20+25	2.6581	0.35	Q				V
20+30	2.6605	0.35	Q				V
20+35	2.6629	0.35	Q				V
20+40	2.6653	0.35	Q				V
20+45	2.6677	0.35	Q				V
20+50	2.6699	0.31	Q				V
20+55	2.6716	0.26	Q				V
21+ 0	2.6733	0.24	Q				V
21+ 5	2.6752	0.28	Q				V
21+10	2.6775	0.33	Q				V
21+15	2.6798	0.34	Q				V
21+20	2.6820	0.31	Q				V
21+25	2.6837	0.25	Q				V
21+30	2.6854	0.24	Q				V
21+35	2.6873	0.28	Q				V
21+40	2.6896	0.33	Q				V
21+45	2.6919	0.34	Q				V
21+50	2.6940	0.31	Q				V
21+55	2.6958	0.25	Q				V
22+ 0	2.6974	0.24	Q				V
22+ 5	2.6994	0.28	Q				V
22+10	2.7016	0.33	Q				V
22+15	2.7040	0.34	Q				V
22+20	2.7061	0.31	Q				V
22+25	2.7078	0.25	Q				V
22+30	2.7095	0.24	Q				V
22+35	2.7112	0.24	Q				V
22+40	2.7128	0.23	Q				V
22+45	2.7144	0.23	Q				V
22+50	2.7160	0.23	Q				V
22+55	2.7176	0.23	Q				V
23+ 0	2.7192	0.23	Q				V
23+ 5	2.7208	0.23	Q				V
23+10	2.7224	0.23	Q				V
23+15	2.7240	0.23	Q				V
23+20	2.7256	0.23	Q				V

23+25	2.7273	0.23	Q				V
23+30	2.7289	0.23	Q				V
23+35	2.7305	0.23	Q				V
23+40	2.7321	0.23	Q				V
23+45	2.7337	0.23	Q				V
23+50	2.7353	0.23	Q				V
23+55	2.7369	0.23	Q				V
24+ 0	2.7385	0.23	Q				V
24+ 5	2.7396	0.15	Q				V
24+10	2.7399	0.04	Q				V
24+15	2.7400	0.02	Q				V
24+20	2.7401	0.01	Q				V
24+25	2.7401	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "C" Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
31.20	0.58	18.10

100 YEAR Area rainfall data:

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

31.20

1.45

45.24

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.734

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	170.840	11.906
2	0.167	341.681	14.292
3	0.250	512.521	3.175
4	0.333	683.361	1.331
5	0.417	854.202	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.306	(0.434)	0.225	0.081
2	0.17	4.50	0.313	(0.434)	0.230	0.083
3	0.25	5.40	0.376	(0.434)	0.276	0.100
4	0.33	5.40	0.376	(0.434)	0.276	0.100
5	0.42	5.70	0.397	(0.434)	0.291	0.106
6	0.50	6.40	0.445	(0.434)	0.327	0.119
7	0.58	7.90	0.550	(0.434)	0.403	0.146
8	0.67	9.10	0.633	0.434	(0.465)	0.199
9	0.75	12.80	0.891	0.434	(0.654)	0.456
10	0.83	25.60	1.781	0.434	(1.307)	1.347
11	0.92	7.90	0.550	(0.434)	0.403	0.146
12	1.00	4.90	0.341	(0.434)	0.250	0.091

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.0

Flood volume = Effective rainfall 0.25(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 0.6(Ac.Ft)

Total soil loss = 0.33(In)

Total soil loss = 0.863(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 28073.7 Cubic Feet

Total soil loss = 37596.2 Cubic Feet

Peak flow rate of this hydrograph = 23.485(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0067	0.97	VQ				
0+10	0.0216	2.16	VQ				
0+15	0.0397	2.64	VQ				
0+20	0.0604	3.00	Q				
0+25	0.0823	3.18	QV				
0+30	0.1059	3.43	Q V				
0+35	0.1333	3.98	Q V				
0+40	0.1681	5.05	Q	V			
0+45	0.2300	8.98		Q V			
0+50	0.3917	23.48			V	Q	
0+55	0.5489	22.83				Q V	
1+ 0	0.6054	8.21		Q			V
1+ 5	0.6323	3.89	Q				V
1+10	0.6424	1.48	Q				V
1+15	0.6440	0.23	Q				V
1+20	0.6445	0.07	Q				V

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Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 3-Hour Unit Hydrograph Analysis Area "C"

Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 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]
31.20	0.98	30.58

100 YEAR Area rainfall data:

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

31.20

2.48

77.38

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 0.980(In)
 Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 0.980(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 0.980(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.734

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	170.840	37.865	11.906
2 0.167	341.681	45.454	14.292
3 0.250	512.521	10.099	3.175
4 0.333	683.361	4.234	1.331
5 0.417	854.202	2.348	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.153	(0.434)	0.112	0.041
2	0.17	1.30	0.153	(0.434)	0.112	0.041
3	0.25	1.10	0.129	(0.434)	0.095	0.034
4	0.33	1.50	0.176	(0.434)	0.129	0.047
5	0.42	1.50	0.176	(0.434)	0.129	0.047
6	0.50	1.80	0.212	(0.434)	0.155	0.056
7	0.58	1.50	0.176	(0.434)	0.129	0.047
8	0.67	1.80	0.212	(0.434)	0.155	0.056
9	0.75	1.80	0.212	(0.434)	0.155	0.056
10	0.83	1.50	0.176	(0.434)	0.129	0.047
11	0.92	1.60	0.188	(0.434)	0.138	0.050
12	1.00	1.80	0.212	(0.434)	0.155	0.056
13	1.08	2.20	0.259	(0.434)	0.190	0.069
14	1.17	2.20	0.259	(0.434)	0.190	0.069
15	1.25	2.20	0.259	(0.434)	0.190	0.069
16	1.33	2.00	0.235	(0.434)	0.173	0.063
17	1.42	2.60	0.306	(0.434)	0.224	0.081
18	1.50	2.70	0.317	(0.434)	0.233	0.085
19	1.58	2.40	0.282	(0.434)	0.207	0.075
20	1.67	2.70	0.317	(0.434)	0.233	0.085
21	1.75	3.30	0.388	(0.434)	0.285	0.103
22	1.83	3.10	0.365	(0.434)	0.267	0.097
23	1.92	2.90	0.341	(0.434)	0.250	0.091
24	2.00	3.00	0.353	(0.434)	0.259	0.094
25	2.08	3.10	0.365	(0.434)	0.267	0.097
26	2.17	4.20	0.494	(0.434)	0.362	0.131
27	2.25	5.00	0.588	(0.434)	0.431	0.157
28	2.33	3.50	0.412	(0.434)	0.302	0.110
29	2.42	6.80	0.800	0.434	(0.587)	0.365
30	2.50	7.30	0.858	0.434	(0.630)	0.424
31	2.58	8.20	0.964	0.434	(0.708)	0.530
32	2.67	5.90	0.694	0.434	(0.509)	0.259
33	2.75	2.00	0.235	(0.434)	0.173	0.063
34	2.83	1.80	0.212	(0.434)	0.155	0.056
35	2.92	1.80	0.212	(0.434)	0.155	0.056
36	3.00	0.60	0.071	(0.434)	0.052	0.019

(Loss Rate Not Used)

Sum = 100.0

Sum = 3.8

Flood volume = Effective rainfall 0.32(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)

Total soil loss = 0.66(In)

Total soil loss = 1.719(Ac.Ft)

Total rainfall = 0.98(In)

Flood volume = 36109.9 Cubic Feet

Total soil loss = 74865.9 Cubic Feet

Peak flow rate of this hydrograph = 13.798(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0033	0.48	Q					
0+10	0.0107	1.07	V Q					
0+15	0.0184	1.12	V Q					
0+20	0.0269	1.24	VQ					
0+25	0.0367	1.42	VQ					
0+30	0.0475	1.57	VQ					
0+35	0.0586	1.60	VQ					
0+40	0.0697	1.62	Q					
0+45	0.0817	1.74	Q					
0+50	0.0930	1.65	QV					
0+55	0.1037	1.56	Q V					
1+ 0	0.1151	1.65	Q V					
1+ 5	0.1281	1.89	Q V					
1+10	0.1425	2.09	Q V					
1+15	0.1572	2.14	Q V					
1+20	0.1715	2.08	Q V					
1+25	0.1869	2.23	Q V					
1+30	0.2042	2.51	Q V					
1+35	0.2214	2.50	Q V					
1+40	0.2386	2.50	Q V					
1+45	0.2582	2.85	Q V					
1+50	0.2793	3.06	Q V					
1+55	0.2998	2.97	Q V					
2+ 0	0.3199	2.92	Q V					
2+ 5	0.3405	2.99	Q V					
2+10	0.3642	3.44	Q V					
2+15	0.3935	4.24	Q V					
2+20	0.4221	4.16	Q V					
2+25	0.4680	6.66	Q V					
2+30	0.5433	10.93	Q V					
2+35	0.6383	13.80	Q V					
2+40	0.7249	12.58	Q V					
2+45	0.7730	6.97	Q V					
2+50	0.7964	3.41	Q V					
2+55	0.8131	2.41	Q V					
3+ 0	0.8233	1.48	Q V					
3+ 5	0.8272	0.57	Q V					
3+10	0.8284	0.18	Q V					
3+15	0.8289	0.07	Q V					
3+20	0.8290	0.01	Q V					

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 6-Hour Unit Hydrograph Analysis Area "C"

Existing Condition

Drainage Area = 31.20(Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20(Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00(Ft.)
Length along longest watercourse measured to centroid = 707.00(Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40(Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
31.20	1.38	43.06

100 YEAR Area rainfall data:

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

31.20

3.48

108.58

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.380(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.380(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20(Ac.)		

RI	RI	Infil. Rate (In/Hr)	Impervious (Dec.)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
AMC2	AMC-1					
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.734

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	0.083	170.840	37.865
2	0.167	341.681	45.454
3	0.250	512.521	10.099
4	0.333	683.361	4.234
5	0.417	854.202	2.348
Sum =		100.000	Sum= 31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.083	(0.434)	0.061	0.022
2	0.17	0.60	0.099	(0.434)	0.073	0.026
3	0.25	0.60	0.099	(0.434)	0.073	0.026
4	0.33	0.60	0.099	(0.434)	0.073	0.026
5	0.42	0.60	0.099	(0.434)	0.073	0.026
6	0.50	0.70	0.116	(0.434)	0.085	0.031
7	0.58	0.70	0.116	(0.434)	0.085	0.031
8	0.67	0.70	0.116	(0.434)	0.085	0.031
9	0.75	0.70	0.116	(0.434)	0.085	0.031
10	0.83	0.70	0.116	(0.434)	0.085	0.031
11	0.92	0.70	0.116	(0.434)	0.085	0.031
12	1.00	0.80	0.132	(0.434)	0.097	0.035
13	1.08	0.80	0.132	(0.434)	0.097	0.035
14	1.17	0.80	0.132	(0.434)	0.097	0.035
15	1.25	0.80	0.132	(0.434)	0.097	0.035
16	1.33	0.80	0.132	(0.434)	0.097	0.035
17	1.42	0.80	0.132	(0.434)	0.097	0.035
18	1.50	0.80	0.132	(0.434)	0.097	0.035
19	1.58	0.80	0.132	(0.434)	0.097	0.035
20	1.67	0.80	0.132	(0.434)	0.097	0.035
21	1.75	0.80	0.132	(0.434)	0.097	0.035
22	1.83	0.80	0.132	(0.434)	0.097	0.035
23	1.92	0.80	0.132	(0.434)	0.097	0.035
24	2.00	0.90	0.149	(0.434)	0.109	0.040
25	2.08	0.80	0.132	(0.434)	0.097	0.035
26	2.17	0.90	0.149	(0.434)	0.109	0.040
27	2.25	0.90	0.149	(0.434)	0.109	0.040
28	2.33	0.90	0.149	(0.434)	0.109	0.040
29	2.42	0.90	0.149	(0.434)	0.109	0.040
30	2.50	0.90	0.149	(0.434)	0.109	0.040
31	2.58	0.90	0.149	(0.434)	0.109	0.040
32	2.67	0.90	0.149	(0.434)	0.109	0.040
33	2.75	1.00	0.166	(0.434)	0.122	0.044
34	2.83	1.00	0.166	(0.434)	0.122	0.044
35	2.92	1.00	0.166	(0.434)	0.122	0.044
36	3.00	1.00	0.166	(0.434)	0.122	0.044
37	3.08	1.00	0.166	(0.434)	0.122	0.044
38	3.17	1.10	0.182	(0.434)	0.134	0.048
39	3.25	1.10	0.182	(0.434)	0.134	0.048
40	3.33	1.10	0.182	(0.434)	0.134	0.048
41	3.42	1.20	0.199	(0.434)	0.146	0.053
42	3.50	1.30	0.215	(0.434)	0.158	0.057
43	3.58	1.40	0.232	(0.434)	0.170	0.062
44	3.67	1.40	0.232	(0.434)	0.170	0.062
45	3.75	1.50	0.248	(0.434)	0.182	0.066
46	3.83	1.50	0.248	(0.434)	0.182	0.066
47	3.92	1.60	0.265	(0.434)	0.194	0.071
48	4.00	1.60	0.265	(0.434)	0.194	0.071
49	4.08	1.70	0.281	(0.434)	0.207	0.075
50	4.17	1.80	0.298	(0.434)	0.219	0.079
51	4.25	1.90	0.315	(0.434)	0.231	0.084
52	4.33	2.00	0.331	(0.434)	0.243	0.088

53	4.42	2.10	0.348	(0.434)	0.255	0.093
54	4.50	2.10	0.348	(0.434)	0.255	0.093
55	4.58	2.20	0.364	(0.434)	0.267	0.097
56	4.67	2.30	0.381	(0.434)	0.279	0.101
57	4.75	2.40	0.397	(0.434)	0.292	0.106
58	4.83	2.40	0.397	(0.434)	0.292	0.106
59	4.92	2.50	0.414	(0.434)	0.304	0.110
60	5.00	2.60	0.431	(0.434)	0.316	0.115
61	5.08	3.10	0.513	(0.434)	0.377	0.137
62	5.17	3.60	0.596	0.434	(0.437)	0.162
63	5.25	3.90	0.646	0.434	(0.474)	0.211
64	5.33	4.20	0.695	0.434	(0.510)	0.261
65	5.42	4.70	0.778	0.434	(0.571)	0.344
66	5.50	5.60	0.927	0.434	(0.680)	0.493
67	5.58	1.90	0.315	(0.434)	0.231	0.084
68	5.67	0.90	0.149	(0.434)	0.109	0.040
69	5.75	0.60	0.099	(0.434)	0.073	0.026
70	5.83	0.50	0.083	(0.434)	0.061	0.022
71	5.92	0.30	0.050	(0.434)	0.036	0.013
72	6.00	0.20	0.033	(0.434)	0.024	0.009

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.9

Flood volume = Effective rainfall 0.41(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 1.1(Ac.Ft)

Total soil loss = 0.97(In)

Total soil loss = 2.524(Ac.Ft)

Total rainfall = 1.38(In)

Flood volume = 46334.1 Cubic Feet

Total soil loss = 109942.4 Cubic Feet

Peak flow rate of this hydrograph = 12.021(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0018	0.26	Q				
0+10	0.0061	0.63	VQ				
0+15	0.0114	0.76	VQ				
0+20	0.0170	0.81	VQ				
0+25	0.0227	0.83	VQ				
0+30	0.0288	0.88	Q				
0+35	0.0353	0.95	Q				
0+40	0.0419	0.96	Q				
0+45	0.0486	0.97	Q				
0+50	0.0553	0.97	QV				
0+55	0.0619	0.97	QV				
1+ 0	0.0690	1.02	Q				
1+ 5	0.0765	1.09	Q				

1+10	0.0840	1.10	QV						
1+15	0.0917	1.11	QV						
1+20	0.0993	1.11	QV						
1+25	0.1069	1.11	Q V						
1+30	0.1146	1.11	Q V						
1+35	0.1222	1.11	Q V						
1+40	0.1299	1.11	Q V						
1+45	0.1375	1.11	Q V						
1+50	0.1451	1.11	Q V						
1+55	0.1528	1.11	Q V						
2+ 0	0.1608	1.16	Q V						
2+ 5	0.1689	1.17	Q V						
2+10	0.1770	1.18	Q V						
2+15	0.1854	1.23	Q V						
2+20	0.1940	1.24	Q V						
2+25	0.2026	1.24	Q V						
2+30	0.2112	1.25	Q V						
2+35	0.2198	1.25	Q V						
2+40	0.2283	1.25	Q V						
2+45	0.2373	1.30	Q V						
2+50	0.2467	1.36	Q V						
2+55	0.2562	1.38	Q V						
3+ 0	0.2657	1.38	Q V						
3+ 5	0.2753	1.39	Q V						
3+10	0.2852	1.44	Q V						
3+15	0.2955	1.50	Q V						
3+20	0.3060	1.52	Q V						
3+25	0.3168	1.57	Q V						
3+30	0.3285	1.69	Q V						
3+35	0.3410	1.82	Q V						
3+40	0.3541	1.91	Q V						
3+45	0.3678	1.98	Q V						
3+50	0.3819	2.05	Q V						
3+55	0.3966	2.12	Q V						
4+ 0	0.4117	2.19	Q V						
4+ 5	0.4272	2.26	Q V						
4+10	0.4437	2.38	Q V						
4+15	0.4610	2.52	Q V						
4+20	0.4792	2.65	Q V						
4+25	0.4985	2.79	Q V						
4+30	0.5183	2.88	Q V						
4+35	0.5386	2.95	Q V						
4+40	0.5598	3.08	Q V						
4+45	0.5819	3.21	Q V						
4+50	0.6046	3.29	Q V						
4+55	0.6278	3.37	Q V						
5+ 0	0.6518	3.49	Q V						
5+ 5	0.6782	3.84	Q V						
5+10	0.7090	4.47	Q V						
5+15	0.7469	5.50	Q V						
5+20	0.7945	6.92	Q V						
5+25	0.8553	8.82	Q V						
5+30	0.9381	12.02	Q V						
5+35	1.0045	9.64	Q V						

5+40	1.0313	3.89		Q				V	
5+45	1.0454	2.06		Q				V	
5+50	1.0540	1.24		Q				V	
5+55	1.0586	0.67		Q				V	
6+ 0	1.0616	0.43	Q					V	
6+ 5	1.0631	0.22	Q					V	
6+10	1.0635	0.06	Q					V	
6+15	1.0636	0.02	Q					V	
6+20	1.0637	0.01	Q					V	

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex242.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 24-Hour Unit Hydrograph Analysis Area "C"

Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 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]
31.20	2.48	77.38

100 YEAR Area rainfall data:

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

31.20

6.90

215.28

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 2.480(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 2.480(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.734

