PRELIMINARY HYDROLOGY AND HYDRAULIC REPORT

For

TENTATIVE TRACT NO. 20849

DRNSTY-2025-00070

PROJ-2025-00106

PHILLIPS BLVD. & PIPELINE AVE

CHINO, CALIFORNIA 91710

APN: 1013-111-01, 1013-111-02, 1013-161-01

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1. Introduction

1.1 Project Description

The 24.16-acre project is located at 4257 Philips Boulevard within the City of Chino, California. The site is bordered by Philips Boulevard to the north, existing residential units to the east and south, and Pipeline Avenue to the west (Appendix A).

Currently, the site is vacant and occupied predominantly by farmland. In addition, a nursery, residential/commercial buildings, and a cellphone tower are located at the corner of the site. The topography generally slopes in the south and southeast direction. Vegetation comprises of localized areas of crops and medium to large trees. The offsite area that drains onto the property includes the few residential buildings to the northeast. A total of 90 single family residential units is proposed for the site. Associated proposed includes interior driveways, hardscape, a park, parking areas, and underground utilities.

A detention basin is proposed to mitigate increased peak flow from the development. Proprietary stormwater system is proposed to treat the Design Capture Flow (DCF) to satisfy stormwater quality requirement.

1.2 Study Objectives

This report was prepared to:

11) Determine 2-yr, 10-yr, 25-yr, and 100-yr 24-hour peak flow of existing and proposed conditions in compliance of detention criteria Policy 2a (Table 1).

2) Design underground detention system to discharge no more than 90% of the existing condition and draw down within 24 hours after the peak water depth is achieved.

3) Determine the sizes of the proposed storm drain system to ensure enough conveyance capacity for 25-year storm.

4) Design and size water quality devices to satisfy Water Quality Management Plan (WQMP) requirement (See separate WQMP report).

2. Hydrologic Data and Design Criteria

The project site is in San Bernardino County's Valley Area. The 1-hour, 6-hour, and 24-hour isohyet of the NOAA Atlas 14 Point Precipitation Frequency Estimates [4] is provided in Table 2 and Appendix C. The slope for rainfall intensity curve is 0.6. The soil is group A, per NRCS soil survey and the San Bernardino County's Hydrology Manual [1] (Appendix B). Soil Group A typically has a low runoff potential with high infiltration rate. The existing onsite land use is agricultural with curve number (CN) of 67, and residential (5-7 unit/ac) for offsite tributary area with CN of 32, per San Bernadino County's

Hydrology Manual [1]. The proposed development type is 3-4 dwelling units/ac with CN of 32.

The County's detention criteria [2] requires post-development peak flow be less than or equal to 90% of the existing condition in compliance with the rainfall land AMC in Table 1.

3. Methodology

For existing and proposed hydrology, San Bernardino County's hydrology methods, available in software program Version 7.1 developed by CivilCadd/CivilDesign [3], were used. Rational Hydrology Method Program was used to calculate Time of Concentration (T_C). The flow and volume were calculated using the Unit Hydrograph Method Program based on Tc obtained from Rational Hydrology Method Program. The basin routing was performed using the Flood Hydrograph Routing, which uses the hydrograph generated from Unit Hydrograph Method Program.

4. Drainage Analysis

4.1 Existing Condition

Runoff of the vacant site drains from northeast towards southwest and exits at the southwest end of the site onto Pipeline Avenue. Runoff from the northeast neighboring buildings drains onsite joining the onsite flow. Based on the drainage pattern, the onsite and offsite drainage can be divided into two subareas (see Existing Hydrology Map).

Subarea A (onsite)

Runoff of the site surface flows southwesterly towards the low point at southwest corner of the site. Eventually water overflows on Pipeline Avenue.

Subarea B (offsite)

Runoff from the developed residential neighbor on the northeast surface flows southwesterly onto the project site and joins the onsite flow. The combined flow continues southwesterly towards the low point at the southwest corner and eventually overflows onto Pipeline Avenue.

Tc of the two subareas were calculated using Rational Method and are provided in Table 3 and Appendix C. Peak flow and volume calculated by Unit Hydrograph Method are provided in Table 4 and Appendix D.

4.2 Proposed Condition

The proposed onsite drainage includes surface flow, street and gutter flow, and catch basin inlet. Runoff of the peripheral area adjacent to Pipeline Avenue and Phillips Blvd. outside of lots flows directly onto those two streets. The offsite area described in Section 4.1 drains in the same pattern. The proposed drainage system is designed to convey both onsite and offsite flow to the same exiting point at the southwest end of the site. Based on drainage patterns, the site's drainage can be divided into three subareas (see Proposed Hydrology Map).

Subarea A

This subarea includes the north and the west portion of the site. Runoff from the lots surface flows onto streets and drains on Street "A" westerly then southerly along the gutter of Street "C" towards the low point on Locust Street.

Subarea B (offsite included)

This subarea includes the east portion of the site and the northeast offsite area. Offsite runoff follows the same path as existing condition onto the site. A concrete rectangular ditch (Ditch #1) is proposed behind the proposed combo wall to convey the flow onto Street "B" and joins the onsite runoff. Onsite runoff from the lots surface flows onto streets and drains along the gutters of Street "D" towards the low point on Locust Street.

Subarea C

This subarea includes the south portion of the site. Runoff from the lots surface flows onto Locust Street and drains westerly along the gutter towards the low point on Locust Street.

Runoff of the above three subarea confluence at the low point on Locust Street and drains through two curb opening catch basins into the proposed detention basin.

It is noted that the peripheral areas that directly drain to Pipeline Avenue, Philipps Blvd. and the south neighboring street are not included in the calculations. Also, the telephone tower lot that originally drains onto Philipps Blvd. is not included. Tc of the subareas were calculated using Rational Method and the results are provided in Table 5 and Appendix C. Peak flow and volume calculated by Unit Hydrograph Method are provided in Table 6 and Appendix D.

5. Detention and Stormwater Quality Infiltration

Per County's detention criteria, proposed peak flow should be less than or equal to 90% of the existing level. The 90% of existing flow is summarized in Table 4. A detention basin is proposed at the southwest end of the site to detain the flow from the above three subareas. The 176'x120' basin is 3.6' deep with 2:1 side slope, which provides a total volume of 66,113 cf. The inlet includes two curb opening inlet each connected with a down-drain. Riprap is proposed for energy dissipation. A 4'x1' outlet pipe is placed at the bottom of the basin at the southwest corner to release flow. Flow is conveyed through the

box to an underground concrete chamber that is connected to four 4'x4" parkway drains. The parkway drains direct flow onto Pipeline Avenue.

The calculation of outflow through the box pipe is provided in Table 7. The basin's Stage-Volume-Discharge relationship is provided in Table 8. The routing program was run for the four frequencies, and the results are provided in Table 9 and Appendix E.

The design capture volume (DCV) of the site is 49,555 cf (see WQMP report). This is smaller than the detention basin volume. Per the soil report [5], infiltration is not feasible for the site. Therefore, proprietary biofiltration system is proposed to satisfy the WQMP requirement. Five Filterra units are proposed on Street "C", Street "D' and Locust Street. Low flow along those streets is intercepted into the units and treated. The treated flow is conveyed by proposed storm drain into the detention basin. High flow bypasses the units and flows through two curb opening inlets in the basin. The WQMP is provided in a separate report.

6. Hydraulic Calculations and Storm Drain Sizing

Bentley Flowmaster [4] was used for sizing the curb openings, concrete ditch, down drains, outlet box pipe, and parkway drains (Tables 10-13). Riprap calculations method per LA County Sedimentation Manual provide reference to size the rocks for the riprap pad based on the discharge velocity from the down drain and channel to the bottom of the basin (Table 14). The calculations and results are provided in Appendix F. It shows that the proposed storm drain system has enough capacity to convey the proposed onsite and offsite runoff.

Street capacity was evaluated by using Flowmaster at two critical locations (Sections 1&2) for 10-year and 25-year events. The street section results are provided in Appendix G and Table 15. It is seen that 10-year runoff is confined within street curb, and 25-year runoff is confined within street right-of-way.

7. Conclusions

The proposed onsite drainage is designed to follow the existing pattern. The peak flow of 2-yr, 10-yr, 25-yr, and 100-yr 24-hour storms were calculated using the San Bernardino County Rational Method for the existing and the proposed conditions. The hydrographs were calculated using the County's Unit Hydrograph Method. Flood routing was performed using the County's Flood Routing Method. Onsite drainage system including curb openings, concrete ditch, parkway drains are sized to intercept, convey, and discharge onsite runoff and offsite runoff. The streets show to have enough capacity to contain 10-year flow within curb, and 25-year flow within right of way. A detention basin is proposed to mitigate peak flow. As infiltration is not feasible for the site, biofiltration BMP was proposed to satisfy the WQMP requirements. Overall, the proposed project does not have negative impacts to the surrounding area.

References

1. San Bernardino County Hydrology Manual, August 1986.
2. Detention Basin Design Criteria for San Bernardino County, 1987
3. San Bernardino County, CivilDesign Engineering Software, Version 7.1
4. Bentley FlowMaster V8i, Bentley System Inc., 2009.
5. Revised Preliminary Geotechnical Investigation for Proposed Water Quality Improvements, Southeast Corner of Phillips Boulevard and Pipeline Avenue (San Bernardino County APN Parcel Numbers 1013-111-01, 1013-161-01, and 1013-111-02), Chino, California, Albus Associates, June 19, 2026

Table 1 – Rainfall and AMC Criteria

Frequency	Proposed		Existing	
	Rainfall	AMC	Rainfall	AMC
2-yr	2	I	2	I
10-yr	10	II	5	I
25-yr	25	III	10	II
100-yr	100	III	25	II

Table 2 – NOAA Atlas 14 Point Precipitation

Frequency	1-h	6-h	24-h
	(in)	(in)	(in)
2-yr	0.6	1.59	2.81
5-yr	0.79	2.06	3.7
10-yr	0.95	2.45	4.44
25-yr	1.17	2.98	5.47
100-yr	1.54	3.8	7.11

Table 3 – Existing Hydrology (Rational Method)

Frequency	Subarea	Area	1-hr	AMC	Imp	Length	Elev.1	Elev.2	Tc	Q
		(ac)	(in)			(ft)			(min)	(cfs)
2-yr	A	24.16	0.6	I	0.1	1441	847.7	830	18.56	7.52
	B (offsite)	1.61			0.5	1687	849.4	830		
10-yr	A	24.16	0.79	I	0.1	1441	847.7	830	18.56	14.76
	B (offsite)	1.61			0.5	1687	849.4	830		
25-yr	A	24.16	0.95	II	0.1	1441	847.7	830	23.22	25.67
	B (offsite)	1.61			0.5	1687	849.4	830		
100-yr	A	24.16	1.17	II	0.1	1441	847.7	830	23.22	34.69
	B (offsite)	1.61			0.5	1687	849.4	830		
Total		25.77								

Table 4 – Existing Hydrology (Unit Hydrograph)

(Soil Type=A, Imp=0.1)

Frequency	Area	1-hr	6-hr	24-hr	AMC	CN[(1)]	Tc	Q	Qallow
	(ac)	(in)	(in)	(in)			(min)	(cfs)	(cfs)
2-yr	25.77	0.6	1.59	2.81	I	67	18.56	12.1	10.97
10-yr	25.77	0.79	2.06	3.7	I	67	18.56	18.87	17.11
25-yr	25.77	0.95	2.45	4.44	II	67	23.22	25.8	23.39
100-yr	25.77	1.17	2.98	5.47	II	67	23.22	33.85	30.69

Table 5 – Proposed Hydrology (Rational Method)

(Soil Type=A)

Frequency	Subarea	Area	1-hr	AMC	Imp	Length	Elev.1	Elev.2	Tc	Q
		(ac)	(in)			(ft)			(min)	(cfs)
2-yr	A	11.07	0.6	I	0.4	1,764	845.5	830.5	13.82	11.91
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
10-yr	A	11.07	0.95	II	0.4	1,764	845.5	830.5	19.37	27.00
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
25-yr	A	11.07	1.17	III	0.4	1,764	845.5	830.5	18.31	39.89
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
100-yr	A	11.07	1.54	III	0.4	1,764	845.5	830.5	17.39	57.37
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
	to street[(1)]	1.93								
Total		25.77								

[(1)] Areas that drain towards offsite streets. Not included in onsite storm drain calculations.

Table 6 – Proposed Hydrology (Unit Hydrograph)

(Soil Type=A, Imp=0.4)

Frequency	Area	1-hr	6-hr	24-hr	AMC	CN(1)	Tc	Q
	(ac)	(in)	(in)	(in)			(min)	(cfs)
2yr	23.84	0.6	1.59	2.81	I	32	13.82	21.37
10-yr	23.84	0.95	2.45	4.44	II	32	19.37	31.07
25-yr	23.84	1.17	2.98	5.47	III	32	18.31	43.78
100-yr	23.84	1.54	3.8	7.11	III	32	17.39	61.03

Table 7 – Detention Basin Outlet Capacity Calculation

(opening 4'x1'@0.5%)

Elevation	Depth	Q_{out}
(ft)	(ft)	(cfs)
827.4	0	0
827.6	0.2	2.04
827.8	0.4	5.5
828	0.6	6.09(1)
828.9	1.5	19.25(1)
829	1.6	20.19(1)
829.5	2.1	24.35(1)
830	2.6	27.9(1)
831	3.6	29.54(2)

(1) Orifice flow calculator
(2) Box pipe full capacity

Table 8 – Detention Basin Stage-Volume-Discharge Relation

Stage	Depth	Area	Volume	Cumulative Volume	Cumulative Volume	Q_{out}[2]
(ft)	(ft)	(sf)	(cf)	(cf)	(ac-ft)	(cfs)
827.4[1]	0	15,685	0	0	0.000	0
827.6	0.2	16,042	3,173	3,173	0.073	2.02
827.8	0.4	16,400	3,244	6,417	0.147	5.5
828	0.6	16,756	3,316	9,733	0.223	6.09
828.9	1.5	17,974	15,628	25,361	0.582	19.25
829	1.6	18,109	1,804	27,165	0.624	20.19
829.5	2.1	18,784	9,223	36,388	0.835	24.35
830	2.6	19,459	9,5,61	45,949	1.055	27.90
831	3.6	20,868	2,0164	66,113	1.518	29.54

[1] Invert of outlet opening (4'x1')
[2] See Table 7

Table 9 – Detention Basin Routing Summary

Frequency	**Area**	**Q_{in}**	**Q_{out}**	**Q_{allow}**	**H_{max}**	**V_{in}**	**V_{remain}**	**Draw-down[1]**
	(ac)	(cfs)	(cfs)	(ft)	(ft)	(ac-ft)	(ac-ft)	(hr)
2-yr	23.84	21.37	9.75	10.97	0.85	2.22	0	8.75
10-yr	23.84	31.07	17.02	17.11	1.35	3.71	0	9.08
25-yr	23.84	43.78	23.05	23.39	1.94	5.82	0	9.25
100-yr	23.84	61.03	28.30	30.69	2.84	8.29	0	9.42

[1] From time reaching peak depth to empty

Table 10 – Catch Basin Sizing

Q_{100}[1]	Width	Slope	Depth	Count	Water Depth
(cfs)	(ft)		(in)		(ft)
61.03	5	0.02	8	2	0.64

[1] Q_{100} in Table 6.

Table 11 – Parkway Drain Sizing

Width	Depth	Slope	Count	$Q_{capacity}$	Q_{100_out}	Status
(ft)	(ft)	(%)		(cfs)	(cfs)	
5	0.33	2	4	8.14x4=32.56	28.30	OK

Table 12 – Concrete Ditch Sizing

Area	Q_{100}	Bottom Width	Slope	Water Depth
(ac)	(cfs)	(ft)	(%)	(ft)
1.75	4.48	4	0.4	0.38

(1) Prorated from Q_{100} in Table 6.

Table 13 – Down Drain Sizing

Down drain	Area(1)	Q_{100}(1)	Width	Slope	Water Depth	Velocity
	(ac)	(cfs)	(ft)		(ft)	(ft/s)
1&2	11.92	30.52	3	3:1	0.39	26.07

(2) Half of area and Q_{100} in Table 6.

Table 14 – Grouted Riprap Sizing

Q_{100}	Velocity	Length	Width	T-thickness	Cutoff	Filter Thickness	D_{50}
(cfs)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(in)	(in)
30.52	26.07	16	8	5	8	12	1-ton

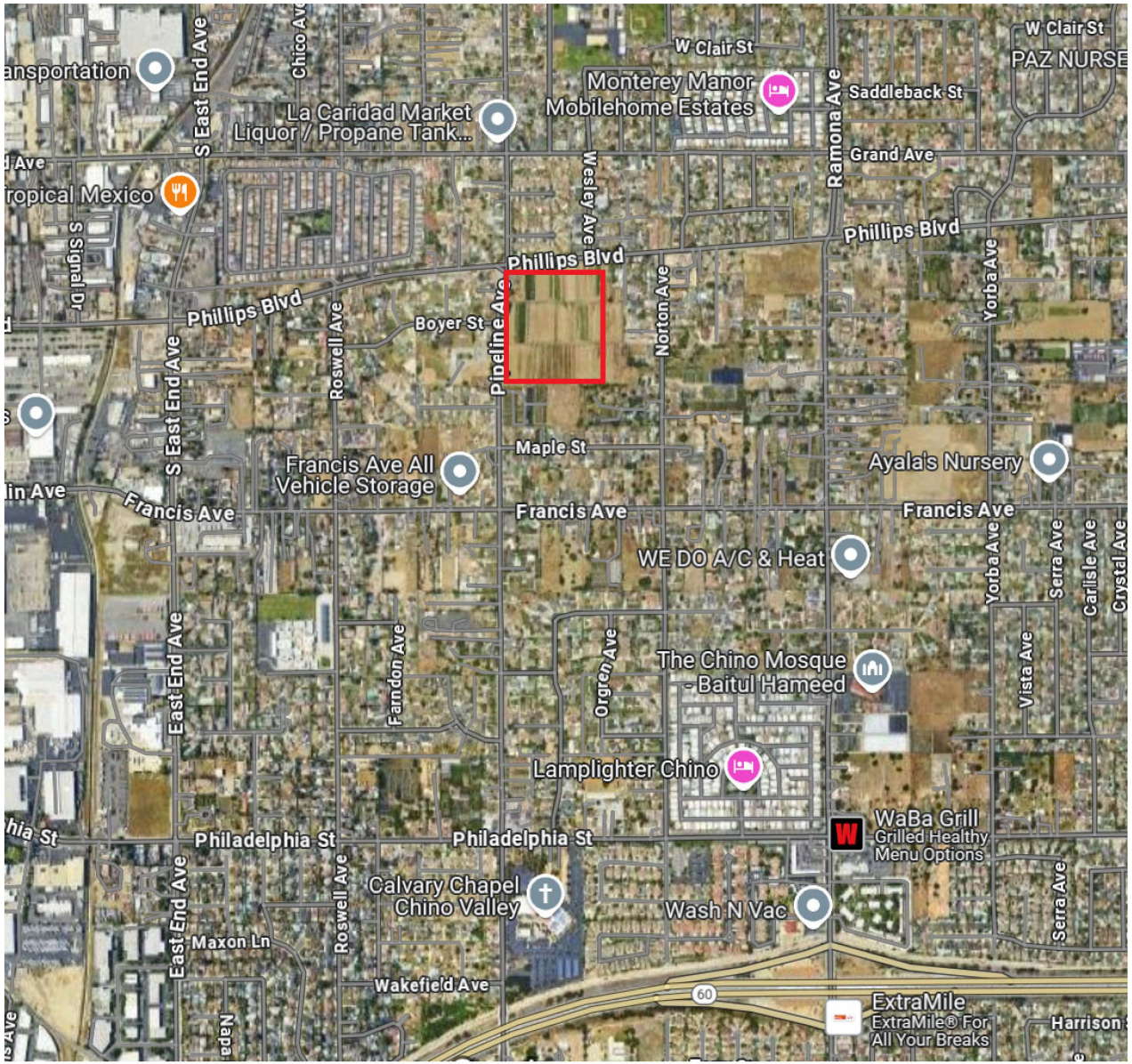
Table 15 – Street Capacity Evaluation

Section #	Street Slope	Q10[(1)]	Water Depth	Within Curb?	Q25[(1)]	Water Depth	Within R/W?
		(cfs)	(ft)		(cfs)	(ft)	
1	0.01	14.43	0.42	Y	20.33	0.46	Y
2	0.01	10.4	0.38	Y	14.65	0.42	Y
Detention Q_{out}		17.02			23.05		

(1) Prorated from Q in Table 6.

APPENDIX A

Vicinity Map


W Clair St
Monterey Manor Mobilehome Estates
Saddleback St
Ramona Ave
Grand Ave
La Caridad Market Liquor / Propane Tank...
Wesley Ave
Phillips Blvd
Norton Ave
Yorba Ave
Boyer St
Pipeline Ave
Roswell Ave
S East End Ave
Maple St
Francis Ave All Vehicle Storage
Ayala's Nursery
Francis Ave
WE DO A/C & Heat
Serra Ave
Carlisle Ave
Crystal Ave
Vista Ave
Farndon Ave
Orgren Ave
The Chino Mosque - Baitul Hameed
Lamplighter Chino
WaBa Grill
Grilled Healthy Menu Options
Philadelphia St
Calvary Chapel Chino Valley
Wash N Vac
Maxon Ln
Wakefield Ave
60
ExtraMile
ExtraMile® For All Your Breaks
Harrison

APPENDIX B

Hydrologic Data
&
References



POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

PF tabular | PF graphical | Supplementary information

Print page

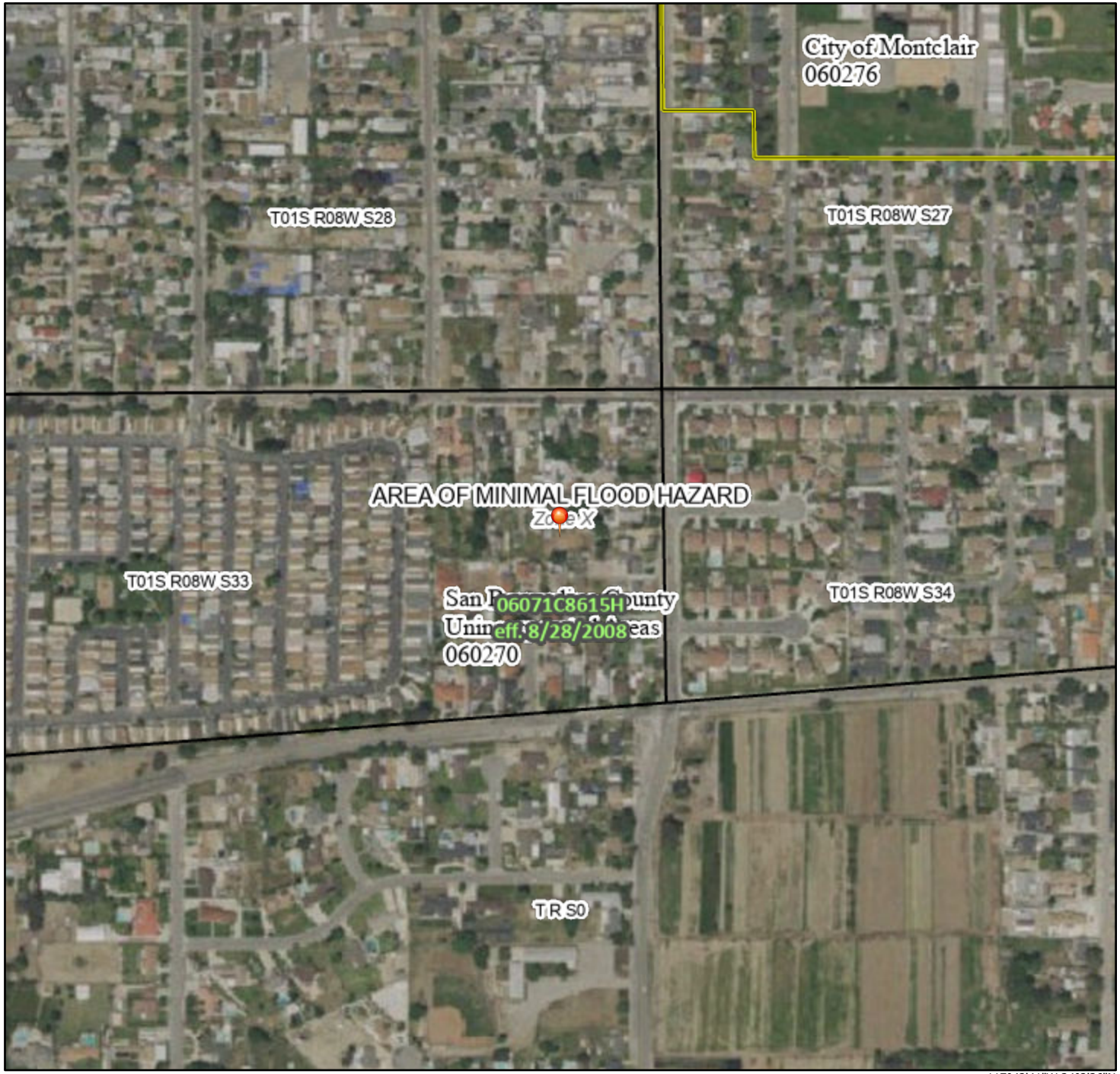
PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.121** (0.101-0.146)	**0.158** (0.132-0.192)	**0.209** (0.173-0.254)	**0.251** (0.207-0.307)	**0.310** (0.247-0.393)	**0.357** (0.278-0.463)	**0.406** (0.308-0.540)	**0.458** (0.337-0.627)	**0.530** (0.374-0.759)	**0.589** (0.401-0.873)
10-min	**0.173** (0.145-0.210)	**0.227** (0.189-0.275)	**0.299** (0.249-0.363)	**0.360** (0.296-0.441)	**0.444** (0.354-0.564)	**0.511** (0.398-0.663)	**0.582** (0.441-0.774)	**0.656** (0.483-0.899)	**0.760** (0.536-1.09)	**0.844** (0.574-1.25)
15-min	**0.209** (0.175-0.253)	**0.274** (0.229-0.332)	**0.362** (0.301-0.439)	**0.435** (0.358-0.533)	**0.537** (0.428-0.682)	**0.618** (0.482-0.802)	**0.703** (0.534-0.936)	**0.793** (0.585-1.09)	**0.919** (0.649-1.32)	**1.02** (0.695-1.51)
30-min	**0.308** (0.257-0.372)	**0.403** (0.336-0.488)	**0.531** (0.442-0.645)	**0.639** (0.526-0.782)	**0.789** (0.628-1.00)	**0.908** (0.707-1.18)	**1.03** (0.784-1.38)	**1.16** (0.859-1.60)	**1.35** (0.953-1.93)	**1.50** (1.02-2.22)
60-min	**0.458** (0.382-0.554)	**0.599** (0.500-0.726)	**0.790** (0.657-0.960)	**0.950** (0.783-1.16)	**1.17** (0.934-1.49)	**1.35** (1.05-1.75)	**1.54** (1.17-2.04)	**1.73** (1.28-2.38)	**2.01** (1.42-2.87)	**2.23** (1.52-3.31)
2-hr	**0.688** (0.574-0.832)	**0.897** (0.748-1.09)	**1.17** (0.975-1.42)	**1.40** (1.15-1.72)	**1.71** (1.36-2.17)	**1.95** (1.52-2.53)	**2.20** (1.67-2.93)	**2.46** (1.82-3.38)	**2.82** (1.99-4.04)	**3.11** (2.11-4.61)
3-hr	**0.872** (0.728-1.06)	**1.13** (0.945-1.37)	**1.48** (1.23-1.79)	**1.76** (1.45-2.15)	**2.14** (1.70-2.72)	**2.44** (1.90-3.16)	**2.74** (2.08-3.65)	**3.06** (2.25-4.19)	**3.49** (2.46-5.00)	**3.83** (2.61-5.69)
6-hr	**1.23** (1.02-1.48)	**1.59** (1.33-1.93)	**2.06** (1.72-2.51)	**2.45** (2.02-3.00)	**2.98** (2.37-3.78)	**3.38** (2.63-4.39)	**3.80** (2.88-5.05)	**4.23** (3.12-5.79)	**4.82** (3.40-6.89)	**5.28** (3.59-7.83)
12-hr	**1.62** (1.35-1.96)	**2.11** (1.76-2.55)	**2.74** (2.28-3.34)	**3.27** (2.70-4.01)	**3.99** (3.17-5.06)	**4.54** (3.54-5.89)	**5.12** (3.88-6.81)	**5.71** (4.21-7.83)	**6.53** (4.61-9.34)	**7.17** (4.88-10.6)
	2.14	**2.81**	**3.70**	**4.44**	**5.47**	**6.27**	**7.11**	**7.98**	**9.20**	**10.2**

National Flood Hazard Layer FIRMette

FEMA

117°43'18"W 34°3'6"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

117°42'41"W 34°2'36"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

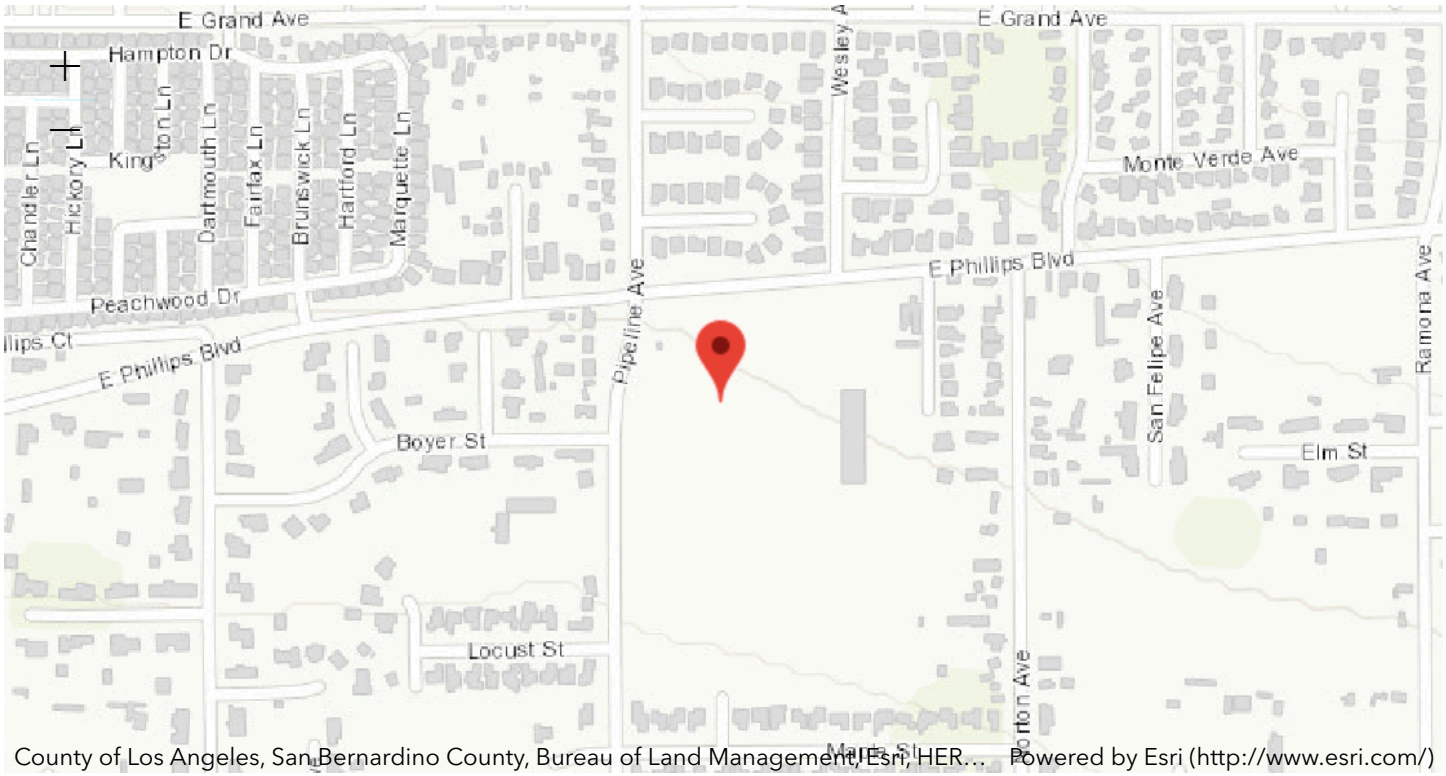
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/13/2026 at 11:23 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Floodplain Information

Latitude: 34.04393, Longitude: -117.71446



County: San Bernardino (34.04393, -117.71446)

Floodplain Layer	100-YR	200-YR	500-YR

FEMA Effective	N	N/A	N
DWR Awareness	N	N/A	N/A
Regional/Special Studies	N	N/A	N
USACE Comp. Study	N	N	N

Y: The location is within the floodplain
N: The location is not within the floodplain
N/A: Data not available
✓ = Active Layer(s)

Floodplains are displayed using semi transparent colors. When viewing overlapping floodplains, the combination of multiple semi transparent colors will not match the legend colors. For accurate color representation, view floodplains individually.

No legend

Search

Clear | Search

Basic Search

Enter keywords

Advanced Search

Clear | Search

Properties and Qualities Ratings

Open All | Close All

- Soil Chemical Properties
- Soil Erosion Factors
- Soil Health Properties
- Soil Physical Properties
- **Soil Qualities and Features**
  - AASHTO Group Classification (Surface)
  - AASHTO Group Index
  - Depth to a Selected Soil Restrictive Layer
  - Depth to Any Soil Restrictive Layer
  - Depth to Bedrock
  - Drainage Class
  - Frost Action
  - Frost-Free Days
  - Hydrologic Soil Group

View Description | View Rating

View Options

Map ☑

Table ☑

Description of Rating ☑

Rating Options ☑

Detailed Description ☐

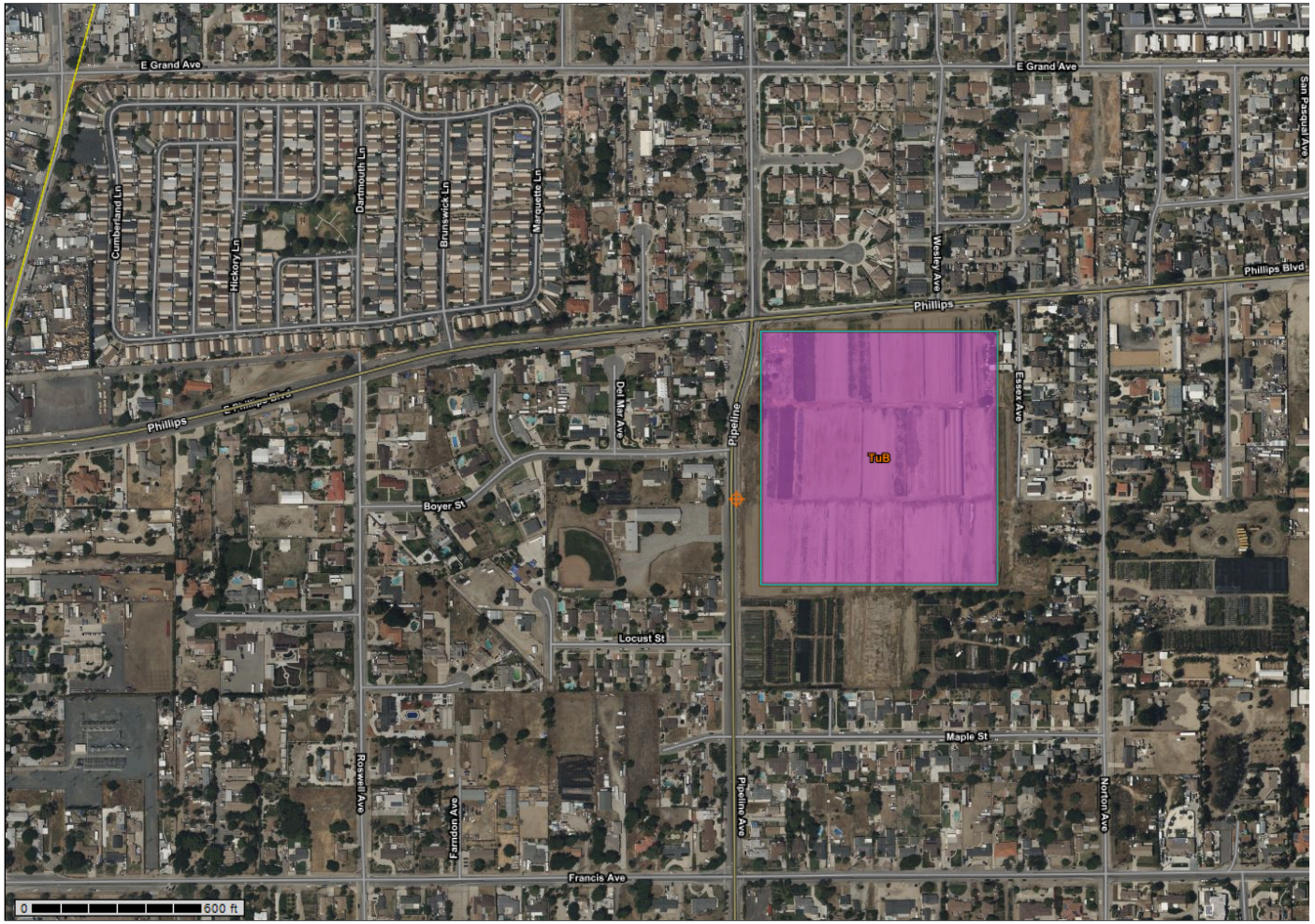
Advanced Options

Aggregation Method: Dominant Condition

Component Percent Cutoff:

Map — Hydrologic Soil Group

Scale (not to scale)



Warning: Soil Ratings Map may not be valid at this scale.

Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — San Bernardino County Southwestern Part, California (CA677)

View Options

Tie-break Rule
- Lower
- Higher

View Description **View Rating**

- Map Unit Name
- Parent Material Name
- Representative Slope
- Soil Slippage Potential
- Subsidence, Initial
- Subsidence, Total
- Unified Soil Classification (Selected Depth)
- Unified Soil Classification (Surface)

Water Features

Summary by Map Unit — San Bernardino County Southwestern Part, California (CA677)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
TuB	Tujunga loamy sand, 0 to 5 percent slopes	A	17.3	100.0%
Totals for Area of Interest			**17.3**	**100.0%**

Description — Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

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Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparral, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	71	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent.)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	25	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		77	86	91	94

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

Curve (1) Numbers of Hydrologic Soil-Cover Complexes For Pervious Areas-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (Continued)					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87

Notes:

1. All curve numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:

   Poor-Heavily grazed, regularly burned areas, or areas of high burn potential. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.

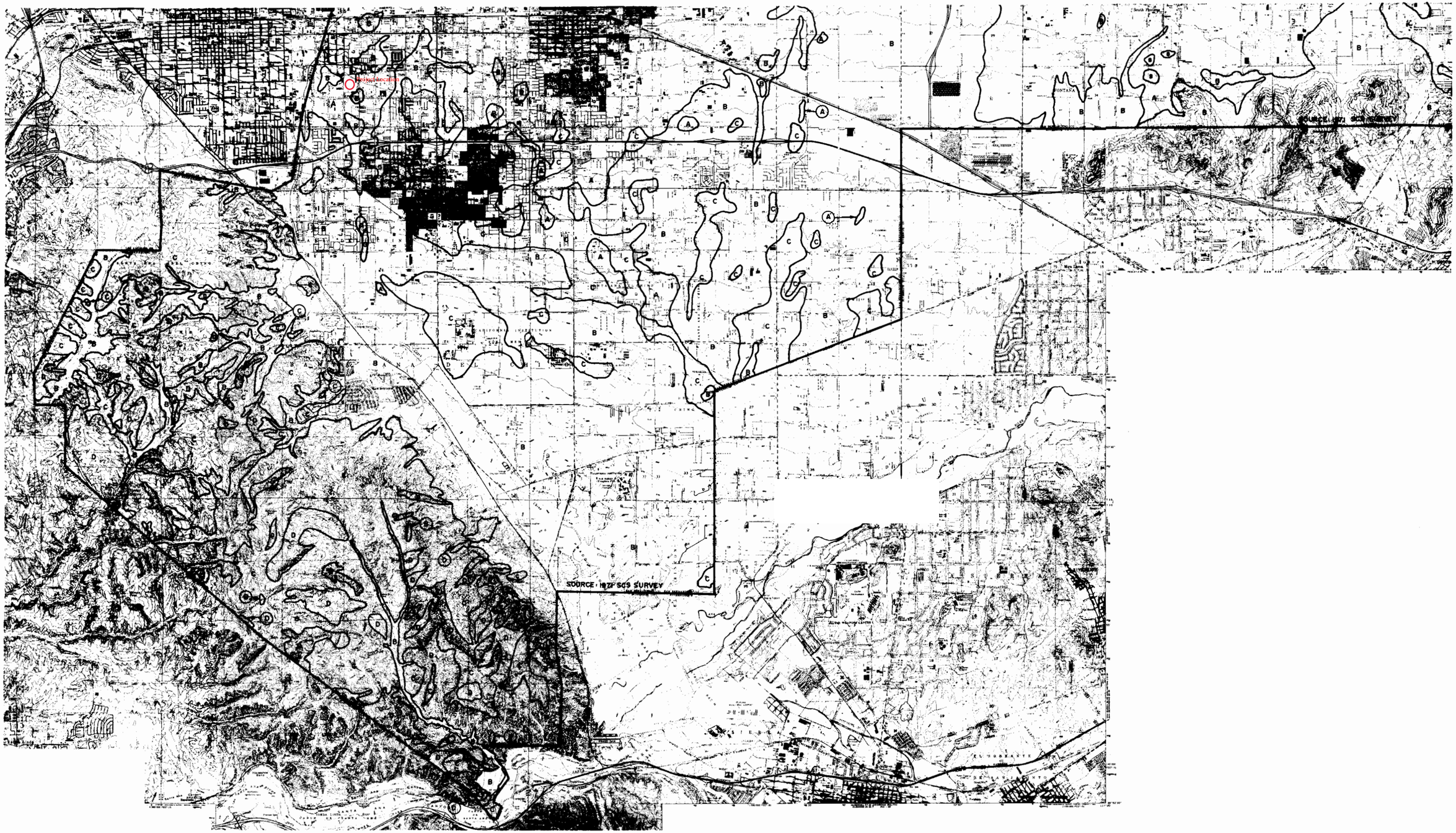
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.