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	170.840	11.906
2	0.167	341.681	14.292
3	0.250	512.521	3.175
4	0.333	683.361	1.331
5	0.417	854.202	0.738
Sum =		100.000	Sum= 31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.020	(0.770)	0.015	0.005
2	0.17	0.07	0.020	(0.767)	0.015	0.005
3	0.25	0.07	0.020	(0.764)	0.015	0.005
4	0.33	0.10	0.030	(0.761)	0.022	0.008
5	0.42	0.10	0.030	(0.758)	0.022	0.008
6	0.50	0.10	0.030	(0.755)	0.022	0.008
7	0.58	0.10	0.030	(0.752)	0.022	0.008
8	0.67	0.10	0.030	(0.749)	0.022	0.008
9	0.75	0.10	0.030	(0.746)	0.022	0.008
10	0.83	0.13	0.040	(0.743)	0.029	0.011
11	0.92	0.13	0.040	(0.740)	0.029	0.011
12	1.00	0.13	0.040	(0.737)	0.029	0.011
13	1.08	0.10	0.030	(0.735)	0.022	0.008
14	1.17	0.10	0.030	(0.732)	0.022	0.008
15	1.25	0.10	0.030	(0.729)	0.022	0.008
16	1.33	0.10	0.030	(0.726)	0.022	0.008
17	1.42	0.10	0.030	(0.723)	0.022	0.008
18	1.50	0.10	0.030	(0.720)	0.022	0.008
19	1.58	0.10	0.030	(0.717)	0.022	0.008
20	1.67	0.10	0.030	(0.714)	0.022	0.008
21	1.75	0.10	0.030	(0.711)	0.022	0.008
22	1.83	0.13	0.040	(0.709)	0.029	0.011
23	1.92	0.13	0.040	(0.706)	0.029	0.011
24	2.00	0.13	0.040	(0.703)	0.029	0.011
25	2.08	0.13	0.040	(0.700)	0.029	0.011
26	2.17	0.13	0.040	(0.697)	0.029	0.011
27	2.25	0.13	0.040	(0.694)	0.029	0.011
28	2.33	0.13	0.040	(0.692)	0.029	0.011
29	2.42	0.13	0.040	(0.689)	0.029	0.011
30	2.50	0.13	0.040	(0.686)	0.029	0.011
31	2.58	0.17	0.050	(0.683)	0.036	0.013
32	2.67	0.17	0.050	(0.680)	0.036	0.013
33	2.75	0.17	0.050	(0.678)	0.036	0.013
34	2.83	0.17	0.050	(0.675)	0.036	0.013
35	2.92	0.17	0.050	(0.672)	0.036	0.013
36	3.00	0.17	0.050	(0.669)	0.036	0.013
37	3.08	0.17	0.050	(0.666)	0.036	0.013
38	3.17	0.17	0.050	(0.664)	0.036	0.013
39	3.25	0.17	0.050	(0.661)	0.036	0.013
40	3.33	0.17	0.050	(0.658)	0.036	0.013
41	3.42	0.17	0.050	(0.655)	0.036	0.013
42	3.50	0.17	0.050	(0.653)	0.036	0.013
43	3.58	0.17	0.050	(0.650)	0.036	0.013
44	3.67	0.17	0.050	(0.647)	0.036	0.013
45	3.75	0.17	0.050	(0.644)	0.036	0.013
46	3.83	0.20	0.060	(0.642)	0.044	0.016
47	3.92	0.20	0.060	(0.639)	0.044	0.016
48	4.00	0.20	0.060	(0.636)	0.044	0.016
49	4.08	0.20	0.060	(0.634)	0.044	0.016
50	4.17	0.20	0.060	(0.631)	0.044	0.016
51	4.25	0.20	0.060	(0.628)	0.044	0.016
52	4.33	0.23	0.069	(0.626)	0.051	0.018

53	4.42	0.23	0.069	(0.623)	0.051	0.018
54	4.50	0.23	0.069	(0.620)	0.051	0.018
55	4.58	0.23	0.069	(0.618)	0.051	0.018
56	4.67	0.23	0.069	(0.615)	0.051	0.018
57	4.75	0.23	0.069	(0.612)	0.051	0.018
58	4.83	0.27	0.079	(0.610)	0.058	0.021
59	4.92	0.27	0.079	(0.607)	0.058	0.021
60	5.00	0.27	0.079	(0.604)	0.058	0.021
61	5.08	0.20	0.060	(0.602)	0.044	0.016
62	5.17	0.20	0.060	(0.599)	0.044	0.016
63	5.25	0.20	0.060	(0.596)	0.044	0.016
64	5.33	0.23	0.069	(0.594)	0.051	0.018
65	5.42	0.23	0.069	(0.591)	0.051	0.018
66	5.50	0.23	0.069	(0.589)	0.051	0.018
67	5.58	0.27	0.079	(0.586)	0.058	0.021
68	5.67	0.27	0.079	(0.584)	0.058	0.021
69	5.75	0.27	0.079	(0.581)	0.058	0.021
70	5.83	0.27	0.079	(0.578)	0.058	0.021
71	5.92	0.27	0.079	(0.576)	0.058	0.021
72	6.00	0.27	0.079	(0.573)	0.058	0.021
73	6.08	0.30	0.089	(0.571)	0.066	0.024
74	6.17	0.30	0.089	(0.568)	0.066	0.024
75	6.25	0.30	0.089	(0.566)	0.066	0.024
76	6.33	0.30	0.089	(0.563)	0.066	0.024
77	6.42	0.30	0.089	(0.561)	0.066	0.024
78	6.50	0.30	0.089	(0.558)	0.066	0.024
79	6.58	0.33	0.099	(0.556)	0.073	0.026
80	6.67	0.33	0.099	(0.553)	0.073	0.026
81	6.75	0.33	0.099	(0.551)	0.073	0.026
82	6.83	0.33	0.099	(0.548)	0.073	0.026
83	6.92	0.33	0.099	(0.546)	0.073	0.026
84	7.00	0.33	0.099	(0.543)	0.073	0.026
85	7.08	0.33	0.099	(0.541)	0.073	0.026
86	7.17	0.33	0.099	(0.538)	0.073	0.026
87	7.25	0.33	0.099	(0.536)	0.073	0.026
88	7.33	0.37	0.109	(0.533)	0.080	0.029
89	7.42	0.37	0.109	(0.531)	0.080	0.029
90	7.50	0.37	0.109	(0.528)	0.080	0.029
91	7.58	0.40	0.119	(0.526)	0.087	0.032
92	7.67	0.40	0.119	(0.524)	0.087	0.032
93	7.75	0.40	0.119	(0.521)	0.087	0.032
94	7.83	0.43	0.129	(0.519)	0.095	0.034
95	7.92	0.43	0.129	(0.516)	0.095	0.034
96	8.00	0.43	0.129	(0.514)	0.095	0.034
97	8.08	0.50	0.149	(0.512)	0.109	0.040
98	8.17	0.50	0.149	(0.509)	0.109	0.040
99	8.25	0.50	0.149	(0.507)	0.109	0.040
100	8.33	0.50	0.149	(0.504)	0.109	0.040
101	8.42	0.50	0.149	(0.502)	0.109	0.040
102	8.50	0.50	0.149	(0.500)	0.109	0.040
103	8.58	0.53	0.159	(0.497)	0.116	0.042
104	8.67	0.53	0.159	(0.495)	0.116	0.042
105	8.75	0.53	0.159	(0.493)	0.116	0.042
106	8.83	0.57	0.169	(0.490)	0.124	0.045

107	8.92	0.57	0.169	(0.488)	0.124	0.045
108	9.00	0.57	0.169	(0.486)	0.124	0.045
109	9.08	0.63	0.188	(0.484)	0.138	0.050
110	9.17	0.63	0.188	(0.481)	0.138	0.050
111	9.25	0.63	0.188	(0.479)	0.138	0.050
112	9.33	0.67	0.198	(0.477)	0.146	0.053
113	9.42	0.67	0.198	(0.474)	0.146	0.053
114	9.50	0.67	0.198	(0.472)	0.146	0.053
115	9.58	0.70	0.208	(0.470)	0.153	0.055
116	9.67	0.70	0.208	(0.468)	0.153	0.055
117	9.75	0.70	0.208	(0.465)	0.153	0.055
118	9.83	0.73	0.218	(0.463)	0.160	0.058
119	9.92	0.73	0.218	(0.461)	0.160	0.058
120	10.00	0.73	0.218	(0.459)	0.160	0.058
121	10.08	0.50	0.149	(0.456)	0.109	0.040
122	10.17	0.50	0.149	(0.454)	0.109	0.040
123	10.25	0.50	0.149	(0.452)	0.109	0.040
124	10.33	0.50	0.149	(0.450)	0.109	0.040
125	10.42	0.50	0.149	(0.448)	0.109	0.040
126	10.50	0.50	0.149	(0.445)	0.109	0.040
127	10.58	0.67	0.198	(0.443)	0.146	0.053
128	10.67	0.67	0.198	(0.441)	0.146	0.053
129	10.75	0.67	0.198	(0.439)	0.146	0.053
130	10.83	0.67	0.198	(0.437)	0.146	0.053
131	10.92	0.67	0.198	(0.435)	0.146	0.053
132	11.00	0.67	0.198	(0.433)	0.146	0.053
133	11.08	0.63	0.188	(0.430)	0.138	0.050
134	11.17	0.63	0.188	(0.428)	0.138	0.050
135	11.25	0.63	0.188	(0.426)	0.138	0.050
136	11.33	0.63	0.188	(0.424)	0.138	0.050
137	11.42	0.63	0.188	(0.422)	0.138	0.050
138	11.50	0.63	0.188	(0.420)	0.138	0.050
139	11.58	0.57	0.169	(0.418)	0.124	0.045
140	11.67	0.57	0.169	(0.416)	0.124	0.045
141	11.75	0.57	0.169	(0.414)	0.124	0.045
142	11.83	0.60	0.179	(0.412)	0.131	0.048
143	11.92	0.60	0.179	(0.410)	0.131	0.048
144	12.00	0.60	0.179	(0.407)	0.131	0.048
145	12.08	0.83	0.248	(0.405)	0.182	0.066
146	12.17	0.83	0.248	(0.403)	0.182	0.066
147	12.25	0.83	0.248	(0.401)	0.182	0.066
148	12.33	0.87	0.258	(0.399)	0.189	0.069
149	12.42	0.87	0.258	(0.397)	0.189	0.069
150	12.50	0.87	0.258	(0.395)	0.189	0.069
151	12.58	0.93	0.278	(0.393)	0.204	0.074
152	12.67	0.93	0.278	(0.391)	0.204	0.074
153	12.75	0.93	0.278	(0.389)	0.204	0.074
154	12.83	0.97	0.288	(0.387)	0.211	0.077
155	12.92	0.97	0.288	(0.385)	0.211	0.077
156	13.00	0.97	0.288	(0.384)	0.211	0.077
157	13.08	1.13	0.337	(0.382)	0.247	0.090
158	13.17	1.13	0.337	(0.380)	0.247	0.090
159	13.25	1.13	0.337	(0.378)	0.247	0.090
160	13.33	1.13	0.337	(0.376)	0.247	0.090

161	13.42	1.13	0.337	(0.374)	0.247	0.090
162	13.50	1.13	0.337	(0.372)	0.247	0.090
163	13.58	0.77	0.228	(0.370)	0.167	0.061
164	13.67	0.77	0.228	(0.368)	0.167	0.061
165	13.75	0.77	0.228	(0.366)	0.167	0.061
166	13.83	0.77	0.228	(0.364)	0.167	0.061
167	13.92	0.77	0.228	(0.363)	0.167	0.061
168	14.00	0.77	0.228	(0.361)	0.167	0.061
169	14.08	0.90	0.268	(0.359)	0.197	0.071
170	14.17	0.90	0.268	(0.357)	0.197	0.071
171	14.25	0.90	0.268	(0.355)	0.197	0.071
172	14.33	0.87	0.258	(0.353)	0.189	0.069
173	14.42	0.87	0.258	(0.352)	0.189	0.069
174	14.50	0.87	0.258	(0.350)	0.189	0.069
175	14.58	0.87	0.258	(0.348)	0.189	0.069
176	14.67	0.87	0.258	(0.346)	0.189	0.069
177	14.75	0.87	0.258	(0.344)	0.189	0.069
178	14.83	0.83	0.248	(0.343)	0.182	0.066
179	14.92	0.83	0.248	(0.341)	0.182	0.066
180	15.00	0.83	0.248	(0.339)	0.182	0.066
181	15.08	0.80	0.238	(0.337)	0.175	0.063
182	15.17	0.80	0.238	(0.336)	0.175	0.063
183	15.25	0.80	0.238	(0.334)	0.175	0.063
184	15.33	0.77	0.228	(0.332)	0.167	0.061
185	15.42	0.77	0.228	(0.331)	0.167	0.061
186	15.50	0.77	0.228	(0.329)	0.167	0.061
187	15.58	0.63	0.188	(0.327)	0.138	0.050
188	15.67	0.63	0.188	(0.326)	0.138	0.050
189	15.75	0.63	0.188	(0.324)	0.138	0.050
190	15.83	0.63	0.188	(0.322)	0.138	0.050
191	15.92	0.63	0.188	(0.321)	0.138	0.050
192	16.00	0.63	0.188	(0.319)	0.138	0.050
193	16.08	0.13	0.040	(0.317)	0.029	0.011
194	16.17	0.13	0.040	(0.316)	0.029	0.011
195	16.25	0.13	0.040	(0.314)	0.029	0.011
196	16.33	0.13	0.040	(0.312)	0.029	0.011
197	16.42	0.13	0.040	(0.311)	0.029	0.011
198	16.50	0.13	0.040	(0.309)	0.029	0.011
199	16.58	0.10	0.030	(0.308)	0.022	0.008
200	16.67	0.10	0.030	(0.306)	0.022	0.008
201	16.75	0.10	0.030	(0.305)	0.022	0.008
202	16.83	0.10	0.030	(0.303)	0.022	0.008
203	16.92	0.10	0.030	(0.302)	0.022	0.008
204	17.00	0.10	0.030	(0.300)	0.022	0.008
205	17.08	0.17	0.050	(0.298)	0.036	0.013
206	17.17	0.17	0.050	(0.297)	0.036	0.013
207	17.25	0.17	0.050	(0.295)	0.036	0.013
208	17.33	0.17	0.050	(0.294)	0.036	0.013
209	17.42	0.17	0.050	(0.293)	0.036	0.013
210	17.50	0.17	0.050	(0.291)	0.036	0.013
211	17.58	0.17	0.050	(0.290)	0.036	0.013
212	17.67	0.17	0.050	(0.288)	0.036	0.013
213	17.75	0.17	0.050	(0.287)	0.036	0.013
214	17.83	0.13	0.040	(0.285)	0.029	0.011

215	17.92	0.13	0.040	(0.284)	0.029	0.011
216	18.00	0.13	0.040	(0.282)	0.029	0.011
217	18.08	0.13	0.040	(0.281)	0.029	0.011
218	18.17	0.13	0.040	(0.280)	0.029	0.011
219	18.25	0.13	0.040	(0.278)	0.029	0.011
220	18.33	0.13	0.040	(0.277)	0.029	0.011
221	18.42	0.13	0.040	(0.276)	0.029	0.011
222	18.50	0.13	0.040	(0.274)	0.029	0.011
223	18.58	0.10	0.030	(0.273)	0.022	0.008
224	18.67	0.10	0.030	(0.272)	0.022	0.008
225	18.75	0.10	0.030	(0.270)	0.022	0.008
226	18.83	0.07	0.020	(0.269)	0.015	0.005
227	18.92	0.07	0.020	(0.268)	0.015	0.005
228	19.00	0.07	0.020	(0.267)	0.015	0.005
229	19.08	0.10	0.030	(0.265)	0.022	0.008
230	19.17	0.10	0.030	(0.264)	0.022	0.008
231	19.25	0.10	0.030	(0.263)	0.022	0.008
232	19.33	0.13	0.040	(0.262)	0.029	0.011
233	19.42	0.13	0.040	(0.260)	0.029	0.011
234	19.50	0.13	0.040	(0.259)	0.029	0.011
235	19.58	0.10	0.030	(0.258)	0.022	0.008
236	19.67	0.10	0.030	(0.257)	0.022	0.008
237	19.75	0.10	0.030	(0.256)	0.022	0.008
238	19.83	0.07	0.020	(0.254)	0.015	0.005
239	19.92	0.07	0.020	(0.253)	0.015	0.005
240	20.00	0.07	0.020	(0.252)	0.015	0.005
241	20.08	0.10	0.030	(0.251)	0.022	0.008
242	20.17	0.10	0.030	(0.250)	0.022	0.008
243	20.25	0.10	0.030	(0.249)	0.022	0.008
244	20.33	0.10	0.030	(0.248)	0.022	0.008
245	20.42	0.10	0.030	(0.247)	0.022	0.008
246	20.50	0.10	0.030	(0.246)	0.022	0.008
247	20.58	0.10	0.030	(0.245)	0.022	0.008
248	20.67	0.10	0.030	(0.244)	0.022	0.008
249	20.75	0.10	0.030	(0.243)	0.022	0.008
250	20.83	0.07	0.020	(0.242)	0.015	0.005
251	20.92	0.07	0.020	(0.241)	0.015	0.005
252	21.00	0.07	0.020	(0.240)	0.015	0.005
253	21.08	0.10	0.030	(0.239)	0.022	0.008
254	21.17	0.10	0.030	(0.238)	0.022	0.008
255	21.25	0.10	0.030	(0.237)	0.022	0.008
256	21.33	0.07	0.020	(0.236)	0.015	0.005
257	21.42	0.07	0.020	(0.235)	0.015	0.005
258	21.50	0.07	0.020	(0.234)	0.015	0.005
259	21.58	0.10	0.030	(0.233)	0.022	0.008
260	21.67	0.10	0.030	(0.233)	0.022	0.008
261	21.75	0.10	0.030	(0.232)	0.022	0.008
262	21.83	0.07	0.020	(0.231)	0.015	0.005
263	21.92	0.07	0.020	(0.230)	0.015	0.005
264	22.00	0.07	0.020	(0.229)	0.015	0.005
265	22.08	0.10	0.030	(0.229)	0.022	0.008
266	22.17	0.10	0.030	(0.228)	0.022	0.008
267	22.25	0.10	0.030	(0.227)	0.022	0.008
268	22.33	0.07	0.020	(0.226)	0.015	0.005

269	22.42	0.07	0.020	(0.226)	0.015	0.005
270	22.50	0.07	0.020	(0.225)	0.015	0.005
271	22.58	0.07	0.020	(0.224)	0.015	0.005
272	22.67	0.07	0.020	(0.224)	0.015	0.005
273	22.75	0.07	0.020	(0.223)	0.015	0.005
274	22.83	0.07	0.020	(0.223)	0.015	0.005
275	22.92	0.07	0.020	(0.222)	0.015	0.005
276	23.00	0.07	0.020	(0.221)	0.015	0.005
277	23.08	0.07	0.020	(0.221)	0.015	0.005
278	23.17	0.07	0.020	(0.220)	0.015	0.005
279	23.25	0.07	0.020	(0.220)	0.015	0.005
280	23.33	0.07	0.020	(0.220)	0.015	0.005
281	23.42	0.07	0.020	(0.219)	0.015	0.005
282	23.50	0.07	0.020	(0.219)	0.015	0.005
283	23.58	0.07	0.020	(0.218)	0.015	0.005
284	23.67	0.07	0.020	(0.218)	0.015	0.005
285	23.75	0.07	0.020	(0.218)	0.015	0.005
286	23.83	0.07	0.020	(0.218)	0.015	0.005
287	23.92	0.07	0.020	(0.217)	0.015	0.005
288	24.00	0.07	0.020	(0.217)	0.015	0.005

(Loss Rate Not Used)

Sum = 100.0

Sum = 7.9

Flood volume = Effective rainfall 0.66(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)

Total soil loss = 1.82(In)

Total soil loss = 4.731(Ac.Ft)

Total rainfall = 2.48(In)

Flood volume = 74764.3 Cubic Feet

Total soil loss = 206093.4 Cubic Feet

Peak flow rate of this hydrograph = 2.824(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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0004	0.06	Q				
0+10	0.0014	0.14	Q				
0+15	0.0025	0.16	Q				
0+20	0.0038	0.19	Q				
0+25	0.0054	0.24	Q				
0+30	0.0071	0.24	Q				
0+35	0.0088	0.25	Q				
0+40	0.0105	0.25	Q				
0+45	0.0122	0.25	Q				
0+50	0.0142	0.28	VQ				
0+55	0.0164	0.32	VQ				
1+ 0	0.0186	0.33	VQ				
1+ 5	0.0207	0.30	VQ				

1+10	0.0225	0.26	VQ
1+15	0.0242	0.25	VQ
1+20	0.0260	0.25	VQ
1+25	0.0277	0.25	Q
1+30	0.0294	0.25	Q
1+35	0.0311	0.25	Q
1+40	0.0328	0.25	Q
1+45	0.0345	0.25	Q
1+50	0.0365	0.28	VQ
1+55	0.0387	0.32	VQ
2+ 0	0.0409	0.33	VQ
2+ 5	0.0432	0.33	Q
2+10	0.0455	0.33	Q
2+15	0.0478	0.33	Q
2+20	0.0501	0.33	Q
2+25	0.0523	0.33	Q
2+30	0.0546	0.33	Q
2+35	0.0571	0.36	Q
2+40	0.0599	0.40	Q
2+45	0.0627	0.41	Q
2+50	0.0656	0.41	Q
2+55	0.0684	0.42	Q
3+ 0	0.0713	0.42	Q
3+ 5	0.0742	0.42	Q
3+10	0.0770	0.42	Q
3+15	0.0799	0.42	Q
3+20	0.0827	0.42	Q
3+25	0.0856	0.42	Q
3+30	0.0885	0.42	QV
3+35	0.0913	0.42	QV
3+40	0.0942	0.42	QV
3+45	0.0970	0.42	QV
3+50	0.1001	0.45	QV
3+55	0.1035	0.48	QV
4+ 0	0.1068	0.49	QV
4+ 5	0.1103	0.50	QV
4+10	0.1137	0.50	QV
4+15	0.1171	0.50	QV
4+20	0.1208	0.53	Q
4+25	0.1247	0.57	Q
4+30	0.1287	0.58	Q
4+35	0.1326	0.58	QV
4+40	0.1367	0.58	QV
4+45	0.1407	0.58	QV
4+50	0.1449	0.61	QV
4+55	0.1494	0.65	QV
5+ 0	0.1539	0.66	QV
5+ 5	0.1580	0.60	QV
5+10	0.1617	0.53	QV
5+15	0.1652	0.51	QV
5+20	0.1688	0.53	QV
5+25	0.1727	0.57	Q V
5+30	0.1767	0.58	Q V
5+35	0.1809	0.61	Q V

5+40	0.1854	0.65	Q V				
5+45	0.1899	0.66	Q V				
5+50	0.1945	0.66	Q V				
5+55	0.1991	0.66	Q V				
6+ 0	0.2037	0.66	Q V				
6+ 5	0.2085	0.70	Q V				
6+10	0.2135	0.73	Q V				
6+15	0.2186	0.74	Q V				
6+20	0.2238	0.75	Q V				
6+25	0.2289	0.75	Q V				
6+30	0.2341	0.75	Q V				
6+35	0.2394	0.78	Q V				
6+40	0.2450	0.82	Q V				
6+45	0.2507	0.83	Q V				
6+50	0.2564	0.83	Q V				
6+55	0.2622	0.83	Q V				
7+ 0	0.2679	0.83	Q V				
7+ 5	0.2736	0.83	Q V				
7+10	0.2793	0.83	Q V				
7+15	0.2850	0.83	Q V				
7+20	0.2910	0.86	Q V				
7+25	0.2972	0.90	Q V				
7+30	0.3034	0.91	Q V				
7+35	0.3099	0.94	Q V				
7+40	0.3167	0.98	Q V				
7+45	0.3235	0.99	Q V				
7+50	0.3306	1.03	Q V				
7+55	0.3379	1.07	Q V				
8+ 0	0.3453	1.07	Q V				
8+ 5	0.3532	1.14	Q V				
8+10	0.3616	1.22	Q V				
8+15	0.3701	1.24	Q V				
8+20	0.3786	1.24	Q V				
8+25	0.3872	1.25	Q V				
8+30	0.3958	1.25	Q V				
8+35	0.4046	1.28	Q V				
8+40	0.4137	1.32	Q V				
8+45	0.4228	1.32	Q V				
8+50	0.4321	1.36	Q V				
8+55	0.4418	1.40	Q V				
9+ 0	0.4515	1.41	Q V				
9+ 5	0.4616	1.47	Q V				
9+10	0.4723	1.55	Q V				
9+15	0.4831	1.57	Q V				
9+20	0.4941	1.61	Q V				
9+25	0.5055	1.65	Q V				
9+30	0.5169	1.66	Q V				
9+35	0.5285	1.69	Q V				
9+40	0.5405	1.73	Q V				
9+45	0.5524	1.74	Q V				
9+50	0.5647	1.77	Q V				
9+55	0.5771	1.81	Q V				
10+ 0	0.5897	1.82	Q V				
10+ 5	0.6007	1.61	Q V				

14+40	1.3349	2.16		Q		V
14+45	1.3497	2.16		Q		V
14+50	1.3644	2.13		Q		V
14+55	1.3788	2.09		Q		V
15+ 0	1.3931	2.08		Q		V
15+ 5	1.4072	2.05		Q		V
15+10	1.4211	2.01		Q		V
15+15	1.4348	2.00		Q		V
15+20	1.4484	1.96		Q		V
15+25	1.4616	1.92		Q		V
15+30	1.4748	1.92		Q		V
15+35	1.4871	1.79		Q		V
15+40	1.4984	1.63		Q		V
15+45	1.5094	1.60		Q		V
15+50	1.5203	1.59		Q		V
15+55	1.5312	1.58		Q		V
16+ 0	1.5420	1.58		Q		V
16+ 5	1.5497	1.11	Q			V
16+10	1.5534	0.54	Q			V
16+15	1.5562	0.41	Q			V
16+20	1.5587	0.36	Q			V
16+25	1.5610	0.33	Q			V
16+30	1.5633	0.33	Q			V
16+35	1.5654	0.30	Q			V
16+40	1.5672	0.26	Q			V
16+45	1.5689	0.25	Q			V
16+50	1.5707	0.25	Q			V
16+55	1.5724	0.25	Q			V
17+ 0	1.5741	0.25	Q			V
17+ 5	1.5763	0.31	Q			V
17+10	1.5789	0.39	Q			V
17+15	1.5817	0.40	Q			V
17+20	1.5845	0.41	Q			V
17+25	1.5874	0.42	Q			V
17+30	1.5903	0.42	Q			V
17+35	1.5931	0.42	Q			V
17+40	1.5960	0.42	Q			V
17+45	1.5988	0.42	Q			V
17+50	1.6015	0.38	Q			V
17+55	1.6039	0.35	Q			V
18+ 0	1.6062	0.34	Q			V
18+ 5	1.6085	0.33	Q			V
18+10	1.6108	0.33	Q			V
18+15	1.6131	0.33	Q			V
18+20	1.6154	0.33	Q			V
18+25	1.6177	0.33	Q			V
18+30	1.6199	0.33	Q			V
18+35	1.6220	0.30	Q			V
18+40	1.6238	0.26	Q			V
18+45	1.6256	0.25	Q			V
18+50	1.6271	0.22	Q			V
18+55	1.6283	0.18	Q			V
19+ 0	1.6295	0.17	Q			V
19+ 5	1.6309	0.20	Q			V

19+10	1.6325	0.24	Q				V
19+15	1.6342	0.24	Q				V
19+20	1.6361	0.28	Q				V
19+25	1.6383	0.32	Q				V
19+30	1.6406	0.33	Q				V
19+35	1.6426	0.30	Q				V
19+40	1.6444	0.26	Q				V
19+45	1.6462	0.25	Q				V
19+50	1.6477	0.22	Q				V
19+55	1.6489	0.18	Q				V
20+ 0	1.6501	0.17	Q				V
20+ 5	1.6515	0.20	Q				V
20+10	1.6531	0.24	Q				V
20+15	1.6548	0.24	Q				V
20+20	1.6565	0.25	Q				V
20+25	1.6582	0.25	Q				V
20+30	1.6599	0.25	Q				V
20+35	1.6616	0.25	Q				V
20+40	1.6634	0.25	Q				V
20+45	1.6651	0.25	Q				V
20+50	1.6666	0.22	Q				V
20+55	1.6678	0.18	Q				V
21+ 0	1.6690	0.17	Q				V
21+ 5	1.6704	0.20	Q				V
21+10	1.6720	0.24	Q				V
21+15	1.6737	0.24	Q				V
21+20	1.6752	0.22	Q				V
21+25	1.6764	0.18	Q				V
21+30	1.6776	0.17	Q				V
21+35	1.6790	0.20	Q				V
21+40	1.6806	0.24	Q				V
21+45	1.6822	0.24	Q				V
21+50	1.6837	0.22	Q				V
21+55	1.6850	0.18	Q				V
22+ 0	1.6862	0.17	Q				V
22+ 5	1.6875	0.20	Q				V
22+10	1.6892	0.24	Q				V
22+15	1.6908	0.24	Q				V
22+20	1.6923	0.22	Q				V
22+25	1.6936	0.18	Q				V
22+30	1.6947	0.17	Q				V
22+35	1.6959	0.17	Q				V
22+40	1.6970	0.17	Q				V
22+45	1.6982	0.17	Q				V
22+50	1.6993	0.17	Q				V
22+55	1.7005	0.17	Q				V
23+ 0	1.7016	0.17	Q				V
23+ 5	1.7028	0.17	Q				V
23+10	1.7039	0.17	Q				V
23+15	1.7051	0.17	Q				V
23+20	1.7062	0.17	Q				V
23+25	1.7073	0.17	Q				V
23+30	1.7085	0.17	Q				V
23+35	1.7096	0.17	Q				V

23+40	1.7108	0.17	Q				V
23+45	1.7119	0.17	Q				V
23+50	1.7131	0.17	Q				V
23+55	1.7142	0.17	Q				V
24+ 0	1.7153	0.17	Q				V
24+ 5	1.7161	0.10	Q				V
24+10	1.7163	0.03	Q				V
24+15	1.7163	0.01	Q				V
24+20	1.7164	0.00	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex15.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 1-Hour Unit Hydrograph Analysis Area "C" Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
31.20	0.58	18.10

100 YEAR Area rainfall data:

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

31.20

1.45

45.24

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.784(In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 0.784(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.734

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	170.840	11.906
2	0.167	341.681	14.292
3	0.250	512.521	3.175
4	0.333	683.361	1.331
5	0.417	854.202	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.414	(0.434)	0.304	0.110
2	0.17	4.50	0.423	(0.434)	0.310	0.113
3	0.25	5.40	0.508	(0.434)	0.373	0.135
4	0.33	5.40	0.508	(0.434)	0.373	0.135
5	0.42	5.70	0.536	(0.434)	0.393	0.143
6	0.50	6.40	0.602	0.434	(0.442)	0.167
7	0.58	7.90	0.743	0.434	(0.545)	0.308
8	0.67	9.10	0.856	0.434	(0.628)	0.421
9	0.75	12.80	1.204	0.434	(0.883)	0.769
10	0.83	25.60	2.407	0.434	(1.766)	1.973
11	0.92	7.90	0.743	0.434	(0.545)	0.308
12	1.00	4.90	0.461	(0.434)	0.338	0.123

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.7

Flood volume = Effective rainfall 0.39(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)

Total soil loss = 0.39(In)

Total soil loss = 1.018(Ac.Ft)

Total rainfall = 0.78(In)

Flood volume = 44416.7 Cubic Feet

Total soil loss = 44325.4 Cubic Feet

Peak flow rate of this hydrograph = 36.373(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0090	1.31	VQ				
0+10	0.0291	2.92	VQ				
0+15	0.0537	3.57	VQ				
0+20	0.0816	4.05	VQ				
0+25	0.1112	4.29	Q				
0+30	0.1437	4.73	QV				
0+35	0.1906	6.80	QV				
0+40	0.2612	10.25	Q				
0+45	0.3748	16.50		V Q			
0+50	0.6253	36.37			V		
0+55	0.8672	35.12				Q	
1+ 0	0.9600	13.48		Q		VQ	
1+ 5	1.0008	5.93		Q			V
1+10	1.0163	2.26	Q				V
1+15	1.0190	0.39	Q				V
1+20	1.0197	0.09	Q				V

Unit Hydrograph Analysis

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 3-Hour Unit Hydrograph Analysis Area "C" Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 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]
31.20	0.98	30.58

100 YEAR Area rainfall data:

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

31.20

2.48

77.38

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.331(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.331(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.734

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 0.083	170.840	37.865	11.906
2 0.167	341.681	45.454	14.292
3 0.250	512.521	10.099	3.175
4 0.333	683.361	4.234	1.331
5 0.417	854.202	2.348	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.208	(0.434)	0.152	0.055
2	0.17	1.30	0.208	(0.434)	0.152	0.055
3	0.25	1.10	0.176	(0.434)	0.129	0.047
4	0.33	1.50	0.240	(0.434)	0.176	0.064
5	0.42	1.50	0.240	(0.434)	0.176	0.064
6	0.50	1.80	0.288	(0.434)	0.211	0.077
7	0.58	1.50	0.240	(0.434)	0.176	0.064
8	0.67	1.80	0.288	(0.434)	0.211	0.077
9	0.75	1.80	0.288	(0.434)	0.211	0.077
10	0.83	1.50	0.240	(0.434)	0.176	0.064
11	0.92	1.60	0.256	(0.434)	0.188	0.068
12	1.00	1.80	0.288	(0.434)	0.211	0.077
13	1.08	2.20	0.351	(0.434)	0.258	0.094
14	1.17	2.20	0.351	(0.434)	0.258	0.094
15	1.25	2.20	0.351	(0.434)	0.258	0.094
16	1.33	2.00	0.319	(0.434)	0.234	0.085
17	1.42	2.60	0.415	(0.434)	0.305	0.111
18	1.50	2.70	0.431	(0.434)	0.316	0.115
19	1.58	2.40	0.383	(0.434)	0.281	0.102
20	1.67	2.70	0.431	(0.434)	0.316	0.115
21	1.75	3.30	0.527	(0.434)	0.387	0.140
22	1.83	3.10	0.495	(0.434)	0.363	0.132
23	1.92	2.90	0.463	(0.434)	0.340	0.123
24	2.00	3.00	0.479	(0.434)	0.352	0.128
25	2.08	3.10	0.495	(0.434)	0.363	0.132
26	2.17	4.20	0.671	0.434	(0.492)	0.237
27	2.25	5.00	0.799	0.434	(0.586)	0.364
28	2.33	3.50	0.559	(0.434)	0.410	0.149
29	2.42	6.80	1.086	0.434	(0.797)	0.652
30	2.50	7.30	1.166	0.434	(0.856)	0.732
31	2.58	8.20	1.310	0.434	(0.961)	0.876
32	2.67	5.90	0.942	0.434	(0.692)	0.508
33	2.75	2.00	0.319	(0.434)	0.234	0.085
34	2.83	1.80	0.288	(0.434)	0.211	0.077
35	2.92	1.80	0.288	(0.434)	0.211	0.077
36	3.00	0.60	0.096	(0.434)	0.070	0.026

(Loss Rate Not Used)

Sum = 100.0

Sum = 6.0

Flood volume = Effective rainfall 0.50(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 1.3(Ac.Ft)

Total soil loss = 0.83(In)

Total soil loss = 2.154(Ac.Ft)

Total rainfall = 1.33(In)

Flood volume = 56913.4 Cubic Feet

Total soil loss = 93847.9 Cubic Feet

Peak flow rate of this hydrograph = 23.433(CFS)

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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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0045	0.66	Q					
0+10	0.0145	1.45	VQ					
0+15	0.0250	1.52	V Q					
0+20	0.0366	1.68	VQ					
0+25	0.0499	1.93	VQ					
0+30	0.0646	2.13	VQ					
0+35	0.0795	2.18	Q					
0+40	0.0947	2.20	Q					
0+45	0.1109	2.36	Q					
0+50	0.1263	2.24	QV					
0+55	0.1409	2.11	Q V					
1+ 0	0.1564	2.25	Q V					
1+ 5	0.1741	2.57	Q V					
1+10	0.1936	2.83	Q V					
1+15	0.2136	2.90	Q V					
1+20	0.2330	2.83	Q V					
1+25	0.2539	3.02	Q V					
1+30	0.2774	3.41	Q V					
1+35	0.3007	3.39	Q V					
1+40	0.3241	3.40	Q V					
1+45	0.3508	3.87	Q V					
1+50	0.3795	4.16	Q V					
1+55	0.4072	4.03	Q V					
2+ 0	0.4346	3.97	Q V					
2+ 5	0.4626	4.07	Q V					
2+10	0.4996	5.37	Q V					
2+15	0.5575	8.40	Q V					
2+20	0.6126	8.00	Q V					
2+25	0.6915	11.46	Q V					
2+30	0.8236	19.17	Q V					
2+35	0.9850	23.43	Q V					
2+40	1.1356	21.88	Q V					
2+45	1.2218	12.52	Q V					
2+50	1.2594	5.45	Q V					
2+55	1.2842	3.60	Q V					
3+ 0	1.2988	2.13	Q V					
3+ 5	1.3041	0.77	Q V					
3+10	1.3058	0.24	Q V					
3+15	1.3064	0.09	Q V					
3+20	1.3066	0.02	Q V					

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex65.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 6-Hour Unit Hydrograph Analysis Area "C"

Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
31.20	1.38	43.06

100 YEAR Area rainfall data:

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

31.20

3.48

108.58

STORM EVENT (YEAR) = 5.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 1.872(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.872(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.734