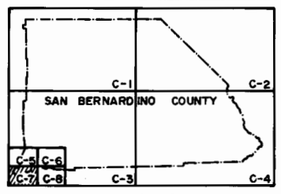
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Figure C-2 for definition of cover types.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (2 of 2)





INDEX MAP

LEGEND

SOIL GROUP BOUNDARY

A SOIL GROUP DESIGNATION

BOUNDARY OF INDICATED SOURCE

SCALE 1:48,000

SCALE REDUCED BY 1/2

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-C AREA

FIGURE C-15

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 0	0
Public Park	10 - 25	15
School	30 - 50	40
Single Family Residential: (3)		
2.5 acre lots	5 - 15	10
1 acre lots	10 - 25	20
2 dwellings/acre	20 - 40	30
3-4 dwellings/acre	30 - 50	40
5-7 dwellings/acre	35 - 55	50
8-10 dwellings/acre	50 - 70	60
More than 10 dwellings/acre	65 - 90	80
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 - 100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area shall always be made, and a review of aerial photos, where available, may assist in estimating the percentage of impervious cover in developed areas.

3. For typical equestrian subdivisions increase impervious area 5 percent over the values recommended in the table above.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

ACTUAL IMPERVIOUS COVER FOR DEVELOPED AREAS

Figure C-4



Technical Guidance Document for Water Quality Management Plans

Prepared by:
CDM Smith Inc.

Prepared for and Submitted by:
The County of San Bernardino Areawide Stormwater Program
NPDES No. CAS618036, ORDER No. R8-2010-0036

Submitted To:
California Water Quality Control Board – Santa Ana Region

June 7, 2013

Approval Date: June 21, 2013
Effective Date: September 19, 2013

5.4.2.1 Infiltration basin

An infiltration basin consists of an earthen basin constructed in naturally pervious soils with a flat bottom. An energy dissipating inlet must be provided, along with an emergency spillway to control excess flows. A forebay settling basin or separate treatment control measure must be provided as pretreatment. An infiltration basin allows retained runoff to percolate into the underlying soils in 48 hours or less. The bottom of an infiltration basin is typically vegetated with dryland grasses or vegetative ground cover. Other types of vegetation are permissible if they can survive periodic inundation and long inter-event dry periods.

The retention volume provided by an infiltration basin is a function of the infiltrating surface area on the basin bottom and the depth of water that is percolated and stored in the basin over the course of the storm and infiltrated within 48 hours after the basin is filled (see Table 5-4).

5.4.2.2 Infiltration trench

An infiltration trench is a long, narrow, rock-filled trench with no outlet other than an overflow outlet. Runoff is stored in the void space between stones and infiltrates through the bottom and sides of the trench. Pretreatment is important for limiting amounts of coarse sediment entering the trench which can clog and render the trench ineffective.

Retention volume provided by an infiltration trench is a function of the infiltrating surface area on the trench bottom and the depth of water that is either percolated over the course of the storm or stored within the BMP for percolation into underlying soils following the storm (Table 5-4). The volume of water that is stored in the trench includes both pore water in the trench gravel layer as well as up to one foot of allowable ponding above the gravel layer. Allowable ponding is limited by the requirement to drawdown ponded water within 48 hours following a storm event.

5.4.2.3 Bioretention with no Underdrain

Bioretention stormwater treatment facilities are shallow landscaped depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plants. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants.

Retention volume provided by a bioretention BMP with no underdrain is a function of the infiltrating surface area on the bioretention bottom and the depth of water that is either percolated over the course of the storm or stored within the BMP for percolation into underlying soils following the storm (Table 5-4). The volume of water that is stored in a bioretention area includes pore water in the amended soil and gravel layers as well as up to 1.5 ft of allowable ponding above the ammended soil layer. Allowable ponding is limited by the

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 0	0
Public Park	10 - 25	15
School	30 - 50	40
Single Family Residential: (3)		
2.5 acre lots	5 - 15	10
1 acre lots	10 - 25	20
2 dwellings/acre	20 - 40	30
3-4 dwellings/acre	30 - 50	40
5-7 dwellings/acre	35 - 55	50
8-10 dwellings/acre	50 - 70	60
More than 10 dwellings/acre	65 - 90	80
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 - 100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area shall always be made, and a review of aerial photos, where available, may assist in estimating the percentage of impervious cover in developed areas.

3. For typical equestrian subdivisions increase impervious area 5 percent over the values recommended in the table above.

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

ACTUAL IMPERVIOUS COVER
FOR
DEVELOPED AREAS

Figure C-4

C.5. ANTECEDENT MOISTURE CONDITION (AMC)

The definitions for the AMC classifications are:

AMC I: Lowest runoff potential. The watershed soils are dry enough to allow satisfactory grading or cultivation to take place.

AMC II: Moderate runoff potential; an average study condition.

AMC III: Highest runoff potential. The watershed is practically saturated from antecedent rains. Heavy rainfall or light rainfall and low temperatures have occurred within the last five days.

For runoff hydrograph studies based on this manual it is assumed that a low AMC index (high loss rates) will be used in developing short return period storms, and a moderate to high AMC index (low loss rates) will be used in developing longer return period storms (e.g., 100 year). For the purposes of design hydrology, AMC I will be used for the 2- and 5-year return frequency storms. For the case of 10-, 25-, 50-year return frequency design storms, AMC II will be used. For 100-year storm analysis, AMC III shall be used. In detention basin design studies, AMC III conditions shall be considered in order to identify any downstream flooding potential.

C.5.1. Adjustment of Curve Numbers (CN) for AMC

The CN values selected for a particular soil cover type and quality also depend upon the AMC condition assumed. The CN values listed in Figure C-3 correspond to AMC II and require adjustment in order to represent either AMC I or AMC III. Table C.1 provides the necessary CN adjustments to account for AMC changes for hydrologic studies in San Bernardino County.

DETENTION BASIN DESIGN CRITERIA FOR SAN BERNARDINO COUNTY

The following design parameters and procedures are listed as guidelines to insure proper detention basin operation. When necessary, these guidelines may be modified if approved in writing by both the Flood Control District and Land Management Department.

I. Definitions

A. Regional Detention Basin

1. A basin which can be incorporated into the Flood Control District's existing or proposed drainage system,

2. Basin owned and operated by the Flood Control District, although it may be joint use, and

3. A basin which will reduce the downstream peak flow rate and the necessary downstream storm drain size.

B. Local Detention Basin

1. A basin which will not be incorporated into the Flood Control District's existing or proposed drainage system,

2. A basin owned by an individual or organization other than the Flood Control District, and

3. A basin which will reduce the downstream peak flow rate, but will not be considered in downsizing future downstream storm drains.

C. Joint Use Detention Basin: A regional or local detention basin which has an additional use such as football field, parking lot, golf course, lake or etc.

D. Temporary Detention Basin

1. A local detention basin used to reduce downstream peak flow rates until ultimate storm drain facilities can be constructed as part of a phased development, and

2. Generally the life of the basin shall not exceed 10 years.

SEE CHANGE PER ATTACHED MEMO

II. Basin Capacity and Outlet Drain

A. When a basin (regional, local, temporary or joint use) is to be used to mitigate downstream impacts due to increased flows generated by a development, the basin capacity and outlet size shall be such that the post-development peak flow rate generated by the site shall be less than or equal to 90% of the pre-development peak flow rate from the site for all frequency storms up to and including 100-year (i.e. the peak 2 year post-development flow rate is equal to or less than 90% of the peak 2 year pre-development flow rate from the site and etc. for all frequency storm events through 100-year).

1. Only 2, 10, 25 and 100-year storms need to be analyzed.

2. Additional studies shall be submitted where there exists more than one basin in the drainage area under review. The studies shall address the timing of the peak flow rates from the basins to ensure downstream flow rates are not increased.

B. When a basin (generally regional or regional joint use) is to be used to reduce the size of a master planned downstream drainage facility, the basin capacity and outlet size shall be such that the 100 year basin peak outflow rate is no greater than the downstream facility's design capacity.

1. Open channel design capacities shall be per the San Bernardino County Flood Control District Standard Plat 100 ("San Bernradino County Standards and Specifications"). A bulking factor is not necessary when the basin is designed to handle debris and the downstream channel is lined.

2. Pressure flow closed conduits shall be designed such that the hydraulic grade line is below the ground or street surface. In those reaches where no surface flow will be intercepted (now or in the future), a hydraulic grade line which encroaches on or is slightly higher than the ground or street surface will be acceptable.

3. Non-pressure flow closed conduit capacities shall be based on a flow depth no greater than 0.8 times the conduits diameter or height.

7. The basin capacity for detention basins located in watersheds known to have a high risk of burning, shall be increased as determined by the Flood Control District.

E. Outlet Drain

1. The outlet pipe for all basins except temporary basins shall be a minimum 24" RCP (1350 D minimum) for local basins and a minimum 36" RCP (1350 D minimum) for regional basins. The outlet pipe or conduit shall be encased with cut-off collars per the "Los Angeles County Flood Control Design Manual - Debris Dams and Basins" or designed per "Section 242. Cut-and-Cover Conduit Detail" of the Bureau of Reclamation's publication "Design of Small Dams".

   a) Reinforced concrete collars generally from 2 to 3 feet high, 12 to 18 inches wide, and spaced from 7 to 10 times their height shall be provided.

   b) All joints for pipes not encased shall be rubber gasketed.

   c) The pipe shall be capable of withstanding H20 live loads plus the applicable dead loads.

   d) Erosion control measures shall be provided at the outlet of the basin outlet pipe.

   e) Temporary basin outlet pipes may be a minimum 24" C.M.P., 12 gauge with seep rings. Design considerations shall be as stated above.

2. A metered outlet structure may be necessary to provide the necessary flow attenuation for all frequency storms. "V"-shaped weirs and notched weirs are preferred over other alternates because they do not plug with debris and trash as easily as other designs.

3. All detention basin outlets should be sized so the basin will drain within 24 hours after the basin reaches its 100 year peak depth/volume. If the basin does not drain in 24 hours, further studies using longer duration storms will be necessary. The basin storage volume (capacity) may need to be increased to accomodate subsequent storms.

4. Trash racks shall be provided at the inlet to the basin outlet structure(s).

5. Anti-vortex devises shall be provided where warranted.

6. A depth gauge shall be provided on the basin outlet structure in order to monitor debris deposition and basin operation.

F. Analysis Methodology

1. Pre and post development peak flow rates shall be developed using the procedures outlined in the San Bernardino County's Hydrology Manual.

2. Basin inflow hydrographs shall be developed using the procedures outlined in the San Bernardino County's Hydrology Manual.

3. Basin outflow hydrographs shall be developed by the Modified Puls Method.

4. Channel hydrograph routing shall be calculated by the convex channel routing method or by moving the hydrograph utilizing travel time.

III. Water Surface Elevation and Depth

A. Local Basins

1. When feasible the 100 year design water surface elevation should be at or below existing natural ground. Generally no more than 50% of the basins 100 year storage depth should be above existing ground (i.e., 50% or more of the 100-year minimum storage depth must be below the lowest ground outside basin).

2. The necessary storage depth for debris plus the two year flow attenuation shall be below existing ground.

3. The basin's maximum water depth for 100-year design should be 6 feet or less.

4. When site conditions warrant and safety can be assured, the above depth requirements may be modified if the following conditions are met.

a) The detention basin is designed in accordance with the Los Angeles County Flood Control Distrit's "Design Manual - Debris Dams and Basins".

E. Generally the spillway crest shall be at, or above the basin's design 100 year high water line.

V. Freeboard to the Top of Embankment

A. Local and temporary basins shall have a minimum 1-foot of freeboard above the 1000-year HWL on the emergency spillway or 2-feet of freeboard above the 100-year HWL in the basin, whichever is more stringent.

B. Regional basins shall have a minimum 2-feet of freeboard above the 1000 year HWL on the emergency spillway. For basins with larger surface areas the freeboard shall be increased due to possible wave action. Also, a Seismic Seiche analysis shall be provided to determine necessary freeboard. Reference "Design of Small Dams" by the United States Department of Interior.

C. Joint use basins shall conform to the applicable local or regional freeboard requirements. For smaller basins such as parking lot and tennis court basins, the freeboard conditions may be reduced.

VI. Basin Embankment

A. Basin side slopes should be of 3H:1V or flatter on the wet side and 2H:1V or flatter on the dry side. Steeper slopes may be acceptable on a case by case basis if rock lined and recommended in the soils and geotechnical report. (See items C and D below for expanded requirements for report.)

B. Top Width of Levee

1. Regional and local basins - 15 feet minimum
2. Joint use - site specific
3. Refer to Section IX.C.

C. For design of the embankment abutments and adjacent slopes, a soils and geotechnical report shall be prepared by a soils and geotechnical engineer with a demonstrated expertise in earth fill dam design. The report shall be reviewed and approved by the Land Management Department and the San Bernardino County Flood Control District. The report shall include:

a) Site geology including bedding, foliation, fracture, joint, fault and land slide plane attitudes.

C. A 15-foot wide roadway shall be provided along the top of embankment, across the spillway and around the basin. The intent of this criteria is to have continuous access around, and to, the basin for maintenance purposes. Under certain circumstances where it can be shown the recommended top width is not necessary for structural safety and maintenance, the criteria may be modified. Approval will be required by both the Land Management Department and the Flood Control District.

1. If access across the spillway is not provided minimum 40' X 60' turn arounds shall be provided on both sides of the spillway.

2. If there exists adequate access for maintenance, this requirement may be amended for local, temporary or joint use basins.

D. Access ramps shall be provided to the basin floor.

1. Minimum of one - 15 foot wide ramp for local basins.
2. Minimum of two - 15 foot wide ramps for regional basins.

E. The maximum roadway or access ramp slope shall be 10%.

F. The minimum access and roadway inside turning radius shall be 35 feet.

X. Fencing

A. All basins shall be fenced with 6-foot chain link fencing per Cal Trans standards or other approved barrier unless otherwise approved by the Land Management Department and the Flood Control District. Joint use basin fencing will be site specific and must meet the needs of all agencies utilizing the basin.

B. All regional basin chain link fencing shall have a 1 foot wide painted horizontal orange stripe at the mid height of the fence.

C. Access to the basins shall be gated and locked.

XI. Rights-of-Way

A. Sufficient rights-of-way shall be provided for the construction and economical maintenance of the basin(s), (including all fill and cut slopes) and shall include sufficient area to provide for an access road from a dedicated public street to the basin.

APPENDIX C

Rational Method Calculation

EXISTING CONDITION

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/11/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.600 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

AGRICULTURE ROW CROPS subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 67.00
Adjusted SCS curve number for AMC 1 = 47.40
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.840(In/Hr)
Initial subarea data:
Initial area flow distance = 1441.000(Ft.)
Top (of initial area) elevation = 847.700(Ft.)
Bottom (of initial area) elevation = 830.000(Ft.)
Difference in elevation = 17.700(Ft.)
Slope = 0.01228 s(%)= 1.23
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 23.215 min.
Rainfall intensity = 1.061(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.187
Subarea runoff = 4.801(CFS)
Total initial stream area = 24.160(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.840(In/Hr)

++
Process from Point/Station 110.000 to Point/Station 210.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 24.160(Ac.)
Runoff from this stream = 4.801(CFS)
Time of concentration = 23.21 min.
Rainfall intensity = 1.061(In/Hr)
Area averaged loss rate (Fm) = 0.8399(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000

++
Process from Point/Station 200.000 to Point/Station 210.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.5000 Max loss rate(Fm)= 0.500(In/Hr)
Initial subarea data:
Initial area flow distance = 1687.000(Ft.)

```
Top (of initial area) elevation =   849.400(Ft.)
Bottom (of initial area) elevation =   830.000(Ft.)
Difference in elevation =    19.400(Ft.)
Slope =    0.01150  s(%)=       1.15
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   18.563 min.
Rainfall intensity =      1.213(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.529
Subarea runoff =      1.033(CFS)
Total initial stream area =        1.610(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.500(In/Hr)


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Process from Point/Station      110.000 to Point/Station      210.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.610(Ac.)
Runoff from this stream =      1.033(CFS)
Time of concentration =   18.56 min.
Rainfall intensity =     1.213(In/Hr)
Area averaged loss rate (Fm) =    0.5000(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5000
Summary of stream data:

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


1      4.80    24.160     23.21    0.840      1.061
2      1.03     1.610     18.56    0.500      1.213
Qmax(1) =
           1.000 *    1.000 *     4.801) +
           0.786 *    1.000 *     1.033) + =       5.613
Qmax(2) =
           1.690 *    0.800 *     4.801) +
           1.000 *    1.000 *     1.033) + =       7.520

Total of 2 streams to confluence:
Flow rates before confluence point:
       4.801       1.033
Maximum flow rates at confluence using above data:
        5.613        7.520
Area of streams before confluence:
       24.160        1.610
Effective area values after confluence:
       25.770       20.929
Results of confluence:
Total flow rate =      7.520(CFS)
Time of concentration =    18.563 min.
Effective stream area after confluence =     20.929(Ac.)
Study area average Pervious fraction(Ap) =  0.969
Study area average soil loss rate(Fm) =    0.819(In/Hr)
Study area total (this main stream) =      25.77(Ac.)
End of computations, Total Study Area =           25.77 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.969
Area averaged SCS curve number =  64.8
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/11/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.790 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 1

++
Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

AGRICULTURE ROW CROPS subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 67.00
Adjusted SCS curve number for AMC 1 = 47.40
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.840(In/Hr)
Initial subarea data:
Initial area flow distance = 1441.000(Ft.)
Top (of initial area) elevation = 847.700(Ft.)
Bottom (of initial area) elevation = 830.000(Ft.)
Difference in elevation = 17.700(Ft.)
Slope = 0.01228 s(%)= 1.23
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 23.215 min.
Rainfall intensity = 1.397(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.359
Subarea runoff = 12.104(CFS)
Total initial stream area = 24.160(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.840(In/Hr)

++
Process from Point/Station 110.000 to Point/Station 210.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 24.160(Ac.)
Runoff from this stream = 12.104(CFS)
Time of concentration = 23.21 min.
Rainfall intensity = 1.397(In/Hr)
Area averaged loss rate (Fm) = 0.8399(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000

++
Process from Point/Station 200.000 to Point/Station 210.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.5000 Max loss rate(Fm)= 0.500(In/Hr)
Initial subarea data:
Initial area flow distance = 1687.000(Ft.)

```
Top (of initial area) elevation =   849.400(Ft.)
Bottom (of initial area) elevation =   830.000(Ft.)
Difference in elevation =    19.400(Ft.)
Slope =    0.01150  s(%)=       1.15
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   18.563 min.
Rainfall intensity =      1.597(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.618
Subarea runoff =      1.590(CFS)
Total initial stream area =        1.610(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.500(In/Hr)


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Process from Point/Station      110.000 to Point/Station      210.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.610(Ac.)
Runoff from this stream =      1.590(CFS)
Time of concentration =   18.56 min.
Rainfall intensity =     1.597(In/Hr)
Area averaged loss rate (Fm) =    0.5000(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5000
Summary of stream data:

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


1     12.10    24.160     23.21    0.840      1.397
2      1.59     1.610     18.56    0.500      1.597
Qmax(1) =
           1.000 *    1.000 *    12.104) +
           0.817 *    1.000 *     1.590) + =      13.404
Qmax(2) =
           1.360 *    0.800 *    12.104) +
           1.000 *    1.000 *     1.590) + =      14.755

Total of 2 streams to confluence:
Flow rates before confluence point:
      12.104       1.590
Maximum flow rates at confluence using above data:
       13.404       14.755
Area of streams before confluence:
       24.160        1.610
Effective area values after confluence:
       25.770       20.929
Results of confluence:
Total flow rate =     14.755(CFS)
Time of concentration =    18.563 min.
Effective stream area after confluence =     20.929(Ac.)
Study area average Pervious fraction(Ap) =  0.969
Study area average soil loss rate(Fm) =    0.819(In/Hr)
Study area total (this main stream) =      25.77(Ac.)
End of computations, Total Study Area =           25.77 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.969
Area averaged SCS curve number =  64.8
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/11/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 25.0
Computed rainfall intensity:
Storm year = 25.00 1 hour rainfall = 0.950 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

AGRICULTURE ROW CROPS subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 67.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)
Initial subarea data:
Initial area flow distance = 1441.000(Ft.)
Top (of initial area) elevation = 847.700(Ft.)
Bottom (of initial area) elevation = 830.000(Ft.)
Difference in elevation = 17.700(Ft.)
Slope = 0.01228 s(%)= 1.23
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 23.215 min.
Rainfall intensity = 1.679(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.590
Subarea runoff = 23.942(CFS)
Total initial stream area = 24.160(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.578(In/Hr)

++

Process from Point/Station 110.000 to Point/Station 210.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 24.160(Ac.)
Runoff from this stream = 23.942(CFS)
Time of concentration = 23.21 min.
Rainfall intensity = 1.679(In/Hr)
Area averaged loss rate (Fm) = 0.5783(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000

++

Process from Point/Station 200.000 to Point/Station 210.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.5000 Max loss rate(Fm)= 0.489(In/Hr)
Initial subarea data:
Initial area flow distance = 1687.000(Ft.)
Top (of initial area) elevation = 849.400(Ft.)
Bottom (of initial area) elevation = 830.000(Ft.)

```
Difference in elevation =    19.400(Ft.)
Slope =    0.01150  s(%)=       1.15
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   18.563 min.
Rainfall intensity =      1.921(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.671
Subarea runoff =      2.074(CFS)
Total initial stream area =        1.610(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.489(In/Hr)


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Process from Point/Station      110.000 to Point/Station      210.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.610(Ac.)
Runoff from this stream =      2.074(CFS)
Time of concentration =   18.56 min.
Rainfall intensity =     1.921(In/Hr)
Area averaged loss rate (Fm) =    0.4889(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5000
Summary of stream data:

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


1     23.94    24.160     23.21    0.578      1.679
2      2.07     1.610     18.56    0.489      1.921
Qmax(1) =
           1.000 *    1.000 *    23.942) +
           0.832 *    1.000 *     2.074) + =      25.667
Qmax(2) =
           1.219 *    0.800 *    23.942) +
           1.000 *    1.000 *     2.074) + =      25.412

Total of 2 streams to confluence:
Flow rates before confluence point:
      23.942       2.074
Maximum flow rates at confluence using above data:
       25.667       25.412
Area of streams before confluence:
       24.160        1.610
Effective area values after confluence:
       25.770       20.929
Results of confluence:
Total flow rate =     25.667(CFS)
Time of concentration =    23.215 min.
Effective stream area after confluence =     25.770(Ac.)
Study area average Pervious fraction(Ap) =  0.969
Study area average soil loss rate(Fm) =    0.573(In/Hr)
Study area total (this main stream) =      25.77(Ac.)
End of computations, Total Study Area =           25.77 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.969
Area averaged SCS curve number =  64.8
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/11/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.170 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

AGRICULTURE ROW CROPS subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 67.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.578(In/Hr)
Initial subarea data:
Initial area flow distance = 1441.000(Ft.)
Top (of initial area) elevation = 847.700(Ft.)
Bottom (of initial area) elevation = 830.000(Ft.)
Difference in elevation = 17.700(Ft.)
Slope = 0.01228 s(%)= 1.23
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 23.215 min.
Rainfall intensity = 2.068(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.648
Subarea runoff = 32.399(CFS)
Total initial stream area = 24.160(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.578(In/Hr)

++

Process from Point/Station 110.000 to Point/Station 210.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 24.160(Ac.)
Runoff from this stream = 32.399(CFS)
Time of concentration = 23.21 min.
Rainfall intensity = 2.068(In/Hr)
Area averaged loss rate (Fm) = 0.5783(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000

++

Process from Point/Station 200.000 to Point/Station 210.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.5000 Max loss rate(Fm)= 0.489(In/Hr)
Initial subarea data:
Initial area flow distance = 1687.000(Ft.)
Top (of initial area) elevation = 849.400(Ft.)
Bottom (of initial area) elevation = 830.000(Ft.)

```
Difference in elevation =    19.400(Ft.)
Slope =    0.01150  s(%)=       1.15
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   18.563 min.
Rainfall intensity =      2.365(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.714
Subarea runoff =      2.719(CFS)
Total initial stream area =        1.610(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.489(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      210.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.610(Ac.)
Runoff from this stream =      2.719(CFS)
Time of concentration =   18.56 min.
Rainfall intensity =     2.365(In/Hr)
Area averaged loss rate (Fm) =    0.4889(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5000
Summary of stream data:

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


1     32.40    24.160     23.21    0.578      2.068
2      2.72     1.610     18.56    0.489      2.365
Qmax(1) =
           1.000 *    1.000 *    32.399) +
           0.842 *    1.000 *     2.719) + =      34.687
Qmax(2) =
           1.199 *    0.800 *    32.399) +
           1.000 *    1.000 *     2.719) + =      33.789

Total of 2 streams to confluence:
Flow rates before confluence point:
      32.399       2.719
Maximum flow rates at confluence using above data:
       34.687       33.789
Area of streams before confluence:
       24.160        1.610
Effective area values after confluence:
       25.770       20.929
Results of confluence:
Total flow rate =     34.687(CFS)
Time of concentration =    23.215 min.
Effective stream area after confluence =     25.770(Ac.)
Study area average Pervious fraction(Ap) =  0.969
Study area average soil loss rate(Fm) =    0.573(In/Hr)
Study area total (this main stream) =      25.77(Ac.)
End of computations, Total Study Area =           25.77 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.969
Area averaged SCS curve number =  64.8
```

PROPOSED CONDITION

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/13/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 2.0
Computed rainfall intensity:
Storm year = 2.00 1 hour rainfall = 0.600 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 1

++

Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.6000 Max loss rate(Fm)= 0.600(In/Hr)
Initial subarea data:
Initial area flow distance = 140.000(Ft.)
Top (of initial area) elevation = 45.500(Ft.)
Bottom (of initial area) elevation = 44.000(Ft.)
Difference in elevation = 1.500(Ft.)
Slope = 0.01071 s(%)= 1.07
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.368 min.
Rainfall intensity = 2.112(In/Hr) for a 2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.644
Subarea runoff = 0.422(CFS)
Total initial stream area = 0.310(Ac.)
Pervious area fraction = 0.600
Initial area Fm value = 0.600(In/Hr)

++

Process from Point/Station 110.000 to Point/Station 120.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 44.000(Ft.)
End of street segment elevation = 30.500(Ft.)
Length of street segment = 1624.000(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 = 16.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.080
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 = 12.000(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 = 2.747(CFS)
Depth of flow = 0.284(Ft.), Average velocity = 1.834(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 7.886(Ft.)
Flow velocity = 1.83(Ft/s)
Travel time = 14.75 min. TC = 22.12 min.
Adding area flow to street

```
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.600(In/Hr)
Rainfall intensity =      1.092(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.405
Subarea runoff =      4.478(CFS) for   10.760(Ac.)
Total runoff =      4.900(CFS)
Effective area this stream =       11.07(Ac.)
Total Study Area (Main Stream No. 1) =       11.07(Ac.)
Area averaged Fm value =    0.600(In/Hr)
Street flow at end of street =      4.900(CFS)
Half street flow at end of street =      2.450(CFS)
Depth of flow =   0.331(Ft.), Average velocity =   2.087(Ft/s)
Flow width (from curb towards crown)=  10.234(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.070(Ac.)
Runoff from this stream =      4.900(CFS)
Time of concentration =   22.12 min.
Rainfall intensity =     1.092(In/Hr)
Area averaged loss rate (Fm) =    0.6000(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.500(In/Hr)
Initial subarea data:
Initial area flow distance =   400.000(Ft.)
Top (of initial area) elevation =    49.400(Ft.)
Bottom (of initial area) elevation =    43.500(Ft.)
Difference in elevation =     5.900(Ft.)
Slope =    0.01475  s(%)=       1.47
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.932 min.
Rainfall intensity =      1.765(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.645
Subarea runoff =      1.993(CFS)
Total initial stream area =        1.750(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.500(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      220.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =    43.500(Ft.)
Downstream point elevation =    42.000(Ft.)
Channel length thru subarea  =   168.000(Ft.)
Channel base width      =    4.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      1.993(CFS)
Depth of flow =   0.170(Ft.), Average velocity =   2.701(Ft/s)
Channel flow top width =    4.680(Ft.)
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Flow Velocity =    2.70(Ft/s)
Travel time  =    1.04 min.
Time of concentration =   10.97 min.
Critical depth =      0.191(Ft.)


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Process from Point/Station      220.000 to Point/Station      230.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    42.000(Ft.)
End of street segment elevation =    30.500(Ft.)
Length of street segment  =  1373.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =      3.421(CFS)
Depth of flow =   0.301(Ft.), Average velocity =   1.930(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.716(Ft.)
Flow velocity =   1.93(Ft/s)
Travel time =   11.86 min.     TC =   22.83  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.600(In/Hr)
Rainfall intensity =      1.072(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.410
Subarea runoff =      2.680(CFS) for    8.890(Ac.)
Total runoff =      4.673(CFS)
Effective area this stream =       10.64(Ac.)
Total Study Area (Main Stream No. 1) =       21.71(Ac.)
Area averaged Fm value =    0.584(In/Hr)
Street flow at end of street =      4.673(CFS)
Half street flow at end of street =      2.336(CFS)
Depth of flow =   0.327(Ft.), Average velocity =   2.070(Ft/s)
Flow width (from curb towards crown)=  10.010(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     10.640(Ac.)
Runoff from this stream =      4.673(CFS)
Time of concentration =   22.83 min.
Rainfall intensity =     1.072(In/Hr)
Area averaged loss rate (Fm) =    0.5836(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5836
Summary of stream data:

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


1      4.90    11.070     22.12    0.600      1.092
2      4.67    10.640     22.83    0.584      1.072
Qmax(1) =
           1.000 *    1.000 *     4.900) +
           1.042 *    0.969 *     4.673) + =       9.617
Qmax(2) =
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           0.959 *    1.000 *     4.900) +
           1.000 *    1.000 *     4.673) + =       9.370

Total of 2 streams to confluence:
Flow rates before confluence point:
       4.900       4.673
Maximum flow rates at confluence using above data:
        9.617        9.370
Area of streams before confluence:
       11.070       10.640
Effective area values after confluence:
       21.383       21.710
Results of confluence:
Total flow rate =      9.617(CFS)
Time of concentration =    22.123 min.
Effective stream area after confluence =     21.383(Ac.)
Study area average Pervious fraction(Ap) =  0.592
Study area average soil loss rate(Fm) =    0.592(In/Hr)
Study area total (this main stream) =      21.71(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.600(In/Hr)
Initial subarea data:
Initial area flow distance =   124.000(Ft.)
Top (of initial area) elevation =    33.700(Ft.)
Bottom (of initial area) elevation =    32.800(Ft.)
Difference in elevation =     0.900(Ft.)
Slope =    0.00726  s(%)=       0.73
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.588 min.
Rainfall intensity =      2.075(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.640
Subarea runoff =      0.159(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.600(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      320.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =    32.800(Ft.)
End of street segment elevation =    30.300(Ft.)
Length of street segment  =   470.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =      0.977(CFS)
Depth of flow =   0.229(Ft.), Average velocity =   1.257(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   5.117(Ft.)
Flow velocity =   1.26(Ft/s)
Travel time =    6.23 min.     TC =   13.82  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
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Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 1 = 16.60
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.600(In/Hr)
Rainfall intensity =      1.448(In/Hr) for a     2.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.527
Subarea runoff =      1.466(CFS) for    2.010(Ac.)
Total runoff =      1.626(CFS)
Effective area this stream =        2.13(Ac.)
Total Study Area (Main Stream No. 1) =       23.84(Ac.)
Area averaged Fm value =    0.600(In/Hr)
Street flow at end of street =      1.626(CFS)
Half street flow at end of street =      0.813(CFS)
Depth of flow =   0.263(Ft.), Average velocity =   1.379(Ft/s)
Flow width (from curb towards crown)=   6.804(Ft.)


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Process from Point/Station      120.000 to Point/Station      320.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      2.130(Ac.)
Runoff from this stream =      1.626(CFS)
Time of concentration =   13.82 min.
Rainfall intensity =     1.448(In/Hr)
Area averaged loss rate (Fm) =    0.6000(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

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


1      4.90    11.070     22.12    0.600      1.092
2      4.67    10.640     22.83    0.584      1.072
3      1.63     2.130     13.82    0.600      1.448
Qmax(1) =
           1.000 *    1.000 *     4.900) +
           1.042 *    0.969 *     4.673) +
           0.580 *    1.000 *     1.626) + =      10.560
Qmax(2) =
           0.959 *    1.000 *     4.900) +
           1.000 *    1.000 *     4.673) +
           0.556 *    1.000 *     1.626) + =      10.274
Qmax(3) =
           1.724 *    0.625 *     4.900) +
           1.771 *    0.605 *     4.673) +
           1.000 *    1.000 *     1.626) + =      11.914

Total of 3 streams to confluence:
Flow rates before confluence point:
       4.900       4.673       1.626
Maximum flow rates at confluence using above data:
       10.560       10.274       11.914
Area of streams before confluence:
       11.070       10.640        2.130
Effective area values after confluence:
       23.513       23.840       15.487
Results of confluence:
Total flow rate =     11.914(CFS)
Time of concentration =    13.819 min.
Effective stream area after confluence =     15.487(Ac.)
Study area average Pervious fraction(Ap) =  0.593
Study area average soil loss rate(Fm) =    0.593(In/Hr)
Study area total (this main stream) =      23.84(Ac.)
End of computations, Total Study Area =           23.84 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.593
Area averaged SCS curve number =  32.0
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San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/13/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.950 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

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Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.6000 Max loss rate(Fm)= 0.587(In/Hr)
Initial subarea data:
Initial area flow distance = 140.000(Ft.)
Top (of initial area) elevation = 45.500(Ft.)
Bottom (of initial area) elevation = 44.000(Ft.)
Difference in elevation = 1.500(Ft.)
Slope = 0.01071 s(%)= 1.07
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.368 min.
Rainfall intensity = 3.343(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.742
Subarea runoff = 0.769(CFS)
Total initial stream area = 0.310(Ac.)
Pervious area fraction = 0.600
Initial area Fm value = 0.587(In/Hr)

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Process from Point/Station 110.000 to Point/Station 120.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 44.000(Ft.)
End of street segment elevation = 30.500(Ft.)
Length of street segment = 1624.000(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 = 16.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.080
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 = 12.000(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 = 6.845(CFS)
Depth of flow = 0.363(Ft.), Average velocity = 2.255(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 11.794(Ft.)
Flow velocity = 2.26(Ft/s)
Travel time = 12.00 min. TC = 19.37 min.
Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)

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Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.587(In/Hr)
Rainfall intensity =      1.872(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.618
Subarea runoff =     12.037(CFS) for   10.760(Ac.)
Total runoff =     12.807(CFS)
Effective area this stream =       11.07(Ac.)
Total Study Area (Main Stream No. 1) =       11.07(Ac.)
Area averaged Fm value =    0.587(In/Hr)
Street flow at end of street =     12.807(CFS)
Half street flow at end of street =      6.403(CFS)
Depth of flow =   0.431(Ft.), Average velocity =   2.618(Ft/s)
Flow width (from curb towards crown)=  15.228(Ft.)


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Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.070(Ac.)
Runoff from this stream =     12.807(CFS)
Time of concentration =   19.37 min.
Rainfall intensity =     1.872(In/Hr)
Area averaged loss rate (Fm) =    0.5867(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000


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Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.489(In/Hr)
Initial subarea data:
Initial area flow distance =   400.000(Ft.)
Top (of initial area) elevation =    49.400(Ft.)
Bottom (of initial area) elevation =    43.500(Ft.)
Difference in elevation =     5.900(Ft.)
Slope =    0.01475  s(%)=       1.47
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.932 min.
Rainfall intensity =      2.795(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.743
Subarea runoff =      3.632(CFS)
Total initial stream area =        1.750(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.489(In/Hr)


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Process from Point/Station      210.000 to Point/Station      220.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =    43.500(Ft.)
Downstream point elevation =    42.000(Ft.)
Channel length thru subarea  =   168.000(Ft.)
Channel base width      =    4.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      3.632(CFS)
Depth of flow =   0.242(Ft.), Average velocity =   3.345(Ft/s)
Channel flow top width =    4.969(Ft.)
Flow Velocity =    3.35(Ft/s)
Travel time  =    0.84 min.
Time of concentration =   10.77 min.
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Critical depth =      0.281(Ft.)


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Process from Point/Station      220.000 to Point/Station      230.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    42.000(Ft.)
End of street segment elevation =    30.500(Ft.)
Length of street segment  =  1373.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =      7.786(CFS)
Depth of flow =   0.375(Ft.), Average velocity =   2.331(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  12.423(Ft.)
Flow velocity =   2.33(Ft/s)
Travel time =    9.82 min.     TC =   20.58  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.587(In/Hr)
Rainfall intensity =      1.805(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.616
Subarea runoff =      8.189(CFS) for    8.890(Ac.)
Total runoff =     11.821(CFS)
Effective area this stream =       10.64(Ac.)
Total Study Area (Main Stream No. 1) =       21.71(Ac.)
Area averaged Fm value =    0.571(In/Hr)
Street flow at end of street =     11.821(CFS)
Half street flow at end of street =      5.911(CFS)
Depth of flow =   0.421(Ft.), Average velocity =   2.576(Ft/s)
Flow width (from curb towards crown)=  14.724(Ft.)


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Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     10.640(Ac.)
Runoff from this stream =     11.821(CFS)
Time of concentration =   20.58 min.
Rainfall intensity =     1.805(In/Hr)
Area averaged loss rate (Fm) =    0.5706(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5836
Summary of stream data:

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


1     12.81    11.070     19.37    0.587      1.872
2     11.82    10.640     20.58    0.571      1.805
Qmax(1) =
          1.000 *    1.000 *    12.807) +
          1.054 *    0.941 *    11.821) + =      24.535
Qmax(2) =
          0.948 *    1.000 *    12.807) +
          1.000 *    1.000 *    11.821) + =      23.960

Total of 2 streams to confluence:
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Flow rates before confluence point:
      12.807      11.821
Maximum flow rates at confluence using above data:
       24.535       23.960
Area of streams before confluence:
       11.070       10.640
Effective area values after confluence:
       21.083       21.710
Results of confluence:
Total flow rate =     24.535(CFS)
Time of concentration =    19.371 min.
Effective stream area after confluence =     21.083(Ac.)
Study area average Pervious fraction(Ap) =  0.592
Study area average soil loss rate(Fm) =    0.579(In/Hr)
Study area total (this main stream) =      21.71(Ac.)