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 0.083	170.840	37.865	11.906
2 0.167	341.681	45.454	14.292
3 0.250	512.521	10.099	3.175
4 0.333	683.361	4.234	1.331
5 0.417	854.202	2.348	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.112	(0.434)	0.082	0.030
2	0.17	0.60	0.135	(0.434)	0.099	0.036
3	0.25	0.60	0.135	(0.434)	0.099	0.036
4	0.33	0.60	0.135	(0.434)	0.099	0.036
5	0.42	0.60	0.135	(0.434)	0.099	0.036
6	0.50	0.70	0.157	(0.434)	0.115	0.042
7	0.58	0.70	0.157	(0.434)	0.115	0.042
8	0.67	0.70	0.157	(0.434)	0.115	0.042
9	0.75	0.70	0.157	(0.434)	0.115	0.042
10	0.83	0.70	0.157	(0.434)	0.115	0.042
11	0.92	0.70	0.157	(0.434)	0.115	0.042
12	1.00	0.80	0.180	(0.434)	0.132	0.048
13	1.08	0.80	0.180	(0.434)	0.132	0.048
14	1.17	0.80	0.180	(0.434)	0.132	0.048
15	1.25	0.80	0.180	(0.434)	0.132	0.048
16	1.33	0.80	0.180	(0.434)	0.132	0.048
17	1.42	0.80	0.180	(0.434)	0.132	0.048
18	1.50	0.80	0.180	(0.434)	0.132	0.048
19	1.58	0.80	0.180	(0.434)	0.132	0.048
20	1.67	0.80	0.180	(0.434)	0.132	0.048
21	1.75	0.80	0.180	(0.434)	0.132	0.048
22	1.83	0.80	0.180	(0.434)	0.132	0.048
23	1.92	0.80	0.180	(0.434)	0.132	0.048
24	2.00	0.90	0.202	(0.434)	0.148	0.054
25	2.08	0.80	0.180	(0.434)	0.132	0.048
26	2.17	0.90	0.202	(0.434)	0.148	0.054
27	2.25	0.90	0.202	(0.434)	0.148	0.054
28	2.33	0.90	0.202	(0.434)	0.148	0.054
29	2.42	0.90	0.202	(0.434)	0.148	0.054
30	2.50	0.90	0.202	(0.434)	0.148	0.054
31	2.58	0.90	0.202	(0.434)	0.148	0.054
32	2.67	0.90	0.202	(0.434)	0.148	0.054
33	2.75	1.00	0.225	(0.434)	0.165	0.060
34	2.83	1.00	0.225	(0.434)	0.165	0.060
35	2.92	1.00	0.225	(0.434)	0.165	0.060
36	3.00	1.00	0.225	(0.434)	0.165	0.060
37	3.08	1.00	0.225	(0.434)	0.165	0.060
38	3.17	1.10	0.247	(0.434)	0.181	0.066
39	3.25	1.10	0.247	(0.434)	0.181	0.066
40	3.33	1.10	0.247	(0.434)	0.181	0.066
41	3.42	1.20	0.270	(0.434)	0.198	0.072
42	3.50	1.30	0.292	(0.434)	0.214	0.078
43	3.58	1.40	0.314	(0.434)	0.231	0.084
44	3.67	1.40	0.314	(0.434)	0.231	0.084
45	3.75	1.50	0.337	(0.434)	0.247	0.090
46	3.83	1.50	0.337	(0.434)	0.247	0.090
47	3.92	1.60	0.359	(0.434)	0.264	0.096
48	4.00	1.60	0.359	(0.434)	0.264	0.096
49	4.08	1.70	0.382	(0.434)	0.280	0.102
50	4.17	1.80	0.404	(0.434)	0.297	0.108
51	4.25	1.90	0.427	(0.434)	0.313	0.114
52	4.33	2.00	0.449	(0.434)	0.330	0.120

53	4.42	2.10	0.472	(0.434)	0.346	0.126
54	4.50	2.10	0.472	(0.434)	0.346	0.126
55	4.58	2.20	0.494	(0.434)	0.363	0.132
56	4.67	2.30	0.517	(0.434)	0.379	0.138
57	4.75	2.40	0.539	(0.434)	0.396	0.143
58	4.83	2.40	0.539	(0.434)	0.396	0.143
59	4.92	2.50	0.562	(0.434)	0.412	0.149
60	5.00	2.60	0.584	(0.434)	0.429	0.155
61	5.08	3.10	0.696	0.434 (0.511)		0.262
62	5.17	3.60	0.809	0.434 (0.593)		0.374
63	5.25	3.90	0.876	0.434 (0.643)		0.442
64	5.33	4.20	0.943	0.434 (0.692)		0.509
65	5.42	4.70	1.056	0.434 (0.775)		0.621
66	5.50	5.60	1.258	0.434 (0.923)		0.823
67	5.58	1.90	0.427	(0.434)	0.313	0.114
68	5.67	0.90	0.202	(0.434)	0.148	0.054
69	5.75	0.60	0.135	(0.434)	0.099	0.036
70	5.83	0.50	0.112	(0.434)	0.082	0.030
71	5.92	0.30	0.067	(0.434)	0.049	0.018
72	6.00	0.20	0.045	(0.434)	0.033	0.012

(Loss Rate Not Used)

Sum = 100.0

Sum = 7.5

Flood volume = Effective rainfall 0.63(In)

times area 31.2(Ac.)/[(In)/(Ft.)) = 1.6(Ac.Ft)

Total soil loss = 1.25(In)

Total soil loss = 3.239(Ac.Ft)

Total rainfall = 1.87(In)

Flood volume = 70877.0 Cubic Feet

Total soil loss = 141100.9 Cubic Feet

Peak flow rate of this hydrograph = 21.176(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0025	0.36	Q				
0+10	0.0083	0.85	VQ				
0+15	0.0155	1.04	VQ				
0+20	0.0230	1.09	VQ				
0+25	0.0307	1.12	VQ				
0+30	0.0390	1.20	VQ				
0+35	0.0479	1.29	Q				
0+40	0.0568	1.30	Q				
0+45	0.0659	1.31	Q				
0+50	0.0750	1.32	Q				
0+55	0.0840	1.32	QV				
1+ 0	0.0936	1.39	QV				
1+ 5	0.1037	1.47	QV				

5+40	1.5801	6.09		Q			V
5+45	1.6016	3.11		Q			V
5+50	1.6140	1.80	Q				V
5+55	1.6202	0.91	Q				V
6+ 0	1.6242	0.58	Q				V
6+ 5	1.6263	0.29	Q				V
6+10	1.6269	0.08	Q				V
6+15	1.6271	0.03	Q				V
6+20	1.6271	0.01	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex245.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

5-Year 24-Hour Unit Hydrograph Analysis Area "C" Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 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]
31.20	2.48	77.38

100 YEAR Area rainfall data:

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

31.20

6.90

215.28

STORM EVENT (YEAR) = 5.00
 Area Averaged 2-Year Rainfall = 2.480(In)
 Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 3.515(In)
 Areal adjustment factor = 99.99 %
 Adjusted average point rain = 3.515(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	1.000	0.071	0.064	0.005
69.0	49.8	0.574	1.000	0.057	0.141	0.008
63.0	43.0	0.641	0.000	0.641	0.170	0.109
75.0	57.0	0.501	0.000	0.501	0.625	0.313
Sum (F) =						0.434

Area averaged mean soil loss (F) (In/Hr) = 0.434

Minimum soil loss rate ((In/Hr)) = 0.217

(for 24 hour storm duration)

Soil loss rate (decimal) = 0.734

Unit Hydrograph
 VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	170.840	37.865	11.906
2 0.167	341.681	45.454	14.292
3 0.250	512.521	10.099	3.175
4 0.333	683.361	4.234	1.331
5 0.417	854.202	2.348	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.028	(0.770)	0.021	0.007
2	0.17	0.07	0.028	(0.767)	0.021	0.007
3	0.25	0.07	0.028	(0.764)	0.021	0.007
4	0.33	0.10	0.042	(0.761)	0.031	0.011
5	0.42	0.10	0.042	(0.758)	0.031	0.011
6	0.50	0.10	0.042	(0.755)	0.031	0.011
7	0.58	0.10	0.042	(0.752)	0.031	0.011
8	0.67	0.10	0.042	(0.749)	0.031	0.011
9	0.75	0.10	0.042	(0.746)	0.031	0.011
10	0.83	0.13	0.056	(0.743)	0.041	0.015
11	0.92	0.13	0.056	(0.740)	0.041	0.015
12	1.00	0.13	0.056	(0.737)	0.041	0.015
13	1.08	0.10	0.042	(0.735)	0.031	0.011
14	1.17	0.10	0.042	(0.732)	0.031	0.011
15	1.25	0.10	0.042	(0.729)	0.031	0.011
16	1.33	0.10	0.042	(0.726)	0.031	0.011
17	1.42	0.10	0.042	(0.723)	0.031	0.011
18	1.50	0.10	0.042	(0.720)	0.031	0.011
19	1.58	0.10	0.042	(0.717)	0.031	0.011
20	1.67	0.10	0.042	(0.714)	0.031	0.011
21	1.75	0.10	0.042	(0.711)	0.031	0.011
22	1.83	0.13	0.056	(0.709)	0.041	0.015
23	1.92	0.13	0.056	(0.706)	0.041	0.015
24	2.00	0.13	0.056	(0.703)	0.041	0.015
25	2.08	0.13	0.056	(0.700)	0.041	0.015
26	2.17	0.13	0.056	(0.697)	0.041	0.015
27	2.25	0.13	0.056	(0.694)	0.041	0.015
28	2.33	0.13	0.056	(0.692)	0.041	0.015
29	2.42	0.13	0.056	(0.689)	0.041	0.015
30	2.50	0.13	0.056	(0.686)	0.041	0.015
31	2.58	0.17	0.070	(0.683)	0.052	0.019
32	2.67	0.17	0.070	(0.680)	0.052	0.019
33	2.75	0.17	0.070	(0.678)	0.052	0.019
34	2.83	0.17	0.070	(0.675)	0.052	0.019
35	2.92	0.17	0.070	(0.672)	0.052	0.019
36	3.00	0.17	0.070	(0.669)	0.052	0.019
37	3.08	0.17	0.070	(0.666)	0.052	0.019
38	3.17	0.17	0.070	(0.664)	0.052	0.019
39	3.25	0.17	0.070	(0.661)	0.052	0.019
40	3.33	0.17	0.070	(0.658)	0.052	0.019
41	3.42	0.17	0.070	(0.655)	0.052	0.019
42	3.50	0.17	0.070	(0.653)	0.052	0.019
43	3.58	0.17	0.070	(0.650)	0.052	0.019
44	3.67	0.17	0.070	(0.647)	0.052	0.019
45	3.75	0.17	0.070	(0.644)	0.052	0.019
46	3.83	0.20	0.084	(0.642)	0.062	0.022
47	3.92	0.20	0.084	(0.639)	0.062	0.022
48	4.00	0.20	0.084	(0.636)	0.062	0.022
49	4.08	0.20	0.084	(0.634)	0.062	0.022
50	4.17	0.20	0.084	(0.631)	0.062	0.022
51	4.25	0.20	0.084	(0.628)	0.062	0.022
52	4.33	0.23	0.098	(0.626)	0.072	0.026

53	4.42	0.23	0.098	(0.623)	0.072	0.026
54	4.50	0.23	0.098	(0.620)	0.072	0.026
55	4.58	0.23	0.098	(0.618)	0.072	0.026
56	4.67	0.23	0.098	(0.615)	0.072	0.026
57	4.75	0.23	0.098	(0.612)	0.072	0.026
58	4.83	0.27	0.112	(0.610)	0.083	0.030
59	4.92	0.27	0.112	(0.607)	0.083	0.030
60	5.00	0.27	0.112	(0.604)	0.083	0.030
61	5.08	0.20	0.084	(0.602)	0.062	0.022
62	5.17	0.20	0.084	(0.599)	0.062	0.022
63	5.25	0.20	0.084	(0.596)	0.062	0.022
64	5.33	0.23	0.098	(0.594)	0.072	0.026
65	5.42	0.23	0.098	(0.591)	0.072	0.026
66	5.50	0.23	0.098	(0.589)	0.072	0.026
67	5.58	0.27	0.112	(0.586)	0.083	0.030
68	5.67	0.27	0.112	(0.584)	0.083	0.030
69	5.75	0.27	0.112	(0.581)	0.083	0.030
70	5.83	0.27	0.112	(0.578)	0.083	0.030
71	5.92	0.27	0.112	(0.576)	0.083	0.030
72	6.00	0.27	0.112	(0.573)	0.083	0.030
73	6.08	0.30	0.127	(0.571)	0.093	0.034
74	6.17	0.30	0.127	(0.568)	0.093	0.034
75	6.25	0.30	0.127	(0.566)	0.093	0.034
76	6.33	0.30	0.127	(0.563)	0.093	0.034
77	6.42	0.30	0.127	(0.561)	0.093	0.034
78	6.50	0.30	0.127	(0.558)	0.093	0.034
79	6.58	0.33	0.141	(0.556)	0.103	0.037
80	6.67	0.33	0.141	(0.553)	0.103	0.037
81	6.75	0.33	0.141	(0.551)	0.103	0.037
82	6.83	0.33	0.141	(0.548)	0.103	0.037
83	6.92	0.33	0.141	(0.546)	0.103	0.037
84	7.00	0.33	0.141	(0.543)	0.103	0.037
85	7.08	0.33	0.141	(0.541)	0.103	0.037
86	7.17	0.33	0.141	(0.538)	0.103	0.037
87	7.25	0.33	0.141	(0.536)	0.103	0.037
88	7.33	0.37	0.155	(0.533)	0.113	0.041
89	7.42	0.37	0.155	(0.531)	0.113	0.041
90	7.50	0.37	0.155	(0.528)	0.113	0.041
91	7.58	0.40	0.169	(0.526)	0.124	0.045
92	7.67	0.40	0.169	(0.524)	0.124	0.045
93	7.75	0.40	0.169	(0.521)	0.124	0.045
94	7.83	0.43	0.183	(0.519)	0.134	0.049
95	7.92	0.43	0.183	(0.516)	0.134	0.049
96	8.00	0.43	0.183	(0.514)	0.134	0.049
97	8.08	0.50	0.211	(0.512)	0.155	0.056
98	8.17	0.50	0.211	(0.509)	0.155	0.056
99	8.25	0.50	0.211	(0.507)	0.155	0.056
100	8.33	0.50	0.211	(0.504)	0.155	0.056
101	8.42	0.50	0.211	(0.502)	0.155	0.056
102	8.50	0.50	0.211	(0.500)	0.155	0.056
103	8.58	0.53	0.225	(0.497)	0.165	0.060
104	8.67	0.53	0.225	(0.495)	0.165	0.060
105	8.75	0.53	0.225	(0.493)	0.165	0.060
106	8.83	0.57	0.239	(0.490)	0.175	0.064

107	8.92	0.57	0.239	(0.488)	0.175	0.064
108	9.00	0.57	0.239	(0.486)	0.175	0.064
109	9.08	0.63	0.267	(0.484)	0.196	0.071
110	9.17	0.63	0.267	(0.481)	0.196	0.071
111	9.25	0.63	0.267	(0.479)	0.196	0.071
112	9.33	0.67	0.281	(0.477)	0.206	0.075
113	9.42	0.67	0.281	(0.474)	0.206	0.075
114	9.50	0.67	0.281	(0.472)	0.206	0.075
115	9.58	0.70	0.295	(0.470)	0.217	0.079
116	9.67	0.70	0.295	(0.468)	0.217	0.079
117	9.75	0.70	0.295	(0.465)	0.217	0.079
118	9.83	0.73	0.309	(0.463)	0.227	0.082
119	9.92	0.73	0.309	(0.461)	0.227	0.082
120	10.00	0.73	0.309	(0.459)	0.227	0.082
121	10.08	0.50	0.211	(0.456)	0.155	0.056
122	10.17	0.50	0.211	(0.454)	0.155	0.056
123	10.25	0.50	0.211	(0.452)	0.155	0.056
124	10.33	0.50	0.211	(0.450)	0.155	0.056
125	10.42	0.50	0.211	(0.448)	0.155	0.056
126	10.50	0.50	0.211	(0.445)	0.155	0.056
127	10.58	0.67	0.281	(0.443)	0.206	0.075
128	10.67	0.67	0.281	(0.441)	0.206	0.075
129	10.75	0.67	0.281	(0.439)	0.206	0.075
130	10.83	0.67	0.281	(0.437)	0.206	0.075
131	10.92	0.67	0.281	(0.435)	0.206	0.075
132	11.00	0.67	0.281	(0.433)	0.206	0.075
133	11.08	0.63	0.267	(0.430)	0.196	0.071
134	11.17	0.63	0.267	(0.428)	0.196	0.071
135	11.25	0.63	0.267	(0.426)	0.196	0.071
136	11.33	0.63	0.267	(0.424)	0.196	0.071
137	11.42	0.63	0.267	(0.422)	0.196	0.071
138	11.50	0.63	0.267	(0.420)	0.196	0.071
139	11.58	0.57	0.239	(0.418)	0.175	0.064
140	11.67	0.57	0.239	(0.416)	0.175	0.064
141	11.75	0.57	0.239	(0.414)	0.175	0.064
142	11.83	0.60	0.253	(0.412)	0.186	0.067
143	11.92	0.60	0.253	(0.410)	0.186	0.067
144	12.00	0.60	0.253	(0.407)	0.186	0.067
145	12.08	0.83	0.352	(0.405)	0.258	0.094
146	12.17	0.83	0.352	(0.403)	0.258	0.094
147	12.25	0.83	0.352	(0.401)	0.258	0.094
148	12.33	0.87	0.366	(0.399)	0.268	0.097
149	12.42	0.87	0.366	(0.397)	0.268	0.097
150	12.50	0.87	0.366	(0.395)	0.268	0.097
151	12.58	0.93	0.394	(0.393)	0.289	0.105
152	12.67	0.93	0.394	(0.391)	0.289	0.105
153	12.75	0.93	0.394	(0.389)	0.289	0.105
154	12.83	0.97	0.408	(0.387)	0.299	0.109
155	12.92	0.97	0.408	(0.385)	0.299	0.109
156	13.00	0.97	0.408	(0.384)	0.299	0.109
157	13.08	1.13	0.478	(0.382)	0.351	0.127
158	13.17	1.13	0.478	(0.380)	0.351	0.127
159	13.25	1.13	0.478	(0.378)	0.351	0.127
160	13.33	1.13	0.478	(0.376)	0.351	0.127

161	13.42	1.13	0.478	(0.374)	0.351	0.127
162	13.50	1.13	0.478	(0.372)	0.351	0.127
163	13.58	0.77	0.323	(0.370)	0.237	0.086
164	13.67	0.77	0.323	(0.368)	0.237	0.086
165	13.75	0.77	0.323	(0.366)	0.237	0.086
166	13.83	0.77	0.323	(0.364)	0.237	0.086
167	13.92	0.77	0.323	(0.363)	0.237	0.086
168	14.00	0.77	0.323	(0.361)	0.237	0.086
169	14.08	0.90	0.380	(0.359)	0.279	0.101
170	14.17	0.90	0.380	(0.357)	0.279	0.101
171	14.25	0.90	0.380	(0.355)	0.279	0.101
172	14.33	0.87	0.366	(0.353)	0.268	0.097
173	14.42	0.87	0.366	(0.352)	0.268	0.097
174	14.50	0.87	0.366	(0.350)	0.268	0.097
175	14.58	0.87	0.366	(0.348)	0.268	0.097
176	14.67	0.87	0.366	(0.346)	0.268	0.097
177	14.75	0.87	0.366	(0.344)	0.268	0.097
178	14.83	0.83	0.352	(0.343)	0.258	0.094
179	14.92	0.83	0.352	(0.341)	0.258	0.094
180	15.00	0.83	0.352	(0.339)	0.258	0.094
181	15.08	0.80	0.337	(0.337)	0.248	0.090
182	15.17	0.80	0.337	(0.336)	0.248	0.090
183	15.25	0.80	0.337	(0.334)	0.248	0.090
184	15.33	0.77	0.323	(0.332)	0.237	0.086
185	15.42	0.77	0.323	(0.331)	0.237	0.086
186	15.50	0.77	0.323	(0.329)	0.237	0.086
187	15.58	0.63	0.267	(0.327)	0.196	0.071
188	15.67	0.63	0.267	(0.326)	0.196	0.071
189	15.75	0.63	0.267	(0.324)	0.196	0.071
190	15.83	0.63	0.267	(0.322)	0.196	0.071
191	15.92	0.63	0.267	(0.321)	0.196	0.071
192	16.00	0.63	0.267	(0.319)	0.196	0.071
193	16.08	0.13	0.056	(0.317)	0.041	0.015
194	16.17	0.13	0.056	(0.316)	0.041	0.015
195	16.25	0.13	0.056	(0.314)	0.041	0.015
196	16.33	0.13	0.056	(0.312)	0.041	0.015
197	16.42	0.13	0.056	(0.311)	0.041	0.015
198	16.50	0.13	0.056	(0.309)	0.041	0.015
199	16.58	0.10	0.042	(0.308)	0.031	0.011
200	16.67	0.10	0.042	(0.306)	0.031	0.011
201	16.75	0.10	0.042	(0.305)	0.031	0.011
202	16.83	0.10	0.042	(0.303)	0.031	0.011
203	16.92	0.10	0.042	(0.302)	0.031	0.011
204	17.00	0.10	0.042	(0.300)	0.031	0.011
205	17.08	0.17	0.070	(0.298)	0.052	0.019
206	17.17	0.17	0.070	(0.297)	0.052	0.019
207	17.25	0.17	0.070	(0.295)	0.052	0.019
208	17.33	0.17	0.070	(0.294)	0.052	0.019
209	17.42	0.17	0.070	(0.293)	0.052	0.019
210	17.50	0.17	0.070	(0.291)	0.052	0.019
211	17.58	0.17	0.070	(0.290)	0.052	0.019
212	17.67	0.17	0.070	(0.288)	0.052	0.019
213	17.75	0.17	0.070	(0.287)	0.052	0.019
214	17.83	0.13	0.056	(0.285)	0.041	0.015