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Process from Point/Station      300.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.587(In/Hr)
Initial subarea data:
Initial area flow distance =   124.000(Ft.)
Top (of initial area) elevation =    33.700(Ft.)
Bottom (of initial area) elevation =    32.800(Ft.)
Difference in elevation =     0.900(Ft.)
Slope =    0.00726  s(%)=       0.73
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.588 min.
Rainfall intensity =      3.285(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.739
Subarea runoff =      0.291(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.587(In/Hr)


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Process from Point/Station      310.000 to Point/Station      320.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =    32.800(Ft.)
End of street segment elevation =    30.300(Ft.)
Length of street segment  =   470.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =      1.919(CFS)
Depth of flow =   0.274(Ft.), Average velocity =   1.426(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   7.391(Ft.)
Flow velocity =   1.43(Ft/s)
Travel time =    5.49 min.     TC =   13.08  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.587(In/Hr)
```

```
Rainfall intensity =      2.369(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.677
Subarea runoff =      3.126(CFS) for    2.010(Ac.)
Total runoff =      3.418(CFS)
Effective area this stream =        2.13(Ac.)
Total Study Area (Main Stream No. 1) =       23.84(Ac.)
Area averaged Fm value =    0.587(In/Hr)
Street flow at end of street =      3.418(CFS)
Half street flow at end of street =      1.709(CFS)
Depth of flow =   0.319(Ft.), Average velocity =   1.618(Ft/s)
Flow width (from curb towards crown)=   9.641(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      320.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      2.130(Ac.)
Runoff from this stream =      3.418(CFS)
Time of concentration =   13.08 min.
Rainfall intensity =     2.369(In/Hr)
Area averaged loss rate (Fm) =    0.5867(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

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


1     12.81    11.070     19.37    0.587      1.872
2     11.82    10.640     20.58    0.571      1.805
3      3.42     2.130     13.08    0.587      2.369
Qmax(1) =
           1.000 *    1.000 *    12.807) +
           1.054 *    0.941 *    11.821) +
           0.721 *    1.000 *     3.418) + =      26.999
Qmax(2) =
           0.948 *    1.000 *    12.807) +
           1.000 *    1.000 *    11.821) +
           0.683 *    1.000 *     3.418) + =      26.296
Qmax(3) =
           1.387 *    0.675 *    12.807) +
           1.457 *    0.635 *    11.821) +
           1.000 *    1.000 *     3.418) + =      26.357

Total of 3 streams to confluence:
Flow rates before confluence point:
      12.807      11.821       3.418
Maximum flow rates at confluence using above data:
       26.999       26.296       26.357
Area of streams before confluence:
       11.070       10.640        2.130
Effective area values after confluence:
       23.213       23.840       16.366
Results of confluence:
Total flow rate =     26.999(CFS)
Time of concentration =    19.371 min.
Effective stream area after confluence =     23.213(Ac.)
Study area average Pervious fraction(Ap) =  0.593
Study area average soil loss rate(Fm) =    0.580(In/Hr)
Study area total (this main stream) =      23.84(Ac.)
End of computations, Total Study Area =           23.84 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.593
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/13/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 25.0
Computed rainfall intensity:
Storm year = 25.00 1 hour rainfall = 1.170 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000 Max loss rate(Fm)= 0.471(In/Hr)
Initial subarea data:
Initial area flow distance = 140.000(Ft.)
Top (of initial area) elevation = 45.500(Ft.)
Bottom (of initial area) elevation = 44.000(Ft.)
Difference in elevation = 1.500(Ft.)
Slope = 0.01071 s(%)= 1.07
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.368 min.
Rainfall intensity = 4.118(In/Hr) for a 25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.797
Subarea runoff = 1.017(CFS)
Total initial stream area = 0.310(Ac.)
Pervious area fraction = 0.600
Initial area Fm value = 0.471(In/Hr)

++

Process from Point/Station 110.000 to Point/Station 120.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 44.000(Ft.)
End of street segment elevation = 30.500(Ft.)
Length of street segment = 1624.000(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 = 16.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.080
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 = 12.000(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 = 10.103(CFS)
Depth of flow = 0.403(Ft.), Average velocity = 2.473(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 13.841(Ft.)
Flow velocity = 2.47(Ft/s)
Travel time = 10.94 min. TC = 18.31 min.
Adding area flow to street

```
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.385(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.722
Subarea runoff =     18.048(CFS) for   10.760(Ac.)
Total runoff =     19.066(CFS)
Effective area this stream =       11.07(Ac.)
Total Study Area (Main Stream No. 1) =       11.07(Ac.)
Area averaged Fm value =    0.471(In/Hr)
Street flow at end of street =     19.066(CFS)
Half street flow at end of street =      9.533(CFS)
Depth of flow =   0.483(Ft.), Average velocity =   2.884(Ft/s)
Flow width (from curb towards crown)=  17.830(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.070(Ac.)
Runoff from this stream =     19.066(CFS)
Time of concentration =   18.31 min.
Rainfall intensity =     2.385(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000


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Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.393(In/Hr)
Initial subarea data:
Initial area flow distance =   400.000(Ft.)
Top (of initial area) elevation =    49.400(Ft.)
Bottom (of initial area) elevation =    43.500(Ft.)
Difference in elevation =     5.900(Ft.)
Slope =    0.01475  s(%)=       1.47
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.932 min.
Rainfall intensity =      3.442(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.797
Subarea runoff =      4.804(CFS)
Total initial stream area =        1.750(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.393(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      220.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =    43.500(Ft.)
Downstream point elevation =    42.000(Ft.)
Channel length thru subarea  =   168.000(Ft.)
Channel base width      =    4.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      4.804(CFS)
Depth of flow =   0.285(Ft.), Average velocity =   3.686(Ft/s)
Channel flow top width =    5.141(Ft.)
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Flow Velocity =    3.69(Ft/s)
Travel time  =    0.76 min.
Time of concentration =   10.69 min.
Critical depth =      0.336(Ft.)


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Process from Point/Station      220.000 to Point/Station      230.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =    42.000(Ft.)
End of street segment elevation =    30.500(Ft.)
Length of street segment  =  1373.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =     11.204(CFS)
Depth of flow =   0.415(Ft.), Average velocity =   2.543(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  14.410(Ft.)
Flow velocity =   2.54(Ft/s)
Travel time =    9.00 min.     TC =   19.69  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.283(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.719
Subarea runoff =     12.672(CFS) for    8.890(Ac.)
Total runoff =     17.475(CFS)
Effective area this stream =       10.64(Ac.)
Total Study Area (Main Stream No. 1) =       21.71(Ac.)
Area averaged Fm value =    0.458(In/Hr)
Street flow at end of street =     17.475(CFS)
Half street flow at end of street =      8.738(CFS)
Depth of flow =   0.471(Ft.), Average velocity =   2.831(Ft/s)
Flow width (from curb towards crown)=  17.203(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     10.640(Ac.)
Runoff from this stream =     17.475(CFS)
Time of concentration =   19.69 min.
Rainfall intensity =     2.283(In/Hr)
Area averaged loss rate (Fm) =    0.4582(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5836
Summary of stream data:

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


1     19.07    11.070     18.31    0.471      2.385
2     17.48    10.640     19.69    0.458      2.283
Qmax(1) =
           1.000 *    1.000 *    19.066) +
           1.056 *    0.930 *    17.475) + =      36.222
Qmax(2) =
```

```
           0.947 *    1.000 *    19.066) +
           1.000 *    1.000 *    17.475) + =      35.528

Total of 2 streams to confluence:
Flow rates before confluence point:
      19.066      17.475
Maximum flow rates at confluence using above data:
       36.222       35.528
Area of streams before confluence:
       11.070       10.640
Effective area values after confluence:
       20.965       21.710
Results of confluence:
Total flow rate =     36.222(CFS)
Time of concentration =    18.312 min.
Effective stream area after confluence =     20.965(Ac.)
Study area average Pervious fraction(Ap) =  0.592
Study area average soil loss rate(Fm) =    0.465(In/Hr)
Study area total (this main stream) =      21.71(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   124.000(Ft.)
Top (of initial area) elevation =    33.700(Ft.)
Bottom (of initial area) elevation =    32.800(Ft.)
Difference in elevation =     0.900(Ft.)
Slope =    0.00726  s(%)=       0.73
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.588 min.
Rainfall intensity =      4.046(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.795
Subarea runoff =      0.386(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      320.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =    32.800(Ft.)
End of street segment elevation =    30.300(Ft.)
Length of street segment  =   470.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =      2.663(CFS)
Depth of flow =   0.299(Ft.), Average velocity =   1.530(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.623(Ft.)
Flow velocity =   1.53(Ft/s)
Travel time =    5.12 min.     TC =   12.71  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
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```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      2.969(In/Hr) for a    25.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.757
Subarea runoff =      4.403(CFS) for    2.010(Ac.)
Total runoff =      4.789(CFS)
Effective area this stream =        2.13(Ac.)
Total Study Area (Main Stream No. 1) =       23.84(Ac.)
Area averaged Fm value =    0.471(In/Hr)
Street flow at end of street =      4.789(CFS)
Half street flow at end of street =      2.394(CFS)
Depth of flow =   0.350(Ft.), Average velocity =   1.748(Ft/s)
Flow width (from curb towards crown)=  11.149(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      320.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      2.130(Ac.)
Runoff from this stream =      4.789(CFS)
Time of concentration =   12.71 min.
Rainfall intensity =     2.969(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

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


1     19.07    11.070     18.31    0.471      2.385
2     17.48    10.640     19.69    0.458      2.283
3      4.79     2.130     12.71    0.471      2.969
Qmax(1) =
           1.000 *    1.000 *    19.066) +
           1.056 *    0.930 *    17.475) +
           0.766 *    1.000 *     4.789) + =      39.891
Qmax(2) =
           0.947 *    1.000 *    19.066) +
           1.000 *    1.000 *    17.475) +
           0.725 *    1.000 *     4.789) + =      39.001
Qmax(3) =
           1.305 *    0.694 *    19.066) +
           1.376 *    0.645 *    17.475) +
           1.000 *    1.000 *     4.789) + =      37.579

Total of 3 streams to confluence:
Flow rates before confluence point:
      19.066      17.475       4.789
Maximum flow rates at confluence using above data:
       39.891       39.001       37.579
Area of streams before confluence:
       11.070       10.640        2.130
Effective area values after confluence:
       23.095       23.840       16.679
Results of confluence:
Total flow rate =     39.891(CFS)
Time of concentration =    18.312 min.
Effective stream area after confluence =     23.095(Ac.)
Study area average Pervious fraction(Ap) =  0.593
Study area average soil loss rate(Fm) =    0.465(In/Hr)
Study area total (this main stream) =      23.84(Ac.)
End of computations, Total Study Area =           23.84 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.593
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2018 Version 9.0
Rational Hydrology Study Date: 07/13/26

Program License Serial Number 6427

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.540 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 100.000 to Point/Station 110.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000 Max loss rate(Fm)= 0.471(In/Hr)
Initial subarea data:
Initial area flow distance = 140.000(Ft.)
Top (of initial area) elevation = 45.500(Ft.)
Bottom (of initial area) elevation = 44.000(Ft.)
Difference in elevation = 1.500(Ft.)
Slope = 0.01071 s(%)= 1.07
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.368 min.
Rainfall intensity = 5.420(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.822
Subarea runoff = 1.381(CFS)
Total initial stream area = 0.310(Ac.)
Pervious area fraction = 0.600
Initial area Fm value = 0.471(In/Hr)

++

Process from Point/Station 110.000 to Point/Station 120.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 44.000(Ft.)
End of street segment elevation = 30.500(Ft.)
Length of street segment = 1624.000(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 = 16.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.080
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 = 12.000(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 = 14.547(CFS)
Depth of flow = 0.447(Ft.), Average velocity = 2.700(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 16.021(Ft.)
Flow velocity = 2.70(Ft/s)
Travel time = 10.02 min. TC = 17.39 min.
Adding area flow to street

```
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      3.237(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.769
Subarea runoff =     26.181(CFS) for   10.760(Ac.)
Total runoff =     27.561(CFS)
Effective area this stream =       11.07(Ac.)
Total Study Area (Main Stream No. 1) =       11.07(Ac.)
Area averaged Fm value =    0.471(In/Hr)
Street flow at end of street =     27.561(CFS)
Half street flow at end of street =     13.781(CFS)
Depth of flow =   0.537(Ft.), Average velocity =   3.205(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 =    1.83(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.070(Ac.)
Runoff from this stream =     27.561(CFS)
Time of concentration =   17.39 min.
Rainfall intensity =     3.237(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      210.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.393(In/Hr)
Initial subarea data:
Initial area flow distance =   400.000(Ft.)
Top (of initial area) elevation =    49.400(Ft.)
Bottom (of initial area) elevation =    43.500(Ft.)
Difference in elevation =     5.900(Ft.)
Slope =    0.01475  s(%)=       1.47
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.932 min.
Rainfall intensity =      4.531(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.822
Subarea runoff =      6.518(CFS)
Total initial stream area =        1.750(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.393(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      210.000 to Point/Station      220.000
**** IMPROVED CHANNEL TRAVEL TIME ****
____________________________________________________________________________
Upstream point elevation =    43.500(Ft.)
Downstream point elevation =    42.000(Ft.)
Channel length thru subarea  =   168.000(Ft.)
Channel base width      =    4.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.500(Ft.)
```

```
Flow(q) thru subarea =      6.518(CFS)
Depth of flow =   0.341(Ft.), Average velocity =   4.089(Ft/s)
Channel flow top width =    5.362(Ft.)
Flow Velocity =    4.09(Ft/s)
Travel time  =    0.68 min.
Time of concentration =   10.62 min.
Critical depth =      0.406(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      220.000 to Point/Station      230.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =    42.000(Ft.)
End of street segment elevation =    30.500(Ft.)
Length of street segment  =  1373.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =     15.897(CFS)
Depth of flow =   0.458(Ft.), Average velocity =   2.767(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.571(Ft.)
Flow velocity =   2.77(Ft/s)
Travel time =    8.27 min.     TC =   18.89  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      3.081(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.766
Subarea runoff =     18.600(CFS) for    8.890(Ac.)
Total runoff =     25.118(CFS)
Effective area this stream =       10.64(Ac.)
Total Study Area (Main Stream No. 1) =       21.71(Ac.)
Area averaged Fm value =    0.458(In/Hr)
Street flow at end of street =     25.118(CFS)
Half street flow at end of street =     12.559(CFS)
Depth of flow =   0.521(Ft.), Average velocity =   3.144(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 =    1.05(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      230.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     10.640(Ac.)
Runoff from this stream =     25.118(CFS)
Time of concentration =   18.89 min.
Rainfall intensity =     3.081(In/Hr)
Area averaged loss rate (Fm) =    0.4582(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5836
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1     27.56    11.070     17.39    0.471      3.237
2     25.12    10.640     18.89    0.458      3.081
Qmax(1) =
           1.000 *    1.000 *    27.561) +
           1.060 *    0.921 *    25.118) + =      52.069
Qmax(2) =
           0.944 *    1.000 *    27.561) +
           1.000 *    1.000 *    25.118) + =      51.122

Total of 2 streams to confluence:
Flow rates before confluence point:
      27.561      25.118
Maximum flow rates at confluence using above data:
       52.069       51.122
Area of streams before confluence:
       11.070       10.640
Effective area values after confluence:
       20.868       21.710
Results of confluence:
Total flow rate =     52.069(CFS)
Time of concentration =    17.392 min.
Effective stream area after confluence =     20.868(Ac.)
Study area average Pervious fraction(Ap) =  0.592
Study area average soil loss rate(Fm) =    0.465(In/Hr)
Study area total (this main stream) =      21.71(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Initial subarea data:
Initial area flow distance =   124.000(Ft.)
Top (of initial area) elevation =    33.700(Ft.)
Bottom (of initial area) elevation =    32.800(Ft.)
Difference in elevation =     0.900(Ft.)
Slope =    0.00726  s(%)=       0.73
TC = k(0.412)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.588 min.
Rainfall intensity =      5.325(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.820
Subarea runoff =      0.524(CFS)
Total initial stream area =        0.120(Ac.)
Pervious area fraction = 0.600
Initial area Fm value =    0.471(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      320.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =    32.800(Ft.)
End of street segment elevation =    30.300(Ft.)
Length of street segment  =   470.000(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  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.080
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  =  12.000(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 =      3.717(CFS)
Depth of flow =   0.327(Ft.), Average velocity =   1.649(Ft/s)
Streetflow hydraulics at midpoint of street travel:
```

```
Halfstreet flow width =  10.002(Ft.)
Flow velocity =   1.65(Ft/s)
Travel time =    4.75 min.     TC =   12.34  min.
 Adding area flow to street
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.471(In/Hr)
Rainfall intensity =      3.978(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.793
Subarea runoff =      6.198(CFS) for    2.010(Ac.)
Total runoff =      6.723(CFS)
Effective area this stream =        2.13(Ac.)
Total Study Area (Main Stream No. 1) =       23.84(Ac.)
Area averaged Fm value =    0.471(In/Hr)
Street flow at end of street =      6.723(CFS)
Half street flow at end of street =      3.361(CFS)
Depth of flow =   0.383(Ft.), Average velocity =   1.893(Ft/s)
Flow width (from curb towards crown)=  12.840(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      320.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      2.130(Ac.)
Runoff from this stream =      6.723(CFS)
Time of concentration =   12.34 min.
Rainfall intensity =     3.978(In/Hr)
Area averaged loss rate (Fm) =    0.4711(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6000
Summary of stream data:

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


1     27.56    11.070     17.39    0.471      3.237
2     25.12    10.640     18.89    0.458      3.081
3      6.72     2.130     12.34    0.471      3.978
Qmax(1) =
           1.000 *    1.000 *    27.561) +
           1.060 *    0.921 *    25.118) +
           0.789 *    1.000 *     6.723) + =      57.373
Qmax(2) =
           0.944 *    1.000 *    27.561) +
           1.000 *    1.000 *    25.118) +
           0.744 *    1.000 *     6.723) + =      56.126
Qmax(3) =
           1.268 *    0.709 *    27.561) +
           1.342 *    0.653 *    25.118) +
           1.000 *    1.000 *     6.723) + =      53.528

Total of 3 streams to confluence:
Flow rates before confluence point:
      27.561      25.118       6.723
Maximum flow rates at confluence using above data:
       57.373       56.126       53.528
Area of streams before confluence:
       11.070       10.640        2.130
Effective area values after confluence:
       22.998       23.840       16.934
Results of confluence:
Total flow rate =     57.373(CFS)
Time of concentration =    17.392 min.
Effective stream area after confluence =     22.998(Ac.)
Study area average Pervious fraction(Ap) =  0.593
Study area average soil loss rate(Fm) =    0.465(In/Hr)
Study area total (this main stream) =      23.84(Ac.)
End of computations, Total Study Area =           23.84 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
```

Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.593
Area averaged SCS curve number = 32.0

APPENDIX D

Unit Hydrograph Calculation

EXISTING CONDITION

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

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Study date 07/11/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 2

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
25.77	1	0.60
Rainfall data for year 2		
25.77	6	1.59
Rainfall data for year 2		
25.77	24	2.81

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 1)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
67.0	47.4	25.77	1.000	0.840	0.900	0.756

Area-averaged adjusted loss rate Fm (In/Hr) = 0.756

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC1)	S	Pervious Yield Fr
23.19	0.900	67.0	47.4	11.10	0.011
2.58	0.100	98.0	98.0	0.20	0.918

Area-averaged catchment yield fraction, Y = 0.101
Area-averaged low loss fraction, Yb = 0.899
User entry of time of concentration = 0.309 (hours)
++
Watershed area = 25.77(Ac.)
Catchment Lag time = 0.247 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 33.6782
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.756(In/Hr)
Average low loss rate fraction (Yb) = 0.899 (decimal)
VALLEY DEVELOPED S-Graph proportion = 0.070
VALLEY UNDEVELOPED S-Graph proportion = 0.930
FOOTHILL S-Graph proportion = 0.000
MOUNTAIN S-Graph proportion = 0.000

DESERT S-Graph proportion = -0.000

Computed peak 5-minute rainfall = 0.222(In)
Computed peak 30-minute rainfall = 0.455(In)
Specified peak 1-hour rainfall = 0.600(In)
Computed peak 3-hour rainfall = 1.091(In)
Specified peak 6-hour rainfall = 1.590(In)
Specified peak 24-hour rainfall = 2.810(In)

Rainfall depth area reduction factors:
Using a total area of 25.77(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.222(In)
30-minute factor = 0.999 Adjusted rainfall = 0.454(In)
1-hour factor = 0.999 Adjusted rainfall = 0.599(In)
3-hour factor = 1.000 Adjusted rainfall = 1.090(In)
6-hour factor = 1.000 Adjusted rainfall = 1.590(In)
24-hour factor = 1.000 Adjusted rainfall = 2.810(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 311.66 (CFS))	
1	3.322	10.353
2	16.345	40.586
3	38.471	68.957
4	59.043	64.115
5	70.514	35.751
6	76.946	20.044
7	81.385	13.834
8	84.717	10.385
9	87.374	8.280
10	89.457	6.493
11	91.275	5.665
12	92.688	4.406
13	93.835	3.574
14	94.825	3.084
15	95.766	2.932
16	96.544	2.427
17	97.205	2.060
18	97.774	1.772
19	98.254	1.496
20	98.662	1.271
21	98.981	0.994
22	99.294	0.976
23	99.607	0.976
24	100.000	0.488

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2218	0.2218
2	0.2927	0.0709
3	0.3442	0.0515
4	0.3862	0.0420
5	0.4222	0.0361
6	0.4542	0.0319
7	0.4831	0.0289
8	0.5096	0.0265
9	0.5341	0.0246
10	0.5571	0.0230
11	0.5788	0.0217
12	0.5993	0.0205
13	0.6260	0.0267
14	0.6518	0.0258
15	0.6768	0.0250
16	0.7010	0.0242
17	0.7245	0.0235
18	0.7474	0.0229
19	0.7698	0.0223
20	0.7916	0.0218
21	0.8129	0.0213
22	0.8338	0.0209
23	0.8542	0.0204

24	0.8743	0.0200
25	0.8939	0.0197
26	0.9133	0.0193
27	0.9322	0.0190
28	0.9509	0.0187
29	0.9692	0.0184
30	0.9873	0.0181
31	1.0051	0.0178
32	1.0226	0.0175
33	1.0399	0.0173
34	1.0570	0.0171
35	1.0738	0.0168
36	1.0904	0.0166
37	1.1068	0.0164
38	1.1230	0.0162
39	1.1390	0.0160
40	1.1548	0.0158
41	1.1704	0.0156
42	1.1858	0.0154
43	1.2011	0.0153
44	1.2162	0.0151
45	1.2312	0.0150
46	1.2460	0.0148
47	1.2606	0.0147
48	1.2752	0.0145
49	1.2895	0.0144
50	1.3038	0.0143
51	1.3179	0.0141
52	1.3319	0.0140
53	1.3458	0.0139
54	1.3595	0.0138
55	1.3732	0.0136
56	1.3867	0.0135
57	1.4001	0.0134
58	1.4134	0.0133
59	1.4266	0.0132
60	1.4397	0.0131
61	1.4528	0.0130
62	1.4657	0.0129
63	1.4785	0.0128
64	1.4912	0.0127
65	1.5038	0.0126
66	1.5164	0.0125
67	1.5288	0.0125
68	1.5412	0.0124
69	1.5535	0.0123
70	1.5657	0.0122
71	1.5778	0.0121
72	1.5899	0.0121
73	1.5989	0.0090
74	1.6079	0.0090
75	1.6168	0.0089
76	1.6256	0.0088
77	1.6343	0.0088
78	1.6430	0.0087
79	1.6516	0.0086
80	1.6602	0.0086
81	1.6687	0.0085
82	1.6771	0.0084
83	1.6855	0.0084
84	1.6938	0.0083
85	1.7021	0.0083
86	1.7103	0.0082
87	1.7184	0.0081
88	1.7265	0.0081
89	1.7345	0.0080
90	1.7425	0.0080
91	1.7504	0.0079
92	1.7583	0.0079
93	1.7661	0.0078
94	1.7739	0.0078
95	1.7816	0.0077
96	1.7893	0.0077
97	1.7970	0.0076
98	1.8045	0.0076
99	1.8121	0.0075
100	1.8196	0.0075
101	1.8270	0.0075

102	1.8344	0.0074
103	1.8418	0.0074
104	1.8491	0.0073
105	1.8564	0.0073
106	1.8637	0.0072
107	1.8709	0.0072
108	1.8780	0.0072
109	1.8852	0.0071
110	1.8922	0.0071
111	1.8993	0.0070
112	1.9063	0.0070
113	1.9133	0.0070
114	1.9202	0.0069
115	1.9271	0.0069
116	1.9340	0.0069
117	1.9408	0.0068
118	1.9476	0.0068
119	1.9544	0.0068
120	1.9611	0.0067
121	1.9678	0.0067
122	1.9745	0.0067
123	1.9811	0.0066
124	1.9877	0.0066
125	1.9943	0.0066
126	2.0008	0.0065
127	2.0073	0.0065
128	2.0138	0.0065
129	2.0202	0.0064
130	2.0267	0.0064
131	2.0330	0.0064
132	2.0394	0.0064
133	2.0457	0.0063
134	2.0520	0.0063
135	2.0583	0.0063
136	2.0646	0.0062
137	2.0708	0.0062
138	2.0770	0.0062
139	2.0832	0.0062
140	2.0893	0.0061
141	2.0954	0.0061
142	2.1015	0.0061
143	2.1076	0.0061
144	2.1136	0.0060
145	2.1196	0.0060
146	2.1256	0.0060
147	2.1316	0.0060
148	2.1375	0.0059
149	2.1435	0.0059
150	2.1494	0.0059
151	2.1552	0.0059
152	2.1611	0.0059
153	2.1669	0.0058
154	2.1727	0.0058
155	2.1785	0.0058
156	2.1843	0.0058
157	2.1900	0.0057
158	2.1957	0.0057
159	2.2014	0.0057
160	2.2071	0.0057
161	2.2128	0.0057
162	2.2184	0.0056
163	2.2240	0.0056
164	2.2296	0.0056
165	2.2352	0.0056
166	2.2407	0.0056
167	2.2463	0.0055
168	2.2518	0.0055
169	2.2573	0.0055
170	2.2628	0.0055
171	2.2682	0.0055
172	2.2737	0.0054
173	2.2791	0.0054
174	2.2845	0.0054
175	2.2899	0.0054
176	2.2952	0.0054
177	2.3006	0.0053
178	2.3059	0.0053
179	2.3112	0.0053

180	2.3165	0.0053
181	2.3218	0.0053
182	2.3271	0.0053
183	2.3323	0.0052
184	2.3375	0.0052
185	2.3428	0.0052
186	2.3479	0.0052
187	2.3531	0.0052
188	2.3583	0.0052
189	2.3634	0.0051
190	2.3686	0.0051
191	2.3737	0.0051
192	2.3788	0.0051
193	2.3839	0.0051
194	2.3889	0.0051
195	2.3940	0.0051
196	2.3990	0.0050
197	2.4040	0.0050
198	2.4090	0.0050
199	2.4140	0.0050
200	2.4190	0.0050
201	2.4240	0.0050
202	2.4289	0.0049
203	2.4338	0.0049
204	2.4388	0.0049
205	2.4437	0.0049
206	2.4486	0.0049
207	2.4534	0.0049
208	2.4583	0.0049
209	2.4631	0.0048
210	2.4680	0.0048
211	2.4728	0.0048
212	2.4776	0.0048
213	2.4824	0.0048
214	2.4872	0.0048
215	2.4919	0.0048
216	2.4967	0.0048
217	2.5014	0.0047
218	2.5062	0.0047
219	2.5109	0.0047
220	2.5156	0.0047
221	2.5203	0.0047
222	2.5250	0.0047
223	2.5296	0.0047
224	2.5343	0.0047
225	2.5389	0.0046
226	2.5436	0.0046
227	2.5482	0.0046
228	2.5528	0.0046
229	2.5574	0.0046
230	2.5620	0.0046
231	2.5665	0.0046
232	2.5711	0.0046
233	2.5756	0.0045
234	2.5802	0.0045
235	2.5847	0.0045
236	2.5892	0.0045
237	2.5937	0.0045
238	2.5982	0.0045
239	2.6027	0.0045
240	2.6071	0.0045
241	2.6116	0.0045
242	2.6160	0.0044
243	2.6205	0.0044
244	2.6249	0.0044
245	2.6293	0.0044
246	2.6337	0.0044
247	2.6381	0.0044
248	2.6425	0.0044
249	2.6469	0.0044
250	2.6512	0.0044
251	2.6556	0.0044
252	2.6599	0.0043
253	2.6643	0.0043
254	2.6686	0.0043
255	2.6729	0.0043
256	2.6772	0.0043
257	2.6815	0.0043

258	2.6858	0.0043
259	2.6900	0.0043
260	2.6943	0.0043
261	2.6985	0.0043
262	2.7028	0.0042
263	2.7070	0.0042
264	2.7112	0.0042
265	2.7155	0.0042
266	2.7197	0.0042
267	2.7239	0.0042
268	2.7280	0.0042
269	2.7322	0.0042
270	2.7364	0.0042
271	2.7405	0.0042
272	2.7447	0.0041
273	2.7488	0.0041
274	2.7530	0.0041
275	2.7571	0.0041
276	2.7612	0.0041
277	2.7653	0.0041
278	2.7694	0.0041
279	2.7735	0.0041
280	2.7776	0.0041
281	2.7816	0.0041
282	2.7857	0.0041
283	2.7898	0.0041
284	2.7938	0.0040
285	2.7978	0.0040
286	2.8019	0.0040
287	2.8059	0.0040
288	2.8099	0.0040

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0040	0.0036	0.0004
2	0.0040	0.0036	0.0004
3	0.0040	0.0036	0.0004
4	0.0040	0.0036	0.0004
5	0.0041	0.0037	0.0004
6	0.0041	0.0037	0.0004
7	0.0041	0.0037	0.0004
8	0.0041	0.0037	0.0004
9	0.0041	0.0037	0.0004
10	0.0041	0.0037	0.0004
11	0.0041	0.0037	0.0004
12	0.0041	0.0037	0.0004
13	0.0042	0.0037	0.0004
14	0.0042	0.0038	0.0004
15	0.0042	0.0038	0.0004
16	0.0042	0.0038	0.0004
17	0.0042	0.0038	0.0004
18	0.0042	0.0038	0.0004
19	0.0043	0.0038	0.0004
20	0.0043	0.0038	0.0004
21	0.0043	0.0038	0.0004
22	0.0043	0.0039	0.0004
23	0.0043	0.0039	0.0004
24	0.0043	0.0039	0.0004
25	0.0043	0.0039	0.0004
26	0.0044	0.0039	0.0004
27	0.0044	0.0039	0.0004
28	0.0044	0.0039	0.0004
29	0.0044	0.0040	0.0004
30	0.0044	0.0040	0.0004
31	0.0044	0.0040	0.0004
32	0.0044	0.0040	0.0005
33	0.0045	0.0040	0.0005
34	0.0045	0.0040	0.0005
35	0.0045	0.0040	0.0005
36	0.0045	0.0041	0.0005
37	0.0045	0.0041	0.0005
38	0.0045	0.0041	0.0005
39	0.0046	0.0041	0.0005
40	0.0046	0.0041	0.0005
41	0.0046	0.0041	0.0005
42	0.0046	0.0041	0.0005

43	0.0046	0.0042	0.0005
44	0.0047	0.0042	0.0005
45	0.0047	0.0042	0.0005
46	0.0047	0.0042	0.0005
47	0.0047	0.0042	0.0005
48	0.0047	0.0042	0.0005
49	0.0048	0.0043	0.0005
50	0.0048	0.0043	0.0005
51	0.0048	0.0043	0.0005
52	0.0048	0.0043	0.0005
53	0.0048	0.0043	0.0005
54	0.0048	0.0044	0.0005
55	0.0049	0.0044	0.0005
56	0.0049	0.0044	0.0005
57	0.0049	0.0044	0.0005
58	0.0049	0.0044	0.0005
59	0.0050	0.0045	0.0005
60	0.0050	0.0045	0.0005
61	0.0050	0.0045	0.0005
62	0.0050	0.0045	0.0005
63	0.0051	0.0045	0.0005
64	0.0051	0.0046	0.0005
65	0.0051	0.0046	0.0005
66	0.0051	0.0046	0.0005
67	0.0051	0.0046	0.0005
68	0.0052	0.0046	0.0005
69	0.0052	0.0047	0.0005
70	0.0052	0.0047	0.0005
71	0.0052	0.0047	0.0005
72	0.0053	0.0047	0.0005
73	0.0053	0.0048	0.0005
74	0.0053	0.0048	0.0005
75	0.0053	0.0048	0.0005
76	0.0054	0.0048	0.0005
77	0.0054	0.0049	0.0005
78	0.0054	0.0049	0.0005
79	0.0055	0.0049	0.0006
80	0.0055	0.0049	0.0006
81	0.0055	0.0050	0.0006
82	0.0055	0.0050	0.0006
83	0.0056	0.0050	0.0006
84	0.0056	0.0050	0.0006
85	0.0056	0.0051	0.0006
86	0.0057	0.0051	0.0006
87	0.0057	0.0051	0.0006
88	0.0057	0.0051	0.0006
89	0.0058	0.0052	0.0006
90	0.0058	0.0052	0.0006
91	0.0058	0.0052	0.0006
92	0.0059	0.0053	0.0006
93	0.0059	0.0053	0.0006
94	0.0059	0.0053	0.0006
95	0.0060	0.0054	0.0006
96	0.0060	0.0054	0.0006
97	0.0060	0.0054	0.0006
98	0.0061	0.0055	0.0006
99	0.0061	0.0055	0.0006
100	0.0061	0.0055	0.0006
101	0.0062	0.0056	0.0006
102	0.0062	0.0056	0.0006
103	0.0063	0.0056	0.0006
104	0.0063	0.0057	0.0006
105	0.0064	0.0057	0.0006
106	0.0064	0.0057	0.0006
107	0.0064	0.0058	0.0007
108	0.0065	0.0058	0.0007
109	0.0065	0.0059	0.0007
110	0.0066	0.0059	0.0007
111	0.0066	0.0060	0.0007
112	0.0067	0.0060	0.0007
113	0.0067	0.0060	0.0007
114	0.0068	0.0061	0.0007
115	0.0068	0.0061	0.0007
116	0.0069	0.0062	0.0007
117	0.0069	0.0062	0.0007
118	0.0070	0.0063	0.0007
119	0.0070	0.0063	0.0007
120	0.0071	0.0064	0.0007

121	0.0072	0.0064	0.0007
122	0.0072	0.0065	0.0007
123	0.0073	0.0065	0.0007
124	0.0073	0.0066	0.0007
125	0.0074	0.0067	0.0008
126	0.0075	0.0067	0.0008
127	0.0075	0.0068	0.0008
128	0.0076	0.0068	0.0008
129	0.0077	0.0069	0.0008
130	0.0077	0.0069	0.0008
131	0.0078	0.0070	0.0008
132	0.0079	0.0071	0.0008
133	0.0080	0.0072	0.0008
134	0.0080	0.0072	0.0008
135	0.0081	0.0073	0.0008
136	0.0082	0.0074	0.0008
137	0.0083	0.0075	0.0008
138	0.0084	0.0075	0.0008
139	0.0085	0.0076	0.0009
140	0.0086	0.0077	0.0009
141	0.0087	0.0078	0.0009
142	0.0088	0.0079	0.0009
143	0.0089	0.0080	0.0009
144	0.0090	0.0081	0.0009
145	0.0121	0.0108	0.0012
146	0.0121	0.0109	0.0012
147	0.0123	0.0110	0.0012
148	0.0124	0.0111	0.0013
149	0.0125	0.0113	0.0013
150	0.0126	0.0114	0.0013
151	0.0128	0.0115	0.0013
152	0.0129	0.0116	0.0013
153	0.0131	0.0118	0.0013
154	0.0132	0.0119	0.0013
155	0.0134	0.0121	0.0014
156	0.0135	0.0122	0.0014
157	0.0138	0.0124	0.0014
158	0.0139	0.0125	0.0014
159	0.0141	0.0127	0.0014
160	0.0143	0.0128	0.0014
161	0.0145	0.0130	0.0015
162	0.0147	0.0132	0.0015
163	0.0150	0.0134	0.0015
164	0.0151	0.0136	0.0015
165	0.0154	0.0139	0.0016
166	0.0156	0.0140	0.0016
167	0.0160	0.0144	0.0016
168	0.0162	0.0145	0.0016
169	0.0166	0.0149	0.0017
170	0.0168	0.0151	0.0017
171	0.0173	0.0155	0.0018
172	0.0175	0.0158	0.0018
173	0.0181	0.0162	0.0018
174	0.0184	0.0165	0.0019
175	0.0190	0.0171	0.0019
176	0.0193	0.0174	0.0020
177	0.0200	0.0180	0.0020
178	0.0204	0.0184	0.0021
179	0.0213	0.0192	0.0022
180	0.0218	0.0196	0.0022
181	0.0229	0.0206	0.0023
182	0.0235	0.0212	0.0024
183	0.0250	0.0224	0.0025
184	0.0258	0.0232	0.0026
185	0.0205	0.0184	0.0021
186	0.0217	0.0195	0.0022
187	0.0246	0.0221	0.0025
188	0.0265	0.0238	0.0027
189	0.0319	0.0287	0.0032
190	0.0361	0.0324	0.0037
191	0.0515	0.0463	0.0052
192	0.0709	0.0630	0.0079
193	0.2218	0.0630	0.1588
194	0.0420	0.0377	0.0043
195	0.0289	0.0260	0.0029
196	0.0230	0.0207	0.0023
197	0.0267	0.0240	0.0027
198	0.0242	0.0218	0.0025

199	0.0223	0.0201	0.0023
200	0.0209	0.0188	0.0021
201	0.0197	0.0177	0.0020
202	0.0187	0.0168	0.0019
203	0.0178	0.0160	0.0018
204	0.0171	0.0153	0.0017
205	0.0164	0.0147	0.0017
206	0.0158	0.0142	0.0016
207	0.0153	0.0137	0.0015
208	0.0148	0.0133	0.0015
209	0.0144	0.0129	0.0015
210	0.0140	0.0126	0.0014
211	0.0136	0.0123	0.0014
212	0.0133	0.0120	0.0013
213	0.0130	0.0117	0.0013
214	0.0127	0.0114	0.0013
215	0.0125	0.0112	0.0013
216	0.0122	0.0110	0.0012
217	0.0090	0.0081	0.0009
218	0.0088	0.0079	0.0009
219	0.0086	0.0077	0.0009
220	0.0084	0.0076	0.0009
221	0.0083	0.0074	0.0008
222	0.0081	0.0073	0.0008
223	0.0079	0.0071	0.0008
224	0.0078	0.0070	0.0008
225	0.0076	0.0069	0.0008
226	0.0075	0.0067	0.0008
227	0.0074	0.0066	0.0007
228	0.0072	0.0065	0.0007
229	0.0071	0.0064	0.0007
230	0.0070	0.0063	0.0007
231	0.0069	0.0062	0.0007
232	0.0068	0.0061	0.0007
233	0.0067	0.0060	0.0007
234	0.0066	0.0059	0.0007
235	0.0065	0.0058	0.0007
236	0.0064	0.0058	0.0007
237	0.0063	0.0057	0.0006
238	0.0062	0.0056	0.0006
239	0.0062	0.0055	0.0006
240	0.0061	0.0055	0.0006
241	0.0060	0.0054	0.0006
242	0.0059	0.0053	0.0006
243	0.0059	0.0053	0.0006
244	0.0058	0.0052	0.0006
245	0.0057	0.0052	0.0006
246	0.0057	0.0051	0.0006
247	0.0056	0.0050	0.0006
248	0.0056	0.0050	0.0006
249	0.0055	0.0049	0.0006
250	0.0054	0.0049	0.0006
251	0.0054	0.0048	0.0005
252	0.0053	0.0048	0.0005
253	0.0053	0.0047	0.0005
254	0.0052	0.0047	0.0005
255	0.0052	0.0047	0.0005
256	0.0051	0.0046	0.0005
257	0.0051	0.0046	0.0005
258	0.0050	0.0045	0.0005
259	0.0050	0.0045	0.0005
260	0.0049	0.0044	0.0005
261	0.0049	0.0044	0.0005
262	0.0049	0.0044	0.0005
263	0.0048	0.0043	0.0005
264	0.0048	0.0043	0.0005
265	0.0047	0.0043	0.0005
266	0.0047	0.0042	0.0005
267	0.0047	0.0042	0.0005
268	0.0046	0.0042	0.0005
269	0.0046	0.0041	0.0005
270	0.0046	0.0041	0.0005
271	0.0045	0.0041	0.0005
272	0.0045	0.0040	0.0005
273	0.0045	0.0040	0.0005
274	0.0044	0.0040	0.0004
275	0.0044	0.0039	0.0004
276	0.0044	0.0039	0.0004

277	0.0043	0.0039	0.0004
278	0.0043	0.0039	0.0004
279	0.0043	0.0038	0.0004
280	0.0042	0.0038	0.0004
281	0.0042	0.0038	0.0004
282	0.0042	0.0038	0.0004
283	0.0042	0.0037	0.0004
284	0.0041	0.0037	0.0004
285	0.0041	0.0037	0.0004
286	0.0041	0.0037	0.0004
287	0.0041	0.0036	0.0004
288	0.0040	0.0036	0.0004

Total soil rain loss = 2.39(In)
Total effective rainfall = 0.42(In)
Peak flow rate in flood hydrograph = 12.10(CFS)

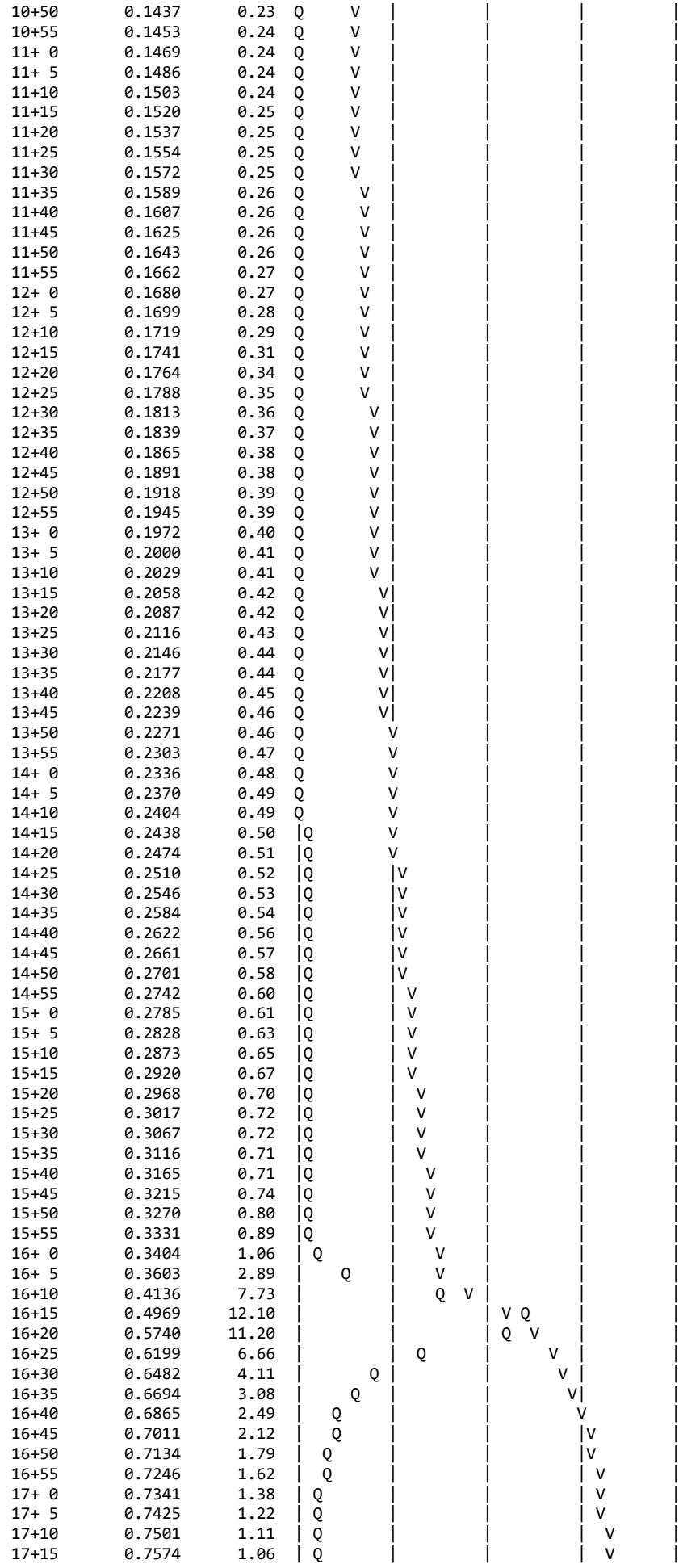
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0000	0.00	Q	|	|	|	|
0+10	0.0002	0.02	Q	|	|	|	|
0+15	0.0005	0.05	Q	|	|	|	|
0+20	0.0010	0.08	Q	|	|	|	|
0+25	0.0016	0.09	Q	|	|	|	|
0+30	0.0023	0.10	Q	|	|	|	|
0+35	0.0030	0.10	Q	|	|	|	|
0+40	0.0038	0.11	Q	|	|	|	|
0+45	0.0046	0.11	Q	|	|	|	|
0+50	0.0054	0.12	Q	|	|	|	|
0+55	0.0062	0.12	Q	|	|	|	|
1+ 0	0.0070	0.12	Q	|	|	|	|
1+ 5	0.0078	0.12	Q	|	|	|	|
1+10	0.0087	0.12	Q	|	|	|	|
1+15	0.0095	0.13	Q	|	|	|	|
1+20	0.0104	0.13	Q	|	|	|	|
1+25	0.0113	0.13	Q	|	|	|	|
1+30	0.0122	0.13	Q	|	|	|	|
1+35	0.0131	0.13	Q	|	|	|	|
1+40	0.0140	0.13	Q	|	|	|	|
1+45	0.0149	0.13	Q	|	|	|	|
1+50	0.0158	0.13	Q	|	|	|	|
1+55	0.0167	0.13	Q	|	|	|	|
2+ 0	0.0177	0.13	Q	|	|	|	|
2+ 5	0.0186	0.13	Q	|	|	|	|
2+10	0.0195	0.14	Q	|	|	|	|
2+15	0.0205	0.14	Q	|	|	|	|
2+20	0.0214	0.14	Q	|	|	|	|
2+25	0.0223	0.14	Q	|	|	|	|
2+30	0.0233	0.14	QV	|	|	|	|
2+35	0.0242	0.14	QV	|	|	|	|
2+40	0.0252	0.14	QV	|	|	|	|
2+45	0.0261	0.14	QV	|	|	|	|
2+50	0.0271	0.14	QV	|	|	|	|
2+55	0.0280	0.14	QV	|	|	|	|
3+ 0	0.0290	0.14	QV	|	|	|	|
3+ 5	0.0300	0.14	QV	|	|	|	|
3+10	0.0309	0.14	QV	|	|	|	|
3+15	0.0319	0.14	QV	|	|	|	|
3+20	0.0329	0.14	QV	|	|	|	|
3+25	0.0339	0.14	QV	|	|	|	|
3+30	0.0349	0.14	QV	|	|	|	|
3+35	0.0359	0.14	QV	|	|	|	|
3+40	0.0369	0.14	QV	|	|	|	|
3+45	0.0379	0.14	QV	|	|	|	|
3+50	0.0389	0.15	QV	|	|	|	|
3+55	0.0399	0.15	QV	|	|	|	|
4+ 0	0.0409	0.15	QV	|	|	|	|
4+ 5	0.0419	0.15	QV	|	|	|	|
4+10	0.0429	0.15	QV	|	|	|	|
4+15	0.0439	0.15	QV	|	|	|	|

4+20	0.0449	0.15	QV	|	|	|	|
4+25	0.0460	0.15	Q V	|	|	|	|
4+30	0.0470	0.15	Q V	|	|	|	|
4+35	0.0481	0.15	Q V	|	|	|	|
4+40	0.0491	0.15	Q V	|	|	|	|
4+45	0.0501	0.15	Q V	|	|	|	|
4+50	0.0512	0.15	Q V	|	|	|	|
4+55	0.0522	0.15	Q V	|	|	|	|
5+ 0	0.0533	0.15	Q V	|	|	|	|
5+ 5	0.0544	0.15	Q V	|	|	|	|
5+10	0.0554	0.16	Q V	|	|	|	|
5+15	0.0565	0.16	Q V	|	|	|	|
5+20	0.0576	0.16	Q V	|	|	|	|
5+25	0.0587	0.16	Q V	|	|	|	|
5+30	0.0598	0.16	Q V	|	|	|	|
5+35	0.0609	0.16	Q V	|	|	|	|
5+40	0.0620	0.16	Q V	|	|	|	|
5+45	0.0631	0.16	Q V	|	|	|	|
5+50	0.0642	0.16	Q V	|	|	|	|
5+55	0.0653	0.16	Q V	|	|	|	|
6+ 0	0.0664	0.16	Q V	|	|	|	|
6+ 5	0.0675	0.16	Q V	|	|	|	|
6+10	0.0687	0.16	Q V	|	|	|	|
6+15	0.0698	0.16	Q V	|	|	|	|
6+20	0.0709	0.17	Q V	|	|	|	|
6+25	0.0721	0.17	Q V	|	|	|	|
6+30	0.0732	0.17	Q V	|	|	|	|
6+35	0.0744	0.17	Q V	|	|	|	|
6+40	0.0756	0.17	Q V	|	|	|	|
6+45	0.0767	0.17	Q V	|	|	|	|
6+50	0.0779	0.17	Q V	|	|	|	|
6+55	0.0791	0.17	Q V	|	|	|	|
7+ 0	0.0803	0.17	Q V	|	|	|	|
7+ 5	0.0815	0.17	Q V	|	|	|	|
7+10	0.0827	0.17	Q V	|	|	|	|
7+15	0.0839	0.18	Q V	|	|	|	|
7+20	0.0851	0.18	Q V	|	|	|	|
7+25	0.0863	0.18	Q V	|	|	|	|
7+30	0.0875	0.18	Q V	|	|	|	|
7+35	0.0888	0.18	Q V	|	|	|	|
7+40	0.0900	0.18	Q V	|	|	|	|
7+45	0.0913	0.18	Q V	|	|	|	|
7+50	0.0925	0.18	Q V	|	|	|	|
7+55	0.0938	0.18	Q V	|	|	|	|
8+ 0	0.0951	0.18	Q V	|	|	|	|
8+ 5	0.0963	0.19	Q V	|	|	|	|
8+10	0.0976	0.19	Q V	|	|	|	|
8+15	0.0989	0.19	Q V	|	|	|	|
8+20	0.1002	0.19	Q V	|	|	|	|
8+25	0.1015	0.19	Q V	|	|	|	|
8+30	0.1028	0.19	Q V	|	|	|	|
8+35	0.1042	0.19	Q V	|	|	|	|
8+40	0.1055	0.19	Q V	|	|	|	|
8+45	0.1068	0.19	Q V	|	|	|	|
8+50	0.1082	0.20	Q V	|	|	|	|
8+55	0.1095	0.20	Q V	|	|	|	|
9+ 0	0.1109	0.20	Q V	|	|	|	|
9+ 5	0.1123	0.20	Q V	|	|	|	|
9+10	0.1137	0.20	Q V	|	|	|	|
9+15	0.1151	0.20	Q V	|	|	|	|
9+20	0.1165	0.20	Q V	|	|	|	|
9+25	0.1179	0.21	Q V	|	|	|	|
9+30	0.1193	0.21	Q V	|	|	|	|
9+35	0.1208	0.21	Q V	|	|	|	|
9+40	0.1222	0.21	Q V	|	|	|	|
9+45	0.1237	0.21	Q V	|	|	|	|
9+50	0.1251	0.21	Q V	|	|	|	|
9+55	0.1266	0.21	Q V	|	|	|	|
10+ 0	0.1281	0.22	Q V	|	|	|	|
10+ 5	0.1296	0.22	Q V	|	|	|	|
10+10	0.1311	0.22	Q V	|	|	|	|
10+15	0.1326	0.22	Q V	|	|	|	|
10+20	0.1342	0.22	Q V	|	|	|	|
10+25	0.1357	0.23	Q V	|	|	|	|
10+30	0.1373	0.23	Q V	|	|	|	|
10+35	0.1389	0.23	Q V	|	|	|	|
10+40	0.1404	0.23	Q V	|	|	|	|
10+45	0.1421	0.23	Q V	|	|	|	|