215	17.92	0.13	0.056	(0.284)	0.041	0.015
216	18.00	0.13	0.056	(0.282)	0.041	0.015
217	18.08	0.13	0.056	(0.281)	0.041	0.015
218	18.17	0.13	0.056	(0.280)	0.041	0.015
219	18.25	0.13	0.056	(0.278)	0.041	0.015
220	18.33	0.13	0.056	(0.277)	0.041	0.015
221	18.42	0.13	0.056	(0.276)	0.041	0.015
222	18.50	0.13	0.056	(0.274)	0.041	0.015
223	18.58	0.10	0.042	(0.273)	0.031	0.011
224	18.67	0.10	0.042	(0.272)	0.031	0.011
225	18.75	0.10	0.042	(0.270)	0.031	0.011
226	18.83	0.07	0.028	(0.269)	0.021	0.007
227	18.92	0.07	0.028	(0.268)	0.021	0.007
228	19.00	0.07	0.028	(0.267)	0.021	0.007
229	19.08	0.10	0.042	(0.265)	0.031	0.011
230	19.17	0.10	0.042	(0.264)	0.031	0.011
231	19.25	0.10	0.042	(0.263)	0.031	0.011
232	19.33	0.13	0.056	(0.262)	0.041	0.015
233	19.42	0.13	0.056	(0.260)	0.041	0.015
234	19.50	0.13	0.056	(0.259)	0.041	0.015
235	19.58	0.10	0.042	(0.258)	0.031	0.011
236	19.67	0.10	0.042	(0.257)	0.031	0.011
237	19.75	0.10	0.042	(0.256)	0.031	0.011
238	19.83	0.07	0.028	(0.254)	0.021	0.007
239	19.92	0.07	0.028	(0.253)	0.021	0.007
240	20.00	0.07	0.028	(0.252)	0.021	0.007
241	20.08	0.10	0.042	(0.251)	0.031	0.011
242	20.17	0.10	0.042	(0.250)	0.031	0.011
243	20.25	0.10	0.042	(0.249)	0.031	0.011
244	20.33	0.10	0.042	(0.248)	0.031	0.011
245	20.42	0.10	0.042	(0.247)	0.031	0.011
246	20.50	0.10	0.042	(0.246)	0.031	0.011
247	20.58	0.10	0.042	(0.245)	0.031	0.011
248	20.67	0.10	0.042	(0.244)	0.031	0.011
249	20.75	0.10	0.042	(0.243)	0.031	0.011
250	20.83	0.07	0.028	(0.242)	0.021	0.007
251	20.92	0.07	0.028	(0.241)	0.021	0.007
252	21.00	0.07	0.028	(0.240)	0.021	0.007
253	21.08	0.10	0.042	(0.239)	0.031	0.011
254	21.17	0.10	0.042	(0.238)	0.031	0.011
255	21.25	0.10	0.042	(0.237)	0.031	0.011
256	21.33	0.07	0.028	(0.236)	0.021	0.007
257	21.42	0.07	0.028	(0.235)	0.021	0.007
258	21.50	0.07	0.028	(0.234)	0.021	0.007
259	21.58	0.10	0.042	(0.233)	0.031	0.011
260	21.67	0.10	0.042	(0.233)	0.031	0.011
261	21.75	0.10	0.042	(0.232)	0.031	0.011
262	21.83	0.07	0.028	(0.231)	0.021	0.007
263	21.92	0.07	0.028	(0.230)	0.021	0.007
264	22.00	0.07	0.028	(0.229)	0.021	0.007
265	22.08	0.10	0.042	(0.229)	0.031	0.011
266	22.17	0.10	0.042	(0.228)	0.031	0.011
267	22.25	0.10	0.042	(0.227)	0.031	0.011
268	22.33	0.07	0.028	(0.226)	0.021	0.007

269	22.42	0.07	0.028	(0.226)	0.021	0.007
270	22.50	0.07	0.028	(0.225)	0.021	0.007
271	22.58	0.07	0.028	(0.224)	0.021	0.007
272	22.67	0.07	0.028	(0.224)	0.021	0.007
273	22.75	0.07	0.028	(0.223)	0.021	0.007
274	22.83	0.07	0.028	(0.223)	0.021	0.007
275	22.92	0.07	0.028	(0.222)	0.021	0.007
276	23.00	0.07	0.028	(0.221)	0.021	0.007
277	23.08	0.07	0.028	(0.221)	0.021	0.007
278	23.17	0.07	0.028	(0.220)	0.021	0.007
279	23.25	0.07	0.028	(0.220)	0.021	0.007
280	23.33	0.07	0.028	(0.220)	0.021	0.007
281	23.42	0.07	0.028	(0.219)	0.021	0.007
282	23.50	0.07	0.028	(0.219)	0.021	0.007
283	23.58	0.07	0.028	(0.218)	0.021	0.007
284	23.67	0.07	0.028	(0.218)	0.021	0.007
285	23.75	0.07	0.028	(0.218)	0.021	0.007
286	23.83	0.07	0.028	(0.218)	0.021	0.007
287	23.92	0.07	0.028	(0.217)	0.021	0.007
288	24.00	0.07	0.028	(0.217)	0.021	0.007

(Loss Rate Not Used)

Sum = 100.0

Sum = 11.2

Flood volume = Effective rainfall 0.94 (In)

times area 31.2 (Ac.) / [(In) / (Ft.)] = 2.4 (Ac.Ft)

Total soil loss = 2.58 (In)

Total soil loss = 6.706 (Ac.Ft)

Total rainfall = 3.52 (In)

Flood volume = 105974.6 Cubic Feet

Total soil loss = 292126.7 Cubic Feet

Peak flow rate of this hydrograph = 4.003 (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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q (CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0006		0.09	Q				
0+10	0.0020		0.20	Q				
0+15	0.0035		0.22	Q				
0+20	0.0054		0.27	VQ				
0+25	0.0077		0.33	VQ				
0+30	0.0100		0.35	VQ				
0+35	0.0125		0.35	VQ				
0+40	0.0149		0.35	VQ				
0+45	0.0173		0.35	VQ				
0+50	0.0201		0.40	VQ				
0+55	0.0232		0.45	VQ				
1+ 0	0.0264		0.46	VQ				
1+ 5	0.0293		0.42	VQ				

1+10	0.0319	0.37	VQ
1+15	0.0343	0.36	VQ
1+20	0.0368	0.36	VQ
1+25	0.0392	0.35	VQ
1+30	0.0417	0.35	VQ
1+35	0.0441	0.35	VQ
1+40	0.0465	0.35	VQ
1+45	0.0490	0.35	VQ
1+50	0.0517	0.40	VQ
1+55	0.0548	0.45	VQ
2+ 0	0.0580	0.46	VQ
2+ 5	0.0612	0.47	Q
2+10	0.0645	0.47	Q
2+15	0.0677	0.47	Q
2+20	0.0709	0.47	Q
2+25	0.0742	0.47	Q
2+30	0.0774	0.47	Q
2+35	0.0810	0.52	VQ
2+40	0.0849	0.57	VQ
2+45	0.0889	0.58	VQ
2+50	0.0929	0.59	VQ
2+55	0.0970	0.59	VQ
3+ 0	0.1011	0.59	VQ
3+ 5	0.1051	0.59	VQ
3+10	0.1092	0.59	VQ
3+15	0.1132	0.59	VQ
3+20	0.1173	0.59	VQ
3+25	0.1213	0.59	VQ
3+30	0.1254	0.59	Q
3+35	0.1294	0.59	Q
3+40	0.1335	0.59	Q
3+45	0.1375	0.59	Q
3+50	0.1419	0.63	Q
3+55	0.1466	0.69	Q
4+ 0	0.1515	0.70	Q
4+ 5	0.1563	0.70	Q
4+10	0.1612	0.71	Q
4+15	0.1660	0.71	Q
4+20	0.1712	0.75	VQ
4+25	0.1767	0.80	VQ
4+30	0.1824	0.82	VQ
4+35	0.1880	0.82	Q
4+40	0.1937	0.82	Q
4+45	0.1994	0.82	Q
4+50	0.2054	0.87	Q
4+55	0.2117	0.92	Q
5+ 0	0.2181	0.93	Q
5+ 5	0.2240	0.85	Q
5+10	0.2291	0.75	QV
5+15	0.2341	0.72	QV
5+20	0.2393	0.76	Q
5+25	0.2449	0.80	QV
5+30	0.2505	0.82	QV
5+35	0.2565	0.87	QV

5+40	0.2628	0.92	QV			
5+45	0.2692	0.93	QV			
5+50	0.2757	0.94	QV			
5+55	0.2822	0.94	QV			
6+ 0	0.2887	0.94	QV			
6+ 5	0.2955	0.99	QV			
6+10	0.3026	1.04	Q			
6+15	0.3099	1.05	QV			
6+20	0.3172	1.06	QV			
6+25	0.3245	1.06	QV			
6+30	0.3318	1.06	QV			
6+35	0.3394	1.10	QV			
6+40	0.3473	1.16	QV			
6+45	0.3554	1.17	QV			
6+50	0.3635	1.17	QV			
6+55	0.3716	1.18	Q V			
7+ 0	0.3797	1.18	Q V			
7+ 5	0.3878	1.18	Q V			
7+10	0.3959	1.18	Q V			
7+15	0.4040	1.18	Q V			
7+20	0.4125	1.22	Q V			
7+25	0.4212	1.28	QV			
7+30	0.4301	1.29	Q V			
7+35	0.4393	1.34	Q V			
7+40	0.4489	1.39	Q V			
7+45	0.4586	1.41	Q V			
7+50	0.4686	1.45	Q V			
7+55	0.4790	1.51	QV			
8+ 0	0.4895	1.52	Q V			
8+ 5	0.5006	1.62	Q V			
8+10	0.5125	1.73	Q V			
8+15	0.5246	1.75	QV			
8+20	0.5367	1.76	QV			
8+25	0.5489	1.77	Q V			
8+30	0.5610	1.77	Q V			
8+35	0.5735	1.81	Q V			
8+40	0.5864	1.86	Q V			
8+45	0.5993	1.88	Q V			
8+50	0.6125	1.93	Q V			
8+55	0.6262	1.98	Q V			
9+ 0	0.6399	1.99	Q V			
9+ 5	0.6543	2.09	Q V			
9+10	0.6694	2.20	Q V			
9+15	0.6847	2.22	Q V			
9+20	0.7004	2.28	Q V			
9+25	0.7165	2.34	Q V			
9+30	0.7327	2.35	Q V			
9+35	0.7492	2.40	Q V			
9+40	0.7661	2.45	Q V			
9+45	0.7830	2.46	Q V			
9+50	0.8004	2.51	Q V			
9+55	0.8181	2.57	Q V			
10+ 0	0.8359	2.58	Q V			
10+ 5	0.8515	2.28	Q V			

10+10	0.8646	1.90	Q	V		
10+15	0.8772	1.82	Q	V		
10+20	0.8895	1.79	Q	V		
10+25	0.9016	1.77	Q	V		
10+30	0.9138	1.77	Q	V		
10+35	0.9275	1.99	Q	V		
10+40	0.9430	2.26	Q	V		
10+45	0.9590	2.32	Q	V		
10+50	0.9751	2.34	Q	V		
10+55	0.9913	2.35	Q	V		
11+ 0	1.0076	2.35	Q	V		
11+ 5	1.0235	2.31	Q	V		
11+10	1.0390	2.26	Q	V		
11+15	1.0545	2.24	Q	V		
11+20	1.0699	2.24	Q	V		
11+25	1.0853	2.24	Q	V		
11+30	1.1007	2.24	Q	V		
11+35	1.1155	2.15	Q	V		
11+40	1.1296	2.04	Q	V		
11+45	1.1435	2.02	Q	V		
11+50	1.1576	2.05	Q	V		
11+55	1.1721	2.10	Q	V		
12+ 0	1.1866	2.11	Q	V		
12+ 5	1.2033	2.43	Q	V		
12+10	1.2227	2.81	Q	V		
12+15	1.2426	2.89	Q	V		
12+20	1.2630	2.97	Q	V		
12+25	1.2840	3.04	Q	V		
12+30	1.3050	3.05	Q	V		
12+35	1.3267	3.15	Q	V		
12+40	1.3491	3.26	Q	V		
12+45	1.3717	3.28	Q	V		
12+50	1.3947	3.34	Q	V		
12+55	1.4181	3.40	Q	V		
13+ 0	1.4415	3.41	Q	V		
13+ 5	1.4666	3.63	Q	V		
13+10	1.4935	3.91	Q	V		
13+15	1.5208	3.96	Q	V		
13+20	1.5482	3.99	Q	V		
13+25	1.5758	4.00	Q	V		
13+30	1.6034	4.00	Q	V		
13+35	1.6276	3.51	Q	V		
13+40	1.6477	2.92	Q	V		
13+45	1.6670	2.79	Q	V		
13+50	1.6858	2.74	Q	V		
13+55	1.7045	2.71	Q	V		
14+ 0	1.7231	2.71	Q	V		
14+ 5	1.7430	2.89	Q	V		
14+10	1.7643	3.10	Q	V		
14+15	1.7860	3.15	Q	V		
14+20	1.8075	3.12	Q	V		
14+25	1.8288	3.08	Q	V		
14+30	1.8499	3.07	Q	V		
14+35	1.8710	3.06	Q	V		

14+40	1.8921	3.06			Q		V
14+45	1.9132	3.06			Q		V
14+50	1.9340	3.02			Q		V
14+55	1.9544	2.96			Q		V
15+ 0	1.9747	2.95			Q		V
15+ 5	1.9947	2.90			Q		V
15+10	2.0143	2.85			Q		V
15+15	2.0338	2.83			Q		V
15+20	2.0530	2.78			Q		V
15+25	2.0718	2.73			Q		V
15+30	2.0905	2.72			Q		V
15+35	2.1079	2.53			Q		V
15+40	2.1238	2.32			Q		V
15+45	2.1395	2.27			Q		V
15+50	2.1550	2.25			Q		V
15+55	2.1704	2.24			Q		V
16+ 0	2.1858	2.24			Q		V
16+ 5	2.1966	1.57		Q			V
16+10	2.2018	0.77		Q			V
16+15	2.2059	0.59		Q			V
16+20	2.2094	0.51		Q			V
16+25	2.2127	0.47	Q				V
16+30	2.2159	0.47	Q				V
16+35	2.2188	0.43	Q				V
16+40	2.2214	0.37	Q				V
16+45	2.2239	0.36	Q				V
16+50	2.2263	0.36	Q				V
16+55	2.2288	0.35	Q				V
17+ 0	2.2312	0.35	Q				V
17+ 5	2.2343	0.44	Q				V
17+10	2.2380	0.55	Q				V
17+15	2.2420	0.57	Q				V
17+20	2.2460	0.58	Q				V
17+25	2.2501	0.59	Q				V
17+30	2.2541	0.59	Q				V
17+35	2.2582	0.59	Q				V
17+40	2.2622	0.59	Q				V
17+45	2.2663	0.59	Q				V
17+50	2.2700	0.54	Q				V
17+55	2.2734	0.49	Q				V
18+ 0	2.2767	0.48	Q				V
18+ 5	2.2800	0.47	Q				V
18+10	2.2832	0.47	Q				V
18+15	2.2865	0.47	Q				V
18+20	2.2897	0.47	Q				V
18+25	2.2929	0.47	Q				V
18+30	2.2962	0.47	Q				V
18+35	2.2991	0.43	Q				V
18+40	2.3017	0.37	Q				V
18+45	2.3042	0.36	Q				V
18+50	2.3063	0.31	Q				V
18+55	2.3081	0.26	Q				V
19+ 0	2.3098	0.24	Q				V
19+ 5	2.3117	0.28	Q				V

19+10	2.3140	0.33	Q				V
19+15	2.3164	0.35	Q				V
19+20	2.3191	0.40	Q				V
19+25	2.3222	0.45	Q				V
19+30	2.3254	0.46	Q				V
19+35	2.3283	0.42	Q				V
19+40	2.3309	0.37	Q				V
19+45	2.3334	0.36	Q				V
19+50	2.3355	0.31	Q				V
19+55	2.3373	0.26	Q				V
20+ 0	2.3390	0.24	Q				V
20+ 5	2.3409	0.28	Q				V
20+10	2.3432	0.33	Q				V
20+15	2.3456	0.35	Q				V
20+20	2.3480	0.35	Q				V
20+25	2.3504	0.35	Q				V
20+30	2.3529	0.35	Q				V
20+35	2.3553	0.35	Q				V
20+40	2.3577	0.35	Q				V
20+45	2.3602	0.35	Q				V
20+50	2.3623	0.31	Q				V
20+55	2.3640	0.26	Q				V
21+ 0	2.3657	0.24	Q				V
21+ 5	2.3677	0.28	Q				V
21+10	2.3700	0.33	Q				V
21+15	2.3723	0.35	Q				V
21+20	2.3744	0.31	Q				V
21+25	2.3762	0.26	Q				V
21+30	2.3779	0.24	Q				V
21+35	2.3798	0.28	Q				V
21+40	2.3821	0.33	Q				V
21+45	2.3845	0.35	Q				V
21+50	2.3866	0.31	Q				V
21+55	2.3884	0.26	Q				V
22+ 0	2.3900	0.24	Q				V
22+ 5	2.3920	0.28	Q				V
22+10	2.3943	0.33	Q				V
22+15	2.3967	0.35	Q				V
22+20	2.3988	0.31	Q				V
22+25	2.4005	0.26	Q				V
22+30	2.4022	0.24	Q				V
22+35	2.4038	0.24	Q				V
22+40	2.4055	0.24	Q				V
22+45	2.4071	0.24	Q				V
22+50	2.4087	0.24	Q				V
22+55	2.4103	0.24	Q				V
23+ 0	2.4120	0.24	Q				V
23+ 5	2.4136	0.24	Q				V
23+10	2.4152	0.24	Q				V
23+15	2.4168	0.24	Q				V
23+20	2.4184	0.24	Q				V
23+25	2.4201	0.24	Q				V
23+30	2.4217	0.24	Q				V
23+35	2.4233	0.24	Q				V

23+40	2.4249	0.24	Q				V
23+45	2.4266	0.24	Q				V
23+50	2.4282	0.24	Q				V
23+55	2.4298	0.24	Q				V
24+ 0	2.4314	0.24	Q				V
24+ 5	2.4324	0.15	Q				V
24+10	2.4327	0.04	Q				V
24+15	2.4328	0.02	Q				V
24+20	2.4328	0.01	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex110.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 1-Hour Unit Hydrograph Analysis Area "C"

Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
31.20	0.58	18.10

100 YEAR Area rainfall data:

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

31.20

1.45

45.24

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.580(In)

Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.938(In)

Areal adjustment factor = 99.97 %

Adjusted average point rain = 0.938(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	1.000	0.051	0.064	0.003
69.0	69.0	0.373	1.000	0.037	0.141	0.005
63.0	63.0	0.438	0.000	0.438	0.170	0.074
75.0	75.0	0.303	0.000	0.303	0.625	0.189
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 loss rate (decimal) = 0.734

Slope of intensity-duration curve for a 1 hour storm = 0.4800

Unit Hydrograph
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.083	170.840	37.865	11.906
2 0.167	341.681	45.454	14.292
3 0.250	512.521	10.099	3.175
4 0.333	683.361	4.234	1.331
5 0.417	854.202	2.348	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	4.40	0.495	0.272	(0.363)	0.223
2	0.17	4.50	0.506	0.272	(0.372)	0.234
3	0.25	5.40	0.608	0.272	(0.446)	0.335
4	0.33	5.40	0.608	0.272	(0.446)	0.335
5	0.42	5.70	0.641	0.272	(0.471)	0.369
6	0.50	6.40	0.720	0.272	(0.528)	0.448
7	0.58	7.90	0.889	0.272	(0.652)	0.617
8	0.67	9.10	1.024	0.272	(0.751)	0.752
9	0.75	12.80	1.440	0.272	(1.057)	1.168
10	0.83	25.60	2.880	0.272	(2.114)	2.608
11	0.92	7.90	0.889	0.272	(0.652)	0.617
12	1.00	4.90	0.551	0.272	(0.405)	0.279

(Loss Rate Not Used)

Sum = 100.0

Sum = 8.0

Flood volume = Effective rainfall 0.67(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 1.7(Ac.Ft)

Total soil loss = 0.27(In)

Total soil loss = 0.708(Ac.Ft)

Total rainfall = 0.94(In)

Flood volume = 75362.5 Cubic Feet

Total soil loss = 30833.1 Cubic Feet

Peak flow rate of this hydrograph = 51.313(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	15.0	30.0	45.0	60.0
0+ 5	0.0183	2.65	VQ				
0+10	0.0594	5.98	V Q				
0+15	0.1149	8.05	V Q				
0+20	0.1826	9.83	V Q				
0+25	0.2565	10.73	V Q				
0+30	0.3412	12.30	VQ				
0+35	0.4488	15.62		Q			
0+40	0.5861	19.93		Q			
0+45	0.7754	27.49			VQ		
0+50	1.1288	51.31				V	
0+55	1.4718	49.81				Q	
1+ 0	1.6271	22.54			Q	QV	V
1+ 5	1.6979	10.29		Q			V
1+10	1.7230	3.63	Q				V
1+15	1.7287	0.83	Q				V
1+20	1.7301	0.21	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex310.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 3-Hour Unit Hydrograph Analysis Area "C"

Existing Condition

Drainage Area = 31.20(Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20(Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00(Ft.)
Length along longest watercourse measured to centroid = 707.00(Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40(Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 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]
31.20	0.98	30.58

100 YEAR Area rainfall data:

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

31.20

2.48

77.38

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 0.980(In)

Area Averaged 100-Year Rainfall = 2.480(In)

Point rain (area averaged) = 1.597(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 1.597(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	1.000	0.051	0.064	0.003
69.0	69.0	0.373	1.000	0.037	0.141	0.005
63.0	63.0	0.438	0.000	0.438	0.170	0.074
75.0	75.0	0.303	0.000	0.303	0.625	0.189
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 loss rate (decimal) = 0.734

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	0.083	170.840	11.906
2	0.167	341.681	14.292
3	0.250	512.521	3.175
4	0.333	683.361	1.331
5	0.417	854.202	0.738
Sum =		100.000	Sum= 31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	1.30	0.249	(0.272)	0.183	0.066
2	0.17	1.30	0.249	(0.272)	0.183	0.066
3	0.25	1.10	0.211	(0.272)	0.155	0.056
4	0.33	1.50	0.287	(0.272)	0.211	0.077
5	0.42	1.50	0.287	(0.272)	0.211	0.077
6	0.50	1.80	0.345	(0.272)	0.253	0.092
7	0.58	1.50	0.287	(0.272)	0.211	0.077
8	0.67	1.80	0.345	(0.272)	0.253	0.092
9	0.75	1.80	0.345	(0.272)	0.253	0.092
10	0.83	1.50	0.287	(0.272)	0.211	0.077
11	0.92	1.60	0.307	(0.272)	0.225	0.082
12	1.00	1.80	0.345	(0.272)	0.253	0.092
13	1.08	2.20	0.422	0.272	(0.309)	0.149
14	1.17	2.20	0.422	0.272	(0.309)	0.149
15	1.25	2.20	0.422	0.272	(0.309)	0.149
16	1.33	2.00	0.383	0.272	(0.281)	0.111
17	1.42	2.60	0.498	0.272	(0.366)	0.226
18	1.50	2.70	0.517	0.272	(0.380)	0.245
19	1.58	2.40	0.460	0.272	(0.337)	0.188
20	1.67	2.70	0.517	0.272	(0.380)	0.245
21	1.75	3.30	0.632	0.272	(0.464)	0.360
22	1.83	3.10	0.594	0.272	(0.436)	0.322
23	1.92	2.90	0.556	0.272	(0.408)	0.283
24	2.00	3.00	0.575	0.272	(0.422)	0.303
25	2.08	3.10	0.594	0.272	(0.436)	0.322
26	2.17	4.20	0.805	0.272	(0.591)	0.533
27	2.25	5.00	0.958	0.272	(0.703)	0.686
28	2.33	3.50	0.671	0.272	(0.492)	0.398
29	2.42	6.80	1.303	0.272	(0.956)	1.031
30	2.50	7.30	1.399	0.272	(1.026)	1.127
31	2.58	8.20	1.571	0.272	(1.153)	1.299
32	2.67	5.90	1.131	0.272	(0.830)	0.858
33	2.75	2.00	0.383	0.272	(0.281)	0.111
34	2.83	1.80	0.345	(0.272)	0.253	0.092
35	2.92	1.80	0.345	(0.272)	0.253	0.092
36	3.00	0.60	0.115	(0.272)	0.084	0.031

(Loss Rate Not Used)

Sum = 100.0

Sum = 10.3

Flood volume = Effective rainfall 0.85(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 2.2(Ac.Ft)

Total soil loss = 0.74(In)

Total soil loss = 1.930(Ac.Ft)

Total rainfall = 1.60(In)

Flood volume = 96773.9 Cubic Feet

Total soil loss = 84083.9 Cubic Feet

Peak flow rate of this hydrograph = 35.899(CFS)

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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 5 Minute intervals ((CFS))

Time (h+m)	Volume	Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0054		0.79	Q				
0+10	0.0174		1.74	VQ				
0+15	0.0300		1.83	VQ				
0+20	0.0439		2.01	V Q				
0+25	0.0598		2.32	VQ				
0+30	0.0774		2.55	VQ				
0+35	0.0954		2.61	VQ				
0+40	0.1136		2.64	Q				
0+45	0.1331		2.83	Q				
0+50	0.1516		2.69	Q				
0+55	0.1690		2.54	QV				
1+ 0	0.1876		2.69	QV				
1+ 5	0.2118		3.52	Q				
1+10	0.2420		4.37	Q				
1+15	0.2734		4.57	Q				
1+20	0.3024		4.20	QV				
1+25	0.3372		5.06	QV				
1+30	0.3842		6.81	Q				
1+35	0.4304		6.72	QV				
1+40	0.4770		6.77	Q V				
1+45	0.5382		8.89	QV				
1+50	0.6084		10.19	Q				
1+55	0.6744		9.59	Q	V			
2+ 0	0.7388		9.34	Q	V			
2+ 5	0.8060		9.76	Q	V			
2+10	0.8922		12.52	Q	V			
2+15	1.0122		17.42		QV			
2+20	1.1286		16.90		Q	V		
2+25	1.2739		21.10			QV		
2+30	1.4856		30.73			V	Q	
2+35	1.7328		35.90				V	Q
2+40	1.9673		34.05				QV	V
2+45	2.1050		19.99		Q			V
2+50	2.1599		7.97		Q			V
2+55	2.1934		4.86	Q				V
3+ 0	2.2123		2.75	Q				V
3+ 5	2.2187		0.93	Q				V
3+10	2.2207		0.29	Q				V
3+15	2.2215		0.11	Q				V
3+20	2.2216		0.02	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex610.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 6-Hour Unit Hydrograph Analysis Area "C"

Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
31.20	1.38	43.06

100 YEAR Area rainfall data:

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

31.20

3.48

108.58

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 1.380(In)

Area Averaged 100-Year Rainfall = 3.480(In)

Point rain (area averaged) = 2.244(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 2.244(In)

Sub-Area Data:

Area (Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20 (Ac.)		

RI	RI	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
AMC2	AMC-2					
56.0	56.0	0.511	1.000	0.051	0.064	0.003
69.0	69.0	0.373	1.000	0.037	0.141	0.005
63.0	63.0	0.438	0.000	0.438	0.170	0.074
75.0	75.0	0.303	0.000	0.303	0.625	0.189
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) = 0.734

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 0.083	170.840	37.865	11.906
2 0.167	341.681	45.454	14.292
3 0.250	512.521	10.099	3.175
4 0.333	683.361	4.234	1.331
5 0.417	854.202	2.348	0.738
Sum = 100.000		Sum=	31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.135	(0.272)	0.099	0.036
2	0.17	0.60	0.162	(0.272)	0.119	0.043
3	0.25	0.60	0.162	(0.272)	0.119	0.043
4	0.33	0.60	0.162	(0.272)	0.119	0.043
5	0.42	0.60	0.162	(0.272)	0.119	0.043
6	0.50	0.70	0.188	(0.272)	0.138	0.050
7	0.58	0.70	0.188	(0.272)	0.138	0.050
8	0.67	0.70	0.188	(0.272)	0.138	0.050
9	0.75	0.70	0.188	(0.272)	0.138	0.050
10	0.83	0.70	0.188	(0.272)	0.138	0.050
11	0.92	0.70	0.188	(0.272)	0.138	0.050
12	1.00	0.80	0.215	(0.272)	0.158	0.057
13	1.08	0.80	0.215	(0.272)	0.158	0.057
14	1.17	0.80	0.215	(0.272)	0.158	0.057
15	1.25	0.80	0.215	(0.272)	0.158	0.057
16	1.33	0.80	0.215	(0.272)	0.158	0.057
17	1.42	0.80	0.215	(0.272)	0.158	0.057
18	1.50	0.80	0.215	(0.272)	0.158	0.057
19	1.58	0.80	0.215	(0.272)	0.158	0.057
20	1.67	0.80	0.215	(0.272)	0.158	0.057
21	1.75	0.80	0.215	(0.272)	0.158	0.057
22	1.83	0.80	0.215	(0.272)	0.158	0.057
23	1.92	0.80	0.215	(0.272)	0.158	0.057
24	2.00	0.90	0.242	(0.272)	0.178	0.065
25	2.08	0.80	0.215	(0.272)	0.158	0.057
26	2.17	0.90	0.242	(0.272)	0.178	0.065
27	2.25	0.90	0.242	(0.272)	0.178	0.065
28	2.33	0.90	0.242	(0.272)	0.178	0.065
29	2.42	0.90	0.242	(0.272)	0.178	0.065
30	2.50	0.90	0.242	(0.272)	0.178	0.065
31	2.58	0.90	0.242	(0.272)	0.178	0.065
32	2.67	0.90	0.242	(0.272)	0.178	0.065
33	2.75	1.00	0.269	(0.272)	0.198	0.072
34	2.83	1.00	0.269	(0.272)	0.198	0.072
35	2.92	1.00	0.269	(0.272)	0.198	0.072
36	3.00	1.00	0.269	(0.272)	0.198	0.072
37	3.08	1.00	0.269	(0.272)	0.198	0.072
38	3.17	1.10	0.296	(0.272)	0.217	0.079
39	3.25	1.10	0.296	(0.272)	0.217	0.079
40	3.33	1.10	0.296	(0.272)	0.217	0.079
41	3.42	1.20	0.323	(0.272)	0.237	0.086
42	3.50	1.30	0.350	(0.272)	0.257	0.093
43	3.58	1.40	0.377	0.272	(0.277)	0.105
44	3.67	1.40	0.377	0.272	(0.277)	0.105
45	3.75	1.50	0.404	0.272	(0.296)	0.132
46	3.83	1.50	0.404	0.272	(0.296)	0.132
47	3.92	1.60	0.431	0.272	(0.316)	0.159
48	4.00	1.60	0.431	0.272	(0.316)	0.159
49	4.08	1.70	0.458	0.272	(0.336)	0.185
50	4.17	1.80	0.485	0.272	(0.356)	0.212
51	4.25	1.90	0.512	0.272	(0.375)	0.239
52	4.33	2.00	0.538	0.272	(0.395)	0.266

53	4.42	2.10	0.565	0.272	(0.415)	0.293
54	4.50	2.10	0.565	0.272	(0.415)	0.293
55	4.58	2.20	0.592	0.272	(0.435)	0.320
56	4.67	2.30	0.619	0.272	(0.454)	0.347
57	4.75	2.40	0.646	0.272	(0.474)	0.374
58	4.83	2.40	0.646	0.272	(0.474)	0.374
59	4.92	2.50	0.673	0.272	(0.494)	0.401
60	5.00	2.60	0.700	0.272	(0.514)	0.428
61	5.08	3.10	0.835	0.272	(0.612)	0.562
62	5.17	3.60	0.969	0.272	(0.711)	0.697
63	5.25	3.90	1.050	0.272	(0.771)	0.778
64	5.33	4.20	1.131	0.272	(0.830)	0.859
65	5.42	4.70	1.265	0.272	(0.929)	0.993
66	5.50	5.60	1.508	0.272	(1.106)	1.236
67	5.58	1.90	0.512	0.272	(0.375)	0.239
68	5.67	0.90	0.242	(0.272)	0.178	0.065
69	5.75	0.60	0.162	(0.272)	0.119	0.043
70	5.83	0.50	0.135	(0.272)	0.099	0.036
71	5.92	0.30	0.081	(0.272)	0.059	0.022
72	6.00	0.20	0.054	(0.272)	0.040	0.014

(Loss Rate Not Used)

Sum = 100.0

Sum = 12.6

Flood volume = Effective rainfall 1.05(In)

times area 31.2(Ac.)/[(In)/(Ft.)] = 2.7(Ac.Ft)

Total soil loss = 1.19(In)

Total soil loss = 3.101(Ac.Ft)

Total rainfall = 2.24(In)

Flood volume = 119020.4 Cubic Feet

Total soil loss = 135093.9 Cubic Feet

Peak flow rate of this hydrograph = 33.200(CFS)

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6 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+ 5	0.0029	0.43	Q				
0+10	0.0100	1.02	VQ				
0+15	0.0185	1.24	VQ				
0+20	0.0276	1.31	VQ				
0+25	0.0369	1.35	VQ				
0+30	0.0468	1.44	VQ				
0+35	0.0574	1.54	VQ				
0+40	0.0681	1.56	VQ				
0+45	0.0790	1.57	Q				
0+50	0.0898	1.58	Q				
0+55	0.1007	1.58	Q				
1+ 0	0.1122	1.66	Q				
1+ 5	0.1243	1.77	Q				

1+10	0.1367	1.79	QV						
1+15	0.1490	1.80	QV						
1+20	0.1615	1.80	QV						
1+25	0.1739	1.80	QV						
1+30	0.1863	1.80	QV						
1+35	0.1987	1.80	QV						
1+40	0.2112	1.80	Q V						
1+45	0.2236	1.80	Q V						
1+50	0.2360	1.80	Q V						
1+55	0.2484	1.80	Q V						
2+ 0	0.2614	1.89	Q V						
2+ 5	0.2746	1.91	Q V						
2+10	0.2877	1.91	Q V						
2+15	0.3015	2.00	Q V						
2+20	0.3154	2.02	Q V						
2+25	0.3294	2.02	Q V						
2+30	0.3434	2.03	Q V						
2+35	0.3573	2.03	Q V						
2+40	0.3713	2.03	Q V						
2+45	0.3859	2.11	Q V						
2+50	0.4011	2.22	Q V						
2+55	0.4166	2.24	Q V						
3+ 0	0.4321	2.25	Q V						
3+ 5	0.4476	2.25	Q V						
3+10	0.4637	2.34	Q V						
3+15	0.4805	2.44	Q V						
3+20	0.4975	2.47	Q V						
3+25	0.5151	2.56	Q V						
3+30	0.5341	2.75	Q V						
3+35	0.5549	3.02	Q V						
3+40	0.5770	3.21	Q V						
3+45	0.6017	3.59	Q V						
3+50	0.6292	3.99	Q V						
3+55	0.6595	4.41	Q V						
4+ 0	0.6928	4.83	Q V						
4+ 5	0.7290	5.25	Q V						
4+10	0.7702	5.99	Q V						
4+15	0.8171	6.81	Q V						
4+20	0.8697	7.63	Q V						
4+25	0.9281	8.48	Q V						
4+30	0.9901	9.01	Q V						
4+35	1.0553	9.47	Q V						
4+40	1.1258	10.23	Q V						
4+45	1.2018	11.04	Q V						
4+50	1.2813	11.55	Q V						
4+55	1.3641	12.01	Q V						
5+ 0	1.4520	12.77	Q V						
5+ 5	1.5544	14.87	Q V						
5+10	1.6819	18.52	Q V						
5+15	1.8326	21.89	Q V						
5+20	2.0023	24.63	Q V						
5+25	2.1946	27.92	Q V						
5+30	2.4232	33.20	Q V						
5+35	2.5981	25.39	Q V						

5+40	2.6675	10.07		Q			V
5+45	2.6990	4.57		Q			V
5+50	2.7161	2.48		Q			V
5+55	2.7241	1.17		Q			V
6+ 0	2.7289	0.70	Q				V
6+ 5	2.7313	0.35	Q				V
6+10	2.7320	0.10	Q				V
6+15	2.7323	0.03	Q				V
6+20	2.7323	0.01	Q				V

Unit Hydrograph Analysis

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Study date 04/29/14 File: 32786Cex2410.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