```
17+20       0.7640      0.96  |Q        |         |         |  V      |
17+25       0.7701      0.88  |Q        |         |         |   V     |
17+30       0.7756      0.81  |Q        |         |         |   V     |
17+35       0.7808      0.75  |Q        |         |         |   V     |
17+40       0.7856      0.70  |Q        |         |         |   V     |
17+45       0.7900      0.64  |Q        |         |         |   V     |
17+50       0.7942      0.62  |Q        |         |         |    V    |
17+55       0.7984      0.60  |Q        |         |         |    V    |
18+ 0       0.8019      0.51  |Q        |         |         |    V    |
18+ 5       0.8048      0.42  Q         |         |         |    V    |
18+10       0.8075      0.40  Q         |         |         |    V    |
18+15       0.8101      0.37  Q         |         |         |    V    |
18+20       0.8124      0.34  Q         |         |         |    V    |
18+25       0.8146      0.32  Q         |         |         |     V   |
18+30       0.8167      0.31  Q         |         |         |     V   |
18+35       0.8187      0.30  Q         |         |         |     V   |
18+40       0.8207      0.29  Q         |         |         |     V   |
18+45       0.8226      0.28  Q         |         |         |     V   |
18+50       0.8245      0.27  Q         |         |         |     V   |
18+55       0.8263      0.26  Q         |         |         |     V   |
19+ 0       0.8280      0.26  Q         |         |         |     V   |
19+ 5       0.8298      0.25  Q         |         |         |     V   |
19+10       0.8315      0.24  Q         |         |         |     V   |
19+15       0.8331      0.24  Q         |         |         |     V   |
19+20       0.8347      0.23  Q         |         |         |     V   |
19+25       0.8363      0.23  Q         |         |         |      V  |
19+30       0.8378      0.23  Q         |         |         |      V  |
19+35       0.8394      0.22  Q         |         |         |      V  |
19+40       0.8409      0.22  Q         |         |         |      V  |
19+45       0.8423      0.21  Q         |         |         |      V  |
19+50       0.8438      0.21  Q         |         |         |      V  |
19+55       0.8452      0.21  Q         |         |         |      V  |
20+ 0       0.8466      0.20  Q         |         |         |      V  |
20+ 5       0.8480      0.20  Q         |         |         |      V  |
20+10       0.8494      0.20  Q         |         |         |      V  |
20+15       0.8507      0.20  Q         |         |         |      V  |
20+20       0.8521      0.19  Q         |         |         |      V  |
20+25       0.8534      0.19  Q         |         |         |      V  |
20+30       0.8547      0.19  Q         |         |         |      V  |
20+35       0.8560      0.19  Q         |         |         |      V  |
20+40       0.8572      0.18  Q         |         |         |      V  |
20+45       0.8585      0.18  Q         |         |         |       V |
20+50       0.8597      0.18  Q         |         |         |       V |
20+55       0.8610      0.18  Q         |         |         |       V |
21+ 0       0.8622      0.18  Q         |         |         |       V |
21+ 5       0.8634      0.17  Q         |         |         |       V |
21+10       0.8646      0.17  Q         |         |         |       V |
21+15       0.8657      0.17  Q         |         |         |       V |
21+20       0.8669      0.17  Q         |         |         |       V |
21+25       0.8681      0.17  Q         |         |         |       V |
21+30       0.8692      0.17  Q         |         |         |       V |
21+35       0.8703      0.16  Q         |         |         |       V |
21+40       0.8714      0.16  Q         |         |         |       V |
21+45       0.8726      0.16  Q         |         |         |       V |
21+50       0.8737      0.16  Q         |         |         |       V |
21+55       0.8747      0.16  Q         |         |         |       V |
22+ 0       0.8758      0.16  Q         |         |         |       V |
22+ 5       0.8769      0.16  Q         |         |         |       V |
22+10       0.8779      0.15  Q         |         |         |       V |
22+15       0.8790      0.15  Q         |         |         |       V |
22+20       0.8800      0.15  Q         |         |         |       V |
22+25       0.8811      0.15  Q         |         |         |        V|
22+30       0.8821      0.15  Q         |         |         |        V|
22+35       0.8831      0.15  Q         |         |         |        V|
22+40       0.8841      0.15  Q         |         |         |        V|
22+45       0.8851      0.15  Q         |         |         |        V|
22+50       0.8861      0.14  Q         |         |         |        V|
22+55       0.8871      0.14  Q         |         |         |        V|
23+ 0       0.8881      0.14  Q         |         |         |        V|
23+ 5       0.8891      0.14  Q         |         |         |        V|
23+10       0.8900      0.14  Q         |         |         |        V|
23+15       0.8910      0.14  Q         |         |         |        V|
23+20       0.8919      0.14  Q         |         |         |        V|
23+25       0.8929      0.14  Q         |         |         |        V|
23+30       0.8938      0.14  Q         |         |         |        V|
23+35       0.8947      0.14  Q         |         |         |        V|
23+40       0.8957      0.13  Q         |         |         |        V|
23+45       0.8966      0.13  Q         |         |         |        V|
```

23+50	0.8975	0.13	Q	|	|	|	V|
23+55	0.8984	0.13	Q	|	|	|	V|
24+ 0	0.8993	0.13	Q	|	|	|	V|
24+ 5	0.9002	0.13	Q	|	|	|	V|
24+10	0.9009	0.11	Q	|	|	|	V|
24+15	0.9015	0.08	Q	|	|	|	V|
24+20	0.9018	0.05	Q	|	|	|	V|
24+25	0.9021	0.04	Q	|	|	|	V|
24+30	0.9023	0.03	Q	|	|	|	V|
24+35	0.9025	0.02	Q	|	|	|	V|
24+40	0.9026	0.02	Q	|	|	|	V|
24+45	0.9027	0.02	Q	|	|	|	V|
24+50	0.9028	0.01	Q	|	|	|	V|
24+55	0.9029	0.01	Q	|	|	|	V|
25+ 0	0.9029	0.01	Q	|	|	|	V|
25+ 5	0.9030	0.01	Q	|	|	|	V|
25+10	0.9030	0.01	Q	|	|	|	V|
25+15	0.9031	0.01	Q	|	|	|	V|
25+20	0.9031	0.00	Q	|	|	|	V|
25+25	0.9031	0.00	Q	|	|	|	V|
25+30	0.9031	0.00	Q	|	|	|	V|
25+35	0.9031	0.00	Q	|	|	|	V|
25+40	0.9032	0.00	Q	|	|	|	V|
25+45	0.9032	0.00	Q	|	|	|	V|
25+50	0.9032	0.00	Q	|	|	|	V|
25+55	0.9032	0.00	Q	|	|	|	V

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

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Study date 07/11/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 10

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
25.77	1	0.79
Rainfall data for year 10		
25.77	6	2.06
Rainfall data for year 10		
25.77	24	3.70

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 1)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
67.0	47.4	25.77	1.000	0.840	0.900	0.756

Area-averaged adjusted loss rate Fm (In/Hr) = 0.756

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC1)	S	Pervious Yield Fr
23.19	0.900	67.0	47.4	11.10	0.047
2.58	0.100	98.0	98.0	0.20	0.937

Area-averaged catchment yield fraction, Y = 0.136
Area-averaged low loss fraction, Yb = 0.864
User entry of time of concentration = 0.309 (hours)
++
Watershed area = 25.77(Ac.)
Catchment Lag time = 0.247 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 33.6782
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.756(In/Hr)
Average low loss rate fraction (Yb) = 0.864 (decimal)
VALLEY DEVELOPED S-Graph proportion = 0.070
VALLEY UNDEVELOPED S-Graph proportion = 0.930
FOOTHILL S-Graph proportion = 0.000
MOUNTAIN S-Graph proportion = 0.000

DESERT S-Graph proportion = -0.000

Computed peak 5-minute rainfall = 0.292(In)
Computed peak 30-minute rainfall = 0.599(In)
Specified peak 1-hour rainfall = 0.790(In)
Computed peak 3-hour rainfall = 1.422(In)
Specified peak 6-hour rainfall = 2.060(In)
Specified peak 24-hour rainfall = 3.700(In)

Rainfall depth area reduction factors:
Using a total area of 25.77(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.292(In)
30-minute factor = 0.999 Adjusted rainfall = 0.598(In)
1-hour factor = 0.999 Adjusted rainfall = 0.789(In)
3-hour factor = 1.000 Adjusted rainfall = 1.422(In)
6-hour factor = 1.000 Adjusted rainfall = 2.060(In)
24-hour factor = 1.000 Adjusted rainfall = 3.700(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 311.66 (CFS))	
1	3.322	10.353
2	16.345	40.586
3	38.471	68.957
4	59.043	64.115
5	70.514	35.751
6	76.946	20.044
7	81.385	13.834
8	84.717	10.385
9	87.374	8.280
10	89.457	6.493
11	91.275	5.665
12	92.688	4.406
13	93.835	3.574
14	94.825	3.084
15	95.766	2.932
16	96.544	2.427
17	97.205	2.060
18	97.774	1.772
19	98.254	1.496
20	98.662	1.271
21	98.981	0.994
22	99.294	0.976
23	99.607	0.976
24	100.000	0.488

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2920	0.2920
2	0.3853	0.0933
3	0.4532	0.0678
4	0.5085	0.0553
5	0.5559	0.0475
6	0.5980	0.0421
7	0.6360	0.0380
8	0.6709	0.0349
9	0.7033	0.0324
10	0.7335	0.0303
11	0.7621	0.0285
12	0.7890	0.0270
13	0.8236	0.0346
14	0.8570	0.0334
15	0.8893	0.0323
16	0.9206	0.0313
17	0.9510	0.0304
18	0.9805	0.0296
19	1.0094	0.0288
20	1.0375	0.0281
21	1.0650	0.0275
22	1.0919	0.0269
23	1.1182	0.0263

24	1.1440	0.0258
25	1.1693	0.0253
26	1.1941	0.0248
27	1.2185	0.0244
28	1.2425	0.0240
29	1.2661	0.0236
30	1.2893	0.0232
31	1.3121	0.0229
32	1.3346	0.0225
33	1.3568	0.0222
34	1.3787	0.0219
35	1.4003	0.0216
36	1.4216	0.0213
37	1.4426	0.0210
38	1.4633	0.0207
39	1.4838	0.0205
40	1.5040	0.0202
41	1.5240	0.0200
42	1.5438	0.0198
43	1.5634	0.0196
44	1.5827	0.0193
45	1.6019	0.0191
46	1.6208	0.0189
47	1.6396	0.0188
48	1.6581	0.0186
49	1.6765	0.0184
50	1.6948	0.0182
51	1.7128	0.0181
52	1.7307	0.0179
53	1.7484	0.0177
54	1.7660	0.0176
55	1.7834	0.0174
56	1.8007	0.0173
57	1.8178	0.0171
58	1.8348	0.0170
59	1.8517	0.0169
60	1.8684	0.0167
61	1.8850	0.0166
62	1.9015	0.0165
63	1.9178	0.0163
64	1.9340	0.0162
65	1.9501	0.0161
66	1.9661	0.0160
67	1.9820	0.0159
68	1.9978	0.0158
69	2.0135	0.0157
70	2.0290	0.0156
71	2.0445	0.0155
72	2.0598	0.0154
73	2.0719	0.0120
74	2.0838	0.0119
75	2.0957	0.0119
76	2.1074	0.0118
77	2.1191	0.0117
78	2.1307	0.0116
79	2.1422	0.0115
80	2.1536	0.0114
81	2.1649	0.0113
82	2.1762	0.0113
83	2.1873	0.0112
84	2.1984	0.0111
85	2.2095	0.0110
86	2.2204	0.0109
87	2.2313	0.0109
88	2.2421	0.0108
89	2.2528	0.0107
90	2.2635	0.0107
91	2.2741	0.0106
92	2.2846	0.0105
93	2.2950	0.0105
94	2.3054	0.0104
95	2.3158	0.0103
96	2.3260	0.0103
97	2.3362	0.0102
98	2.3464	0.0101
99	2.3565	0.0101
100	2.3665	0.0100
101	2.3765	0.0100

102	2.3864	0.0099
103	2.3962	0.0099
104	2.4060	0.0098
105	2.4158	0.0097
106	2.4255	0.0097
107	2.4351	0.0096
108	2.4447	0.0096
109	2.4542	0.0095
110	2.4637	0.0095
111	2.4732	0.0094
112	2.4826	0.0094
113	2.4919	0.0093
114	2.5012	0.0093
115	2.5104	0.0092
116	2.5196	0.0092
117	2.5288	0.0092
118	2.5379	0.0091
119	2.5470	0.0091
120	2.5560	0.0090
121	2.5650	0.0090
122	2.5739	0.0089
123	2.5828	0.0089
124	2.5916	0.0089
125	2.6004	0.0088
126	2.6092	0.0088
127	2.6179	0.0087
128	2.6266	0.0087
129	2.6353	0.0086
130	2.6439	0.0086
131	2.6525	0.0086
132	2.6610	0.0085
133	2.6695	0.0085
134	2.6780	0.0085
135	2.6864	0.0084
136	2.6948	0.0084
137	2.7031	0.0084
138	2.7114	0.0083
139	2.7197	0.0083
140	2.7280	0.0082
141	2.7362	0.0082
142	2.7444	0.0082
143	2.7525	0.0081
144	2.7606	0.0081
145	2.7687	0.0081
146	2.7768	0.0081
147	2.7848	0.0080
148	2.7928	0.0080
149	2.8007	0.0080
150	2.8087	0.0079
151	2.8166	0.0079
152	2.8244	0.0079
153	2.8323	0.0078
154	2.8401	0.0078
155	2.8478	0.0078
156	2.8556	0.0077
157	2.8633	0.0077
158	2.8710	0.0077
159	2.8787	0.0077
160	2.8863	0.0076
161	2.8939	0.0076
162	2.9015	0.0076
163	2.9090	0.0076
164	2.9166	0.0075
165	2.9241	0.0075
166	2.9315	0.0075
167	2.9390	0.0074
168	2.9464	0.0074
169	2.9538	0.0074
170	2.9612	0.0074
171	2.9685	0.0073
172	2.9758	0.0073
173	2.9831	0.0073
174	2.9904	0.0073
175	2.9977	0.0072
176	3.0049	0.0072
177	3.0121	0.0072
178	3.0193	0.0072
179	3.0264	0.0072

180	3.0336	0.0071
181	3.0407	0.0071
182	3.0478	0.0071
183	3.0548	0.0071
184	3.0619	0.0070
185	3.0689	0.0070
186	3.0759	0.0070
187	3.0828	0.0070
188	3.0898	0.0070
189	3.0967	0.0069
190	3.1036	0.0069
191	3.1105	0.0069
192	3.1174	0.0069
193	3.1243	0.0068
194	3.1311	0.0068
195	3.1379	0.0068
196	3.1447	0.0068
197	3.1515	0.0068
198	3.1582	0.0067
199	3.1649	0.0067
200	3.1716	0.0067
201	3.1783	0.0067
202	3.1850	0.0067
203	3.1916	0.0067
204	3.1983	0.0066
205	3.2049	0.0066
206	3.2115	0.0066
207	3.2181	0.0066
208	3.2246	0.0066
209	3.2312	0.0065
210	3.2377	0.0065
211	3.2442	0.0065
212	3.2507	0.0065
213	3.2572	0.0065
214	3.2636	0.0065
215	3.2700	0.0064
216	3.2765	0.0064
217	3.2829	0.0064
218	3.2892	0.0064
219	3.2956	0.0064
220	3.3020	0.0063
221	3.3083	0.0063
222	3.3146	0.0063
223	3.3209	0.0063
224	3.3272	0.0063
225	3.3335	0.0063
226	3.3397	0.0063
227	3.3459	0.0062
228	3.3522	0.0062
229	3.3584	0.0062
230	3.3645	0.0062
231	3.3707	0.0062
232	3.3769	0.0062
233	3.3830	0.0061
234	3.3891	0.0061
235	3.3953	0.0061
236	3.4014	0.0061
237	3.4074	0.0061
238	3.4135	0.0061
239	3.4196	0.0061
240	3.4256	0.0060
241	3.4316	0.0060
242	3.4376	0.0060
243	3.4436	0.0060
244	3.4496	0.0060
245	3.4556	0.0060
246	3.4615	0.0060
247	3.4675	0.0059
248	3.4734	0.0059
249	3.4793	0.0059
250	3.4852	0.0059
251	3.4911	0.0059
252	3.4969	0.0059
253	3.5028	0.0059
254	3.5086	0.0058
255	3.5145	0.0058
256	3.5203	0.0058
257	3.5261	0.0058

258	3.5319	0.0058
259	3.5376	0.0058
260	3.5434	0.0058
261	3.5492	0.0058
262	3.5549	0.0057
263	3.5606	0.0057
264	3.5663	0.0057
265	3.5720	0.0057
266	3.5777	0.0057
267	3.5834	0.0057
268	3.5891	0.0057
269	3.5947	0.0057
270	3.6004	0.0056
271	3.6060	0.0056
272	3.6116	0.0056
273	3.6172	0.0056
274	3.6228	0.0056
275	3.6284	0.0056
276	3.6340	0.0056
277	3.6395	0.0056
278	3.6451	0.0055
279	3.6506	0.0055
280	3.6561	0.0055
281	3.6616	0.0055
282	3.6671	0.0055
283	3.6726	0.0055
284	3.6781	0.0055
285	3.6835	0.0055
286	3.6890	0.0055
287	3.6944	0.0054
288	3.6999	0.0054

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0054	0.0047	0.0007
2	0.0054	0.0047	0.0007
3	0.0055	0.0047	0.0007
4	0.0055	0.0047	0.0007
5	0.0055	0.0048	0.0007
6	0.0055	0.0048	0.0007
7	0.0055	0.0048	0.0008
8	0.0055	0.0048	0.0008
9	0.0056	0.0048	0.0008
10	0.0056	0.0048	0.0008
11	0.0056	0.0048	0.0008
12	0.0056	0.0049	0.0008
13	0.0056	0.0049	0.0008
14	0.0057	0.0049	0.0008
15	0.0057	0.0049	0.0008
16	0.0057	0.0049	0.0008
17	0.0057	0.0049	0.0008
18	0.0057	0.0049	0.0008
19	0.0058	0.0050	0.0008
20	0.0058	0.0050	0.0008
21	0.0058	0.0050	0.0008
22	0.0058	0.0050	0.0008
23	0.0058	0.0050	0.0008
24	0.0058	0.0050	0.0008
25	0.0059	0.0051	0.0008
26	0.0059	0.0051	0.0008
27	0.0059	0.0051	0.0008
28	0.0059	0.0051	0.0008
29	0.0060	0.0051	0.0008
30	0.0060	0.0052	0.0008
31	0.0060	0.0052	0.0008
32	0.0060	0.0052	0.0008
33	0.0060	0.0052	0.0008
34	0.0061	0.0052	0.0008
35	0.0061	0.0053	0.0008
36	0.0061	0.0053	0.0008
37	0.0061	0.0053	0.0008
38	0.0061	0.0053	0.0008
39	0.0062	0.0053	0.0008
40	0.0062	0.0053	0.0008
41	0.0062	0.0054	0.0008
42	0.0062	0.0054	0.0008

43	0.0063	0.0054	0.0009
44	0.0063	0.0054	0.0009
45	0.0063	0.0055	0.0009
46	0.0063	0.0055	0.0009
47	0.0064	0.0055	0.0009
48	0.0064	0.0055	0.0009
49	0.0064	0.0055	0.0009
50	0.0064	0.0056	0.0009
51	0.0065	0.0056	0.0009
52	0.0065	0.0056	0.0009
53	0.0065	0.0056	0.0009
54	0.0065	0.0057	0.0009
55	0.0066	0.0057	0.0009
56	0.0066	0.0057	0.0009
57	0.0066	0.0057	0.0009
58	0.0067	0.0057	0.0009
59	0.0067	0.0058	0.0009
60	0.0067	0.0058	0.0009
61	0.0067	0.0058	0.0009
62	0.0068	0.0058	0.0009
63	0.0068	0.0059	0.0009
64	0.0068	0.0059	0.0009
65	0.0069	0.0059	0.0009
66	0.0069	0.0060	0.0009
67	0.0069	0.0060	0.0009
68	0.0070	0.0060	0.0009
69	0.0070	0.0060	0.0010
70	0.0070	0.0061	0.0010
71	0.0071	0.0061	0.0010
72	0.0071	0.0061	0.0010
73	0.0071	0.0062	0.0010
74	0.0072	0.0062	0.0010
75	0.0072	0.0062	0.0010
76	0.0072	0.0062	0.0010
77	0.0073	0.0063	0.0010
78	0.0073	0.0063	0.0010
79	0.0073	0.0063	0.0010
80	0.0074	0.0064	0.0010
81	0.0074	0.0064	0.0010
82	0.0074	0.0064	0.0010
83	0.0075	0.0065	0.0010
84	0.0075	0.0065	0.0010
85	0.0076	0.0065	0.0010
86	0.0076	0.0066	0.0010
87	0.0077	0.0066	0.0010
88	0.0077	0.0066	0.0010
89	0.0077	0.0067	0.0011
90	0.0078	0.0067	0.0011
91	0.0078	0.0068	0.0011
92	0.0079	0.0068	0.0011
93	0.0079	0.0068	0.0011
94	0.0080	0.0069	0.0011
95	0.0080	0.0069	0.0011
96	0.0081	0.0070	0.0011
97	0.0081	0.0070	0.0011
98	0.0081	0.0070	0.0011
99	0.0082	0.0071	0.0011
100	0.0082	0.0071	0.0011
101	0.0083	0.0072	0.0011
102	0.0084	0.0072	0.0011
103	0.0084	0.0073	0.0011
104	0.0085	0.0073	0.0012
105	0.0085	0.0074	0.0012
106	0.0086	0.0074	0.0012
107	0.0086	0.0075	0.0012
108	0.0087	0.0075	0.0012
109	0.0088	0.0076	0.0012
110	0.0088	0.0076	0.0012
111	0.0089	0.0077	0.0012
112	0.0089	0.0077	0.0012
113	0.0090	0.0078	0.0012
114	0.0091	0.0078	0.0012
115	0.0092	0.0079	0.0012
116	0.0092	0.0079	0.0013
117	0.0093	0.0080	0.0013
118	0.0093	0.0081	0.0013
119	0.0094	0.0082	0.0013
120	0.0095	0.0082	0.0013

121	0.0096	0.0083	0.0013
122	0.0096	0.0083	0.0013
123	0.0097	0.0084	0.0013
124	0.0098	0.0085	0.0013
125	0.0099	0.0086	0.0013
126	0.0100	0.0086	0.0014
127	0.0101	0.0087	0.0014
128	0.0101	0.0088	0.0014
129	0.0103	0.0089	0.0014
130	0.0103	0.0089	0.0014
131	0.0105	0.0090	0.0014
132	0.0105	0.0091	0.0014
133	0.0107	0.0092	0.0015
134	0.0107	0.0093	0.0015
135	0.0109	0.0094	0.0015
136	0.0109	0.0095	0.0015
137	0.0111	0.0096	0.0015
138	0.0112	0.0097	0.0015
139	0.0113	0.0098	0.0015
140	0.0114	0.0099	0.0016
141	0.0116	0.0100	0.0016
142	0.0117	0.0101	0.0016
143	0.0119	0.0102	0.0016
144	0.0119	0.0103	0.0016
145	0.0154	0.0133	0.0021
146	0.0155	0.0134	0.0021
147	0.0157	0.0135	0.0021
148	0.0158	0.0136	0.0021
149	0.0160	0.0138	0.0022
150	0.0161	0.0139	0.0022
151	0.0163	0.0141	0.0022
152	0.0165	0.0142	0.0022
153	0.0167	0.0144	0.0023
154	0.0169	0.0146	0.0023
155	0.0171	0.0148	0.0023
156	0.0173	0.0149	0.0024
157	0.0176	0.0152	0.0024
158	0.0177	0.0153	0.0024
159	0.0181	0.0156	0.0025
160	0.0182	0.0157	0.0025
161	0.0186	0.0160	0.0025
162	0.0188	0.0162	0.0026
163	0.0191	0.0165	0.0026
164	0.0193	0.0167	0.0026
165	0.0198	0.0171	0.0027
166	0.0200	0.0173	0.0027
167	0.0205	0.0177	0.0028
168	0.0207	0.0179	0.0028
169	0.0213	0.0184	0.0029
170	0.0216	0.0186	0.0029
171	0.0222	0.0192	0.0030
172	0.0225	0.0195	0.0031
173	0.0232	0.0201	0.0032
174	0.0236	0.0204	0.0032
175	0.0244	0.0211	0.0033
176	0.0248	0.0215	0.0034
177	0.0258	0.0223	0.0035
178	0.0263	0.0227	0.0036
179	0.0275	0.0237	0.0037
180	0.0281	0.0243	0.0038
181	0.0296	0.0256	0.0040
182	0.0304	0.0263	0.0041
183	0.0323	0.0279	0.0044
184	0.0334	0.0288	0.0045
185	0.0270	0.0233	0.0037
186	0.0285	0.0246	0.0039
187	0.0324	0.0280	0.0044
188	0.0349	0.0301	0.0047
189	0.0421	0.0363	0.0057
190	0.0475	0.0410	0.0065
191	0.0678	0.0586	0.0092
192	0.0933	0.0630	0.0303
193	0.2920	0.0630	0.2290
194	0.0553	0.0477	0.0075
195	0.0380	0.0329	0.0052
196	0.0303	0.0262	0.0041
197	0.0346	0.0299	0.0047
198	0.0313	0.0270	0.0043

199	0.0288	0.0249	0.0039
200	0.0269	0.0232	0.0037
201	0.0253	0.0219	0.0034
202	0.0240	0.0207	0.0033
203	0.0229	0.0197	0.0031
204	0.0219	0.0189	0.0030
205	0.0210	0.0181	0.0029
206	0.0202	0.0175	0.0028
207	0.0196	0.0169	0.0027
208	0.0189	0.0164	0.0026
209	0.0184	0.0159	0.0025
210	0.0179	0.0155	0.0024
211	0.0174	0.0151	0.0024
212	0.0170	0.0147	0.0023
213	0.0166	0.0143	0.0023
214	0.0162	0.0140	0.0022
215	0.0159	0.0137	0.0022
216	0.0156	0.0134	0.0021
217	0.0120	0.0104	0.0016
218	0.0118	0.0102	0.0016
219	0.0115	0.0099	0.0016
220	0.0113	0.0097	0.0015
221	0.0110	0.0095	0.0015
222	0.0108	0.0093	0.0015
223	0.0106	0.0092	0.0014
224	0.0104	0.0090	0.0014
225	0.0102	0.0088	0.0014
226	0.0100	0.0087	0.0014
227	0.0099	0.0085	0.0013
228	0.0097	0.0084	0.0013
229	0.0095	0.0082	0.0013
230	0.0094	0.0081	0.0013
231	0.0092	0.0080	0.0013
232	0.0091	0.0079	0.0012
233	0.0090	0.0078	0.0012
234	0.0089	0.0076	0.0012
235	0.0087	0.0075	0.0012
236	0.0086	0.0074	0.0012
237	0.0085	0.0073	0.0012
238	0.0084	0.0072	0.0011
239	0.0083	0.0072	0.0011
240	0.0082	0.0071	0.0011
241	0.0081	0.0070	0.0011
242	0.0080	0.0069	0.0011
243	0.0079	0.0068	0.0011
244	0.0078	0.0067	0.0011
245	0.0077	0.0067	0.0011
246	0.0076	0.0066	0.0010
247	0.0076	0.0065	0.0010
248	0.0075	0.0065	0.0010
249	0.0074	0.0064	0.0010
250	0.0073	0.0063	0.0010
251	0.0072	0.0063	0.0010
252	0.0072	0.0062	0.0010
253	0.0071	0.0061	0.0010
254	0.0070	0.0061	0.0010
255	0.0070	0.0060	0.0009
256	0.0069	0.0060	0.0009
257	0.0068	0.0059	0.0009
258	0.0068	0.0059	0.0009
259	0.0067	0.0058	0.0009
260	0.0067	0.0058	0.0009
261	0.0066	0.0057	0.0009
262	0.0066	0.0057	0.0009
263	0.0065	0.0056	0.0009
264	0.0065	0.0056	0.0009
265	0.0064	0.0055	0.0009
266	0.0063	0.0055	0.0009
267	0.0063	0.0054	0.0009
268	0.0063	0.0054	0.0009
269	0.0062	0.0054	0.0008
270	0.0062	0.0053	0.0008
271	0.0061	0.0053	0.0008
272	0.0061	0.0052	0.0008
273	0.0060	0.0052	0.0008
274	0.0060	0.0052	0.0008
275	0.0059	0.0051	0.0008
276	0.0059	0.0051	0.0008

277	0.0059	0.0051	0.0008
278	0.0058	0.0050	0.0008
279	0.0058	0.0050	0.0008
280	0.0057	0.0050	0.0008
281	0.0057	0.0049	0.0008
282	0.0057	0.0049	0.0008
283	0.0056	0.0049	0.0008
284	0.0056	0.0048	0.0008
285	0.0056	0.0048	0.0008
286	0.0055	0.0048	0.0008
287	0.0055	0.0047	0.0007
288	0.0055	0.0047	0.0007

Total soil rain loss = 2.99(In)
Total effective rainfall = 0.71(In)
Peak flow rate in flood hydrograph = 18.87(CFS)

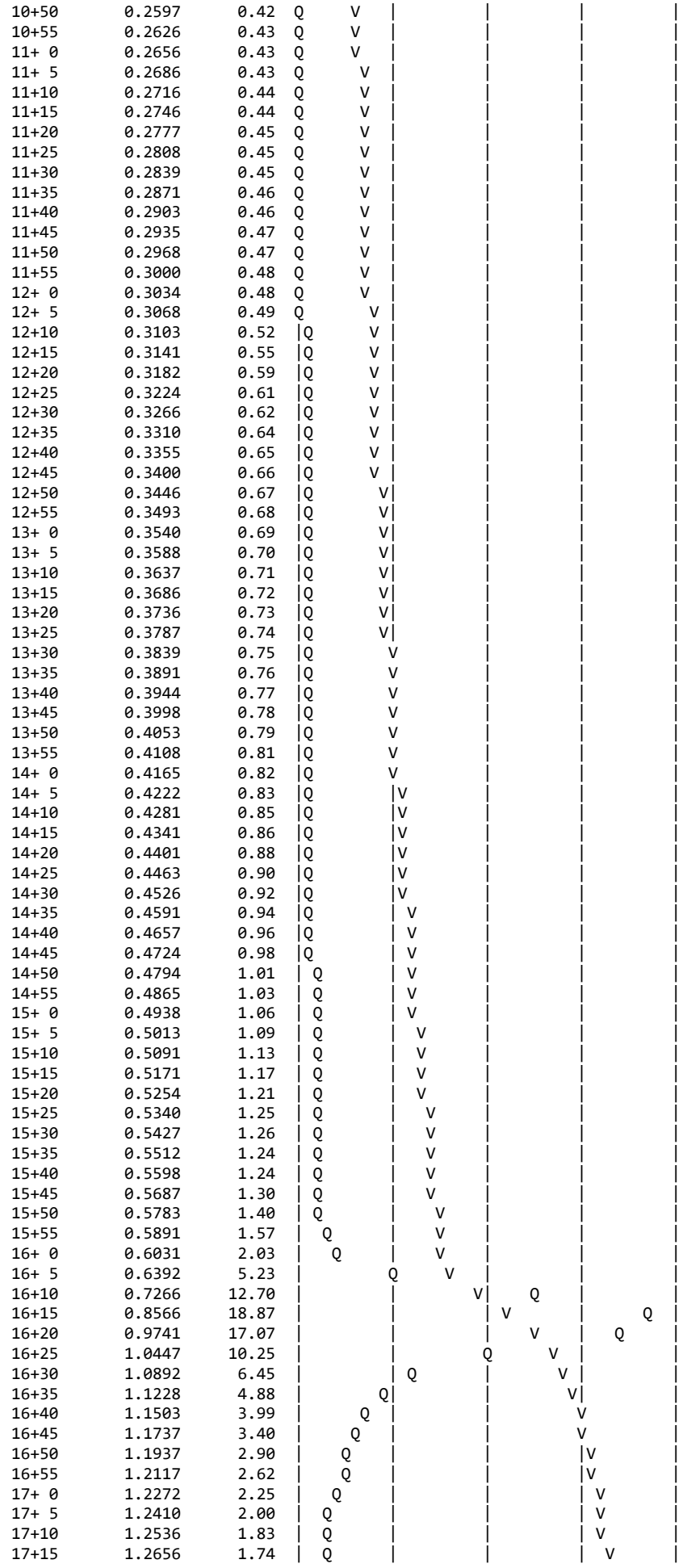
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0003	0.04	Q				
0+15	0.0009	0.09	Q				
0+20	0.0019	0.14	Q				
0+25	0.0030	0.16	Q				
0+30	0.0042	0.18	Q				
0+35	0.0055	0.19	Q				
0+40	0.0069	0.20	Q				
0+45	0.0083	0.20	Q				
0+50	0.0097	0.21	Q				
0+55	0.0112	0.21	Q				
1+ 0	0.0127	0.22	Q				
1+ 5	0.0142	0.22	Q				
1+10	0.0158	0.22	Q				
1+15	0.0174	0.23	Q				
1+20	0.0189	0.23	Q				
1+25	0.0205	0.23	Q				
1+30	0.0222	0.23	Q				
1+35	0.0238	0.24	Q				
1+40	0.0254	0.24	Q				
1+45	0.0271	0.24	Q				
1+50	0.0287	0.24	Q				
1+55	0.0304	0.24	Q				
2+ 0	0.0321	0.24	Q				
2+ 5	0.0338	0.24	Q				
2+10	0.0355	0.25	Q				
2+15	0.0372	0.25	Q				
2+20	0.0389	0.25	QV				
2+25	0.0406	0.25	QV				
2+30	0.0423	0.25	QV				
2+35	0.0440	0.25	QV				
2+40	0.0457	0.25	QV				
2+45	0.0475	0.25	QV				
2+50	0.0492	0.25	QV				
2+55	0.0509	0.25	QV				
3+ 0	0.0527	0.25	QV				
3+ 5	0.0544	0.26	QV				
3+10	0.0562	0.26	QV				
3+15	0.0580	0.26	QV				
3+20	0.0597	0.26	QV				
3+25	0.0615	0.26	QV				
3+30	0.0633	0.26	QV				
3+35	0.0651	0.26	QV				
3+40	0.0669	0.26	QV				
3+45	0.0687	0.26	QV				
3+50	0.0705	0.26	QV				
3+55	0.0724	0.26	QV				
4+ 0	0.0742	0.27	QV				
4+ 5	0.0760	0.27	QV				
4+10	0.0779	0.27	Q V				
4+15	0.0797	0.27	Q V				

4+20	0.0816	0.27	Q V	|	|	|	|
4+25	0.0835	0.27	Q V	|	|	|	|
4+30	0.0853	0.27	Q V	|	|	|	|
4+35	0.0872	0.27	Q V	|	|	|	|
4+40	0.0891	0.27	Q V	|	|	|	|
4+45	0.0910	0.28	Q V	|	|	|	|
4+50	0.0929	0.28	Q V	|	|	|	|
4+55	0.0948	0.28	Q V	|	|	|	|
5+ 0	0.0967	0.28	Q V	|	|	|	|
5+ 5	0.0987	0.28	Q V	|	|	|	|
5+10	0.1006	0.28	Q V	|	|	|	|
5+15	0.1026	0.28	Q V	|	|	|	|
5+20	0.1045	0.28	Q V	|	|	|	|
5+25	0.1065	0.28	Q V	|	|	|	|
5+30	0.1084	0.29	Q V	|	|	|	|
5+35	0.1104	0.29	Q V	|	|	|	|
5+40	0.1124	0.29	Q V	|	|	|	|
5+45	0.1144	0.29	Q V	|	|	|	|
5+50	0.1164	0.29	Q V	|	|	|	|
5+55	0.1184	0.29	Q V	|	|	|	|
6+ 0	0.1205	0.29	Q V	|	|	|	|
6+ 5	0.1225	0.30	Q V	|	|	|	|
6+10	0.1245	0.30	Q V	|	|	|	|
6+15	0.1266	0.30	Q V	|	|	|	|
6+20	0.1287	0.30	Q V	|	|	|	|
6+25	0.1307	0.30	Q V	|	|	|	|
6+30	0.1328	0.30	Q V	|	|	|	|
6+35	0.1349	0.30	Q V	|	|	|	|
6+40	0.1370	0.31	Q V	|	|	|	|
6+45	0.1391	0.31	Q V	|	|	|	|
6+50	0.1412	0.31	Q V	|	|	|	|
6+55	0.1434	0.31	Q V	|	|	|	|
7+ 0	0.1455	0.31	Q V	|	|	|	|
7+ 5	0.1477	0.31	Q V	|	|	|	|
7+10	0.1499	0.31	Q V	|	|	|	|
7+15	0.1520	0.32	Q V	|	|	|	|
7+20	0.1542	0.32	Q V	|	|	|	|
7+25	0.1564	0.32	Q V	|	|	|	|
7+30	0.1587	0.32	Q V	|	|	|	|
7+35	0.1609	0.32	Q V	|	|	|	|
7+40	0.1631	0.33	Q V	|	|	|	|
7+45	0.1654	0.33	Q V	|	|	|	|
7+50	0.1676	0.33	Q V	|	|	|	|
7+55	0.1699	0.33	Q V	|	|	|	|
8+ 0	0.1722	0.33	Q V	|	|	|	|
8+ 5	0.1745	0.33	Q V	|	|	|	|
8+10	0.1768	0.34	Q V	|	|	|	|
8+15	0.1792	0.34	Q V	|	|	|	|
8+20	0.1815	0.34	Q V	|	|	|	|
8+25	0.1839	0.34	Q V	|	|	|	|
8+30	0.1862	0.34	Q V	|	|	|	|
8+35	0.1886	0.35	Q V	|	|	|	|
8+40	0.1910	0.35	Q V	|	|	|	|
8+45	0.1934	0.35	Q V	|	|	|	|
8+50	0.1959	0.35	Q V	|	|	|	|
8+55	0.1983	0.36	Q V	|	|	|	|
9+ 0	0.2008	0.36	Q V	|	|	|	|
9+ 5	0.2033	0.36	Q V	|	|	|	|
9+10	0.2058	0.36	Q V	|	|	|	|
9+15	0.2083	0.37	Q V	|	|	|	|
9+20	0.2108	0.37	Q V	|	|	|	|
9+25	0.2134	0.37	Q V	|	|	|	|
9+30	0.2159	0.37	Q V	|	|	|	|
9+35	0.2185	0.38	Q V	|	|	|	|
9+40	0.2211	0.38	Q V	|	|	|	|
9+45	0.2237	0.38	Q V	|	|	|	|
9+50	0.2264	0.38	Q V	|	|	|	|
9+55	0.2290	0.39	Q V	|	|	|	|
10+ 0	0.2317	0.39	Q V	|	|	|	|
10+ 5	0.2344	0.39	Q V	|	|	|	|
10+10	0.2371	0.40	Q V	|	|	|	|
10+15	0.2399	0.40	Q V	|	|	|	|
10+20	0.2427	0.40	Q V	|	|	|	|
10+25	0.2454	0.40	Q V	|	|	|	|
10+30	0.2482	0.41	Q V	|	|	|	|
10+35	0.2511	0.41	Q V	|	|	|	|
10+40	0.2539	0.41	Q V	|	|	|	|
10+45	0.2568	0.42	Q V	|	|	|	|



```
17+20       1.2764      1.58  |  Q      |         |         |  V      |
17+25       1.2864      1.45  | Q       |         |         |  V      |
17+30       1.2957      1.34  | Q       |         |         |   V     |
17+35       1.3042      1.24  | Q       |         |         |   V     |
17+40       1.3122      1.16  | Q       |         |         |   V     |
17+45       1.3195      1.07  | Q       |         |         |   V     |
17+50       1.3267      1.04  | Q       |         |         |   V     |
17+55       1.3336      1.00  |Q        |         |         |    V    |
18+ 0       1.3395      0.86  |Q        |         |         |    V    |
18+ 5       1.3444      0.72  |Q        |         |         |    V    |
18+10       1.3491      0.68  |Q        |         |         |    V    |
18+15       1.3535      0.64  |Q        |         |         |    V    |
18+20       1.3576      0.59  |Q        |         |         |    V    |
18+25       1.3615      0.56  |Q        |         |         |    V    |
18+30       1.3652      0.54  |Q        |         |         |    V    |
18+35       1.3689      0.52  |Q        |         |         |    V    |
18+40       1.3723      0.51  |Q        |         |         |     V   |
18+45       1.3757      0.49  Q        |         |         |     V   |
18+50       1.3790      0.48  Q        |         |         |     V   |
18+55       1.3823      0.47  Q        |         |         |     V   |
19+ 0       1.3854      0.46  Q        |         |         |     V   |
19+ 5       1.3885      0.45  Q        |         |         |     V   |
19+10       1.3915      0.44  Q        |         |         |     V   |
19+15       1.3945      0.43  Q        |         |         |     V   |
19+20       1.3973      0.42  Q        |         |         |     V   |
19+25       1.4002      0.41  Q        |         |         |     V   |
19+30       1.4030      0.40  Q        |         |         |     V   |
19+35       1.4057      0.40  Q        |         |         |     V   |
19+40       1.4084      0.39  Q        |         |         |      V  |
19+45       1.4111      0.38  Q        |         |         |      V  |
19+50       1.4137      0.38  Q        |         |         |      V  |
19+55       1.4162      0.37  Q        |         |         |      V  |
20+ 0       1.4188      0.37  Q        |         |         |      V  |
20+ 5       1.4213      0.36  Q        |         |         |      V  |
20+10       1.4237      0.36  Q        |         |         |      V  |
20+15       1.4262      0.35  Q        |         |         |      V  |
20+20       1.4286      0.35  Q        |         |         |      V  |
20+25       1.4309      0.34  Q        |         |         |      V  |
20+30       1.4333      0.34  Q        |         |         |      V  |
20+35       1.4356      0.34  Q        |         |         |      V  |
20+40       1.4379      0.33  Q        |         |         |      V  |
20+45       1.4402      0.33  Q        |         |         |      V  |
20+50       1.4424      0.33  Q        |         |         |      V  |
20+55       1.4446      0.32  Q        |         |         |      V  |
21+ 0       1.4468      0.32  Q        |         |         |       V |
21+ 5       1.4490      0.31  Q        |         |         |       V |
21+10       1.4511      0.31  Q        |         |         |       V |
21+15       1.4532      0.31  Q        |         |         |       V |
21+20       1.4553      0.31  Q        |         |         |       V |
21+25       1.4574      0.30  Q        |         |         |       V |
21+30       1.4595      0.30  Q        |         |         |       V |
21+35       1.4615      0.30  Q        |         |         |       V |
21+40       1.4636      0.29  Q        |         |         |       V |
21+45       1.4656      0.29  Q        |         |         |       V |
21+50       1.4676      0.29  Q        |         |         |       V |
21+55       1.4695      0.29  Q        |         |         |       V |
22+ 0       1.4715      0.28  Q        |         |         |       V |
22+ 5       1.4734      0.28  Q        |         |         |       V |
22+10       1.4753      0.28  Q        |         |         |       V |
22+15       1.4772      0.28  Q        |         |         |       V |
22+20       1.4791      0.27  Q        |         |         |       V |
22+25       1.4810      0.27  Q        |         |         |       V |
22+30       1.4829      0.27  Q        |         |         |       V |
22+35       1.4847      0.27  Q        |         |         |        V|
22+40       1.4865      0.27  Q        |         |         |        V|
22+45       1.4883      0.26  Q        |         |         |        V|
22+50       1.4901      0.26  Q        |         |         |        V|
22+55       1.4919      0.26  Q        |         |         |        V|
23+ 0       1.4937      0.26  Q        |         |         |        V|
23+ 5       1.4955      0.26  Q        |         |         |        V|
23+10       1.4972      0.25  Q        |         |         |        V|
23+15       1.4990      0.25  Q        |         |         |        V|
23+20       1.5007      0.25  Q        |         |         |        V|
23+25       1.5024      0.25  Q        |         |         |        V|
23+30       1.5041      0.25  Q        |         |         |        V|
23+35       1.5058      0.25  Q        |         |         |        V|
23+40       1.5075      0.24  Q        |         |         |        V|
23+45       1.5091      0.24  Q        |         |         |        V|
```

23+50	1.5108	0.24	Q	|	|	|	V|
23+55	1.5124	0.24	Q	|	|	|	V|
24+ 0	1.5141	0.24	Q	|	|	|	V|
24+ 5	1.5156	0.23	Q	|	|	|	V|
24+10	1.5170	0.20	Q	|	|	|	V|
24+15	1.5180	0.14	Q	|	|	|	V|
24+20	1.5186	0.10	Q	|	|	|	V|
24+25	1.5191	0.07	Q	|	|	|	V|
24+30	1.5195	0.05	Q	|	|	|	V|
24+35	1.5198	0.04	Q	|	|	|	V|
24+40	1.5200	0.04	Q	|	|	|	V|
24+45	1.5202	0.03	Q	|	|	|	V|
24+50	1.5204	0.02	Q	|	|	|	V|
24+55	1.5206	0.02	Q	|	|	|	V|
25+ 0	1.5207	0.02	Q	|	|	|	V|
25+ 5	1.5208	0.01	Q	|	|	|	V|
25+10	1.5208	0.01	Q	|	|	|	V|
25+15	1.5209	0.01	Q	|	|	|	V|
25+20	1.5210	0.01	Q	|	|	|	V|
25+25	1.5210	0.01	Q	|	|	|	V|
25+30	1.5210	0.00	Q	|	|	|	V|
25+35	1.5211	0.00	Q	|	|	|	V|
25+40	1.5211	0.00	Q	|	|	|	V|
25+45	1.5211	0.00	Q	|	|	|	V|
25+50	1.5211	0.00	Q	|	|	|	V|
25+55	1.5211	0.00	Q	|	|	|	V|

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

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Study date 07/11/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 25

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 25		
25.77	1	0.95
Rainfall data for year 25		
25.77	6	2.45
Rainfall data for year 25		
25.77	24	4.44

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
67.0	67.0	25.77	1.000	0.578	0.900	0.520

Area-averaged adjusted loss rate Fm (In/Hr) = 0.520

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
23.19	0.900	67.0	67.0	4.93	0.321
2.58	0.100	98.0	98.0	0.20	0.947

Area-averaged catchment yield fraction, Y = 0.383
Area-averaged low loss fraction, Yb = 0.617
User entry of time of concentration = 0.387 (hours)
++
Watershed area = 25.77(Ac.)
Catchment Lag time = 0.310 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 26.9165
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.520(In/Hr)
Average low loss rate fraction (Yb) = 0.617 (decimal)
VALLEY DEVELOPED S-Graph proportion = 0.070
VALLEY UNDEVELOPED S-Graph proportion = 0.930
FOOTHILL S-Graph proportion = 0.000
MOUNTAIN S-Graph proportion = 0.000

DESERT S-Graph proportion = -0.000

Computed peak 5-minute rainfall = 0.352(In)
Computed peak 30-minute rainfall = 0.720(In)
Specified peak 1-hour rainfall = 0.950(In)
Computed peak 3-hour rainfall = 1.698(In)
Specified peak 6-hour rainfall = 2.450(In)
Specified peak 24-hour rainfall = 4.440(In)

Rainfall depth area reduction factors:
Using a total area of 25.77(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.351(In)
30-minute factor = 0.999 Adjusted rainfall = 0.719(In)
1-hour factor = 0.999 Adjusted rainfall = 0.949(In)
3-hour factor = 1.000 Adjusted rainfall = 1.698(In)
6-hour factor = 1.000 Adjusted rainfall = 2.450(In)
24-hour factor = 1.000 Adjusted rainfall = 4.440(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 311.66 (CFS))	
1	2.459	7.664
2	11.075	26.850
3	26.574	48.305
4	45.532	59.084
5	60.657	47.138
6	69.685	28.135
7	75.335	17.608
8	79.328	12.444
9	82.470	9.793
10	84.998	7.878
11	87.124	6.627
12	88.860	5.410
13	90.398	4.792
14	91.712	4.097
15	92.811	3.424
16	93.723	2.843
17	94.522	2.490
18	95.286	2.381
19	96.019	2.284
20	96.603	1.820
21	97.138	1.666
22	97.598	1.434
23	98.023	1.326
24	98.378	1.105
25	98.692	0.979
26	98.943	0.784
27	99.194	0.780
28	99.444	0.780
29	99.694	0.780
30	100.000	0.390

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3512	0.3512
2	0.4634	0.1122
3	0.5450	0.0816
4	0.6114	0.0665
5	0.6685	0.0571
6	0.7191	0.0506
7	0.7648	0.0457
8	0.8068	0.0420
9	0.8457	0.0389
10	0.8821	0.0364
11	0.9164	0.0343
12	0.9489	0.0325
13	0.9899	0.0411
14	1.0296	0.0396
15	1.0679	0.0383
16	1.1050	0.0371
17	1.1411	0.0361

18	1.1762	0.0351
19	1.2104	0.0342
20	1.2437	0.0333
21	1.2763	0.0326
22	1.3081	0.0318
23	1.3393	0.0312
24	1.3698	0.0305
25	1.3997	0.0299
26	1.4291	0.0294
27	1.4580	0.0289
28	1.4863	0.0284
29	1.5142	0.0279
30	1.5417	0.0274
31	1.5687	0.0270
32	1.5953	0.0266
33	1.6215	0.0262
34	1.6473	0.0258
35	1.6728	0.0255
36	1.6980	0.0251
37	1.7228	0.0248
38	1.7472	0.0245
39	1.7714	0.0242
40	1.7953	0.0239
41	1.8189	0.0236
42	1.8422	0.0233
43	1.8653	0.0231
44	1.8881	0.0228
45	1.9107	0.0226
46	1.9330	0.0223
47	1.9551	0.0221
48	1.9770	0.0219
49	1.9987	0.0217
50	2.0201	0.0215
51	2.0414	0.0213
52	2.0625	0.0211
53	2.0834	0.0209
54	2.1041	0.0207
55	2.1246	0.0205
56	2.1449	0.0203
57	2.1651	0.0202
58	2.1851	0.0200
59	2.2049	0.0198
60	2.2246	0.0197
61	2.2442	0.0195
62	2.2635	0.0194
63	2.2828	0.0192
64	2.3019	0.0191
65	2.3208	0.0190
66	2.3396	0.0188
67	2.3583	0.0187
68	2.3769	0.0185
69	2.3953	0.0184
70	2.4136	0.0183
71	2.4317	0.0182
72	2.4498	0.0181
73	2.4643	0.0145
74	2.4788	0.0144
75	2.4931	0.0143
76	2.5073	0.0142
77	2.5214	0.0141
78	2.5354	0.0140
79	2.5493	0.0139
80	2.5631	0.0138
81	2.5767	0.0137
82	2.5903	0.0136
83	2.6038	0.0135
84	2.6173	0.0134
85	2.6306	0.0133
86	2.6438	0.0132
87	2.6569	0.0131
88	2.6700	0.0131
89	2.6830	0.0130
90	2.6959	0.0129
91	2.7087	0.0128
92	2.7214	0.0127
93	2.7340	0.0126
94	2.7466	0.0126
95	2.7591	0.0125

96	2.7715	0.0124
97	2.7839	0.0123
98	2.7962	0.0123
99	2.8084	0.0122
100	2.8205	0.0121
101	2.8326	0.0121
102	2.8445	0.0120
103	2.8565	0.0119
104	2.8683	0.0119
105	2.8801	0.0118
106	2.8919	0.0117
107	2.9035	0.0117
108	2.9151	0.0116
109	2.9267	0.0115
110	2.9382	0.0115
111	2.9496	0.0114
112	2.9610	0.0114
113	2.9723	0.0113
114	2.9835	0.0113
115	2.9947	0.0112
116	3.0059	0.0111
117	3.0170	0.0111
118	3.0280	0.0110
119	3.0390	0.0110
120	3.0499	0.0109
121	3.0608	0.0109
122	3.0716	0.0108
123	3.0824	0.0108
124	3.0931	0.0107
125	3.1038	0.0107
126	3.1144	0.0106
127	3.1250	0.0106
128	3.1355	0.0105
129	3.1460	0.0105
130	3.1564	0.0104
131	3.1668	0.0104
132	3.1772	0.0103
133	3.1875	0.0103
134	3.1977	0.0103
135	3.2080	0.0102
136	3.2181	0.0102
137	3.2283	0.0101
138	3.2383	0.0101
139	3.2484	0.0100
140	3.2584	0.0100
141	3.2683	0.0100
142	3.2783	0.0099
143	3.2882	0.0099
144	3.2980	0.0098
145	3.3078	0.0098
146	3.3176	0.0098
147	3.3273	0.0097
148	3.3370	0.0097
149	3.3466	0.0097
150	3.3563	0.0096
151	3.3658	0.0096
152	3.3754	0.0095
153	3.3849	0.0095
154	3.3944	0.0095
155	3.4038	0.0094
156	3.4132	0.0094
157	3.4226	0.0094
158	3.4319	0.0093
159	3.4412	0.0093
160	3.4505	0.0093
161	3.4597	0.0092
162	3.4689	0.0092
163	3.4781	0.0092
164	3.4872	0.0091
165	3.4963	0.0091
166	3.5054	0.0091
167	3.5144	0.0090
168	3.5234	0.0090
169	3.5324	0.0090
170	3.5414	0.0090
171	3.5503	0.0089
172	3.5592	0.0089
173	3.5680	0.0089

174	3.5769	0.0088
175	3.5857	0.0088
176	3.5944	0.0088
177	3.6032	0.0087
178	3.6119	0.0087
179	3.6206	0.0087
180	3.6293	0.0087
181	3.6379	0.0086
182	3.6465	0.0086
183	3.6551	0.0086
184	3.6636	0.0086
185	3.6722	0.0085
186	3.6807	0.0085
187	3.6891	0.0085
188	3.6976	0.0084
189	3.7060	0.0084
190	3.7144	0.0084
191	3.7228	0.0084
192	3.7311	0.0083
193	3.7394	0.0083
194	3.7477	0.0083
195	3.7560	0.0083
196	3.7643	0.0082
197	3.7725	0.0082
198	3.7807	0.0082
199	3.7889	0.0082
200	3.7970	0.0082
201	3.8052	0.0081
202	3.8133	0.0081
203	3.8214	0.0081
204	3.8294	0.0081
205	3.8375	0.0080
206	3.8455	0.0080
207	3.8535	0.0080
208	3.8614	0.0080
209	3.8694	0.0080
210	3.8773	0.0079
211	3.8852	0.0079
212	3.8931	0.0079
213	3.9010	0.0079
214	3.9088	0.0078
215	3.9167	0.0078
216	3.9245	0.0078
217	3.9322	0.0078
218	3.9400	0.0078
219	3.9477	0.0077
220	3.9555	0.0077
221	3.9632	0.0077
222	3.9709	0.0077
223	3.9785	0.0077
224	3.9862	0.0076
225	3.9938	0.0076
226	4.0014	0.0076
227	4.0090	0.0076
228	4.0165	0.0076
229	4.0241	0.0075
230	4.0316	0.0075
231	4.0391	0.0075
232	4.0466	0.0075
233	4.0541	0.0075
234	4.0615	0.0075
235	4.0690	0.0074
236	4.0764	0.0074
237	4.0838	0.0074
238	4.0912	0.0074
239	4.0985	0.0074
240	4.1059	0.0073
241	4.1132	0.0073
242	4.1205	0.0073
243	4.1278	0.0073
244	4.1351	0.0073
245	4.1424	0.0073
246	4.1496	0.0072
247	4.1568	0.0072
248	4.1640	0.0072
249	4.1712	0.0072
250	4.1784	0.0072
251	4.1856	0.0072

252	4.1927	0.0071
253	4.1998	0.0071
254	4.2070	0.0071
255	4.2140	0.0071
256	4.2211	0.0071
257	4.2282	0.0071
258	4.2352	0.0070
259	4.2423	0.0070
260	4.2493	0.0070
261	4.2563	0.0070
262	4.2633	0.0070
263	4.2703	0.0070
264	4.2772	0.0070
265	4.2842	0.0069
266	4.2911	0.0069
267	4.2980	0.0069
268	4.3049	0.0069
269	4.3118	0.0069
270	4.3186	0.0069
271	4.3255	0.0069
272	4.3323	0.0068
273	4.3392	0.0068
274	4.3460	0.0068
275	4.3528	0.0068
276	4.3595	0.0068
277	4.3663	0.0068
278	4.3731	0.0068
279	4.3798	0.0067
280	4.3865	0.0067
281	4.3932	0.0067
282	4.3999	0.0067
283	4.4066	0.0067
284	4.4133	0.0067
285	4.4200	0.0067
286	4.4266	0.0066
287	4.4332	0.0066
288	4.4399	0.0066

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0066	0.0041	0.0025
2	0.0066	0.0041	0.0025
3	0.0067	0.0041	0.0026
4	0.0067	0.0041	0.0026
5	0.0067	0.0041	0.0026
6	0.0067	0.0041	0.0026
7	0.0067	0.0042	0.0026
8	0.0068	0.0042	0.0026
9	0.0068	0.0042	0.0026
10	0.0068	0.0042	0.0026
11	0.0068	0.0042	0.0026
12	0.0068	0.0042	0.0026
13	0.0069	0.0042	0.0026
14	0.0069	0.0042	0.0026
15	0.0069	0.0043	0.0027
16	0.0069	0.0043	0.0027
17	0.0070	0.0043	0.0027
18	0.0070	0.0043	0.0027
19	0.0070	0.0043	0.0027
20	0.0070	0.0043	0.0027
21	0.0070	0.0043	0.0027
22	0.0071	0.0044	0.0027
23	0.0071	0.0044	0.0027
24	0.0071	0.0044	0.0027
25	0.0071	0.0044	0.0027
26	0.0072	0.0044	0.0027
27	0.0072	0.0044	0.0028
28	0.0072	0.0044	0.0028
29	0.0072	0.0045	0.0028
30	0.0073	0.0045	0.0028
31	0.0073	0.0045	0.0028
32	0.0073	0.0045	0.0028
33	0.0073	0.0045	0.0028
34	0.0074	0.0045	0.0028
35	0.0074	0.0046	0.0028
36	0.0074	0.0046	0.0028

37	0.0075	0.0046	0.0029
38	0.0075	0.0046	0.0029
39	0.0075	0.0046	0.0029
40	0.0075	0.0046	0.0029
41	0.0076	0.0047	0.0029
42	0.0076	0.0047	0.0029
43	0.0076	0.0047	0.0029
44	0.0076	0.0047	0.0029
45	0.0077	0.0047	0.0029
46	0.0077	0.0047	0.0030
47	0.0077	0.0048	0.0030
48	0.0078	0.0048	0.0030
49	0.0078	0.0048	0.0030
50	0.0078	0.0048	0.0030
51	0.0079	0.0049	0.0030
52	0.0079	0.0049	0.0030
53	0.0079	0.0049	0.0030
54	0.0080	0.0049	0.0030
55	0.0080	0.0049	0.0031
56	0.0080	0.0049	0.0031
57	0.0081	0.0050	0.0031
58	0.0081	0.0050	0.0031
59	0.0081	0.0050	0.0031
60	0.0082	0.0050	0.0031
61	0.0082	0.0051	0.0031
62	0.0082	0.0051	0.0032
63	0.0083	0.0051	0.0032
64	0.0083	0.0051	0.0032
65	0.0083	0.0051	0.0032
66	0.0084	0.0052	0.0032
67	0.0084	0.0052	0.0032
68	0.0084	0.0052	0.0032
69	0.0085	0.0052	0.0033
70	0.0085	0.0053	0.0033
71	0.0086	0.0053	0.0033
72	0.0086	0.0053	0.0033
73	0.0087	0.0053	0.0033
74	0.0087	0.0054	0.0033
75	0.0087	0.0054	0.0034
76	0.0088	0.0054	0.0034
77	0.0088	0.0054	0.0034
78	0.0089	0.0055	0.0034
79	0.0089	0.0055	0.0034
80	0.0090	0.0055	0.0034
81	0.0090	0.0056	0.0035
82	0.0090	0.0056	0.0035
83	0.0091	0.0056	0.0035
84	0.0091	0.0056	0.0035
85	0.0092	0.0057	0.0035
86	0.0092	0.0057	0.0035
87	0.0093	0.0057	0.0036
88	0.0093	0.0058	0.0036
89	0.0094	0.0058	0.0036
90	0.0094	0.0058	0.0036
91	0.0095	0.0059	0.0036
92	0.0095	0.0059	0.0037
93	0.0096	0.0059	0.0037
94	0.0097	0.0060	0.0037
95	0.0097	0.0060	0.0037
96	0.0098	0.0060	0.0037
97	0.0098	0.0061	0.0038
98	0.0099	0.0061	0.0038
99	0.0100	0.0061	0.0038
100	0.0100	0.0062	0.0038
101	0.0101	0.0062	0.0039
102	0.0101	0.0062	0.0039
103	0.0102	0.0063	0.0039
104	0.0103	0.0063	0.0039
105	0.0103	0.0064	0.0040
106	0.0104	0.0064	0.0040
107	0.0105	0.0065	0.0040
108	0.0105	0.0065	0.0040
109	0.0106	0.0066	0.0041
110	0.0107	0.0066	0.0041
111	0.0108	0.0066	0.0041
112	0.0108	0.0067	0.0042
113	0.0109	0.0067	0.0042
114	0.0110	0.0068	0.0042

115	0.0111	0.0068	0.0043
116	0.0111	0.0069	0.0043
117	0.0113	0.0069	0.0043
118	0.0113	0.0070	0.0043
119	0.0114	0.0070	0.0044
120	0.0115	0.0071	0.0044
121	0.0116	0.0072	0.0045
122	0.0117	0.0072	0.0045
123	0.0118	0.0073	0.0045
124	0.0119	0.0073	0.0045
125	0.0120	0.0074	0.0046
126	0.0121	0.0074	0.0046
127	0.0122	0.0075	0.0047
128	0.0123	0.0076	0.0047
129	0.0124	0.0077	0.0048
130	0.0125	0.0077	0.0048
131	0.0126	0.0078	0.0048
132	0.0127	0.0078	0.0049
133	0.0129	0.0079	0.0049
134	0.0130	0.0080	0.0050
135	0.0131	0.0081	0.0050
136	0.0132	0.0082	0.0051
137	0.0134	0.0083	0.0051
138	0.0135	0.0083	0.0052
139	0.0137	0.0084	0.0053
140	0.0138	0.0085	0.0053
141	0.0140	0.0086	0.0054
142	0.0141	0.0087	0.0054
143	0.0143	0.0088	0.0055
144	0.0144	0.0089	0.0055
145	0.0181	0.0111	0.0069
146	0.0182	0.0112	0.0070
147	0.0184	0.0114	0.0071
148	0.0185	0.0114	0.0071
149	0.0188	0.0116	0.0072
150	0.0190	0.0117	0.0073
151	0.0192	0.0119	0.0074
152	0.0194	0.0120	0.0074
153	0.0197	0.0121	0.0075
154	0.0198	0.0122	0.0076
155	0.0202	0.0124	0.0077
156	0.0203	0.0125	0.0078
157	0.0207	0.0128	0.0079
158	0.0209	0.0129	0.0080
159	0.0213	0.0131	0.0082
160	0.0215	0.0132	0.0082
161	0.0219	0.0135	0.0084
162	0.0221	0.0136	0.0085
163	0.0226	0.0139	0.0087
164	0.0228	0.0141	0.0087
165	0.0233	0.0144	0.0089
166	0.0236	0.0146	0.0090
167	0.0242	0.0149	0.0093
168	0.0245	0.0151	0.0094
169	0.0251	0.0155	0.0096
170	0.0255	0.0157	0.0098
171	0.0262	0.0162	0.0101
172	0.0266	0.0164	0.0102
173	0.0274	0.0169	0.0105
174	0.0279	0.0172	0.0107
175	0.0289	0.0178	0.0111
176	0.0294	0.0181	0.0113
177	0.0305	0.0188	0.0117
178	0.0312	0.0192	0.0119
179	0.0326	0.0201	0.0125
180	0.0333	0.0206	0.0128
181	0.0351	0.0216	0.0134
182	0.0361	0.0222	0.0138
183	0.0383	0.0236	0.0147
184	0.0396	0.0244	0.0152
185	0.0325	0.0200	0.0124
186	0.0343	0.0211	0.0131
187	0.0389	0.0240	0.0149
188	0.0420	0.0259	0.0161
189	0.0506	0.0312	0.0194
190	0.0571	0.0352	0.0219
191	0.0816	0.0434	0.0382
192	0.1122	0.0434	0.0688

193	0.3512	0.0434	0.3078
194	0.0665	0.0410	0.0255
195	0.0457	0.0282	0.0175
196	0.0364	0.0224	0.0140
197	0.0411	0.0253	0.0158
198	0.0371	0.0229	0.0142
199	0.0342	0.0211	0.0131
200	0.0318	0.0196	0.0122
201	0.0299	0.0185	0.0115
202	0.0284	0.0175	0.0109
203	0.0270	0.0167	0.0104
204	0.0258	0.0159	0.0099
205	0.0248	0.0153	0.0095
206	0.0239	0.0147	0.0092
207	0.0231	0.0142	0.0088
208	0.0223	0.0138	0.0086
209	0.0217	0.0134	0.0083
210	0.0211	0.0130	0.0081
211	0.0205	0.0127	0.0079
212	0.0200	0.0123	0.0077
213	0.0195	0.0120	0.0075
214	0.0191	0.0118	0.0073
215	0.0187	0.0115	0.0072
216	0.0183	0.0113	0.0070
217	0.0145	0.0090	0.0056
218	0.0142	0.0088	0.0054
219	0.0139	0.0086	0.0053
220	0.0136	0.0084	0.0052
221	0.0133	0.0082	0.0051
222	0.0131	0.0081	0.0050
223	0.0128	0.0079	0.0049
224	0.0126	0.0078	0.0048
225	0.0123	0.0076	0.0047
226	0.0121	0.0075	0.0047
227	0.0119	0.0074	0.0046
228	0.0117	0.0072	0.0045
229	0.0115	0.0071	0.0044
230	0.0114	0.0070	0.0044
231	0.0112	0.0069	0.0043
232	0.0110	0.0068	0.0042
233	0.0109	0.0067	0.0042
234	0.0107	0.0066	0.0041
235	0.0106	0.0065	0.0041
236	0.0104	0.0064	0.0040
237	0.0103	0.0064	0.0039
238	0.0102	0.0063	0.0039
239	0.0100	0.0062	0.0039
240	0.0099	0.0061	0.0038
241	0.0098	0.0060	0.0038
242	0.0097	0.0060	0.0037
243	0.0096	0.0059	0.0037
244	0.0095	0.0058	0.0036
245	0.0094	0.0058	0.0036
246	0.0093	0.0057	0.0036
247	0.0092	0.0057	0.0035
248	0.0091	0.0056	0.0035
249	0.0090	0.0055	0.0034
250	0.0089	0.0055	0.0034
251	0.0088	0.0054	0.0034
252	0.0087	0.0054	0.0033
253	0.0086	0.0053	0.0033
254	0.0086	0.0053	0.0033
255	0.0085	0.0052	0.0032
256	0.0084	0.0052	0.0032
257	0.0083	0.0051	0.0032
258	0.0082	0.0051	0.0032
259	0.0082	0.0050	0.0031
260	0.0081	0.0050	0.0031
261	0.0080	0.0050	0.0031
262	0.0080	0.0049	0.0031
263	0.0079	0.0049	0.0030
264	0.0078	0.0048	0.0030
265	0.0078	0.0048	0.0030
266	0.0077	0.0048	0.0030
267	0.0077	0.0047	0.0029
268	0.0076	0.0047	0.0029
269	0.0075	0.0047	0.0029
270	0.0075	0.0046	0.0029

271	0.0074	0.0046	0.0029
272	0.0074	0.0046	0.0028
273	0.0073	0.0045	0.0028
274	0.0073	0.0045	0.0028
275	0.0072	0.0045	0.0028
276	0.0072	0.0044	0.0028
277	0.0071	0.0044	0.0027
278	0.0071	0.0044	0.0027
279	0.0070	0.0043	0.0027
280	0.0070	0.0043	0.0027
281	0.0069	0.0043	0.0027
282	0.0069	0.0043	0.0026
283	0.0069	0.0042	0.0026
284	0.0068	0.0042	0.0026
285	0.0068	0.0042	0.0026
286	0.0067	0.0041	0.0026
287	0.0067	0.0041	0.0026
288	0.0066	0.0041	0.0025

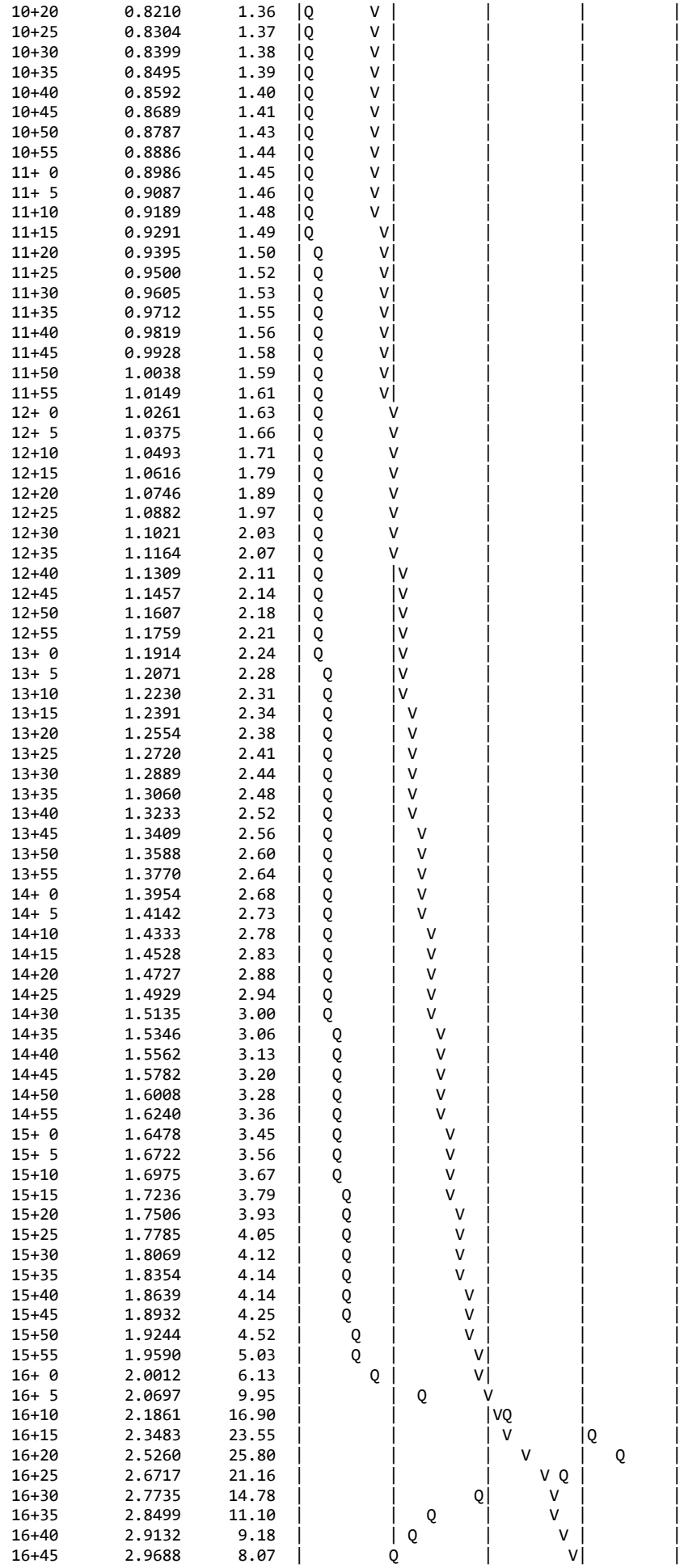
Total soil rain loss = 2.53(In)
Total effective rainfall = 1.91(In)
Peak flow rate in flood hydrograph = 25.80(CFS)

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

Hydrograph in 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	0.0007	0.09	Q				
0+15	0.0022	0.21	Q				
0+20	0.0047	0.36	Q				
0+25	0.0080	0.48	Q				
0+30	0.0118	0.55	Q				
0+35	0.0159	0.60	Q				
0+40	0.0203	0.63	Q				
0+45	0.0249	0.66	Q				
0+50	0.0296	0.68	Q				
0+55	0.0344	0.70	Q				
1+ 0	0.0393	0.72	Q				
1+ 5	0.0444	0.73	Q				
1+10	0.0495	0.74	Q				
1+15	0.0547	0.76	VQ				
1+20	0.0600	0.77	VQ				
1+25	0.0653	0.77	VQ				
1+30	0.0707	0.78	VQ				
1+35	0.0762	0.79	VQ				
1+40	0.0817	0.80	VQ				
1+45	0.0872	0.80	VQ				
1+50	0.0928	0.81	VQ				
1+55	0.0984	0.82	VQ				
2+ 0	0.1041	0.82	|Q				
2+ 5	0.1098	0.83	|Q				
2+10	0.1155	0.83	|Q				
2+15	0.1213	0.84	|Q				
2+20	0.1271	0.84	|Q				
2+25	0.1329	0.85	|Q				
2+30	0.1388	0.85	|Q				
2+35	0.1446	0.85	|Q				
2+40	0.1505	0.86	|Q				
2+45	0.1565	0.86	|Q				
2+50	0.1624	0.86	|Q				
2+55	0.1684	0.87	|Q				
3+ 0	0.1743	0.87	|Q				
3+ 5	0.1803	0.87	|Q				
3+10	0.1864	0.87	|Q				
3+15	0.1924	0.88	|Q				
3+20	0.1985	0.88	|Q				
3+25	0.2046	0.88	|QV				
3+30	0.2107	0.89	|QV				
3+35	0.2168	0.89	|QV				
3+40	0.2230	0.89	|QV				
3+45	0.2292	0.90	|QV				

3+50	0.2354	0.90	QV				
3+55	0.2416	0.90	QV				
4+ 0	0.2478	0.91	QV				
4+ 5	0.2541	0.91	QV				
4+10	0.2604	0.91	QV				
4+15	0.2667	0.92	QV				
4+20	0.2731	0.92	QV				
4+25	0.2795	0.93	QV				
4+30	0.2859	0.93	QV				
4+35	0.2923	0.93	QV				
4+40	0.2987	0.94	QV				
4+45	0.3052	0.94	QV				
4+50	0.3117	0.94	Q V				
4+55	0.3182	0.95	Q V				
5+ 0	0.3248	0.95	Q V				
5+ 5	0.3314	0.96	Q V				
5+10	0.3380	0.96	Q V				
5+15	0.3446	0.96	Q V				
5+20	0.3513	0.97	Q V				
5+25	0.3580	0.97	Q V				
5+30	0.3647	0.98	Q V				
5+35	0.3715	0.98	Q V				
5+40	0.3782	0.98	Q V				
5+45	0.3851	0.99	Q V				
5+50	0.3919	0.99	Q V				
5+55	0.3988	1.00	Q V				
6+ 0	0.4057	1.00	Q V				
6+ 5	0.4126	1.01	Q V				
6+10	0.4196	1.01	Q V				
6+15	0.4266	1.02	Q V				
6+20	0.4336	1.02	Q V				
6+25	0.4407	1.03	Q V				
6+30	0.4478	1.03	Q V				
6+35	0.4549	1.04	Q V				
6+40	0.4621	1.04	Q V				
6+45	0.4693	1.05	Q V				
6+50	0.4765	1.05	Q V				
6+55	0.4838	1.06	Q V				
7+ 0	0.4911	1.06	Q V				
7+ 5	0.4985	1.07	Q V				
7+10	0.5059	1.07	Q V				
7+15	0.5133	1.08	Q V				
7+20	0.5207	1.08	Q V				
7+25	0.5282	1.09	Q V				
7+30	0.5358	1.09	Q V				
7+35	0.5434	1.10	Q V				
7+40	0.5510	1.11	Q V				
7+45	0.5587	1.11	Q V				
7+50	0.5664	1.12	Q V				
7+55	0.5741	1.12	Q V				
8+ 0	0.5819	1.13	Q V				
8+ 5	0.5897	1.14	Q V				
8+10	0.5976	1.14	Q V				
8+15	0.6055	1.15	Q V				
8+20	0.6135	1.16	Q V				
8+25	0.6215	1.16	Q V				
8+30	0.6296	1.17	Q V				
8+35	0.6377	1.18	Q V				
8+40	0.6459	1.19	Q V				
8+45	0.6541	1.19	Q V				
8+50	0.6623	1.20	Q V				
8+55	0.6707	1.21	Q V				
9+ 0	0.6790	1.22	Q V				
9+ 5	0.6875	1.22	Q V				
9+10	0.6959	1.23	Q V				
9+15	0.7045	1.24	Q V				
9+20	0.7131	1.25	Q V				
9+25	0.7217	1.26	Q V				
9+30	0.7304	1.26	Q V				
9+35	0.7392	1.27	Q V				
9+40	0.7480	1.28	Q V				
9+45	0.7569	1.29	Q V				
9+50	0.7658	1.30	Q V				
9+55	0.7749	1.31	Q V				
10+ 0	0.7839	1.32	Q V				
10+ 5	0.7931	1.33	Q V				
10+10	0.8023	1.34	Q V				
10+15	0.8116	1.35	Q V				



16+50	3.0184	7.20	| Q|	|	| V|	|
16+55	3.0634	6.54	| Q |	|	| V|	|
17+ 0	3.1043	5.94	| Q |	|	| V	|
17+ 5	3.1423	5.52	| Q |	|	| V	|
17+10	3.1775	5.11	| Q |	|	| V	|
17+15	3.2100	4.72	| Q |	|	| V	|
17+20	3.2402	4.39	| Q |	|	| V	|
17+25	3.2688	4.15	| Q |	|	| V	|
17+30	3.2963	3.99	| Q |	|	| V	|
17+35	3.3227	3.83	| Q |	|	| V	|
17+40	3.3473	3.58	| Q |	|	| V	|
17+45	3.3709	3.43	| Q |	|	| V	|
17+50	3.3934	3.26	| Q |	|	| V	|
17+55	3.4150	3.14	| Q |	|	| V	|
18+ 0	3.4356	2.99	| Q |	|	| V	|
18+ 5	3.4553	2.86	| Q |	|	| V	|
18+10	3.4739	2.70	| Q |	|	| V	|
18+15	3.4916	2.57	| Q |	|	| V	|
18+20	3.5084	2.43	| Q |	|	| V	|
18+25	3.5241	2.28	| Q |	|	| V	|
18+30	3.5383	2.06	| Q |	|	| V	|
18+35	3.5512	1.87	| Q |	|	| V	|
18+40	3.5637	1.81	| Q |	|	| V	|
18+45	3.5758	1.76	| Q |	|	| V	|
18+50	3.5875	1.71	| Q |	|	| V	|
18+55	3.5989	1.66	| Q |	|	| V	|
19+ 0	3.6101	1.62	| Q |	|	| V	|
19+ 5	3.6210	1.58	| Q |	|	| V	|
19+10	3.6316	1.54	| Q |	|	| V	|
19+15	3.6420	1.51	| Q |	|	| V	|
19+20	3.6522	1.48	|Q |	|	| V	|
19+25	3.6622	1.45	|Q |	|	| V	|
19+30	3.6720	1.42	|Q |	|	| V	|
19+35	3.6816	1.40	|Q |	|	| V	|
19+40	3.6911	1.37	|Q |	|	| V	|
19+45	3.7004	1.35	|Q |	|	| V	|
19+50	3.7095	1.33	|Q |	|	| V	|
19+55	3.7185	1.31	|Q |	|	| V	|
20+ 0	3.7274	1.29	|Q |	|	| V	|
20+ 5	3.7361	1.27	|Q |	|	| V	|
20+10	3.7447	1.25	|Q |	|	| V	|
20+15	3.7532	1.23	|Q |	|	| V	|
20+20	3.7615	1.21	|Q |	|	| V	|
20+25	3.7698	1.20	|Q |	|	| V	|
20+30	3.7779	1.18	|Q |	|	| V	|
20+35	3.7860	1.17	|Q |	|	| V	|
20+40	3.7939	1.15	|Q |	|	| V	|
20+45	3.8018	1.14	|Q |	|	| V	|
20+50	3.8096	1.13	|Q |	|	| V	|
20+55	3.8173	1.12	|Q |	|	| V	|
21+ 0	3.8249	1.10	|Q |	|	| V	|
21+ 5	3.8324	1.09	|Q |	|	| V	|
21+10	3.8398	1.08	|Q |	|	| V	|
21+15	3.8472	1.07	|Q |	|	| V	|
21+20	3.8545	1.06	|Q |	|	| V	|
21+25	3.8617	1.05	|Q |	|	| V	|
21+30	3.8689	1.04	|Q |	|	| V	|
21+35	3.8759	1.03	|Q |	|	| V	|
21+40	3.8830	1.02	|Q |	|	| V	|
21+45	3.8899	1.01	|Q |	|	| V	|
21+50	3.8968	1.00	|Q |	|	| V	|
21+55	3.9036	0.99	|Q |	|	| V	|
22+ 0	3.9104	0.98	|Q |	|	| V	|
22+ 5	3.9171	0.97	|Q |	|	| V	|
22+10	3.9237	0.97	|Q |	|	| V	|
22+15	3.9303	0.96	|Q |	|	| V	|
22+20	3.9369	0.95	|Q |	|	| V	|
22+25	3.9433	0.94	|Q |	|	| V	|
22+30	3.9498	0.93	|Q |	|	| V	|
22+35	3.9562	0.93	|Q |	|	| V	|
22+40	3.9625	0.92	|Q |	|	| V	|
22+45	3.9688	0.91	|Q |	|	| V	|
22+50	3.9750	0.91	|Q |	|	| V	|
22+55	3.9812	0.90	|Q |	|	| V	|
23+ 0	3.9873	0.89	|Q |	|	| V|
23+ 5	3.9934	0.89	|Q |	|	| V|
23+10	3.9995	0.88	|Q |	|	| V|
23+15	4.0055	0.87	|Q |	|	| V|

23+20	4.0115	0.87	|Q	|	|	|	V|
23+25	4.0174	0.86	|Q	|	|	|	V|
23+30	4.0233	0.85	|Q	|	|	|	V|
23+35	4.0291	0.85	|Q	|	|	|	V|
23+40	4.0349	0.84	|Q	|	|	|	V|
23+45	4.0407	0.84	|Q	|	|	|	V|
23+50	4.0464	0.83	|Q	|	|	|	V|
23+55	4.0521	0.83	|Q	|	|	|	V|
24+ 0	4.0577	0.82	|Q	|	|	|	V|
24+ 5	4.0632	0.80	|Q	|	|	|	V|
24+10	4.0682	0.72	Q	|	|	|	V|
24+15	4.0723	0.60	Q	|	|	|	V|
24+20	4.0754	0.44	Q	|	|	|	V|
24+25	4.0776	0.32	Q	|	|	|	V|
24+30	4.0793	0.25	Q	|	|	|	V|
24+35	4.0807	0.20	Q	|	|	|	V|
24+40	4.0818	0.17	Q	|	|	|	V|
24+45	4.0828	0.14	Q	|	|	|	V|
24+50	4.0837	0.12	Q	|	|	|	V|
24+55	4.0844	0.10	Q	|	|	|	V|
25+ 0	4.0850	0.09	Q	|	|	|	V|
25+ 5	4.0855	0.08	Q	|	|	|	V|
25+10	4.0860	0.07	Q	|	|	|	V|
25+15	4.0864	0.06	Q	|	|	|	V|
25+20	4.0867	0.05	Q	|	|	|	V|
25+25	4.0870	0.04	Q	|	|	|	V|
25+30	4.0873	0.04	Q	|	|	|	V|
25+35	4.0875	0.03	Q	|	|	|	V|
25+40	4.0877	0.03	Q	|	|	|	V|
25+45	4.0878	0.02	Q	|	|	|	V|
25+50	4.0880	0.02	Q	|	|	|	V|
25+55	4.0881	0.01	Q	|	|	|	V|
26+ 0	4.0881	0.01	Q	|	|	|	V|
26+ 5	4.0882	0.01	Q	|	|	|	V|
26+10	4.0882	0.01	Q	|	|	|	V|
26+15	4.0883	0.00	Q	|	|	|	V|
26+20	4.0883	0.00	Q	|	|	|	V|
26+25	4.0883	0.00	Q	|	|	|	V|

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

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Study date 07/11/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
25.77	1	1.17
Rainfall data for year 100		
25.77	6	2.98
Rainfall data for year 100		
25.77	24	5.47

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
67.0	67.0	25.77	1.000	0.578	0.900	0.520

Area-averaged adjusted loss rate Fm (In/Hr) = 0.520

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
23.19	0.900	67.0	67.0	4.93	0.391
2.58	0.100	98.0	98.0	0.20	0.957

Area-averaged catchment yield fraction, Y = 0.447
Area-averaged low loss fraction, Yb = 0.553
User entry of time of concentration = 0.387 (hours)
++
Watershed area = 25.77(Ac.)
Catchment Lag time = 0.310 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 26.9165
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.520(In/Hr)
Average low loss rate fraction (Yb) = 0.553 (decimal)
VALLEY DEVELOPED S-Graph proportion = 0.062
VALLEY UNDEVELOPED S-Graph proportion = 0.938
FOOTHILL S-Graph proportion = 0.000
MOUNTAIN S-Graph proportion = 0.000

DESERT S-Graph proportion = 0.000

Computed peak 5-minute rainfall = 0.433(In)
Computed peak 30-minute rainfall = 0.887(In)
Specified peak 1-hour rainfall = 1.170(In)
Computed peak 3-hour rainfall = 2.076(In)
Specified peak 6-hour rainfall = 2.980(In)
Specified peak 24-hour rainfall = 5.470(In)

Rainfall depth area reduction factors:
Using a total area of   25.77(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999   Adjusted rainfall = 0.433(In)
30-minute factor = 0.999   Adjusted rainfall = 0.886(In)
1-hour factor = 0.999   Adjusted rainfall = 1.169(In)
3-hour factor = 1.000   Adjusted rainfall = 2.075(In)
6-hour factor = 1.000   Adjusted rainfall = 2.980(In)
24-hour factor = 1.000   Adjusted rainfall = 5.470(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 311.66 (CFS))	
1	2.466	7.685
2	11.094	26.889
3	26.597	48.316
4	45.542	59.045
5	60.598	46.924
6	69.583	28.000
7	75.206	17.527
8	79.194	12.427
9	82.341	9.810
10	84.882	7.919
11	87.023	6.671
12	88.770	5.444
13	90.317	4.821
14	91.641	4.127
15	92.749	3.453
16	93.669	2.868
17	94.475	2.512
18	95.245	2.401
19	95.985	2.304
20	96.574	1.836
21	97.113	1.681
22	97.577	1.446
23	98.006	1.337
24	98.364	1.115
25	98.681	0.988
26	98.934	0.790
27	99.187	0.787
28	99.439	0.787
29	99.692	0.787
30	100.000	0.393

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4325	0.4325
2	0.5707	0.1382
3	0.6712	0.1005
4	0.7530	0.0819
5	0.8233	0.0703
6	0.8856	0.0623
7	0.9419	0.0563
8	0.9936	0.0517
9	1.0416	0.0479
10	1.0864	0.0448
11	1.1286	0.0422
12	1.1686	0.0400
13	1.2185	0.0499
14	1.2667	0.0481
15	1.3132	0.0465
16	1.3582	0.0451
17	1.4020	0.0437

18	1.4445	0.0425
19	1.4859	0.0414
20	1.5263	0.0404
21	1.5657	0.0394
22	1.6042	0.0385
23	1.6420	0.0377
24	1.6789	0.0369
25	1.7151	0.0362
26	1.7506	0.0355
27	1.7855	0.0349
28	1.8198	0.0343
29	1.8535	0.0337
30	1.8866	0.0331
31	1.9192	0.0326
32	1.9514	0.0321
33	1.9830	0.0316
34	2.0142	0.0312
35	2.0449	0.0308
36	2.0753	0.0303
37	2.1052	0.0299
38	2.1347	0.0295
39	2.1638	0.0291
40	2.1926	0.0288
41	2.2210	0.0284
42	2.2491	0.0281
43	2.2769	0.0278
44	2.3044	0.0275
45	2.3316	0.0272
46	2.3585	0.0269
47	2.3851	0.0266
48	2.4115	0.0264
49	2.4376	0.0261
50	2.4634	0.0258
51	2.4890	0.0256
52	2.5143	0.0254
53	2.5395	0.0251
54	2.5643	0.0249
55	2.5890	0.0247
56	2.6135	0.0245
57	2.6377	0.0243
58	2.6618	0.0241
59	2.6856	0.0239
60	2.7093	0.0237
61	2.7328	0.0235
62	2.7561	0.0233
63	2.7792	0.0231
64	2.8021	0.0229
65	2.8249	0.0228
66	2.8475	0.0226
67	2.8699	0.0224
68	2.8922	0.0223
69	2.9143	0.0221
70	2.9363	0.0220
71	2.9581	0.0218
72	2.9798	0.0217
73	2.9978	0.0181
74	3.0157	0.0179
75	3.0335	0.0178
76	3.0512	0.0177
77	3.0687	0.0175
78	3.0861	0.0174
79	3.1034	0.0173
80	3.1205	0.0172
81	3.1376	0.0170
82	3.1545	0.0169
83	3.1713	0.0168
84	3.1880	0.0167
85	3.2045	0.0166
86	3.2210	0.0165
87	3.2374	0.0164
88	3.2536	0.0163
89	3.2698	0.0161
90	3.2858	0.0160
91	3.3018	0.0159
92	3.3176	0.0158
93	3.3334	0.0158
94	3.3490	0.0157
95	3.3646	0.0156

96	3.3800	0.0155
97	3.3954	0.0154
98	3.4107	0.0153
99	3.4259	0.0152
100	3.4410	0.0151
101	3.4561	0.0150
102	3.4710	0.0150
103	3.4859	0.0149
104	3.5007	0.0148
105	3.5154	0.0147
106	3.5300	0.0146
107	3.5446	0.0146
108	3.5591	0.0145
109	3.5735	0.0144
110	3.5878	0.0143
111	3.6020	0.0143
112	3.6162	0.0142
113	3.6303	0.0141
114	3.6444	0.0140
115	3.6584	0.0140
116	3.6723	0.0139
117	3.6861	0.0138
118	3.6999	0.0138
119	3.7136	0.0137
120	3.7272	0.0136
121	3.7408	0.0136
122	3.7543	0.0135
123	3.7678	0.0135
124	3.7811	0.0134
125	3.7945	0.0133
126	3.8077	0.0133
127	3.8210	0.0132
128	3.8341	0.0132
129	3.8472	0.0131
130	3.8602	0.0130
131	3.8732	0.0130
132	3.8862	0.0129
133	3.8990	0.0129
134	3.9118	0.0128
135	3.9246	0.0128
136	3.9373	0.0127
137	3.9500	0.0127
138	3.9626	0.0126
139	3.9751	0.0126
140	3.9876	0.0125
141	4.0001	0.0125
142	4.0125	0.0124
143	4.0249	0.0124
144	4.0372	0.0123
145	4.0494	0.0123
146	4.0616	0.0122
147	4.0738	0.0122
148	4.0859	0.0121
149	4.0980	0.0121
150	4.1100	0.0120
151	4.1220	0.0120
152	4.1340	0.0119
153	4.1458	0.0119
154	4.1577	0.0119
155	4.1695	0.0118
156	4.1813	0.0118
157	4.1930	0.0117
158	4.2047	0.0117
159	4.2163	0.0116
160	4.2279	0.0116
161	4.2395	0.0116
162	4.2510	0.0115
163	4.2625	0.0115
164	4.2739	0.0114
165	4.2853	0.0114
166	4.2967	0.0114
167	4.3080	0.0113
168	4.3193	0.0113
169	4.3305	0.0112
170	4.3417	0.0112
171	4.3529	0.0112
172	4.3640	0.0111
173	4.3751	0.0111

174	4.3862	0.0111
175	4.3972	0.0110
176	4.4082	0.0110
177	4.4192	0.0110
178	4.4301	0.0109
179	4.4410	0.0109
180	4.4518	0.0109
181	4.4626	0.0108
182	4.4734	0.0108
183	4.4842	0.0108
184	4.4949	0.0107
185	4.5056	0.0107
186	4.5162	0.0107
187	4.5269	0.0106
188	4.5375	0.0106
189	4.5480	0.0106
190	4.5585	0.0105
191	4.5690	0.0105
192	4.5795	0.0105
193	4.5899	0.0104
194	4.6004	0.0104
195	4.6107	0.0104
196	4.6211	0.0103
197	4.6314	0.0103
198	4.6417	0.0103
199	4.6519	0.0103
200	4.6622	0.0102
201	4.6724	0.0102
202	4.6825	0.0102
203	4.6927	0.0101
204	4.7028	0.0101
205	4.7129	0.0101
206	4.7229	0.0101
207	4.7330	0.0100
208	4.7430	0.0100
209	4.7529	0.0100
210	4.7629	0.0100
211	4.7728	0.0099
212	4.7827	0.0099
213	4.7926	0.0099
214	4.8024	0.0098
215	4.8123	0.0098
216	4.8220	0.0098
217	4.8318	0.0098
218	4.8416	0.0097
219	4.8513	0.0097
220	4.8610	0.0097
221	4.8706	0.0097
222	4.8803	0.0096
223	4.8899	0.0096
224	4.8995	0.0096
225	4.9091	0.0096
226	4.9186	0.0095
227	4.9281	0.0095
228	4.9376	0.0095
229	4.9471	0.0095
230	4.9566	0.0095
231	4.9660	0.0094
232	4.9754	0.0094
233	4.9848	0.0094
234	4.9942	0.0094
235	5.0035	0.0093
236	5.0128	0.0093
237	5.0221	0.0093
238	5.0314	0.0093
239	5.0406	0.0093
240	5.0499	0.0092
241	5.0591	0.0092
242	5.0683	0.0092
243	5.0774	0.0092
244	5.0866	0.0091
245	5.0957	0.0091
246	5.1048	0.0091
247	5.1139	0.0091
248	5.1229	0.0091
249	5.1320	0.0090
250	5.1410	0.0090
251	5.1500	0.0090

252	5.1590	0.0090
253	5.1679	0.0090
254	5.1769	0.0089
255	5.1858	0.0089
256	5.1947	0.0089
257	5.2036	0.0089
258	5.2124	0.0089
259	5.2213	0.0088
260	5.2301	0.0088
261	5.2389	0.0088
262	5.2477	0.0088
263	5.2565	0.0088
264	5.2652	0.0087
265	5.2739	0.0087
266	5.2827	0.0087
267	5.2913	0.0087
268	5.3000	0.0087
269	5.3087	0.0087
270	5.3173	0.0086
271	5.3259	0.0086
272	5.3345	0.0086
273	5.3431	0.0086
274	5.3517	0.0086
275	5.3602	0.0085
276	5.3688	0.0085
277	5.3773	0.0085
278	5.3858	0.0085
279	5.3943	0.0085
280	5.4027	0.0085
281	5.4112	0.0084
282	5.4196	0.0084
283	5.4280	0.0084
284	5.4364	0.0084
285	5.4448	0.0084
286	5.4531	0.0084
287	5.4615	0.0083
288	5.4698	0.0083

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0083	0.0046	0.0037
2	0.0083	0.0046	0.0037
3	0.0084	0.0046	0.0037
4	0.0084	0.0046	0.0038
5	0.0084	0.0047	0.0038
6	0.0084	0.0047	0.0038
7	0.0085	0.0047	0.0038
8	0.0085	0.0047	0.0038
9	0.0085	0.0047	0.0038
10	0.0085	0.0047	0.0038
11	0.0086	0.0047	0.0038
12	0.0086	0.0048	0.0038
13	0.0086	0.0048	0.0039
14	0.0087	0.0048	0.0039
15	0.0087	0.0048	0.0039
16	0.0087	0.0048	0.0039
17	0.0087	0.0048	0.0039
18	0.0088	0.0048	0.0039
19	0.0088	0.0049	0.0039
20	0.0088	0.0049	0.0039
21	0.0089	0.0049	0.0040
22	0.0089	0.0049	0.0040
23	0.0089	0.0049	0.0040
24	0.0089	0.0049	0.0040
25	0.0090	0.0050	0.0040
26	0.0090	0.0050	0.0040
27	0.0090	0.0050	0.0040
28	0.0091	0.0050	0.0041
29	0.0091	0.0050	0.0041
30	0.0091	0.0050	0.0041
31	0.0092	0.0051	0.0041
32	0.0092	0.0051	0.0041
33	0.0092	0.0051	0.0041
34	0.0093	0.0051	0.0041
35	0.0093	0.0051	0.0042
36	0.0093	0.0051	0.0042

37	0.0094	0.0052	0.0042
38	0.0094	0.0052	0.0042
39	0.0094	0.0052	0.0042
40	0.0095	0.0052	0.0042
41	0.0095	0.0053	0.0043
42	0.0095	0.0053	0.0043
43	0.0096	0.0053	0.0043
44	0.0096	0.0053	0.0043
45	0.0096	0.0053	0.0043
46	0.0097	0.0053	0.0043
47	0.0097	0.0054	0.0043
48	0.0097	0.0054	0.0044
49	0.0098	0.0054	0.0044
50	0.0098	0.0054	0.0044
51	0.0099	0.0055	0.0044
52	0.0099	0.0055	0.0044
53	0.0100	0.0055	0.0045
54	0.0100	0.0055	0.0045
55	0.0100	0.0055	0.0045
56	0.0101	0.0056	0.0045
57	0.0101	0.0056	0.0045
58	0.0101	0.0056	0.0045
59	0.0102	0.0056	0.0046
60	0.0102	0.0057	0.0046
61	0.0103	0.0057	0.0046
62	0.0103	0.0057	0.0046
63	0.0104	0.0057	0.0046
64	0.0104	0.0058	0.0047
65	0.0105	0.0058	0.0047
66	0.0105	0.0058	0.0047
67	0.0106	0.0058	0.0047
68	0.0106	0.0059	0.0047
69	0.0107	0.0059	0.0048
70	0.0107	0.0059	0.0048
71	0.0108	0.0059	0.0048
72	0.0108	0.0060	0.0048
73	0.0109	0.0060	0.0049
74	0.0109	0.0060	0.0049
75	0.0110	0.0061	0.0049
76	0.0110	0.0061	0.0049
77	0.0111	0.0061	0.0049
78	0.0111	0.0061	0.0050
79	0.0112	0.0062	0.0050
80	0.0112	0.0062	0.0050
81	0.0113	0.0062	0.0050
82	0.0113	0.0063	0.0051
83	0.0114	0.0063	0.0051
84	0.0114	0.0063	0.0051
85	0.0115	0.0064	0.0052
86	0.0116	0.0064	0.0052
87	0.0116	0.0064	0.0052
88	0.0117	0.0065	0.0052
89	0.0118	0.0065	0.0053
90	0.0118	0.0065	0.0053
91	0.0119	0.0066	0.0053
92	0.0119	0.0066	0.0053
93	0.0120	0.0066	0.0054
94	0.0121	0.0067	0.0054
95	0.0122	0.0067	0.0054
96	0.0122	0.0067	0.0055
97	0.0123	0.0068	0.0055
98	0.0124	0.0068	0.0055
99	0.0125	0.0069	0.0056
100	0.0125	0.0069	0.0056
101	0.0126	0.0070	0.0056
102	0.0127	0.0070	0.0057
103	0.0128	0.0071	0.0057
104	0.0128	0.0071	0.0057
105	0.0129	0.0071	0.0058
106	0.0130	0.0072	0.0058
107	0.0131	0.0072	0.0059
108	0.0132	0.0073	0.0059
109	0.0133	0.0073	0.0059
110	0.0133	0.0074	0.0060
111	0.0135	0.0074	0.0060
112	0.0135	0.0075	0.0060
113	0.0136	0.0075	0.0061
114	0.0137	0.0076	0.0061

115	0.0138	0.0076	0.0062
116	0.0139	0.0077	0.0062
117	0.0140	0.0078	0.0063
118	0.0141	0.0078	0.0063
119	0.0143	0.0079	0.0064
120	0.0143	0.0079	0.0064
121	0.0145	0.0080	0.0065
122	0.0146	0.0080	0.0065
123	0.0147	0.0081	0.0066
124	0.0148	0.0082	0.0066
125	0.0150	0.0083	0.0067
126	0.0150	0.0083	0.0067
127	0.0152	0.0084	0.0068
128	0.0153	0.0085	0.0068
129	0.0155	0.0086	0.0069
130	0.0156	0.0086	0.0070
131	0.0158	0.0087	0.0070
132	0.0158	0.0088	0.0071
133	0.0160	0.0089	0.0072
134	0.0161	0.0089	0.0072
135	0.0164	0.0090	0.0073
136	0.0165	0.0091	0.0074
137	0.0167	0.0092	0.0075
138	0.0168	0.0093	0.0075
139	0.0170	0.0094	0.0076
140	0.0172	0.0095	0.0077
141	0.0174	0.0096	0.0078
142	0.0175	0.0097	0.0078
143	0.0178	0.0098	0.0080
144	0.0179	0.0099	0.0080
145	0.0217	0.0120	0.0097
146	0.0218	0.0121	0.0098
147	0.0221	0.0122	0.0099
148	0.0223	0.0123	0.0100
149	0.0226	0.0125	0.0101
150	0.0228	0.0126	0.0102
151	0.0231	0.0128	0.0103
152	0.0233	0.0129	0.0104
153	0.0237	0.0131	0.0106
154	0.0239	0.0132	0.0107
155	0.0243	0.0134	0.0108
156	0.0245	0.0135	0.0109
157	0.0249	0.0138	0.0111
158	0.0251	0.0139	0.0112
159	0.0256	0.0141	0.0114
160	0.0258	0.0143	0.0116
161	0.0264	0.0146	0.0118
162	0.0266	0.0147	0.0119
163	0.0272	0.0150	0.0122
164	0.0275	0.0152	0.0123
165	0.0281	0.0155	0.0126
166	0.0284	0.0157	0.0127
167	0.0291	0.0161	0.0130
168	0.0295	0.0163	0.0132
169	0.0303	0.0168	0.0136
170	0.0308	0.0170	0.0138
171	0.0316	0.0175	0.0142
172	0.0321	0.0178	0.0144
173	0.0331	0.0183	0.0148
174	0.0337	0.0186	0.0151
175	0.0349	0.0193	0.0156
176	0.0355	0.0196	0.0159
177	0.0369	0.0204	0.0165
178	0.0377	0.0208	0.0169
179	0.0394	0.0218	0.0176
180	0.0404	0.0223	0.0181
181	0.0425	0.0235	0.0190
182	0.0437	0.0242	0.0196
183	0.0465	0.0257	0.0208
184	0.0481	0.0266	0.0215
185	0.0400	0.0221	0.0179
186	0.0422	0.0233	0.0189
187	0.0479	0.0265	0.0214
188	0.0517	0.0286	0.0231
189	0.0623	0.0344	0.0279
190	0.0703	0.0389	0.0315
191	0.1005	0.0434	0.0571
192	0.1382	0.0434	0.0948

193	0.4325	0.0434	0.3891
194	0.0819	0.0434	0.0385
195	0.0563	0.0311	0.0252
196	0.0448	0.0248	0.0201
197	0.0499	0.0276	0.0223
198	0.0451	0.0249	0.0202
199	0.0414	0.0229	0.0185
200	0.0385	0.0213	0.0172
201	0.0362	0.0200	0.0162
202	0.0343	0.0189	0.0153
203	0.0326	0.0180	0.0146
204	0.0312	0.0172	0.0140
205	0.0299	0.0165	0.0134
206	0.0288	0.0159	0.0129
207	0.0278	0.0154	0.0124
208	0.0269	0.0149	0.0120
209	0.0261	0.0144	0.0117
210	0.0254	0.0140	0.0113
211	0.0247	0.0136	0.0110
212	0.0241	0.0133	0.0108
213	0.0235	0.0130	0.0105
214	0.0229	0.0127	0.0103
215	0.0224	0.0124	0.0100
216	0.0220	0.0121	0.0098
217	0.0181	0.0100	0.0081
218	0.0177	0.0098	0.0079
219	0.0173	0.0095	0.0077
220	0.0169	0.0093	0.0076
221	0.0166	0.0092	0.0074
222	0.0163	0.0090	0.0073
223	0.0159	0.0088	0.0071
224	0.0157	0.0087	0.0070
225	0.0154	0.0085	0.0069
226	0.0151	0.0084	0.0068
227	0.0149	0.0082	0.0067
228	0.0146	0.0081	0.0065
229	0.0144	0.0080	0.0064
230	0.0142	0.0078	0.0063
231	0.0140	0.0077	0.0063
232	0.0138	0.0076	0.0062
233	0.0136	0.0075	0.0061
234	0.0134	0.0074	0.0060
235	0.0132	0.0073	0.0059
236	0.0130	0.0072	0.0058
237	0.0129	0.0071	0.0058
238	0.0127	0.0070	0.0057
239	0.0126	0.0069	0.0056
240	0.0124	0.0069	0.0055
241	0.0123	0.0068	0.0055
242	0.0121	0.0067	0.0054
243	0.0120	0.0066	0.0054
244	0.0119	0.0065	0.0053
245	0.0117	0.0065	0.0052
246	0.0116	0.0064	0.0052
247	0.0115	0.0063	0.0051
248	0.0114	0.0063	0.0051
249	0.0112	0.0062	0.0050
250	0.0111	0.0062	0.0050
251	0.0110	0.0061	0.0049
252	0.0109	0.0060	0.0049
253	0.0108	0.0060	0.0048
254	0.0107	0.0059	0.0048
255	0.0106	0.0059	0.0048
256	0.0105	0.0058	0.0047
257	0.0104	0.0058	0.0047
258	0.0103	0.0057	0.0046
259	0.0103	0.0057	0.0046
260	0.0102	0.0056	0.0045
261	0.0101	0.0056	0.0045
262	0.0100	0.0055	0.0045
263	0.0099	0.0055	0.0044
264	0.0098	0.0054	0.0044
265	0.0098	0.0054	0.0044
266	0.0097	0.0054	0.0043
267	0.0096	0.0053	0.0043
268	0.0095	0.0053	0.0043
269	0.0095	0.0052	0.0042
270	0.0094	0.0052	0.0042

271	0.0093	0.0052	0.0042
272	0.0093	0.0051	0.0041
273	0.0092	0.0051	0.0041
274	0.0091	0.0051	0.0041
275	0.0091	0.0050	0.0041
276	0.0090	0.0050	0.0040
277	0.0090	0.0050	0.0040
278	0.0089	0.0049	0.0040
279	0.0088	0.0049	0.0040
280	0.0088	0.0049	0.0039
281	0.0087	0.0048	0.0039
282	0.0087	0.0048	0.0039
283	0.0086	0.0048	0.0039
284	0.0086	0.0047	0.0038
285	0.0085	0.0047	0.0038
286	0.0085	0.0047	0.0038
287	0.0084	0.0046	0.0038
288	0.0084	0.0046	0.0037

Total soil rain loss = 2.78(In)
Total effective rainfall = 2.69(In)
Peak flow rate in flood hydrograph = 33.85(CFS)

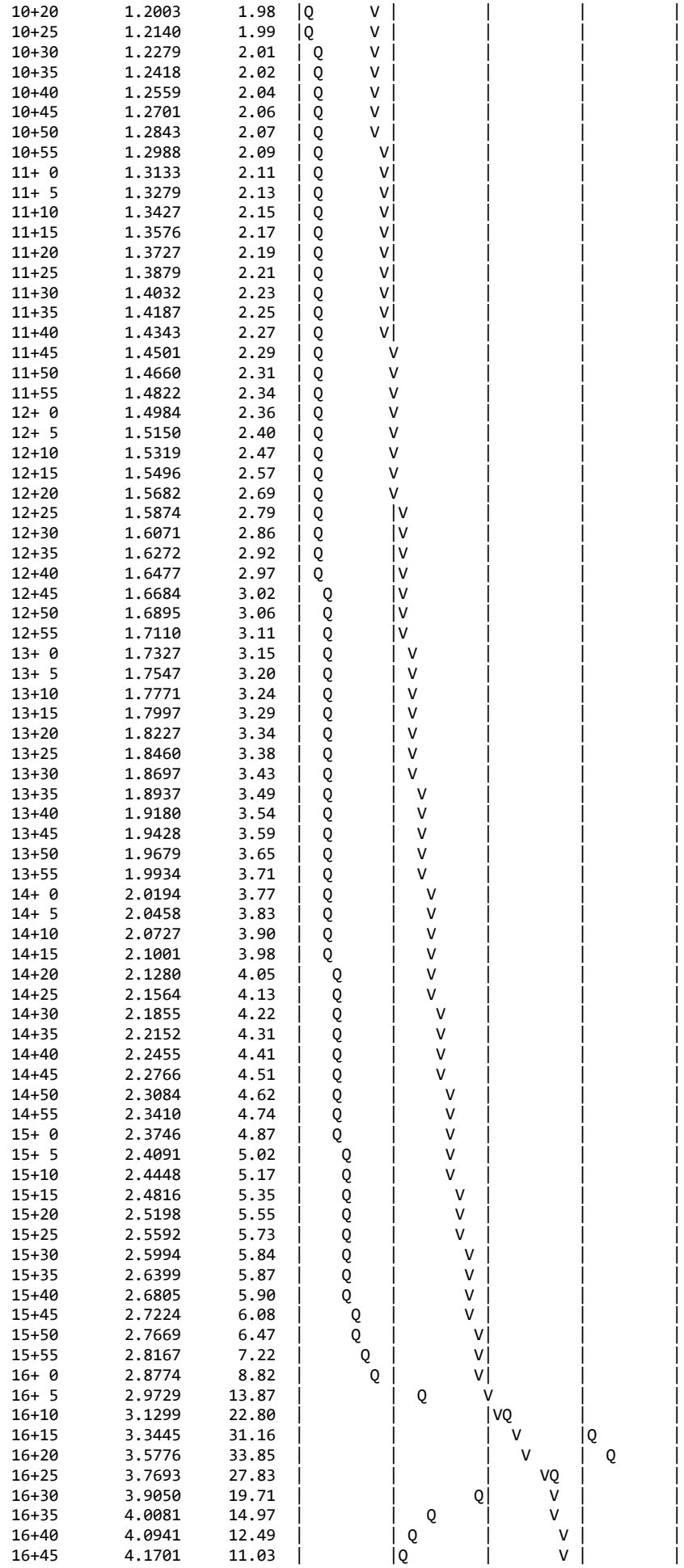
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0002	0.03	Q	|	|	|	|
0+10	0.0011	0.13	Q	|	|	|	|
0+15	0.0032	0.31	Q	|	|	|	|
0+20	0.0069	0.53	Q	|	|	|	|
0+25	0.0117	0.71	Q	|	|	|	|
0+30	0.0173	0.81	Q	|	|	|	|
0+35	0.0234	0.88	Q	|	|	|	|
0+40	0.0298	0.93	Q	|	|	|	|
0+45	0.0365	0.97	Q	|	|	|	|
0+50	0.0434	1.00	VQ	|	|	|	|
0+55	0.0504	1.03	VQ	|	|	|	|
1+ 0	0.0577	1.05	VQ	|	|	|	|
1+ 5	0.0651	1.07	VQ	|	|	|	|
1+10	0.0726	1.09	VQ	|	|	|	|
1+15	0.0802	1.11	VQ	|	|	|	|
1+20	0.0880	1.12	VQ	|	|	|	|
1+25	0.0958	1.14	VQ	|	|	|	|
1+30	0.1037	1.15	VQ	|	|	|	|
1+35	0.1117	1.16	VQ	|	|	|	|
1+40	0.1197	1.17	VQ	|	|	|	|
1+45	0.1279	1.18	VQ	|	|	|	|
1+50	0.1361	1.19	VQ	|	|	|	|
1+55	0.1443	1.20	|Q	|	|	|	|
2+ 0	0.1526	1.21	|Q	|	|	|	|
2+ 5	0.1610	1.21	|Q	|	|	|	|
2+10	0.1694	1.22	|Q	|	|	|	|
2+15	0.1779	1.23	|Q	|	|	|	|
2+20	0.1864	1.23	|Q	|	|	|	|
2+25	0.1949	1.24	|Q	|	|	|	|
2+30	0.2035	1.25	|Q	|	|	|	|
2+35	0.2121	1.25	|Q	|	|	|	|
2+40	0.2208	1.26	|Q	|	|	|	|
2+45	0.2295	1.26	|Q	|	|	|	|
2+50	0.2382	1.26	|Q	|	|	|	|
2+55	0.2469	1.27	|Q	|	|	|	|
3+ 0	0.2557	1.27	|Q	|	|	|	|
3+ 5	0.2645	1.28	|Q	|	|	|	|
3+10	0.2733	1.28	|Q	|	|	|	|
3+15	0.2822	1.29	|Q	|	|	|	|
3+20	0.2911	1.29	|QV	|	|	|	|
3+25	0.3000	1.30	|QV	|	|	|	|
3+30	0.3090	1.30	|QV	|	|	|	|
3+35	0.3179	1.31	|QV	|	|	|	|
3+40	0.3270	1.31	|QV	|	|	|	|
3+45	0.3360	1.31	|QV	|	|	|	|

3+50	0.3451	1.32	|QV	|	|	|	|
3+55	0.3542	1.32	|QV	|	|	|	|
4+ 0	0.3634	1.33	|QV	|	|	|	|
4+ 5	0.3726	1.33	|QV	|	|	|	|
4+10	0.3818	1.34	|QV	|	|	|	|
4+15	0.3911	1.34	|QV	|	|	|	|
4+20	0.4004	1.35	|QV	|	|	|	|
4+25	0.4097	1.36	|QV	|	|	|	|
4+30	0.4191	1.36	|QV	|	|	|	|
4+35	0.4285	1.37	|QV	|	|	|	|
4+40	0.4379	1.37	|Q V	|	|	|	|
4+45	0.4474	1.38	|Q V	|	|	|	|
4+50	0.4569	1.38	|Q V	|	|	|	|
4+55	0.4665	1.39	|Q V	|	|	|	|
5+ 0	0.4761	1.39	|Q V	|	|	|	|
5+ 5	0.4857	1.40	|Q V	|	|	|	|
5+10	0.4954	1.40	|Q V	|	|	|	|
5+15	0.5051	1.41	|Q V	|	|	|	|
5+20	0.5148	1.42	|Q V	|	|	|	|
5+25	0.5246	1.42	|Q V	|	|	|	|
5+30	0.5345	1.43	|Q V	|	|	|	|
5+35	0.5444	1.43	|Q V	|	|	|	|
5+40	0.5543	1.44	|Q V	|	|	|	|
5+45	0.5643	1.45	|Q V	|	|	|	|
5+50	0.5743	1.45	|Q V	|	|	|	|
5+55	0.5843	1.46	|Q V	|	|	|	|
6+ 0	0.5944	1.47	|Q V	|	|	|	|
6+ 5	0.6046	1.47	|Q V	|	|	|	|
6+10	0.6148	1.48	|Q V	|	|	|	|
6+15	0.6250	1.49	|Q V	|	|	|	|
6+20	0.6353	1.49	|Q V	|	|	|	|
6+25	0.6456	1.50	|Q V	|	|	|	|
6+30	0.6560	1.51	|Q V	|	|	|	|
6+35	0.6664	1.51	|Q V	|	|	|	|
6+40	0.6769	1.52	|Q V	|	|	|	|
6+45	0.6874	1.53	|Q V	|	|	|	|
6+50	0.6980	1.54	|Q V	|	|	|	|
6+55	0.7086	1.54	|Q V	|	|	|	|
7+ 0	0.7193	1.55	|Q V	|	|	|	|
7+ 5	0.7301	1.56	|Q V	|	|	|	|
7+10	0.7408	1.57	|Q V	|	|	|	|
7+15	0.7517	1.57	|Q V	|	|	|	|
7+20	0.7626	1.58	|Q V	|	|	|	|
7+25	0.7735	1.59	|Q V	|	|	|	|
7+30	0.7846	1.60	|Q V	|	|	|	|
7+35	0.7956	1.61	|Q V	|	|	|	|
7+40	0.8068	1.62	|Q V	|	|	|	|
7+45	0.8179	1.62	|Q V	|	|	|	|
7+50	0.8292	1.63	|Q V	|	|	|	|
7+55	0.8405	1.64	|Q V	|	|	|	|
8+ 0	0.8519	1.65	|Q V	|	|	|	|
8+ 5	0.8633	1.66	|Q V	|	|	|	|
8+10	0.8748	1.67	|Q V	|	|	|	|
8+15	0.8864	1.68	|Q V	|	|	|	|
8+20	0.8980	1.69	|Q V	|	|	|	|
8+25	0.9097	1.70	|Q V	|	|	|	|
8+30	0.9215	1.71	|Q V	|	|	|	|
8+35	0.9333	1.72	|Q V	|	|	|	|
8+40	0.9452	1.73	|Q V	|	|	|	|
8+45	0.9572	1.74	|Q V	|	|	|	|
8+50	0.9693	1.75	|Q V	|	|	|	|
8+55	0.9814	1.76	|Q V	|	|	|	|
9+ 0	0.9936	1.77	|Q V	|	|	|	|
9+ 5	1.0059	1.78	|Q V	|	|	|	|
9+10	1.0182	1.79	|Q V	|	|	|	|
9+15	1.0307	1.81	|Q V	|	|	|	|
9+20	1.0432	1.82	|Q V	|	|	|	|
9+25	1.0558	1.83	|Q V	|	|	|	|
9+30	1.0685	1.84	|Q V	|	|	|	|
9+35	1.0812	1.85	|Q V	|	|	|	|
9+40	1.0941	1.87	|Q V	|	|	|	|
9+45	1.1070	1.88	|Q V	|	|	|	|
9+50	1.1201	1.89	|Q V	|	|	|	|
9+55	1.1332	1.91	|Q V	|	|	|	|
10+ 0	1.1464	1.92	|Q V	|	|	|	|
10+ 5	1.1598	1.93	|Q V	|	|	|	|
10+10	1.1732	1.95	|Q V	|	|	|	|
10+15	1.1867	1.96	|Q V	|	|	|	|



16+50	4.2382	9.88	| Q|	|	| V|	|
16+55	4.3001	8.99	| Q |	|	| V|	|
17+ 0	4.3565	8.18	| Q |	|	| V	|
17+ 5	4.4089	7.62	| Q |	|	| V	|
17+10	4.4575	7.06	| Q |	|	| V	|
17+15	4.5026	6.54	| Q |	|	| |V	|
17+20	4.5446	6.10	| Q |	|	| |V	|
17+25	4.5843	5.77	| Q |	|	| |V	|
17+30	4.6224	5.54	| Q |	|	| V	|
17+35	4.6590	5.31	| Q |	|	| V	|
17+40	4.6933	4.98	| Q |	|	| V	|
17+45	4.7261	4.76	| Q |	|	| V	|
17+50	4.7574	4.54	| Q |	|	| V	|
17+55	4.7875	4.37	| Q |	|	| V	|
18+ 0	4.8161	4.16	| Q |	|	| V	|
18+ 5	4.8436	3.99	| Q |	|	| V	|
18+10	4.8696	3.78	| Q |	|	| V	|
18+15	4.8945	3.61	| Q |	|	| V	|
18+20	4.9180	3.42	| Q |	|	| V	|
18+25	4.9402	3.23	| Q |	|	| V	|
18+30	4.9605	2.94	| Q |	|	| V	|
18+35	4.9790	2.69	| Q |	|	| V	|
18+40	4.9970	2.60	| Q |	|	| V	|
18+45	5.0144	2.53	| Q |	|	| V	|
18+50	5.0313	2.46	| Q |	|	| V	|
18+55	5.0479	2.40	| Q |	|	| V	|
19+ 0	5.0640	2.34	| Q |	|	| V	|
19+ 5	5.0797	2.29	| Q |	|	| V	|
19+10	5.0951	2.24	| Q |	|	| V	|
19+15	5.1102	2.19	| Q |	|	| V	|
19+20	5.1249	2.15	| Q |	|	| V	|
19+25	5.1394	2.10	| Q |	|	| V	|
19+30	5.1537	2.07	| Q |	|	| V	|
19+35	5.1676	2.03	| Q |	|	| V	|
19+40	5.1814	2.00	|Q |	|	| V	|
19+45	5.1949	1.96	|Q |	|	| V	|
19+50	5.2082	1.93	|Q |	|	| V	|
19+55	5.2213	1.90	|Q |	|	| V	|
20+ 0	5.2342	1.87	|Q |	|	| V	|
20+ 5	5.2469	1.85	|Q |	|	| V	|
20+10	5.2594	1.82	|Q |	|	| V	|
20+15	5.2718	1.80	|Q |	|	| V	|
20+20	5.2840	1.77	|Q |	|	| V	|
20+25	5.2960	1.75	|Q |	|	| V	|
20+30	5.3079	1.73	|Q |	|	| V	|
20+35	5.3197	1.71	|Q |	|	| V	|
20+40	5.3313	1.69	|Q |	|	| V	|
20+45	5.3428	1.67	|Q |	|	| V	|
20+50	5.3541	1.65	|Q |	|	| V	|
20+55	5.3653	1.63	|Q |	|	| V	|
21+ 0	5.3764	1.61	|Q |	|	| V	|
21+ 5	5.3874	1.60	|Q |	|	| V	|
21+10	5.3983	1.58	|Q |	|	| V	|
21+15	5.4091	1.56	|Q |	|	| V	|
21+20	5.4197	1.55	|Q |	|	| V	|
21+25	5.4303	1.53	|Q |	|	| V	|
21+30	5.4407	1.52	|Q |	|	| V	|
21+35	5.4511	1.50	|Q |	|	| V	|
21+40	5.4613	1.49	|Q |	|	| V	|
21+45	5.4715	1.48	|Q |	|	| V	|
21+50	5.4816	1.46	|Q |	|	| V	|
21+55	5.4916	1.45	|Q |	|	| V	|
22+ 0	5.5015	1.44	|Q |	|	| V	|
22+ 5	5.5113	1.42	|Q |	|	| V	|
22+10	5.5210	1.41	|Q |	|	| V	|
22+15	5.5307	1.40	|Q |	|	| V	|
22+20	5.5402	1.39	|Q |	|	| V	|
22+25	5.5497	1.38	|Q |	|	| V	|
22+30	5.5591	1.37	|Q |	|	| V	|
22+35	5.5685	1.36	|Q |	|	| V	|
22+40	5.5778	1.35	|Q |	|	| V	|
22+45	5.5870	1.34	|Q |	|	| V	|
22+50	5.5961	1.33	|Q |	|	| V	|
22+55	5.6052	1.32	|Q |	|	| V	|
23+ 0	5.6142	1.31	|Q |	|	| V	|
23+ 5	5.6231	1.30	|Q |	|	| V	
23+10	5.6320	1.29	|Q |	|	| V	
23+15	5.6408	1.28	|Q |	|	| V	