10-Year 24-Hour Unit Hydrograph Analysis Area "C" Existing Condition

Drainage Area = 31.20 (Ac.) = 0.049 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 31.20 (Ac.) = 0.049 Sq. Mi.
Length along longest watercourse = 1885.00 (Ft.)
Length along longest watercourse measured to centroid = 707.00 (Ft.)
Length along longest watercourse = 0.357 Mi.
Length along longest watercourse measured to centroid = 0.134 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 384.8658 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.049 Hr.
Lag time = 2.93 Min.
25% of lag time = 0.73 Min.
40% of lag time = 1.17 Min.
Unit time = 5.00 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]
31.20	2.48	77.38

100 YEAR Area rainfall data:

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

31.20

6.90

215.28

STORM EVENT (YEAR) = 10.00

Area Averaged 2-Year Rainfall = 2.480(In)

Area Averaged 100-Year Rainfall = 6.900(In)

Point rain (area averaged) = 4.298(In)

Areal adjustment factor = 99.99 %

Adjusted average point rain = 4.298(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
2.000	56.00	1.000
4.400	69.00	1.000
5.300	63.00	0.000
19.500	75.00	0.000
Total Area Entered = 31.20(Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-2	(In/Hr)	(Dec.)	(In/Hr)	(Dec.)	(In/Hr)
56.0	56.0	0.511	1.000	0.051	0.064	0.003
69.0	69.0	0.373	1.000	0.037	0.141	0.005
63.0	63.0	0.438	0.000	0.438	0.170	0.074
75.0	75.0	0.303	0.000	0.303	0.625	0.189
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 loss rate (decimal) = 0.734

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	0.083	170.840	11.906
2	0.167	341.681	14.292
3	0.250	512.521	3.175
4	0.333	683.361	1.331
5	0.417	854.202	0.738
Sum =		100.000	Sum= 31.444

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)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.034	(0.483)	0.025	0.009
2	0.17	0.07	0.034	(0.481)	0.025	0.009
3	0.25	0.07	0.034	(0.479)	0.025	0.009
4	0.33	0.10	0.052	(0.477)	0.038	0.014
5	0.42	0.10	0.052	(0.475)	0.038	0.014
6	0.50	0.10	0.052	(0.473)	0.038	0.014
7	0.58	0.10	0.052	(0.471)	0.038	0.014
8	0.67	0.10	0.052	(0.470)	0.038	0.014
9	0.75	0.10	0.052	(0.468)	0.038	0.014
10	0.83	0.13	0.069	(0.466)	0.050	0.018
11	0.92	0.13	0.069	(0.464)	0.050	0.018
12	1.00	0.13	0.069	(0.462)	0.050	0.018
13	1.08	0.10	0.052	(0.460)	0.038	0.014
14	1.17	0.10	0.052	(0.459)	0.038	0.014
15	1.25	0.10	0.052	(0.457)	0.038	0.014
16	1.33	0.10	0.052	(0.455)	0.038	0.014
17	1.42	0.10	0.052	(0.453)	0.038	0.014
18	1.50	0.10	0.052	(0.451)	0.038	0.014
19	1.58	0.10	0.052	(0.450)	0.038	0.014
20	1.67	0.10	0.052	(0.448)	0.038	0.014
21	1.75	0.10	0.052	(0.446)	0.038	0.014
22	1.83	0.13	0.069	(0.444)	0.050	0.018
23	1.92	0.13	0.069	(0.442)	0.050	0.018
24	2.00	0.13	0.069	(0.441)	0.050	0.018
25	2.08	0.13	0.069	(0.439)	0.050	0.018
26	2.17	0.13	0.069	(0.437)	0.050	0.018
27	2.25	0.13	0.069	(0.435)	0.050	0.018
28	2.33	0.13	0.069	(0.433)	0.050	0.018
29	2.42	0.13	0.069	(0.432)	0.050	0.018
30	2.50	0.13	0.069	(0.430)	0.050	0.018
31	2.58	0.17	0.086	(0.428)	0.063	0.023
32	2.67	0.17	0.086	(0.426)	0.063	0.023
33	2.75	0.17	0.086	(0.425)	0.063	0.023
34	2.83	0.17	0.086	(0.423)	0.063	0.023
35	2.92	0.17	0.086	(0.421)	0.063	0.023
36	3.00	0.17	0.086	(0.419)	0.063	0.023
37	3.08	0.17	0.086	(0.418)	0.063	0.023
38	3.17	0.17	0.086	(0.416)	0.063	0.023
39	3.25	0.17	0.086	(0.414)	0.063	0.023
40	3.33	0.17	0.086	(0.413)	0.063	0.023
41	3.42	0.17	0.086	(0.411)	0.063	0.023
42	3.50	0.17	0.086	(0.409)	0.063	0.023
43	3.58	0.17	0.086	(0.407)	0.063	0.023
44	3.67	0.17	0.086	(0.406)	0.063	0.023
45	3.75	0.17	0.086	(0.404)	0.063	0.023
46	3.83	0.20	0.103	(0.402)	0.076	0.027
47	3.92	0.20	0.103	(0.401)	0.076	0.027
48	4.00	0.20	0.103	(0.399)	0.076	0.027
49	4.08	0.20	0.103	(0.397)	0.076	0.027
50	4.17	0.20	0.103	(0.395)	0.076	0.027
51	4.25	0.20	0.103	(0.394)	0.076	0.027
52	4.33	0.23	0.120	(0.392)	0.088	0.032

53	4.42	0.23	0.120	(0.390)	0.088	0.032
54	4.50	0.23	0.120	(0.389)	0.088	0.032
55	4.58	0.23	0.120	(0.387)	0.088	0.032
56	4.67	0.23	0.120	(0.385)	0.088	0.032
57	4.75	0.23	0.120	(0.384)	0.088	0.032
58	4.83	0.27	0.138	(0.382)	0.101	0.037
59	4.92	0.27	0.138	(0.380)	0.101	0.037
60	5.00	0.27	0.138	(0.379)	0.101	0.037
61	5.08	0.20	0.103	(0.377)	0.076	0.027
62	5.17	0.20	0.103	(0.376)	0.076	0.027
63	5.25	0.20	0.103	(0.374)	0.076	0.027
64	5.33	0.23	0.120	(0.372)	0.088	0.032
65	5.42	0.23	0.120	(0.371)	0.088	0.032
66	5.50	0.23	0.120	(0.369)	0.088	0.032
67	5.58	0.27	0.138	(0.367)	0.101	0.037
68	5.67	0.27	0.138	(0.366)	0.101	0.037
69	5.75	0.27	0.138	(0.364)	0.101	0.037
70	5.83	0.27	0.138	(0.363)	0.101	0.037
71	5.92	0.27	0.138	(0.361)	0.101	0.037
72	6.00	0.27	0.138	(0.359)	0.101	0.037
73	6.08	0.30	0.155	(0.358)	0.114	0.041
74	6.17	0.30	0.155	(0.356)	0.114	0.041
75	6.25	0.30	0.155	(0.355)	0.114	0.041
76	6.33	0.30	0.155	(0.353)	0.114	0.041
77	6.42	0.30	0.155	(0.351)	0.114	0.041
78	6.50	0.30	0.155	(0.350)	0.114	0.041
79	6.58	0.33	0.172	(0.348)	0.126	0.046
80	6.67	0.33	0.172	(0.347)	0.126	0.046
81	6.75	0.33	0.172	(0.345)	0.126	0.046
82	6.83	0.33	0.172	(0.344)	0.126	0.046
83	6.92	0.33	0.172	(0.342)	0.126	0.046
84	7.00	0.33	0.172	(0.340)	0.126	0.046
85	7.08	0.33	0.172	(0.339)	0.126	0.046
86	7.17	0.33	0.172	(0.337)	0.126	0.046
87	7.25	0.33	0.172	(0.336)	0.126	0.046
88	7.33	0.37	0.189	(0.334)	0.139	0.050
89	7.42	0.37	0.189	(0.333)	0.139	0.050
90	7.50	0.37	0.189	(0.331)	0.139	0.050
91	7.58	0.40	0.206	(0.330)	0.151	0.055
92	7.67	0.40	0.206	(0.328)	0.151	0.055
93	7.75	0.40	0.206	(0.327)	0.151	0.055
94	7.83	0.43	0.224	(0.325)	0.164	0.059
95	7.92	0.43	0.224	(0.324)	0.164	0.059
96	8.00	0.43	0.224	(0.322)	0.164	0.059
97	8.08	0.50	0.258	(0.321)	0.189	0.069
98	8.17	0.50	0.258	(0.319)	0.189	0.069
99	8.25	0.50	0.258	(0.318)	0.189	0.069
100	8.33	0.50	0.258	(0.316)	0.189	0.069
101	8.42	0.50	0.258	(0.315)	0.189	0.069
102	8.50	0.50	0.258	(0.313)	0.189	0.069
103	8.58	0.53	0.275	(0.312)	0.202	0.073
104	8.67	0.53	0.275	(0.310)	0.202	0.073
105	8.75	0.53	0.275	(0.309)	0.202	0.073
106	8.83	0.57	0.292	(0.307)	0.214	0.078

107	8.92	0.57	0.292	(0.306)	0.214	0.078
108	9.00	0.57	0.292	(0.305)	0.214	0.078
109	9.08	0.63	0.327	(0.303)	0.240	0.087
110	9.17	0.63	0.327	(0.302)	0.240	0.087
111	9.25	0.63	0.327	(0.300)	0.240	0.087
112	9.33	0.67	0.344	(0.299)	0.252	0.092
113	9.42	0.67	0.344	(0.297)	0.252	0.092
114	9.50	0.67	0.344	(0.296)	0.252	0.092
115	9.58	0.70	0.361	(0.295)	0.265	0.096
116	9.67	0.70	0.361	(0.293)	0.265	0.096
117	9.75	0.70	0.361	(0.292)	0.265	0.096
118	9.83	0.73	0.378	(0.290)	0.278	0.101
119	9.92	0.73	0.378	(0.289)	0.278	0.101
120	10.00	0.73	0.378	(0.287)	0.278	0.101
121	10.08	0.50	0.258	(0.286)	0.189	0.069
122	10.17	0.50	0.258	(0.285)	0.189	0.069
123	10.25	0.50	0.258	(0.283)	0.189	0.069
124	10.33	0.50	0.258	(0.282)	0.189	0.069
125	10.42	0.50	0.258	(0.281)	0.189	0.069
126	10.50	0.50	0.258	(0.279)	0.189	0.069
127	10.58	0.67	0.344	(0.278)	0.252	0.092
128	10.67	0.67	0.344	(0.276)	0.252	0.092
129	10.75	0.67	0.344	(0.275)	0.252	0.092
130	10.83	0.67	0.344	(0.274)	0.252	0.092
131	10.92	0.67	0.344	(0.272)	0.252	0.092
132	11.00	0.67	0.344	(0.271)	0.252	0.092
133	11.08	0.63	0.327	(0.270)	0.240	0.087
134	11.17	0.63	0.327	(0.268)	0.240	0.087
135	11.25	0.63	0.327	(0.267)	0.240	0.087
136	11.33	0.63	0.327	(0.266)	0.240	0.087
137	11.42	0.63	0.327	(0.264)	0.240	0.087
138	11.50	0.63	0.327	(0.263)	0.240	0.087
139	11.58	0.57	0.292	(0.262)	0.214	0.078
140	11.67	0.57	0.292	(0.261)	0.214	0.078
141	11.75	0.57	0.292	(0.259)	0.214	0.078
142	11.83	0.60	0.309	(0.258)	0.227	0.082
143	11.92	0.60	0.309	(0.257)	0.227	0.082
144	12.00	0.60	0.309	(0.255)	0.227	0.082
145	12.08	0.83	0.430	0.254	(0.315)	0.176
146	12.17	0.83	0.430	0.253	(0.315)	0.177
147	12.25	0.83	0.430	0.252	(0.315)	0.178
148	12.33	0.87	0.447	0.250	(0.328)	0.197
149	12.42	0.87	0.447	0.249	(0.328)	0.198
150	12.50	0.87	0.447	0.248	(0.328)	0.199
151	12.58	0.93	0.481	0.247	(0.353)	0.235
152	12.67	0.93	0.481	0.245	(0.353)	0.236
153	12.75	0.93	0.481	0.244	(0.353)	0.237
154	12.83	0.97	0.499	0.243	(0.366)	0.256
155	12.92	0.97	0.499	0.242	(0.366)	0.257
156	13.00	0.97	0.499	0.240	(0.366)	0.258
157	13.08	1.13	0.585	0.239	(0.429)	0.345
158	13.17	1.13	0.585	0.238	(0.429)	0.347
159	13.25	1.13	0.585	0.237	(0.429)	0.348
160	13.33	1.13	0.585	0.236	(0.429)	0.349

161	13.42	1.13	0.585	0.234	(0.429)	0.350
162	13.50	1.13	0.585	0.233	(0.429)	0.351
163	13.58	0.77	0.395	0.232	(0.290)	0.163
164	13.67	0.77	0.395	0.231	(0.290)	0.165
165	13.75	0.77	0.395	0.230	(0.290)	0.166
166	13.83	0.77	0.395	0.228	(0.290)	0.167
167	13.92	0.77	0.395	0.227	(0.290)	0.168
168	14.00	0.77	0.395	0.226	(0.290)	0.169
169	14.08	0.90	0.464	0.225	(0.341)	0.239
170	14.17	0.90	0.464	0.224	(0.341)	0.240
171	14.25	0.90	0.464	0.223	(0.341)	0.242
172	14.33	0.87	0.447	0.222	(0.328)	0.225
173	14.42	0.87	0.447	0.220	(0.328)	0.227
174	14.50	0.87	0.447	0.219	(0.328)	0.228
175	14.58	0.87	0.447	0.218	(0.328)	0.229
176	14.67	0.87	0.447	0.217	(0.328)	0.230
177	14.75	0.87	0.447	0.216	(0.328)	0.231
178	14.83	0.83	0.430	0.215	(0.315)	0.215
179	14.92	0.83	0.430	0.214	(0.315)	0.216
180	15.00	0.83	0.430	0.213	(0.315)	0.217
181	15.08	0.80	0.413	0.212	(0.303)	0.201
182	15.17	0.80	0.413	0.210	(0.303)	0.202
183	15.25	0.80	0.413	0.209	(0.303)	0.203
184	15.33	0.77	0.395	0.208	(0.290)	0.187
185	15.42	0.77	0.395	0.207	(0.290)	0.188
186	15.50	0.77	0.395	0.206	(0.290)	0.189
187	15.58	0.63	0.327	0.205	(0.240)	0.122
188	15.67	0.63	0.327	0.204	(0.240)	0.123
189	15.75	0.63	0.327	0.203	(0.240)	0.124
190	15.83	0.63	0.327	0.202	(0.240)	0.125
191	15.92	0.63	0.327	0.201	(0.240)	0.126
192	16.00	0.63	0.327	0.200	(0.240)	0.127
193	16.08	0.13	0.069	(0.199)	0.050	0.018
194	16.17	0.13	0.069	(0.198)	0.050	0.018
195	16.25	0.13	0.069	(0.197)	0.050	0.018
196	16.33	0.13	0.069	(0.196)	0.050	0.018
197	16.42	0.13	0.069	(0.195)	0.050	0.018
198	16.50	0.13	0.069	(0.194)	0.050	0.018
199	16.58	0.10	0.052	(0.193)	0.038	0.014
200	16.67	0.10	0.052	(0.192)	0.038	0.014
201	16.75	0.10	0.052	(0.191)	0.038	0.014
202	16.83	0.10	0.052	(0.190)	0.038	0.014
203	16.92	0.10	0.052	(0.189)	0.038	0.014
204	17.00	0.10	0.052	(0.188)	0.038	0.014
205	17.08	0.17	0.086	(0.187)	0.063	0.023
206	17.17	0.17	0.086	(0.186)	0.063	0.023
207	17.25	0.17	0.086	(0.185)	0.063	0.023
208	17.33	0.17	0.086	(0.184)	0.063	0.023
209	17.42	0.17	0.086	(0.183)	0.063	0.023
210	17.50	0.17	0.086	(0.182)	0.063	0.023
211	17.58	0.17	0.086	(0.182)	0.063	0.023
212	17.67	0.17	0.086	(0.181)	0.063	0.023
213	17.75	0.17	0.086	(0.180)	0.063	0.023
214	17.83	0.13	0.069	(0.179)	0.050	0.018

215	17.92	0.13	0.069	(0.178)	0.050	0.018
216	18.00	0.13	0.069	(0.177)	0.050	0.018
217	18.08	0.13	0.069	(0.176)	0.050	0.018
218	18.17	0.13	0.069	(0.175)	0.050	0.018
219	18.25	0.13	0.069	(0.174)	0.050	0.018
220	18.33	0.13	0.069	(0.174)	0.050	0.018
221	18.42	0.13	0.069	(0.173)	0.050	0.018
222	18.50	0.13	0.069	(0.172)	0.050	0.018
223	18.58	0.10	0.052	(0.171)	0.038	0.014
224	18.67	0.10	0.052	(0.170)	0.038	0.014
225	18.75	0.10	0.052	(0.169)	0.038	0.014
226	18.83	0.07	0.034	(0.169)	0.025	0.009
227	18.92	0.07	0.034	(0.168)	0.025	0.009
228	19.00	0.07	0.034	(0.167)	0.025	0.009
229	19.08	0.10	0.052	(0.166)	0.038	0.014
230	19.17	0.10	0.052	(0.165)	0.038	0.014
231	19.25	0.10	0.052	(0.165)	0.038	0.014
232	19.33	0.13	0.069	(0.164)	0.050	0.018
233	19.42	0.13	0.069	(0.163)	0.050	0.018
234	19.50	0.13	0.069	(0.162)	0.050	0.018
235	19.58	0.10	0.052	(0.162)	0.038	0.014
236	19.67	0.10	0.052	(0.161)	0.038	0.014
237	19.75	0.10	0.052	(0.160)	0.038	0.014
238	19.83	0.07	0.034	(0.160)	0.025	0.009
239	19.92	0.07	0.034	(0.159)	0.025	0.009
240	20.00	0.07	0.034	(0.158)	0.025	0.009
241	20.08	0.10	0.052	(0.157)	0.038	0.014
242	20.17	0.10	0.052	(0.157)	0.038	0.014
243	20.25	0.10	0.052	(0.156)	0.038	0.014
244	20.33	0.10	0.052	(0.155)	0.038	0.014
245	20.42	0.10	0.052	(0.155)	0.038	0.014
246	20.50	0.10	0.052	(0.154)	0.038	0.014
247	20.58	0.10	0.052	(0.153)	0.038	0.014
248	20.67	0.10	0.052	(0.153)	0.038	0.014
249	20.75	0.10	0.052	(0.152)	0.038	0.014
250	20.83	0.07	0.034	(0.151)	0.025	0.009
251	20.92	0.07	0.034	(0.151)	0.025	0.009
252	21.00	0.07	0.034	(0.150)	0.025	0.009
253	21.08	0.10	0.052	(0.150)	0.038	0.014
254	21.17	0.10	0.052	(0.149)	0.038	0.014
255	21.25	0.10	0.052	(0.148)	0.038	0.014
256	21.33	0.07	0.034	(0.148)	0.025	0.009
257	21.42	0.07	0.034	(0.147)	0.025	0.009
258	21.50	0.07	0.034	(0.147)	0.025	0.009
259	21.58	0.10	0.052	(0.146)	0.038	0.014
260	21.67	0.10	0.052	(0.146)	0.038	0.014
261	21.75	0.10	0.052	(0.145)	0.038	0.014
262	21.83	0.07	0.034	(0.145)	0.025	0.009
263	21.92	0.07	0.034	(0.144)	0.025	0.009
264	22.00	0.07	0.034	(0.144)	0.025	0.009
265	22.08	0.10	0.052	(0.143)	0.038	0.014
266	22.17	0.10	0.052	(0.143)	0.038	0.014
267	22.25	0.10	0.052	(0.142)	0.038	0.014
268	22.33	0.07	0.034	(0.142)	0.025	0.009