```
  23+20       5.6495      1.27  |Q        |         |         |        V|
  23+25       5.6582      1.26  |Q        |         |         |        V|
  23+30       5.6668      1.25  |Q        |         |         |        V|
  23+35       5.6754      1.24  |Q        |         |         |        V|
  23+40       5.6839      1.24  |Q        |         |         |        V|
  23+45       5.6924      1.23  |Q        |         |         |        V|
  23+50       5.7008      1.22  |Q        |         |         |        V|
  23+55       5.7091      1.21  |Q        |         |         |        V|
  24+ 0       5.7174      1.20  |Q        |         |         |        V|
  24+ 5       5.7255      1.17  |Q        |         |         |        V|
  24+10       5.7328      1.06  |Q        |         |         |        V|
  24+15       5.7388      0.88  Q        |         |         |        V|
  24+20       5.7433      0.65  Q        |         |         |        V|
  24+25       5.7466      0.47  Q        |         |         |        V|
  24+30       5.7491      0.36  Q        |         |         |        V|
  24+35       5.7511      0.30  Q        |         |         |        V|
  24+40       5.7528      0.25  Q        |         |         |        V|
  24+45       5.7543      0.21  Q        |         |         |        V|
  24+50       5.7555      0.18  Q        |         |         |        V|
  24+55       5.7566      0.15  Q        |         |         |        V|
  25+ 0       5.7575      0.13  Q        |         |         |        V|
  25+ 5       5.7583      0.11  Q        |         |         |        V|
  25+10       5.7590      0.10  Q        |         |         |        V|
  25+15       5.7596      0.08  Q        |         |         |        V|
  25+20       5.7601      0.07  Q        |         |         |        V|
  25+25       5.7605      0.06  Q        |         |         |        V|
  25+30       5.7609      0.05  Q        |         |         |        V|
  25+35       5.7612      0.05  Q        |         |         |        V|
  25+40       5.7615      0.04  Q        |         |         |        V|
  25+45       5.7617      0.03  Q        |         |         |        V|
  25+50       5.7619      0.03  Q        |         |         |        V|
  25+55       5.7620      0.02  Q        |         |         |        V|
  26+ 0       5.7621      0.02  Q        |         |         |        V|
  26+ 5       5.7622      0.01  Q        |         |         |        V|
  26+10       5.7623      0.01  Q        |         |         |        V|
  26+15       5.7624      0.01  Q        |         |         |        V|
  26+20       5.7624      0.00  Q        |         |         |        V|
  26+25       5.7624      0.00  Q        |         |         |         V
---------------------------------------------------------------------
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PROPOSED CONDITION

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

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Study date 07/13/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 2

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 2		
23.84	1	0.60
Rainfall data for year 2		
23.84	6	1.59
Rainfall data for year 2		
23.84	24	2.81

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 1)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	16.6	23.84	1.000	1.000	0.600	0.600

Area-averaged adjusted loss rate Fm (In/Hr) = 0.600

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC1)	S	Pervious Yield Fr
14.30	0.600	32.0	16.6	14.05	0.000
9.54	0.400	98.0	98.0	0.20	0.918

Area-averaged catchment yield fraction, Y = 0.367
Area-averaged low loss fraction, Yb = 0.633
User entry of time of concentration = 0.230 (hours)
++
Watershed area = 23.84(Ac.)
Catchment Lag time = 0.184 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 45.2899
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.600(In/Hr)
Average low loss rate fraction (Yb) = 0.633 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.222(In)
Computed peak 30-minute rainfall = 0.455(In)
Specified peak 1-hour rainfall = 0.600(In)

Computed peak 3-hour rainfall = 1.091(In)
Specified peak 6-hour rainfall = 1.590(In)
Specified peak 24-hour rainfall = 2.810(In)

Rainfall depth area reduction factors:
Using a total area of 23.84(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.222(In)
30-minute factor = 0.999 Adjusted rainfall = 0.454(In)
1-hour factor = 0.999 Adjusted rainfall = 0.599(In)
3-hour factor = 1.000 Adjusted rainfall = 1.090(In)
6-hour factor = 1.000 Adjusted rainfall = 1.590(In)
24-hour factor = 1.000 Adjusted rainfall = 2.810(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 288.31 (CFS))	
1	3.796	10.944
2	24.745	60.400
3	60.645	103.503
4	85.208	70.821
5	94.972	28.150
6	98.207	9.326
7	99.099	2.573
8	100.000	1.286

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2218	0.2218
2	0.2927	0.0709
3	0.3442	0.0515
4	0.3862	0.0420
5	0.4223	0.0361
6	0.4542	0.0319
7	0.4831	0.0289
8	0.5096	0.0265
9	0.5342	0.0246
10	0.5572	0.0230
11	0.5788	0.0217
12	0.5993	0.0205
13	0.6260	0.0267
14	0.6518	0.0258
15	0.6768	0.0250
16	0.7010	0.0242
17	0.7246	0.0235
18	0.7475	0.0229
19	0.7698	0.0223
20	0.7916	0.0218
21	0.8130	0.0213
22	0.8338	0.0209
23	0.8543	0.0204
24	0.8743	0.0200
25	0.8940	0.0197
26	0.9133	0.0193
27	0.9323	0.0190
28	0.9509	0.0187
29	0.9693	0.0184
30	0.9873	0.0181
31	1.0051	0.0178
32	1.0227	0.0175
33	1.0400	0.0173
34	1.0570	0.0171
35	1.0738	0.0168
36	1.0904	0.0166
37	1.1068	0.0164
38	1.1230	0.0162
39	1.1390	0.0160
40	1.1548	0.0158
41	1.1704	0.0156
42	1.1858	0.0154
43	1.2011	0.0153
44	1.2162	0.0151

45	1.2312	0.0150
46	1.2460	0.0148
47	1.2607	0.0147
48	1.2752	0.0145
49	1.2896	0.0144
50	1.3038	0.0143
51	1.3179	0.0141
52	1.3319	0.0140
53	1.3458	0.0139
54	1.3596	0.0138
55	1.3732	0.0136
56	1.3867	0.0135
57	1.4001	0.0134
58	1.4134	0.0133
59	1.4267	0.0132
60	1.4398	0.0131
61	1.4528	0.0130
62	1.4657	0.0129
63	1.4785	0.0128
64	1.4912	0.0127
65	1.5038	0.0126
66	1.5164	0.0125
67	1.5288	0.0125
68	1.5412	0.0124
69	1.5535	0.0123
70	1.5657	0.0122
71	1.5778	0.0121
72	1.5899	0.0121
73	1.5989	0.0090
74	1.6079	0.0090
75	1.6168	0.0089
76	1.6256	0.0088
77	1.6343	0.0088
78	1.6430	0.0087
79	1.6516	0.0086
80	1.6602	0.0086
81	1.6687	0.0085
82	1.6771	0.0084
83	1.6855	0.0084
84	1.6938	0.0083
85	1.7021	0.0083
86	1.7103	0.0082
87	1.7184	0.0081
88	1.7265	0.0081
89	1.7345	0.0080
90	1.7425	0.0080
91	1.7504	0.0079
92	1.7583	0.0079
93	1.7661	0.0078
94	1.7739	0.0078
95	1.7816	0.0077
96	1.7893	0.0077
97	1.7970	0.0076
98	1.8045	0.0076
99	1.8121	0.0075
100	1.8196	0.0075
101	1.8270	0.0075
102	1.8345	0.0074
103	1.8418	0.0074
104	1.8491	0.0073
105	1.8564	0.0073
106	1.8637	0.0072
107	1.8709	0.0072
108	1.8780	0.0072
109	1.8852	0.0071
110	1.8922	0.0071
111	1.8993	0.0070
112	1.9063	0.0070
113	1.9133	0.0070
114	1.9202	0.0069
115	1.9271	0.0069
116	1.9340	0.0069
117	1.9408	0.0068
118	1.9476	0.0068
119	1.9544	0.0068
120	1.9611	0.0067
121	1.9678	0.0067
122	1.9745	0.0067

123	1.9811	0.0066
124	1.9877	0.0066
125	1.9943	0.0066
126	2.0008	0.0065
127	2.0073	0.0065
128	2.0138	0.0065
129	2.0202	0.0064
130	2.0267	0.0064
131	2.0331	0.0064
132	2.0394	0.0064
133	2.0457	0.0063
134	2.0521	0.0063
135	2.0583	0.0063
136	2.0646	0.0062
137	2.0708	0.0062
138	2.0770	0.0062
139	2.0832	0.0062
140	2.0893	0.0061
141	2.0954	0.0061
142	2.1015	0.0061
143	2.1076	0.0061
144	2.1136	0.0060
145	2.1196	0.0060
146	2.1256	0.0060
147	2.1316	0.0060
148	2.1376	0.0059
149	2.1435	0.0059
150	2.1494	0.0059
151	2.1552	0.0059
152	2.1611	0.0059
153	2.1669	0.0058
154	2.1727	0.0058
155	2.1785	0.0058
156	2.1843	0.0058
157	2.1900	0.0057
158	2.1957	0.0057
159	2.2014	0.0057
160	2.2071	0.0057
161	2.2128	0.0057
162	2.2184	0.0056
163	2.2240	0.0056
164	2.2296	0.0056
165	2.2352	0.0056
166	2.2408	0.0056
167	2.2463	0.0055
168	2.2518	0.0055
169	2.2573	0.0055
170	2.2628	0.0055
171	2.2682	0.0055
172	2.2737	0.0054
173	2.2791	0.0054
174	2.2845	0.0054
175	2.2899	0.0054
176	2.2953	0.0054
177	2.3006	0.0053
178	2.3059	0.0053
179	2.3112	0.0053
180	2.3165	0.0053
181	2.3218	0.0053
182	2.3271	0.0053
183	2.3323	0.0052
184	2.3376	0.0052
185	2.3428	0.0052
186	2.3480	0.0052
187	2.3531	0.0052
188	2.3583	0.0052
189	2.3634	0.0051
190	2.3686	0.0051
191	2.3737	0.0051
192	2.3788	0.0051
193	2.3839	0.0051
194	2.3889	0.0051
195	2.3940	0.0051
196	2.3990	0.0050
197	2.4040	0.0050
198	2.4090	0.0050
199	2.4140	0.0050
200	2.4190	0.0050

201	2.4240	0.0050
202	2.4289	0.0049
203	2.4338	0.0049
204	2.4388	0.0049
205	2.4437	0.0049
206	2.4486	0.0049
207	2.4534	0.0049
208	2.4583	0.0049
209	2.4631	0.0048
210	2.4680	0.0048
211	2.4728	0.0048
212	2.4776	0.0048
213	2.4824	0.0048
214	2.4872	0.0048
215	2.4920	0.0048
216	2.4967	0.0048
217	2.5015	0.0047
218	2.5062	0.0047
219	2.5109	0.0047
220	2.5156	0.0047
221	2.5203	0.0047
222	2.5250	0.0047
223	2.5296	0.0047
224	2.5343	0.0047
225	2.5389	0.0046
226	2.5436	0.0046
227	2.5482	0.0046
228	2.5528	0.0046
229	2.5574	0.0046
230	2.5620	0.0046
231	2.5665	0.0046
232	2.5711	0.0046
233	2.5756	0.0045
234	2.5802	0.0045
235	2.5847	0.0045
236	2.5892	0.0045
237	2.5937	0.0045
238	2.5982	0.0045
239	2.6027	0.0045
240	2.6071	0.0045
241	2.6116	0.0045
242	2.6160	0.0044
243	2.6205	0.0044
244	2.6249	0.0044
245	2.6293	0.0044
246	2.6337	0.0044
247	2.6381	0.0044
248	2.6425	0.0044
249	2.6469	0.0044
250	2.6512	0.0044
251	2.6556	0.0044
252	2.6599	0.0043
253	2.6643	0.0043
254	2.6686	0.0043
255	2.6729	0.0043
256	2.6772	0.0043
257	2.6815	0.0043
258	2.6858	0.0043
259	2.6900	0.0043
260	2.6943	0.0043
261	2.6986	0.0043
262	2.7028	0.0042
263	2.7070	0.0042
264	2.7113	0.0042
265	2.7155	0.0042
266	2.7197	0.0042
267	2.7239	0.0042
268	2.7281	0.0042
269	2.7322	0.0042
270	2.7364	0.0042
271	2.7406	0.0042
272	2.7447	0.0041
273	2.7488	0.0041
274	2.7530	0.0041
275	2.7571	0.0041
276	2.7612	0.0041
277	2.7653	0.0041
278	2.7694	0.0041

279	2.7735	0.0041	
280	2.7776	0.0041	
281	2.7817	0.0041	
282	2.7857	0.0041	
283	2.7898	0.0041	
284	2.7938	0.0040	
285	2.7979	0.0040	
286	2.8019	0.0040	
287	2.8059	0.0040	
288	2.8099	0.0040	

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0040	0.0025	0.0015
2	0.0040	0.0025	0.0015
3	0.0040	0.0026	0.0015
4	0.0040	0.0026	0.0015
5	0.0041	0.0026	0.0015
6	0.0041	0.0026	0.0015
7	0.0041	0.0026	0.0015
8	0.0041	0.0026	0.0015
9	0.0041	0.0026	0.0015
10	0.0041	0.0026	0.0015
11	0.0041	0.0026	0.0015
12	0.0041	0.0026	0.0015
13	0.0042	0.0026	0.0015
14	0.0042	0.0026	0.0015
15	0.0042	0.0027	0.0015
16	0.0042	0.0027	0.0015
17	0.0042	0.0027	0.0016
18	0.0042	0.0027	0.0016
19	0.0043	0.0027	0.0016
20	0.0043	0.0027	0.0016
21	0.0043	0.0027	0.0016
22	0.0043	0.0027	0.0016
23	0.0043	0.0027	0.0016
24	0.0043	0.0027	0.0016
25	0.0043	0.0027	0.0016
26	0.0044	0.0028	0.0016
27	0.0044	0.0028	0.0016
28	0.0044	0.0028	0.0016
29	0.0044	0.0028	0.0016
30	0.0044	0.0028	0.0016
31	0.0044	0.0028	0.0016
32	0.0044	0.0028	0.0016
33	0.0045	0.0028	0.0016
34	0.0045	0.0028	0.0016
35	0.0045	0.0028	0.0017
36	0.0045	0.0029	0.0017
37	0.0045	0.0029	0.0017
38	0.0045	0.0029	0.0017
39	0.0046	0.0029	0.0017
40	0.0046	0.0029	0.0017
41	0.0046	0.0029	0.0017
42	0.0046	0.0029	0.0017
43	0.0046	0.0029	0.0017
44	0.0047	0.0029	0.0017
45	0.0047	0.0030	0.0017
46	0.0047	0.0030	0.0017
47	0.0047	0.0030	0.0017
48	0.0047	0.0030	0.0017
49	0.0048	0.0030	0.0017
50	0.0048	0.0030	0.0018
51	0.0048	0.0030	0.0018
52	0.0048	0.0030	0.0018
53	0.0048	0.0031	0.0018
54	0.0048	0.0031	0.0018
55	0.0049	0.0031	0.0018
56	0.0049	0.0031	0.0018
57	0.0049	0.0031	0.0018
58	0.0049	0.0031	0.0018
59	0.0050	0.0031	0.0018
60	0.0050	0.0031	0.0018
61	0.0050	0.0032	0.0018
62	0.0050	0.0032	0.0018
63	0.0051	0.0032	0.0019

64	0.0051	0.0032	0.0019
65	0.0051	0.0032	0.0019
66	0.0051	0.0032	0.0019
67	0.0051	0.0033	0.0019
68	0.0052	0.0033	0.0019
69	0.0052	0.0033	0.0019
70	0.0052	0.0033	0.0019
71	0.0052	0.0033	0.0019
72	0.0053	0.0033	0.0019
73	0.0053	0.0034	0.0019
74	0.0053	0.0034	0.0020
75	0.0053	0.0034	0.0020
76	0.0054	0.0034	0.0020
77	0.0054	0.0034	0.0020
78	0.0054	0.0034	0.0020
79	0.0055	0.0035	0.0020
80	0.0055	0.0035	0.0020
81	0.0055	0.0035	0.0020
82	0.0055	0.0035	0.0020
83	0.0056	0.0035	0.0020
84	0.0056	0.0035	0.0021
85	0.0056	0.0036	0.0021
86	0.0057	0.0036	0.0021
87	0.0057	0.0036	0.0021
88	0.0057	0.0036	0.0021
89	0.0058	0.0036	0.0021
90	0.0058	0.0037	0.0021
91	0.0058	0.0037	0.0021
92	0.0059	0.0037	0.0021
93	0.0059	0.0037	0.0022
94	0.0059	0.0037	0.0022
95	0.0060	0.0038	0.0022
96	0.0060	0.0038	0.0022
97	0.0060	0.0038	0.0022
98	0.0061	0.0038	0.0022
99	0.0061	0.0039	0.0022
100	0.0061	0.0039	0.0023
101	0.0062	0.0039	0.0023
102	0.0062	0.0039	0.0023
103	0.0063	0.0040	0.0023
104	0.0063	0.0040	0.0023
105	0.0064	0.0040	0.0023
106	0.0064	0.0040	0.0023
107	0.0064	0.0041	0.0024
108	0.0065	0.0041	0.0024
109	0.0065	0.0041	0.0024
110	0.0066	0.0042	0.0024
111	0.0066	0.0042	0.0024
112	0.0067	0.0042	0.0024
113	0.0067	0.0043	0.0025
114	0.0068	0.0043	0.0025
115	0.0068	0.0043	0.0025
116	0.0069	0.0043	0.0025
117	0.0069	0.0044	0.0025
118	0.0070	0.0044	0.0026
119	0.0070	0.0045	0.0026
120	0.0071	0.0045	0.0026
121	0.0072	0.0045	0.0026
122	0.0072	0.0046	0.0026
123	0.0073	0.0046	0.0027
124	0.0073	0.0046	0.0027
125	0.0074	0.0047	0.0027
126	0.0075	0.0047	0.0027
127	0.0075	0.0048	0.0028
128	0.0076	0.0048	0.0028
129	0.0077	0.0049	0.0028
130	0.0077	0.0049	0.0028
131	0.0078	0.0050	0.0029
132	0.0079	0.0050	0.0029
133	0.0080	0.0051	0.0029
134	0.0080	0.0051	0.0029
135	0.0081	0.0052	0.0030
136	0.0082	0.0052	0.0030
137	0.0083	0.0053	0.0031
138	0.0084	0.0053	0.0031
139	0.0085	0.0054	0.0031
140	0.0086	0.0054	0.0031
141	0.0087	0.0055	0.0032

142	0.0088	0.0055	0.0032
143	0.0089	0.0056	0.0033
144	0.0090	0.0057	0.0033
145	0.0121	0.0076	0.0044
146	0.0121	0.0077	0.0045
147	0.0123	0.0078	0.0045
148	0.0124	0.0078	0.0045
149	0.0125	0.0079	0.0046
150	0.0126	0.0080	0.0046
151	0.0128	0.0081	0.0047
152	0.0129	0.0082	0.0047
153	0.0131	0.0083	0.0048
154	0.0132	0.0084	0.0048
155	0.0134	0.0085	0.0049
156	0.0135	0.0086	0.0050
157	0.0138	0.0087	0.0050
158	0.0139	0.0088	0.0051
159	0.0141	0.0089	0.0052
160	0.0143	0.0090	0.0052
161	0.0145	0.0092	0.0053
162	0.0147	0.0093	0.0054
163	0.0150	0.0095	0.0055
164	0.0151	0.0096	0.0055
165	0.0154	0.0098	0.0057
166	0.0156	0.0099	0.0057
167	0.0160	0.0101	0.0059
168	0.0162	0.0102	0.0059
169	0.0166	0.0105	0.0061
170	0.0168	0.0106	0.0062
171	0.0173	0.0109	0.0063
172	0.0175	0.0111	0.0064
173	0.0181	0.0114	0.0066
174	0.0184	0.0116	0.0067
175	0.0190	0.0120	0.0070
176	0.0193	0.0122	0.0071
177	0.0200	0.0127	0.0074
178	0.0204	0.0129	0.0075
179	0.0213	0.0135	0.0078
180	0.0218	0.0138	0.0080
181	0.0229	0.0145	0.0084
182	0.0235	0.0149	0.0086
183	0.0250	0.0158	0.0092
184	0.0258	0.0163	0.0095
185	0.0205	0.0130	0.0075
186	0.0217	0.0137	0.0079
187	0.0246	0.0156	0.0090
188	0.0265	0.0168	0.0097
189	0.0319	0.0202	0.0117
190	0.0361	0.0228	0.0132
191	0.0515	0.0326	0.0189
192	0.0709	0.0449	0.0260
193	0.2218	0.0500	0.1718
194	0.0420	0.0266	0.0154
195	0.0289	0.0183	0.0106
196	0.0230	0.0146	0.0084
197	0.0267	0.0169	0.0098
198	0.0242	0.0153	0.0089
199	0.0223	0.0141	0.0082
200	0.0209	0.0132	0.0077
201	0.0197	0.0124	0.0072
202	0.0187	0.0118	0.0068
203	0.0178	0.0113	0.0065
204	0.0171	0.0108	0.0063
205	0.0164	0.0104	0.0060
206	0.0158	0.0100	0.0058
207	0.0153	0.0097	0.0056
208	0.0148	0.0094	0.0054
209	0.0144	0.0091	0.0053
210	0.0140	0.0089	0.0051
211	0.0136	0.0086	0.0050
212	0.0133	0.0084	0.0049
213	0.0130	0.0082	0.0048
214	0.0127	0.0081	0.0047
215	0.0125	0.0079	0.0046
216	0.0122	0.0077	0.0045
217	0.0090	0.0057	0.0033
218	0.0088	0.0056	0.0032
219	0.0086	0.0055	0.0032

220	0.0084	0.0053	0.0031
221	0.0083	0.0052	0.0030
222	0.0081	0.0051	0.0030
223	0.0079	0.0050	0.0029
224	0.0078	0.0049	0.0029
225	0.0076	0.0048	0.0028
226	0.0075	0.0047	0.0028
227	0.0074	0.0047	0.0027
228	0.0072	0.0046	0.0027
229	0.0071	0.0045	0.0026
230	0.0070	0.0044	0.0026
231	0.0069	0.0044	0.0025
232	0.0068	0.0043	0.0025
233	0.0067	0.0042	0.0025
234	0.0066	0.0042	0.0024
235	0.0065	0.0041	0.0024
236	0.0064	0.0041	0.0024
237	0.0063	0.0040	0.0023
238	0.0062	0.0040	0.0023
239	0.0062	0.0039	0.0023
240	0.0061	0.0039	0.0022
241	0.0060	0.0038	0.0022
242	0.0059	0.0038	0.0022
243	0.0059	0.0037	0.0022
244	0.0058	0.0037	0.0021
245	0.0057	0.0036	0.0021
246	0.0057	0.0036	0.0021
247	0.0056	0.0036	0.0021
248	0.0056	0.0035	0.0020
249	0.0055	0.0035	0.0020
250	0.0054	0.0034	0.0020
251	0.0054	0.0034	0.0020
252	0.0053	0.0034	0.0020
253	0.0053	0.0033	0.0019
254	0.0052	0.0033	0.0019
255	0.0052	0.0033	0.0019
256	0.0051	0.0032	0.0019
257	0.0051	0.0032	0.0019
258	0.0050	0.0032	0.0018
259	0.0050	0.0032	0.0018
260	0.0049	0.0031	0.0018
261	0.0049	0.0031	0.0018
262	0.0049	0.0031	0.0018
263	0.0048	0.0031	0.0018
264	0.0048	0.0030	0.0018
265	0.0047	0.0030	0.0017
266	0.0047	0.0030	0.0017
267	0.0047	0.0030	0.0017
268	0.0046	0.0029	0.0017
269	0.0046	0.0029	0.0017
270	0.0046	0.0029	0.0017
271	0.0045	0.0029	0.0017
272	0.0045	0.0028	0.0016
273	0.0045	0.0028	0.0016
274	0.0044	0.0028	0.0016
275	0.0044	0.0028	0.0016
276	0.0044	0.0028	0.0016
277	0.0043	0.0027	0.0016
278	0.0043	0.0027	0.0016
279	0.0043	0.0027	0.0016
280	0.0042	0.0027	0.0016
281	0.0042	0.0027	0.0015
282	0.0042	0.0026	0.0015
283	0.0042	0.0026	0.0015
284	0.0041	0.0026	0.0015
285	0.0041	0.0026	0.0015
286	0.0041	0.0026	0.0015
287	0.0041	0.0026	0.0015
288	0.0040	0.0025	0.0015

Total soil rain loss = 1.69(In)
Total effective rainfall = 1.12(In)
Peak flow rate in flood hydrograph = 21.37(CFS)

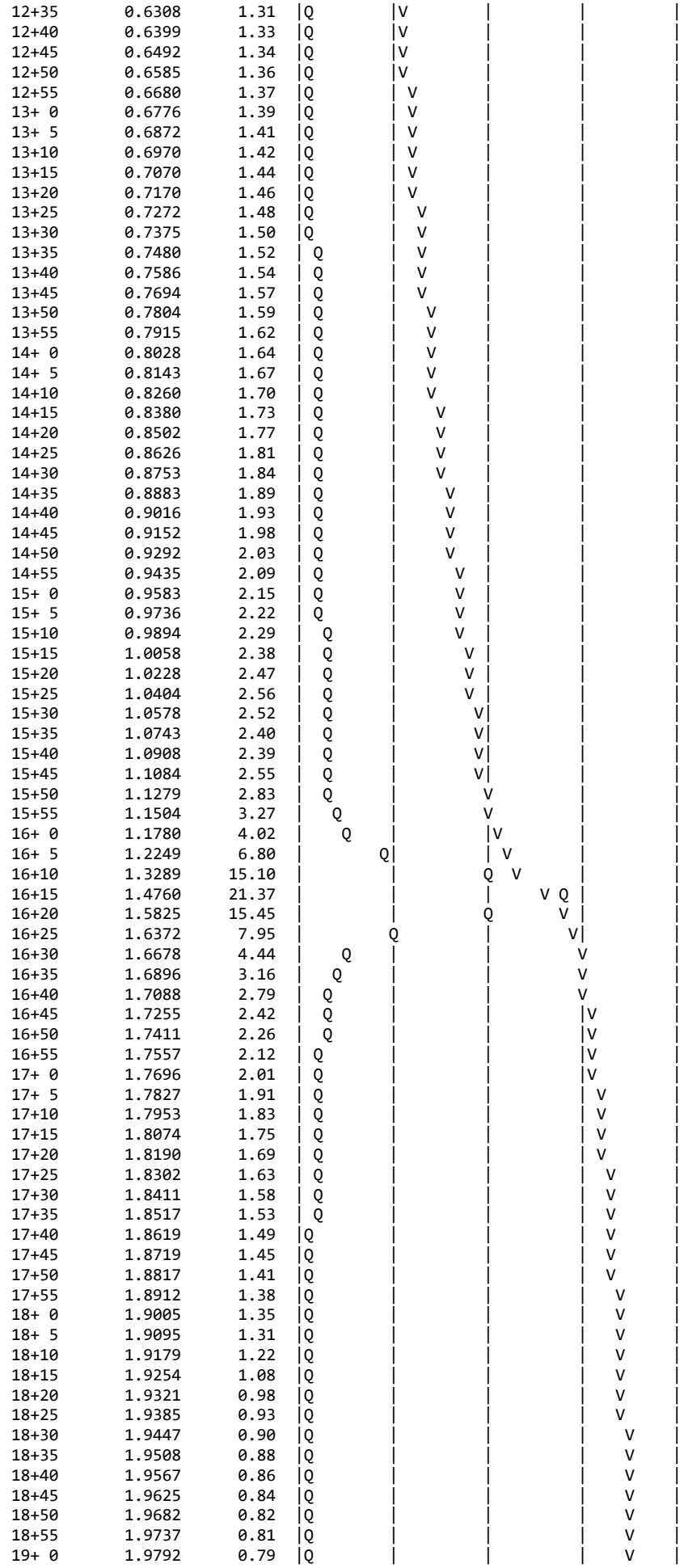
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.11	Q				
0+15	0.0026	0.26	Q				
0+20	0.0051	0.36	Q				
0+25	0.0079	0.41	Q				
0+30	0.0108	0.42	Q				
0+35	0.0137	0.43	Q				
0+40	0.0167	0.43	Q				
0+45	0.0196	0.43	Q				
0+50	0.0226	0.43	Q				
0+55	0.0256	0.43	Q				
1+ 0	0.0286	0.43	Q				
1+ 5	0.0316	0.44	Q				
1+10	0.0346	0.44	Q				
1+15	0.0376	0.44	Q				
1+20	0.0406	0.44	Q				
1+25	0.0437	0.44	Q				
1+30	0.0467	0.44	Q				
1+35	0.0498	0.44	Q				
1+40	0.0529	0.45	Q				
1+45	0.0559	0.45	QV				
1+50	0.0590	0.45	QV				
1+55	0.0621	0.45	QV				
2+ 0	0.0653	0.45	QV				
2+ 5	0.0684	0.45	QV				
2+10	0.0715	0.46	QV				
2+15	0.0747	0.46	QV				
2+20	0.0778	0.46	QV				
2+25	0.0810	0.46	QV				
2+30	0.0842	0.46	QV				
2+35	0.0873	0.46	QV				
2+40	0.0906	0.46	QV				
2+45	0.0938	0.47	QV				
2+50	0.0970	0.47	QV				
2+55	0.1002	0.47	QV				
3+ 0	0.1035	0.47	QV				
3+ 5	0.1067	0.47	QV				
3+10	0.1100	0.48	QV				
3+15	0.1133	0.48	Q V				
3+20	0.1166	0.48	Q V				
3+25	0.1199	0.48	Q V				
3+30	0.1232	0.48	Q V				
3+35	0.1266	0.48	Q V				
3+40	0.1299	0.49	Q V				
3+45	0.1333	0.49	Q V				
3+50	0.1366	0.49	Q V				
3+55	0.1400	0.49	Q V				
4+ 0	0.1434	0.49	Q V				
4+ 5	0.1469	0.50	Q V				
4+10	0.1503	0.50	Q V				
4+15	0.1537	0.50	Q V				
4+20	0.1572	0.50	Q V				
4+25	0.1607	0.50	Q V				
4+30	0.1641	0.51	Q V				
4+35	0.1676	0.51	Q V				
4+40	0.1712	0.51	Q V				
4+45	0.1747	0.51	Q V				
4+50	0.1782	0.51	Q V				
4+55	0.1818	0.52	Q V				
5+ 0	0.1854	0.52	Q V				
5+ 5	0.1890	0.52	Q V				
5+10	0.1926	0.52	Q V				
5+15	0.1962	0.53	Q V				
5+20	0.1998	0.53	Q V				
5+25	0.2035	0.53	Q V				
5+30	0.2072	0.53	Q V				
5+35	0.2109	0.54	Q V				
5+40	0.2146	0.54	Q V				
5+45	0.2183	0.54	Q V				
5+50	0.2220	0.54	Q V				
5+55	0.2258	0.55	Q V				
6+ 0	0.2296	0.55	Q V				

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 6+ 5       0.2334      0.55  Q   V     |          |          |          |
 6+10       0.2372      0.55  Q   V     |          |          |          |
 6+15       0.2410      0.56  Q   V     |          |          |          |
 6+20       0.2449      0.56  Q   V     |          |          |          |
 6+25       0.2488      0.56  Q   V     |          |          |          |
 6+30       0.2526      0.57  Q   V     |          |          |          |
 6+35       0.2566      0.57  Q   V     |          |          |          |
 6+40       0.2605      0.57  Q   V     |          |          |          |
 6+45       0.2644      0.57  Q   V     |          |          |          |
 6+50       0.2684      0.58  Q   V     |          |          |          |
 6+55       0.2724      0.58  Q   V     |          |          |          |
 7+ 0       0.2764      0.58  Q   V     |          |          |          |
 7+ 5       0.2805      0.59  Q    V    |          |          |          |
 7+10       0.2845      0.59  Q    V    |          |          |          |
 7+15       0.2886      0.59  Q    V    |          |          |          |
 7+20       0.2927      0.60  Q    V    |          |          |          |
 7+25       0.2968      0.60  Q    V    |          |          |          |
 7+30       0.3010      0.60  Q    V    |          |          |          |
 7+35       0.3051      0.61  Q    V    |          |          |          |
 7+40       0.3093      0.61  Q    V    |          |          |          |
 7+45       0.3136      0.61  Q    V    |          |          |          |
 7+50       0.3178      0.62  Q    V    |          |          |          |
 7+55       0.3221      0.62  Q    V    |          |          |          |
 8+ 0       0.3264      0.62  Q    V    |          |          |          |
 8+ 5       0.3307      0.63  Q    V    |          |          |          |
 8+10       0.3350      0.63  Q     V   |          |          |          |
 8+15       0.3394      0.63  Q     V   |          |          |          |
 8+20       0.3438      0.64  Q     V   |          |          |          |
 8+25       0.3482      0.64  Q     V   |          |          |          |
 8+30       0.3527      0.65  Q     V   |          |          |          |
 8+35       0.3572      0.65  Q     V   |          |          |          |
 8+40       0.3617      0.66  Q     V   |          |          |          |
 8+45       0.3662      0.66  Q     V   |          |          |          |
 8+50       0.3708      0.66  Q     V   |          |          |          |
 8+55       0.3754      0.67  Q     V   |          |          |          |
 9+ 0       0.3800      0.67  Q     V   |          |          |          |
 9+ 5       0.3847      0.68  Q     V   |          |          |          |
 9+10       0.3894      0.68  Q      V  |          |          |          |
 9+15       0.3941      0.69  Q      V  |          |          |          |
 9+20       0.3989      0.69  Q      V  |          |          |          |
 9+25       0.4037      0.70  Q      V  |          |          |          |
 9+30       0.4085      0.70  Q      V  |          |          |          |
 9+35       0.4134      0.71  Q      V  |          |          |          |
 9+40       0.4183      0.71  Q      V  |          |          |          |
 9+45       0.4232      0.72  Q      V  |          |          |          |
 9+50       0.4282      0.72  Q      V  |          |          |          |
 9+55       0.4332      0.73  Q      V  |          |          |          |
10+ 0       0.4383      0.73  Q      V  |          |          |          |
10+ 5       0.4434      0.74  Q      V  |          |          |          |
10+10       0.4485      0.75  Q       V |          |          |          |
10+15       0.4537      0.75  |Q      V |          |          |          |
10+20       0.4589      0.76  |Q      V |          |          |          |
10+25       0.4642      0.76  |Q      V |          |          |          |
10+30       0.4695      0.77  |Q      V |          |          |          |
10+35       0.4748      0.78  |Q      V |          |          |          |
10+40       0.4802      0.78  |Q      V |          |          |          |
10+45       0.4857      0.79  |Q      V |          |          |          |
10+50       0.4912      0.80  |Q      V |          |          |          |
10+55       0.4967      0.81  |Q      V |          |          |          |
11+ 0       0.5023      0.81  |Q       V|          |          |          |
11+ 5       0.5080      0.82  |Q       V|          |          |          |
11+10       0.5137      0.83  |Q       V|          |          |          |
11+15       0.5195      0.84  |Q       V|          |          |          |
11+20       0.5253      0.85  |Q       V|          |          |          |
11+25       0.5312      0.85  |Q       V|          |          |          |
11+30       0.5371      0.86  |Q       V|          |          |          |
11+35       0.5431      0.87  |Q       V|          |          |          |
11+40       0.5492      0.88  |Q       V|          |          |          |
11+45       0.5553      0.89  |Q        V          |          |          |
11+50       0.5615      0.90  |Q        V          |          |          |
11+55       0.5678      0.91  |Q        V          |          |          |
12+ 0       0.5741      0.92  |Q        V          |          |          |
12+ 5       0.5806      0.94  |Q        V          |          |          |
12+10       0.5876      1.02  |Q        V          |          |          |
12+15       0.5955      1.14  |Q        V          |          |          |
12+20       0.6040      1.23  |Q        V          |          |          |
12+25       0.6128      1.27  |Q        |V         |          |          |
12+30       0.6217      1.30  |Q        |V         |          |          |
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  19+ 5       1.9846      0.78  |Q        |         |         |    V    |
  19+10       1.9899      0.77  |Q        |         |         |    V    |
  19+15       1.9951      0.75  |Q        |         |         |    V    |
  19+20       2.0002      0.74  Q         |         |         |     V   |
  19+25       2.0052      0.73  Q         |         |         |     V   |
  19+30       2.0102      0.72  Q         |         |         |     V   |
  19+35       2.0151      0.71  Q         |         |         |     V   |
  19+40       2.0199      0.70  Q         |         |         |     V   |
  19+45       2.0246      0.69  Q         |         |         |     V   |
  19+50       2.0293      0.68  Q         |         |         |     V   |
  19+55       2.0339      0.67  Q         |         |         |     V   |
  20+ 0       2.0385      0.66  Q         |         |         |     V   |
  20+ 5       2.0430      0.65  Q         |         |         |     V   |
  20+10       2.0474      0.64  Q         |         |         |     V   |
  20+15       2.0518      0.64  Q         |         |         |      V  |
  20+20       2.0561      0.63  Q         |         |         |      V  |
  20+25       2.0604      0.62  Q         |         |         |      V  |
  20+30       2.0646      0.61  Q         |         |         |      V  |
  20+35       2.0688      0.61  Q         |         |         |      V  |
  20+40       2.0730      0.60  Q         |         |         |      V  |
  20+45       2.0770      0.59  Q         |         |         |      V  |
  20+50       2.0811      0.59  Q         |         |         |      V  |
  20+55       2.0851      0.58  Q         |         |         |      V  |
  21+ 0       2.0891      0.58  Q         |         |         |      V  |
  21+ 5       2.0930      0.57  Q         |         |         |      V  |
  21+10       2.0969      0.56  Q         |         |         |      V  |
  21+15       2.1007      0.56  Q         |         |         |      V  |
  21+20       2.1045      0.55  Q         |         |         |      V  |
  21+25       2.1083      0.55  Q         |         |         |       V |
  21+30       2.1120      0.54  Q         |         |         |       V |
  21+35       2.1157      0.54  Q         |         |         |       V |
  21+40       2.1194      0.53  Q         |         |         |       V |
  21+45       2.1230      0.53  Q         |         |         |       V |
  21+50       2.1266      0.52  Q         |         |         |       V |
  21+55       2.1302      0.52  Q         |         |         |       V |
  22+ 0       2.1337      0.51  Q         |         |         |       V |
  22+ 5       2.1372      0.51  Q         |         |         |       V |
  22+10       2.1407      0.51  Q         |         |         |       V |
  22+15       2.1441      0.50  Q         |         |         |       V |
  22+20       2.1476      0.50  Q         |         |         |       V |
  22+25       2.1510      0.49  Q         |         |         |       V |
  22+30       2.1543      0.49  Q         |         |         |       V |
  22+35       2.1577      0.49  Q         |         |         |       V |
  22+40       2.1610      0.48  Q         |         |         |       V |
  22+45       2.1643      0.48  Q         |         |         |        V|
  22+50       2.1676      0.47  Q         |         |         |        V|
  22+55       2.1708      0.47  Q         |         |         |        V|
  23+ 0       2.1740      0.47  Q         |         |         |        V|
  23+ 5       2.1772      0.46  Q         |         |         |        V|
  23+10       2.1804      0.46  Q         |         |         |        V|
  23+15       2.1835      0.46  Q         |         |         |        V|
  23+20       2.1867      0.45  Q         |         |         |        V|
  23+25       2.1898      0.45  Q         |         |         |        V|
  23+30       2.1928      0.45  Q         |         |         |        V|
  23+35       2.1959      0.45  Q         |         |         |        V|
  23+40       2.1990      0.44  Q         |         |         |        V|
  23+45       2.2020      0.44  Q         |         |         |        V|
  23+50       2.2050      0.44  Q         |         |         |        V|
  23+55       2.2080      0.43  Q         |         |         |        V|
  24+ 0       2.2109      0.43  Q         |         |         |        V|
  24+ 5       2.2138      0.41  Q         |         |         |        V|
  24+10       2.2160      0.32  Q         |         |         |        V|
  24+15       2.2171      0.17  Q         |         |         |        V|
  24+20       2.2176      0.06  Q         |         |         |        V|
  24+25       2.2177      0.02  Q         |         |         |        V|
  24+30       2.2177      0.01  Q         |         |         |        V|
  24+35       2.2177      0.00  Q         |         |         |        V|
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/13/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 10		
23.84	1	0.95
Rainfall data for year 10		
23.84	6	2.45
Rainfall data for year 10		
23.84	24	4.44