269	22.42	0.07	0.034	(0.141)	0.025	0.009
270	22.50	0.07	0.034	(0.141)	0.025	0.009
271	22.58	0.07	0.034	(0.141)	0.025	0.009
272	22.67	0.07	0.034	(0.140)	0.025	0.009
273	22.75	0.07	0.034	(0.140)	0.025	0.009
274	22.83	0.07	0.034	(0.140)	0.025	0.009
275	22.92	0.07	0.034	(0.139)	0.025	0.009
276	23.00	0.07	0.034	(0.139)	0.025	0.009
277	23.08	0.07	0.034	(0.138)	0.025	0.009
278	23.17	0.07	0.034	(0.138)	0.025	0.009
279	23.25	0.07	0.034	(0.138)	0.025	0.009
280	23.33	0.07	0.034	(0.138)	0.025	0.009
281	23.42	0.07	0.034	(0.137)	0.025	0.009
282	23.50	0.07	0.034	(0.137)	0.025	0.009
283	23.58	0.07	0.034	(0.137)	0.025	0.009
284	23.67	0.07	0.034	(0.137)	0.025	0.009
285	23.75	0.07	0.034	(0.136)	0.025	0.009
286	23.83	0.07	0.034	(0.136)	0.025	0.009
287	23.92	0.07	0.034	(0.136)	0.025	0.009
288	24.00	0.07	0.034	(0.136)	0.025	0.009

(Loss Rate Not Used)

Sum = 100.0

Sum = 18.4

Flood volume = Effective rainfall 1.54 (In)

times area 31.2 (Ac.) / [(In) / (Ft.)] = 4.0 (Ac.Ft)

Total soil loss = 2.76 (In)

Total soil loss = 7.181 (Ac.Ft)

Total rainfall = 4.30 (In)

Flood volume = 173981.6 Cubic Feet

Total soil loss = 312811.0 Cubic Feet

Peak flow rate of this hydrograph = 11.021 (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 5 Minute intervals ((CFS))

Time (h+m)	Volume Ac.Ft	Q (CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0008	0.11	Q				
0+10	0.0024	0.24	Q				
0+15	0.0043	0.27	Q				
0+20	0.0066	0.34	Q				
0+25	0.0094	0.41	Q				
0+30	0.0123	0.42	Q				
0+35	0.0152	0.43	Q				
0+40	0.0182	0.43	Q				
0+45	0.0212	0.43	Q				
0+50	0.0245	0.49	Q				
0+55	0.0283	0.55	VQ				
1+ 0	0.0322	0.57	VQ				
1+ 5	0.0358	0.52	VQ				

1+10	0.0389	0.46	Q
1+15	0.0420	0.44	Q
1+20	0.0450	0.44	Q
1+25	0.0480	0.43	Q
1+30	0.0509	0.43	Q
1+35	0.0539	0.43	Q
1+40	0.0569	0.43	Q
1+45	0.0599	0.43	Q
1+50	0.0632	0.49	Q
1+55	0.0670	0.55	VQ
2+ 0	0.0709	0.57	VQ
2+ 5	0.0749	0.57	VQ
2+10	0.0788	0.58	VQ
2+15	0.0828	0.58	VQ
2+20	0.0868	0.58	VQ
2+25	0.0907	0.58	VQ
2+30	0.0947	0.58	VQ
2+35	0.0990	0.63	VQ
2+40	0.1038	0.70	Q
2+45	0.1087	0.71	Q
2+50	0.1137	0.72	Q
2+55	0.1186	0.72	Q
3+ 0	0.1236	0.72	Q
3+ 5	0.1285	0.72	Q
3+10	0.1335	0.72	Q
3+15	0.1384	0.72	Q
3+20	0.1434	0.72	Q
3+25	0.1484	0.72	Q
3+30	0.1533	0.72	Q
3+35	0.1583	0.72	Q
3+40	0.1632	0.72	Q
3+45	0.1682	0.72	Q
3+50	0.1735	0.77	Q
3+55	0.1793	0.84	Q
4+ 0	0.1852	0.85	Q
4+ 5	0.1911	0.86	Q
4+10	0.1971	0.86	Q
4+15	0.2030	0.86	QV
4+20	0.2093	0.92	QV
4+25	0.2161	0.98	QV
4+30	0.2230	1.00	QV
4+35	0.2299	1.00	Q
4+40	0.2369	1.01	Q
4+45	0.2438	1.01	Q
4+50	0.2511	1.06	Q
4+55	0.2589	1.13	Q
5+ 0	0.2667	1.14	Q
5+ 5	0.2739	1.04	Q
5+10	0.2802	0.91	QV
5+15	0.2863	0.88	QV
5+20	0.2926	0.93	QV
5+25	0.2994	0.98	QV
5+30	0.3063	1.00	Q V
5+35	0.3136	1.06	QV

5+40	0.3214	1.13	QV				
5+45	0.3292	1.14	QV				
5+50	0.3371	1.15	QV				
5+55	0.3451	1.15	QV				
6+ 0	0.3530	1.15	QV				
6+ 5	0.3613	1.21	QV				
6+10	0.3701	1.27	QV				
6+15	0.3789	1.29	QV				
6+20	0.3878	1.29	QV				
6+25	0.3967	1.30	QV				
6+30	0.4057	1.30	Q V				
6+35	0.4150	1.35	Q V				
6+40	0.4247	1.42	Q V				
6+45	0.4346	1.43	Q V				
6+50	0.4445	1.44	Q V				
6+55	0.4544	1.44	Q V				
7+ 0	0.4643	1.44	Q V				
7+ 5	0.4742	1.44	Q V				
7+10	0.4841	1.44	Q V				
7+15	0.4940	1.44	Q V				
7+20	0.5043	1.49	Q V				
7+25	0.5151	1.56	Q V				
7+30	0.5259	1.57	Q V				
7+35	0.5372	1.63	Q V				
7+40	0.5489	1.70	Q V				
7+45	0.5608	1.72	Q V				
7+50	0.5730	1.78	Q V				
7+55	0.5857	1.85	Q V				
8+ 0	0.5986	1.86	Q V				
8+ 5	0.6122	1.98	Q V				
8+10	0.6267	2.11	Q V				
8+15	0.6415	2.14	Q V				
8+20	0.6563	2.15	Q V				
8+25	0.6712	2.16	Q V				
8+30	0.6860	2.16	Q V				
8+35	0.7013	2.21	Q V				
8+40	0.7170	2.28	Q V				
8+45	0.7328	2.29	Q V				
8+50	0.7490	2.35	Q V				
8+55	0.7657	2.42	Q V				
9+ 0	0.7825	2.44	Q V				
9+ 5	0.8001	2.55	Q V				
9+10	0.8186	2.69	Q V				
9+15	0.8373	2.72	Q V				
9+20	0.8565	2.78	Q V				
9+25	0.8761	2.86	Q V				
9+30	0.8959	2.87	Q V				
9+35	0.9161	2.93	Q V				
9+40	0.9367	3.00	Q V				
9+45	0.9575	3.01	Q V				
9+50	0.9787	3.07	Q V				
9+55	1.0003	3.14	Q V				
10+ 0	1.0221	3.16	Q V				
10+ 5	1.0412	2.78	Q V				

10+10	1.0573	2.33	Q	V					
10+15	1.0726	2.23	Q	V					
10+20	1.0876	2.18	Q	V					
10+25	1.1025	2.16	Q	V					
10+30	1.1174	2.16	Q	V					
10+35	1.1341	2.43	Q	V					
10+40	1.1531	2.76	Q	V					
10+45	1.1727	2.83	Q	V					
10+50	1.1924	2.86	Q	V					
10+55	1.2122	2.88	Q	V					
11+ 0	1.2320	2.88	Q	V					
11+ 5	1.2515	2.83	Q	V					
11+10	1.2705	2.76	Q	V					
11+15	1.2894	2.75	Q	V					
11+20	1.3083	2.74	Q	V					
11+25	1.3271	2.74	Q	V					
11+30	1.3459	2.74	Q	V					
11+35	1.3640	2.63	Q	V					
11+40	1.3812	2.50	Q	V					
11+45	1.3982	2.47	Q	V					
11+50	1.4155	2.51	Q	V					
11+55	1.4332	2.57	Q	V					
12+ 0	1.4510	2.58	Q	V					
12+ 5	1.4764	3.70	Q	V					
12+10	1.5112	5.05	Q	V					
12+15	1.5483	5.38	Q	V					
12+20	1.5879	5.75	Q	V					
12+25	1.6299	6.10	Q	V					
12+30	1.6726	6.20	Q	V					
12+35	1.7185	6.67	Q	V					
12+40	1.7682	7.21	Q	V					
12+45	1.8189	7.36	Q	V					
12+50	1.8716	7.65	Q	V					
12+55	1.9264	7.96	Q	V					
13+ 0	1.9818	8.05	Q	V					
13+ 5	2.0448	9.14	Q	V					
13+10	2.1165	10.42	Q	V					
13+15	2.1904	10.73	Q	V					
13+20	2.2654	10.88	Q	V					
13+25	2.3410	10.98	Q	V					
13+30	2.4169	11.02	Q	V					
13+35	2.4776	8.81	Q	V					
13+40	2.5198	6.14	Q	V					
13+45	2.5582	5.57	Q	V					
13+50	2.5951	5.36	Q	V					
13+55	2.6314	5.26	Q	V					
14+ 0	2.6678	5.29	Q	V					
14+ 5	2.7102	6.15	Q	V					
14+10	2.7595	7.17	Q	V					
14+15	2.8107	7.42	Q	V					
14+20	2.8613	7.35	Q	V					
14+25	2.9108	7.19	Q	V					
14+30	2.9601	7.17	Q	V					
14+35	3.0096	7.18	Q	V					

14+40	3.0592	7.20				Q	V
14+45	3.1091	7.24				Q	V
14+50	3.1577	7.07				Q	V
14+55	3.2050	6.86				Q	V
15+ 0	3.2521	6.84				Q	V
15+ 5	3.2978	6.64				Q	V
15+10	3.3420	6.42				Q	V
15+15	3.3861	6.40				Q	V
15+20	3.4289	6.21				Q	V
15+25	3.4701	5.98				Q	V
15+30	3.5111	5.96				Q	V
15+35	3.5466	5.15				Q	V
15+40	3.5754	4.19				Q	V
15+45	3.6030	4.00				Q	V
15+50	3.6302	3.94				Q	V
15+55	3.6572	3.93				Q	V
16+ 0	3.6845	3.96				Q	V
16+ 5	3.7030	2.69				Q	V
16+10	3.7108	1.14	Q				V
16+15	3.7164	0.80	Q				V
16+20	3.7209	0.66	Q				V
16+25	3.7248	0.58	Q				V
16+30	3.7288	0.58	Q				V
16+35	3.7324	0.52	Q				V
16+40	3.7355	0.46	Q				V
16+45	3.7386	0.44	Q				V
16+50	3.7416	0.44	Q				V
16+55	3.7445	0.43	Q				V
17+ 0	3.7475	0.43	Q				V
17+ 5	3.7512	0.54	Q				V
17+10	3.7559	0.67	Q				V
17+15	3.7607	0.70	Q				V
17+20	3.7656	0.71	Q				V
17+25	3.7706	0.72	Q				V
17+30	3.7755	0.72	Q				V
17+35	3.7805	0.72	Q				V
17+40	3.7854	0.72	Q				V
17+45	3.7904	0.72	Q				V
17+50	3.7950	0.67	Q				V
17+55	3.7991	0.60	Q				V
18+ 0	3.8031	0.59	Q				V
18+ 5	3.8071	0.58	Q				V
18+10	3.8111	0.58	Q				V
18+15	3.8151	0.58	Q				V
18+20	3.8190	0.58	Q				V
18+25	3.8230	0.58	Q				V
18+30	3.8270	0.58	Q				V
18+35	3.8306	0.52	Q				V
18+40	3.8337	0.46	Q				V
18+45	3.8367	0.44	Q				V
18+50	3.8394	0.38	Q				V
18+55	3.8415	0.31	Q				V
19+ 0	3.8436	0.30	Q				V
19+ 5	3.8459	0.35	Q				V

19+10	3.8488	0.41	Q	V
19+15	3.8517	0.42	Q	V
19+20	3.8550	0.48	Q	V
19+25	3.8588	0.55	Q	V
19+30	3.8627	0.57	Q	V
19+35	3.8663	0.52	Q	V
19+40	3.8694	0.46	Q	V
19+45	3.8724	0.44	Q	V
19+50	3.8751	0.38	Q	V
19+55	3.8772	0.31	Q	V
20+ 0	3.8793	0.30	Q	V
20+ 5	3.8816	0.35	Q	V
20+10	3.8845	0.41	Q	V
20+15	3.8874	0.42	Q	V
20+20	3.8903	0.43	Q	V
20+25	3.8933	0.43	Q	V
20+30	3.8963	0.43	Q	V
20+35	3.8992	0.43	Q	V
20+40	3.9022	0.43	Q	V
20+45	3.9052	0.43	Q	V
20+50	3.9078	0.38	Q	V
20+55	3.9099	0.31	Q	V
21+ 0	3.9120	0.30	Q	V
21+ 5	3.9144	0.35	Q	V
21+10	3.9172	0.41	Q	V
21+15	3.9201	0.42	Q	V
21+20	3.9227	0.37	Q	V
21+25	3.9248	0.31	Q	V
21+30	3.9269	0.30	Q	V
21+35	3.9292	0.35	Q	V
21+40	3.9320	0.41	Q	V
21+45	3.9350	0.42	Q	V
21+50	3.9375	0.37	Q	V
21+55	3.9397	0.31	Q	V
22+ 0	3.9417	0.30	Q	V
22+ 5	3.9441	0.35	Q	V
22+10	3.9469	0.41	Q	V
22+15	3.9498	0.42	Q	V
22+20	3.9524	0.37	Q	V
22+25	3.9546	0.31	Q	V
22+30	3.9566	0.30	Q	V
22+35	3.9586	0.29	Q	V
22+40	3.9606	0.29	Q	V
22+45	3.9626	0.29	Q	V
22+50	3.9646	0.29	Q	V
22+55	3.9665	0.29	Q	V
23+ 0	3.9685	0.29	Q	V
23+ 5	3.9705	0.29	Q	V
23+10	3.9725	0.29	Q	V
23+15	3.9745	0.29	Q	V
23+20	3.9765	0.29	Q	V
23+25	3.9784	0.29	Q	V
23+30	3.9804	0.29	Q	V
23+35	3.9824	0.29	Q	V

Unit Hydrograph Analysis

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Study date 08/22/13 File: 32786CDev12.out

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

Program License Serial Number 6194

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

English Units used in output format

TTM 36557

2-Year 1-Hour Unit Hydrograph Analysis Area "C" (Subarea 1) Proposed Developed Condition

Drainage Area = 17.20 (Ac.) = 0.027 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 17.20 (Ac.) = 0.027 Sq. Mi.
Length along longest watercourse = 1978.00 (Ft.)
Length along longest watercourse measured to centroid = 794.00 (Ft.)
Length along longest watercourse = 0.375 Mi.
Length along longest watercourse measured to centroid = 0.150 Mi.
Difference in elevation = 137.40 (Ft.)
Slope along watercourse = 366.7705 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.039 Hr.
Lag time = 2.36 Min.
25% of lag time = 0.59 Min.
40% of lag time = 0.94 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00 (CFS)

2 YEAR Area rainfall data:

Area (Ac.) [1]	Rainfall (In) [2]	Weighting [1*2]
17.20	0.58	9.98

100 YEAR Area rainfall data:

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

17.20

1.45

24.94

STORM EVENT (YEAR) = 2.00
 Area Averaged 2-Year Rainfall = 0.580(In)
 Area Averaged 100-Year Rainfall = 1.450(In)

Point rain (area averaged) = 0.580(In)
 Areal adjustment factor = 99.98 %
 Adjusted average point rain = 0.580(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.200	56.00	0.500
14.000	69.00	0.500
Total Area Entered = 17.20 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-1	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	36.0	0.706	0.500	0.388	0.186	0.072
69.0	49.8	0.574	0.500	0.316	0.814	0.257
Sum (F) =						0.329

Area averaged mean soil loss (F) (In/Hr) = 0.329
 Minimum soil loss rate ((In/Hr)) = 0.165
 (for 24 hour storm duration)
 Soil loss rate (decimal) = 0.500

 Slope of intensity-duration curve for a 1 hour storm =0.4800

Unit Hydrograph
 VALLEY S-Curve

 Unit Hydrograph Data

Unit time period	Time % of lag	Distribution	Unit Hydrograph
(hrs)		Graph %	(CFS)
1	0.083	212.058	7.872
2	0.167	424.117	7.373
3	0.250	636.175	1.443
4	0.333	848.233	0.647
Sum = 100.000		Sum=	17.334

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	0.08	4.40	0.306 (0.329)	0.153

2	0.17	4.50	0.313	(0.329)	0.157	0.157
3	0.25	5.40	0.376	(0.329)	0.188	0.188
4	0.33	5.40	0.376	(0.329)	0.188	0.188
5	0.42	5.70	0.397	(0.329)	0.198	0.198
6	0.50	6.40	0.445	(0.329)	0.223	0.223
7	0.58	7.90	0.550	(0.329)	0.275	0.275
8	0.67	9.10	0.633	(0.329)	0.317	0.317
9	0.75	12.80	0.891	0.329 (0.445)		0.562
10	0.83	25.60	1.781	0.329 (0.891)		1.452
11	0.92	7.90	0.550	(0.329)	0.275	0.275
12	1.00	4.90	0.341	(0.329)	0.170	0.170

(Loss Rate Not Used)

Sum = 100.0

Sum = 4.2

Flood volume = Effective rainfall 0.35(In)

times area 17.2(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)

Total soil loss = 0.23(In)

Total soil loss = 0.335(Ac.Ft)

Total rainfall = 0.58(In)

Flood volume = 21629.9 Cubic Feet

Total soil loss = 14577.4 Cubic Feet

Peak flow rate of this hydrograph = 16.215(CFS)

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1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume	Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0083	1.21	V Q					
0+10	0.0246	2.36	V Q					
0+15	0.0442	2.86	V Q					
0+20	0.0662	3.19	VQ					
0+25	0.0891	3.32	QV					
0+30	0.1139	3.61	Q V					
0+35	0.1430	4.22	Q V					
0+40	0.1772	4.97	Q		V			
0+45	0.2275	7.30	Q		Q	V		
0+50	0.3392	16.22					V	
0+55	0.4349	13.89					Q	
1+ 0	0.4750	5.83			Q		V	V
1+ 5	0.4929	2.59		Q				V
1+10	0.4958	0.42	Q					V
1+15	0.4966	0.11	Q					V