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 2)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	32.0	23.84	1.000	0.978	0.600	0.587

Area-averaged adjusted loss rate Fm (In/Hr) = 0.587

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
14.30	0.600	32.0	32.0	21.25	0.000
9.54	0.400	98.0	98.0	0.20	0.947

Area-averaged catchment yield fraction, Y = 0.379
Area-averaged low loss fraction, Yb = 0.621
User entry of time of concentration = 0.323 (hours)
++
Watershed area = 23.84(Ac.)
Catchment Lag time = 0.258 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 32.2497
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.587(In/Hr)
Average low loss rate fraction (Yb) = 0.621 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.352(In)
Computed peak 30-minute rainfall = 0.720(In)
Specified peak 1-hour rainfall = 0.950(In)

Computed peak 3-hour rainfall = 1.698(In)
Specified peak 6-hour rainfall = 2.450(In)
Specified peak 24-hour rainfall = 4.440(In)

Rainfall depth area reduction factors:
Using a total area of 23.84(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.351(In)
30-minute factor = 0.999 Adjusted rainfall = 0.719(In)
1-hour factor = 0.999 Adjusted rainfall = 0.949(In)
3-hour factor = 1.000 Adjusted rainfall = 1.698(In)
6-hour factor = 1.000 Adjusted rainfall = 2.450(In)
24-hour factor = 1.000 Adjusted rainfall = 4.440(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 288.31 (CFS))	
1	2.160	6.226
2	12.835	30.779
3	33.438	59.400
4	60.871	79.093
5	80.340	56.134
6	90.740	29.983
7	95.786	14.550
8	98.033	6.477
9	98.734	2.023
10	99.315	1.673
11	100.000	0.837

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3512	0.3512
2	0.4634	0.1122
3	0.5450	0.0816
4	0.6115	0.0665
5	0.6686	0.0571
6	0.7192	0.0506
7	0.7649	0.0457
8	0.8069	0.0420
9	0.8458	0.0389
10	0.8822	0.0364
11	0.9165	0.0343
12	0.9489	0.0325
13	0.9900	0.0411
14	1.0297	0.0396
15	1.0680	0.0383
16	1.1051	0.0371
17	1.1412	0.0361
18	1.1763	0.0351
19	1.2104	0.0342
20	1.2438	0.0333
21	1.2763	0.0326
22	1.3082	0.0318
23	1.3393	0.0312
24	1.3699	0.0305
25	1.3998	0.0299
26	1.4292	0.0294
27	1.4580	0.0289
28	1.4864	0.0284
29	1.5143	0.0279
30	1.5417	0.0274
31	1.5687	0.0270
32	1.5953	0.0266
33	1.6215	0.0262
34	1.6474	0.0258
35	1.6729	0.0255
36	1.6980	0.0251
37	1.7228	0.0248
38	1.7472	0.0245
39	1.7714	0.0242
40	1.7953	0.0239
41	1.8189	0.0236

42	1.8422	0.0233
43	1.8653	0.0231
44	1.8881	0.0228
45	1.9107	0.0226
46	1.9330	0.0223
47	1.9551	0.0221
48	1.9770	0.0219
49	1.9987	0.0217
50	2.0202	0.0215
51	2.0414	0.0213
52	2.0625	0.0211
53	2.0834	0.0209
54	2.1041	0.0207
55	2.1246	0.0205
56	2.1449	0.0203
57	2.1651	0.0202
58	2.1851	0.0200
59	2.2050	0.0198
60	2.2246	0.0197
61	2.2442	0.0195
62	2.2636	0.0194
63	2.2828	0.0192
64	2.3019	0.0191
65	2.3208	0.0190
66	2.3396	0.0188
67	2.3583	0.0187
68	2.3769	0.0185
69	2.3953	0.0184
70	2.4136	0.0183
71	2.4318	0.0182
72	2.4498	0.0181
73	2.4644	0.0145
74	2.4788	0.0144
75	2.4931	0.0143
76	2.5073	0.0142
77	2.5214	0.0141
78	2.5354	0.0140
79	2.5493	0.0139
80	2.5631	0.0138
81	2.5768	0.0137
82	2.5904	0.0136
83	2.6039	0.0135
84	2.6173	0.0134
85	2.6306	0.0133
86	2.6438	0.0132
87	2.6570	0.0131
88	2.6700	0.0131
89	2.6830	0.0130
90	2.6959	0.0129
91	2.7087	0.0128
92	2.7214	0.0127
93	2.7341	0.0126
94	2.7466	0.0126
95	2.7591	0.0125
96	2.7715	0.0124
97	2.7839	0.0123
98	2.7962	0.0123
99	2.8084	0.0122
100	2.8205	0.0121
101	2.8326	0.0121
102	2.8446	0.0120
103	2.8565	0.0119
104	2.8684	0.0119
105	2.8802	0.0118
106	2.8919	0.0117
107	2.9036	0.0117
108	2.9152	0.0116
109	2.9267	0.0115
110	2.9382	0.0115
111	2.9496	0.0114
112	2.9610	0.0114
113	2.9723	0.0113
114	2.9836	0.0113
115	2.9948	0.0112
116	3.0059	0.0111
117	3.0170	0.0111
118	3.0280	0.0110
119	3.0390	0.0110

120	3.0499	0.0109
121	3.0608	0.0109
122	3.0716	0.0108
123	3.0824	0.0108
124	3.0931	0.0107
125	3.1038	0.0107
126	3.1144	0.0106
127	3.1250	0.0106
128	3.1355	0.0105
129	3.1460	0.0105
130	3.1565	0.0104
131	3.1668	0.0104
132	3.1772	0.0103
133	3.1875	0.0103
134	3.1978	0.0103
135	3.2080	0.0102
136	3.2181	0.0102
137	3.2283	0.0101
138	3.2384	0.0101
139	3.2484	0.0100
140	3.2584	0.0100
141	3.2684	0.0100
142	3.2783	0.0099
143	3.2882	0.0099
144	3.2980	0.0098
145	3.3078	0.0098
146	3.3176	0.0098
147	3.3273	0.0097
148	3.3370	0.0097
149	3.3466	0.0097
150	3.3563	0.0096
151	3.3658	0.0096
152	3.3754	0.0095
153	3.3849	0.0095
154	3.3944	0.0095
155	3.4038	0.0094
156	3.4132	0.0094
157	3.4226	0.0094
158	3.4319	0.0093
159	3.4412	0.0093
160	3.4505	0.0093
161	3.4597	0.0092
162	3.4689	0.0092
163	3.4781	0.0092
164	3.4872	0.0091
165	3.4963	0.0091
166	3.5054	0.0091
167	3.5144	0.0090
168	3.5234	0.0090
169	3.5324	0.0090
170	3.5414	0.0090
171	3.5503	0.0089
172	3.5592	0.0089
173	3.5680	0.0089
174	3.5769	0.0088
175	3.5857	0.0088
176	3.5944	0.0088
177	3.6032	0.0087
178	3.6119	0.0087
179	3.6206	0.0087
180	3.6293	0.0087
181	3.6379	0.0086
182	3.6465	0.0086
183	3.6551	0.0086
184	3.6636	0.0086
185	3.6722	0.0085
186	3.6807	0.0085
187	3.6891	0.0085
188	3.6976	0.0084
189	3.7060	0.0084
190	3.7144	0.0084
191	3.7228	0.0084
192	3.7311	0.0083
193	3.7395	0.0083
194	3.7478	0.0083
195	3.7560	0.0083
196	3.7643	0.0082
197	3.7725	0.0082

198	3.7807	0.0082
199	3.7889	0.0082
200	3.7970	0.0082
201	3.8052	0.0081
202	3.8133	0.0081
203	3.8214	0.0081
204	3.8294	0.0081
205	3.8375	0.0080
206	3.8455	0.0080
207	3.8535	0.0080
208	3.8615	0.0080
209	3.8694	0.0080
210	3.8773	0.0079
211	3.8852	0.0079
212	3.8931	0.0079
213	3.9010	0.0079
214	3.9088	0.0078
215	3.9167	0.0078
216	3.9245	0.0078
217	3.9323	0.0078
218	3.9400	0.0078
219	3.9478	0.0077
220	3.9555	0.0077
221	3.9632	0.0077
222	3.9709	0.0077
223	3.9785	0.0077
224	3.9862	0.0076
225	3.9938	0.0076
226	4.0014	0.0076
227	4.0090	0.0076
228	4.0165	0.0076
229	4.0241	0.0075
230	4.0316	0.0075
231	4.0391	0.0075
232	4.0466	0.0075
233	4.0541	0.0075
234	4.0615	0.0075
235	4.0690	0.0074
236	4.0764	0.0074
237	4.0838	0.0074
238	4.0912	0.0074
239	4.0985	0.0074
240	4.1059	0.0073
241	4.1132	0.0073
242	4.1205	0.0073
243	4.1278	0.0073
244	4.1351	0.0073
245	4.1424	0.0073
246	4.1496	0.0072
247	4.1568	0.0072
248	4.1640	0.0072
249	4.1712	0.0072
250	4.1784	0.0072
251	4.1856	0.0072
252	4.1927	0.0071
253	4.1999	0.0071
254	4.2070	0.0071
255	4.2141	0.0071
256	4.2211	0.0071
257	4.2282	0.0071
258	4.2353	0.0070
259	4.2423	0.0070
260	4.2493	0.0070
261	4.2563	0.0070
262	4.2633	0.0070
263	4.2703	0.0070
264	4.2772	0.0070
265	4.2842	0.0069
266	4.2911	0.0069
267	4.2980	0.0069
268	4.3049	0.0069
269	4.3118	0.0069
270	4.3186	0.0069
271	4.3255	0.0069
272	4.3323	0.0068
273	4.3392	0.0068
274	4.3460	0.0068
275	4.3528	0.0068

276	4.3596	0.0068
277	4.3663	0.0068
278	4.3731	0.0068
279	4.3798	0.0067
280	4.3865	0.0067
281	4.3933	0.0067
282	4.4000	0.0067
283	4.4066	0.0067
284	4.4133	0.0067
285	4.4200	0.0067
286	4.4266	0.0066
287	4.4332	0.0066
288	4.4399	0.0066

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0066	0.0041	0.0025
2	0.0066	0.0041	0.0025
3	0.0067	0.0041	0.0025
4	0.0067	0.0041	0.0025
5	0.0067	0.0042	0.0025
6	0.0067	0.0042	0.0025
7	0.0067	0.0042	0.0026
8	0.0068	0.0042	0.0026
9	0.0068	0.0042	0.0026
10	0.0068	0.0042	0.0026
11	0.0068	0.0042	0.0026
12	0.0068	0.0042	0.0026
13	0.0069	0.0043	0.0026
14	0.0069	0.0043	0.0026
15	0.0069	0.0043	0.0026
16	0.0069	0.0043	0.0026
17	0.0070	0.0043	0.0026
18	0.0070	0.0043	0.0026
19	0.0070	0.0043	0.0027
20	0.0070	0.0044	0.0027
21	0.0070	0.0044	0.0027
22	0.0071	0.0044	0.0027
23	0.0071	0.0044	0.0027
24	0.0071	0.0044	0.0027
25	0.0071	0.0044	0.0027
26	0.0072	0.0044	0.0027
27	0.0072	0.0045	0.0027
28	0.0072	0.0045	0.0027
29	0.0072	0.0045	0.0027
30	0.0073	0.0045	0.0028
31	0.0073	0.0045	0.0028
32	0.0073	0.0045	0.0028
33	0.0073	0.0046	0.0028
34	0.0074	0.0046	0.0028
35	0.0074	0.0046	0.0028
36	0.0074	0.0046	0.0028
37	0.0075	0.0046	0.0028
38	0.0075	0.0046	0.0028
39	0.0075	0.0047	0.0028
40	0.0075	0.0047	0.0029
41	0.0076	0.0047	0.0029
42	0.0076	0.0047	0.0029
43	0.0076	0.0047	0.0029
44	0.0076	0.0047	0.0029
45	0.0077	0.0048	0.0029
46	0.0077	0.0048	0.0029
47	0.0077	0.0048	0.0029
48	0.0078	0.0048	0.0029
49	0.0078	0.0048	0.0030
50	0.0078	0.0049	0.0030
51	0.0079	0.0049	0.0030
52	0.0079	0.0049	0.0030
53	0.0079	0.0049	0.0030
54	0.0080	0.0049	0.0030
55	0.0080	0.0050	0.0030
56	0.0080	0.0050	0.0030
57	0.0081	0.0050	0.0031
58	0.0081	0.0050	0.0031
59	0.0081	0.0050	0.0031
60	0.0082	0.0051	0.0031

61	0.0082	0.0051	0.0031
62	0.0082	0.0051	0.0031
63	0.0083	0.0051	0.0031
64	0.0083	0.0052	0.0031
65	0.0083	0.0052	0.0032
66	0.0084	0.0052	0.0032
67	0.0084	0.0052	0.0032
68	0.0084	0.0052	0.0032
69	0.0085	0.0053	0.0032
70	0.0085	0.0053	0.0032
71	0.0086	0.0053	0.0033
72	0.0086	0.0053	0.0033
73	0.0087	0.0054	0.0033
74	0.0087	0.0054	0.0033
75	0.0087	0.0054	0.0033
76	0.0088	0.0054	0.0033
77	0.0088	0.0055	0.0033
78	0.0089	0.0055	0.0034
79	0.0089	0.0055	0.0034
80	0.0090	0.0056	0.0034
81	0.0090	0.0056	0.0034
82	0.0090	0.0056	0.0034
83	0.0091	0.0057	0.0035
84	0.0091	0.0057	0.0035
85	0.0092	0.0057	0.0035
86	0.0092	0.0057	0.0035
87	0.0093	0.0058	0.0035
88	0.0093	0.0058	0.0035
89	0.0094	0.0058	0.0036
90	0.0094	0.0059	0.0036
91	0.0095	0.0059	0.0036
92	0.0095	0.0059	0.0036
93	0.0096	0.0060	0.0036
94	0.0097	0.0060	0.0037
95	0.0097	0.0060	0.0037
96	0.0098	0.0061	0.0037
97	0.0098	0.0061	0.0037
98	0.0099	0.0061	0.0037
99	0.0100	0.0062	0.0038
100	0.0100	0.0062	0.0038
101	0.0101	0.0063	0.0038
102	0.0101	0.0063	0.0038
103	0.0102	0.0063	0.0039
104	0.0103	0.0064	0.0039
105	0.0103	0.0064	0.0039
106	0.0104	0.0065	0.0039
107	0.0105	0.0065	0.0040
108	0.0105	0.0065	0.0040
109	0.0106	0.0066	0.0040
110	0.0107	0.0066	0.0040
111	0.0108	0.0067	0.0041
112	0.0108	0.0067	0.0041
113	0.0109	0.0068	0.0041
114	0.0110	0.0068	0.0042
115	0.0111	0.0069	0.0042
116	0.0111	0.0069	0.0042
117	0.0113	0.0070	0.0043
118	0.0113	0.0070	0.0043
119	0.0114	0.0071	0.0043
120	0.0115	0.0071	0.0044
121	0.0116	0.0072	0.0044
122	0.0117	0.0072	0.0044
123	0.0118	0.0073	0.0045
124	0.0119	0.0074	0.0045
125	0.0120	0.0074	0.0045
126	0.0121	0.0075	0.0046
127	0.0122	0.0076	0.0046
128	0.0123	0.0076	0.0047
129	0.0124	0.0077	0.0047
130	0.0125	0.0078	0.0047
131	0.0126	0.0079	0.0048
132	0.0127	0.0079	0.0048
133	0.0129	0.0080	0.0049
134	0.0130	0.0081	0.0049
135	0.0131	0.0082	0.0050
136	0.0132	0.0082	0.0050
137	0.0134	0.0083	0.0051
138	0.0135	0.0084	0.0051

139	0.0137	0.0085	0.0052
140	0.0138	0.0086	0.0052
141	0.0140	0.0087	0.0053
142	0.0141	0.0088	0.0053
143	0.0143	0.0089	0.0054
144	0.0144	0.0090	0.0055
145	0.0181	0.0112	0.0068
146	0.0182	0.0113	0.0069
147	0.0184	0.0114	0.0070
148	0.0185	0.0115	0.0070
149	0.0188	0.0117	0.0071
150	0.0190	0.0118	0.0072
151	0.0192	0.0119	0.0073
152	0.0194	0.0120	0.0073
153	0.0197	0.0122	0.0075
154	0.0198	0.0123	0.0075
155	0.0202	0.0125	0.0076
156	0.0203	0.0126	0.0077
157	0.0207	0.0129	0.0078
158	0.0209	0.0130	0.0079
159	0.0213	0.0132	0.0081
160	0.0215	0.0133	0.0081
161	0.0219	0.0136	0.0083
162	0.0221	0.0137	0.0084
163	0.0226	0.0140	0.0086
164	0.0228	0.0142	0.0086
165	0.0233	0.0145	0.0088
166	0.0236	0.0147	0.0089
167	0.0242	0.0150	0.0092
168	0.0245	0.0152	0.0093
169	0.0251	0.0156	0.0095
170	0.0255	0.0158	0.0097
171	0.0262	0.0163	0.0099
172	0.0266	0.0165	0.0101
173	0.0274	0.0170	0.0104
174	0.0279	0.0173	0.0106
175	0.0289	0.0179	0.0109
176	0.0294	0.0182	0.0111
177	0.0305	0.0190	0.0116
178	0.0312	0.0194	0.0118
179	0.0326	0.0202	0.0123
180	0.0333	0.0207	0.0126
181	0.0351	0.0218	0.0133
182	0.0361	0.0224	0.0137
183	0.0383	0.0238	0.0145
184	0.0396	0.0246	0.0150
185	0.0325	0.0202	0.0123
186	0.0343	0.0213	0.0130
187	0.0389	0.0242	0.0148
188	0.0420	0.0261	0.0159
189	0.0506	0.0314	0.0192
190	0.0571	0.0355	0.0216
191	0.0816	0.0489	0.0327
192	0.1122	0.0489	0.0633
193	0.3512	0.0489	0.3023
194	0.0665	0.0413	0.0252
195	0.0457	0.0284	0.0173
196	0.0364	0.0226	0.0138
197	0.0411	0.0255	0.0156
198	0.0371	0.0231	0.0141
199	0.0342	0.0212	0.0129
200	0.0318	0.0198	0.0121
201	0.0299	0.0186	0.0113
202	0.0284	0.0176	0.0107
203	0.0270	0.0168	0.0102
204	0.0258	0.0160	0.0098
205	0.0248	0.0154	0.0094
206	0.0239	0.0148	0.0090
207	0.0231	0.0143	0.0087
208	0.0223	0.0139	0.0085
209	0.0217	0.0135	0.0082
210	0.0211	0.0131	0.0080
211	0.0205	0.0127	0.0078
212	0.0200	0.0124	0.0076
213	0.0195	0.0121	0.0074
214	0.0191	0.0119	0.0072
215	0.0187	0.0116	0.0071
216	0.0183	0.0114	0.0069

217	0.0145	0.0090	0.0055
218	0.0142	0.0088	0.0054
219	0.0139	0.0086	0.0053
220	0.0136	0.0084	0.0052
221	0.0133	0.0083	0.0050
222	0.0131	0.0081	0.0049
223	0.0128	0.0080	0.0049
224	0.0126	0.0078	0.0048
225	0.0123	0.0077	0.0047
226	0.0121	0.0075	0.0046
227	0.0119	0.0074	0.0045
228	0.0117	0.0073	0.0044
229	0.0115	0.0072	0.0044
230	0.0114	0.0071	0.0043
231	0.0112	0.0070	0.0042
232	0.0110	0.0069	0.0042
233	0.0109	0.0068	0.0041
234	0.0107	0.0067	0.0041
235	0.0106	0.0066	0.0040
236	0.0104	0.0065	0.0040
237	0.0103	0.0064	0.0039
238	0.0102	0.0063	0.0039
239	0.0100	0.0062	0.0038
240	0.0099	0.0062	0.0038
241	0.0098	0.0061	0.0037
242	0.0097	0.0060	0.0037
243	0.0096	0.0059	0.0036
244	0.0095	0.0059	0.0036
245	0.0094	0.0058	0.0036
246	0.0093	0.0058	0.0035
247	0.0092	0.0057	0.0035
248	0.0091	0.0056	0.0034
249	0.0090	0.0056	0.0034
250	0.0089	0.0055	0.0034
251	0.0088	0.0055	0.0033
252	0.0087	0.0054	0.0033
253	0.0086	0.0054	0.0033
254	0.0086	0.0053	0.0032
255	0.0085	0.0053	0.0032
256	0.0084	0.0052	0.0032
257	0.0083	0.0052	0.0032
258	0.0082	0.0051	0.0031
259	0.0082	0.0051	0.0031
260	0.0081	0.0050	0.0031
261	0.0080	0.0050	0.0030
262	0.0080	0.0050	0.0030
263	0.0079	0.0049	0.0030
264	0.0078	0.0049	0.0030
265	0.0078	0.0048	0.0029
266	0.0077	0.0048	0.0029
267	0.0077	0.0048	0.0029
268	0.0076	0.0047	0.0029
269	0.0075	0.0047	0.0029
270	0.0075	0.0047	0.0028
271	0.0074	0.0046	0.0028
272	0.0074	0.0046	0.0028
273	0.0073	0.0046	0.0028
274	0.0073	0.0045	0.0028
275	0.0072	0.0045	0.0027
276	0.0072	0.0045	0.0027
277	0.0071	0.0044	0.0027
278	0.0071	0.0044	0.0027
279	0.0070	0.0044	0.0027
280	0.0070	0.0043	0.0026
281	0.0069	0.0043	0.0026
282	0.0069	0.0043	0.0026
283	0.0069	0.0043	0.0026
284	0.0068	0.0042	0.0026
285	0.0068	0.0042	0.0026
286	0.0067	0.0042	0.0025
287	0.0067	0.0042	0.0025
288	0.0066	0.0041	0.0025

Total soil rain loss = 2.57(In)
Total effective rainfall = 1.87(In)
Peak flow rate in flood hydrograph = 31.07(CFS)

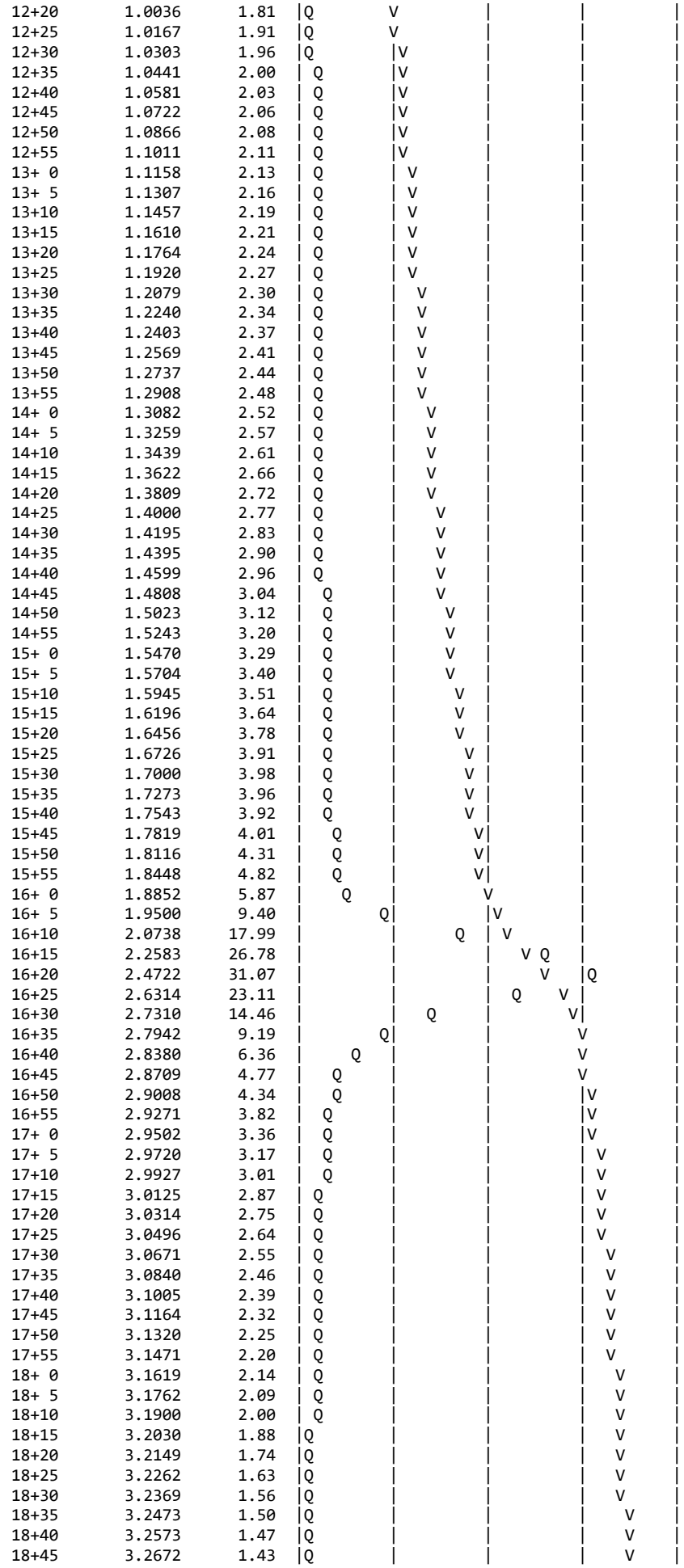
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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	0.0001	0.02	Q				
0+10	0.0007	0.09	Q				
0+15	0.0024	0.24	Q				
0+20	0.0055	0.44	Q				
0+25	0.0095	0.58	Q				
0+30	0.0140	0.66	Q				
0+35	0.0188	0.70	Q				
0+40	0.0238	0.72	Q				
0+45	0.0287	0.72	Q				
0+50	0.0338	0.73	Q				
0+55	0.0388	0.73	Q				
1+ 0	0.0439	0.74	Q				
1+ 5	0.0490	0.74	Q				
1+10	0.0541	0.74	Q				
1+15	0.0592	0.74	Q				
1+20	0.0644	0.75	Q				
1+25	0.0695	0.75	Q				
1+30	0.0747	0.75	Q				
1+35	0.0799	0.75	Q				
1+40	0.0851	0.76	Q				
1+45	0.0903	0.76	Q				
1+50	0.0956	0.76	QV				
1+55	0.1008	0.76	QV				
2+ 0	0.1061	0.77	QV				
2+ 5	0.1114	0.77	QV				
2+10	0.1167	0.77	QV				
2+15	0.1221	0.77	QV				
2+20	0.1274	0.78	QV				
2+25	0.1328	0.78	QV				
2+30	0.1382	0.78	QV				
2+35	0.1436	0.78	QV				
2+40	0.1490	0.79	QV				
2+45	0.1544	0.79	QV				
2+50	0.1599	0.79	QV				
2+55	0.1654	0.80	QV				
3+ 0	0.1709	0.80	QV				
3+ 5	0.1764	0.80	QV				
3+10	0.1819	0.80	QV				
3+15	0.1875	0.81	Q V				
3+20	0.1930	0.81	Q V				
3+25	0.1986	0.81	Q V				
3+30	0.2043	0.82	Q V				
3+35	0.2099	0.82	Q V				
3+40	0.2156	0.82	Q V				
3+45	0.2213	0.83	Q V				
3+50	0.2270	0.83	Q V				
3+55	0.2327	0.83	Q V				
4+ 0	0.2384	0.83	Q V				
4+ 5	0.2442	0.84	Q V				
4+10	0.2500	0.84	Q V				
4+15	0.2558	0.84	Q V				
4+20	0.2617	0.85	Q V				
4+25	0.2675	0.85	Q V				
4+30	0.2734	0.85	Q V				
4+35	0.2793	0.86	Q V				
4+40	0.2853	0.86	Q V				
4+45	0.2912	0.87	Q V				
4+50	0.2972	0.87	Q V				
4+55	0.3032	0.87	Q V				
5+ 0	0.3092	0.88	Q V				
5+ 5	0.3153	0.88	Q V				
5+10	0.3214	0.88	Q V				
5+15	0.3275	0.89	Q V				
5+20	0.3336	0.89	Q V				
5+25	0.3398	0.89	Q V				
5+30	0.3460	0.90	Q V				
5+35	0.3522	0.90	Q V				
5+40	0.3584	0.91	Q V				
5+45	0.3647	0.91	Q V				

```
 5+50      0.3710      0.92  Q   V     |         |         |         |
 5+55      0.3773      0.92  Q   V     |         |         |         |
 6+ 0      0.3837      0.92  Q   V     |         |         |         |
 6+ 5      0.3901      0.93  Q   V     |         |         |         |
 6+10      0.3965      0.93  Q   V     |         |         |         |
 6+15      0.4030      0.94  Q   V     |         |         |         |
 6+20      0.4094      0.94  Q   V     |         |         |         |
 6+25      0.4160      0.95  Q   V     |         |         |         |
 6+30      0.4225      0.95  Q   V     |         |         |         |
 6+35      0.4291      0.95  Q   V     |         |         |         |
 6+40      0.4357      0.96  Q   V     |         |         |         |
 6+45      0.4423      0.96  Q   V     |         |         |         |
 6+50      0.4490      0.97  Q   V     |         |         |         |
 6+55      0.4557      0.97  Q   V     |         |         |         |
 7+ 0      0.4624      0.98  Q   V     |         |         |         |
 7+ 5      0.4692      0.98  Q    V    |         |         |         |
 7+10      0.4760      0.99  Q    V    |         |         |         |
 7+15      0.4829      0.99  Q    V    |         |         |         |
 7+20      0.4898      1.00  Q    V    |         |         |         |
 7+25      0.4967      1.00  |Q   V    |         |         |         |
 7+30      0.5036      1.01  |Q   V    |         |         |         |
 7+35      0.5106      1.02  |Q   V    |         |         |         |
 7+40      0.5177      1.02  |Q   V    |         |         |         |
 7+45      0.5247      1.03  |Q   V    |         |         |         |
 7+50      0.5318      1.03  |Q   V    |         |         |         |
 7+55      0.5390      1.04  |Q   V    |         |         |         |
 8+ 0      0.5462      1.04  |Q   V    |         |         |         |
 8+ 5      0.5534      1.05  |Q   V    |         |         |         |
 8+10      0.5607      1.06  |Q    V   |         |         |         |
 8+15      0.5680      1.06  |Q    V   |         |         |         |
 8+20      0.5754      1.07  |Q    V   |         |         |         |
 8+25      0.5828      1.08  |Q    V   |         |         |         |
 8+30      0.5902      1.08  |Q    V   |         |         |         |
 8+35      0.5977      1.09  |Q    V   |         |         |         |
 8+40      0.6053      1.10  |Q    V   |         |         |         |
 8+45      0.6128      1.10  |Q    V   |         |         |         |
 8+50      0.6205      1.11  |Q    V   |         |         |         |
 8+55      0.6282      1.12  |Q    V   |         |         |         |
 9+ 0      0.6359      1.12  |Q    V   |         |         |         |
 9+ 5      0.6437      1.13  |Q    V   |         |         |         |
 9+10      0.6515      1.14  |Q     V  |         |         |         |
 9+15      0.6594      1.15  |Q     V  |         |         |         |
 9+20      0.6674      1.15  |Q     V  |         |         |         |
 9+25      0.6754      1.16  |Q     V  |         |         |         |
 9+30      0.6834      1.17  |Q     V  |         |         |         |
 9+35      0.6915      1.18  |Q     V  |         |         |         |
 9+40      0.6997      1.19  |Q     V  |         |         |         |
 9+45      0.7079      1.19  |Q     V  |         |         |         |
 9+50      0.7162      1.20  |Q     V  |         |         |         |
 9+55      0.7245      1.21  |Q     V  |         |         |         |
10+ 0      0.7330      1.22  |Q     V  |         |         |         |
10+ 5      0.7414      1.23  |Q     V  |         |         |         |
10+10      0.7500      1.24  |Q      V |         |         |         |
10+15      0.7586      1.25  |Q      V |         |         |         |
10+20      0.7672      1.26  |Q      V |         |         |         |
10+25      0.7760      1.27  |Q      V |         |         |         |
10+30      0.7848      1.28  |Q      V |         |         |         |
10+35      0.7937      1.29  |Q      V |         |         |         |
10+40      0.8027      1.30  |Q      V |         |         |         |
10+45      0.8117      1.31  |Q      V |         |         |         |
10+50      0.8208      1.32  |Q      V |         |         |         |
10+55      0.8300      1.34  |Q      V |         |         |         |
11+ 0      0.8393      1.35  |Q       V|         |         |         |
11+ 5      0.8486      1.36  |Q       V|         |         |         |
11+10      0.8581      1.37  |Q       V|         |         |         |
11+15      0.8676      1.38  |Q       V|         |         |         |
11+20      0.8773      1.40  |Q       V|         |         |         |
11+25      0.8870      1.41  |Q       V|         |         |         |
11+30      0.8968      1.43  |Q       V|         |         |         |
11+35      0.9067      1.44  |Q       V|         |         |         |
11+40      0.9167      1.45  |Q       V|         |         |         |
11+45      0.9268      1.47  |Q        V         |         |         |
11+50      0.9370      1.48  |Q        V         |         |         |
11+55      0.9474      1.50  |Q        V         |         |         |
12+ 0      0.9578      1.52  |Q        V         |         |         |
12+ 5      0.9684      1.54  |Q        V         |         |         |
12+10      0.9795      1.60  |Q        V         |         |         |
12+15      0.9911      1.69  |Q        V         |         |         |
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  18+50       3.2769      1.40  |Q        |         |         |    V    |
  18+55       3.2864      1.38  |Q        |         |         |    V    |
  19+ 0       3.2957      1.35  |Q        |         |         |    V    |
  19+ 5       3.3048      1.33  |Q        |         |         |    V    |
  19+10       3.3138      1.31  |Q        |         |         |    V    |
  19+15       3.3226      1.28  |Q        |         |         |    V    |
  19+20       3.3313      1.26  |Q        |         |         |    V    |
  19+25       3.3399      1.24  |Q        |         |         |     V   |
  19+30       3.3483      1.22  |Q        |         |         |     V   |
  19+35       3.3566      1.21  |Q        |         |         |     V   |
  19+40       3.3648      1.19  |Q        |         |         |     V   |
  19+45       3.3729      1.17  |Q        |         |         |     V   |
  19+50       3.3809      1.16  |Q        |         |         |     V   |
  19+55       3.3887      1.14  |Q        |         |         |     V   |
  20+ 0       3.3965      1.13  |Q        |         |         |     V   |
  20+ 5       3.4041      1.11  |Q        |         |         |     V   |
  20+10       3.4117      1.10  |Q        |         |         |     V   |
  20+15       3.4191      1.08  |Q        |         |         |     V   |
  20+20       3.4265      1.07  |Q        |         |         |     V   |
  20+25       3.4338      1.06  |Q        |         |         |      V  |
  20+30       3.4410      1.05  |Q        |         |         |      V  |
  20+35       3.4481      1.03  |Q        |         |         |      V  |
  20+40       3.4552      1.02  |Q        |         |         |      V  |
  20+45       3.4621      1.01  |Q        |         |         |      V  |
  20+50       3.4690      1.00  |Q        |         |         |      V  |
  20+55       3.4759      0.99  Q        |         |         |      V  |
  21+ 0       3.4826      0.98  Q        |         |         |      V  |
  21+ 5       3.4893      0.97  Q        |         |         |      V  |
  21+10       3.4959      0.96  Q        |         |         |      V  |
  21+15       3.5025      0.95  Q        |         |         |      V  |
  21+20       3.5089      0.94  Q        |         |         |      V  |
  21+25       3.5154      0.93  Q        |         |         |      V  |
  21+30       3.5217      0.92  Q        |         |         |      V  |
  21+35       3.5281      0.92  Q        |         |         |       V |
  21+40       3.5343      0.91  Q        |         |         |       V |
  21+45       3.5405      0.90  Q        |         |         |       V |
  21+50       3.5467      0.89  Q        |         |         |       V |
  21+55       3.5527      0.88  Q        |         |         |       V |
  22+ 0       3.5588      0.88  Q        |         |         |       V |
  22+ 5       3.5648      0.87  Q        |         |         |       V |
  22+10       3.5707      0.86  Q        |         |         |       V |
  22+15       3.5766      0.86  Q        |         |         |       V |
  22+20       3.5825      0.85  Q        |         |         |       V |
  22+25       3.5883      0.84  Q        |         |         |       V |
  22+30       3.5940      0.84  Q        |         |         |       V |
  22+35       3.5997      0.83  Q        |         |         |       V |
  22+40       3.6054      0.82  Q        |         |         |       V |
  22+45       3.6110      0.82  Q        |         |         |       V |
  22+50       3.6166      0.81  Q        |         |         |        V|
  22+55       3.6222      0.81  Q        |         |         |        V|
  23+ 0       3.6277      0.80  Q        |         |         |        V|
  23+ 5       3.6331      0.79  Q        |         |         |        V|
  23+10       3.6385      0.79  Q        |         |         |        V|
  23+15       3.6439      0.78  Q        |         |         |        V|
  23+20       3.6493      0.78  Q        |         |         |        V|
  23+25       3.6546      0.77  Q        |         |         |        V|
  23+30       3.6599      0.77  Q        |         |         |        V|
  23+35       3.6651      0.76  Q        |         |         |        V|
  23+40       3.6703      0.76  Q        |         |         |        V|
  23+45       3.6755      0.75  Q        |         |         |        V|
  23+50       3.6807      0.75  Q        |         |         |        V|
  23+55       3.6858      0.74  Q        |         |         |        V|
  24+ 0       3.6909      0.74  Q        |         |         |        V|
  24+ 5       3.6958      0.72  Q        |         |         |        V|
  24+10       3.7002      0.64  Q        |         |         |        V|
  24+15       3.7035      0.48  Q        |         |         |        V|
  24+20       3.7055      0.28  Q        |         |         |        V|
  24+25       3.7064      0.14  Q        |         |         |        V|
  24+30       3.7069      0.06  Q        |         |         |        V|
  24+35       3.7071      0.03  Q        |         |         |        V|
  24+40       3.7072      0.01  Q        |         |         |        V|
  24+45       3.7072      0.01  Q        |         |         |        V|
  24+50       3.7072      0.00  Q        |         |         |        V|
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/13/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 25

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 25		
23.84	1	1.17
Rainfall data for year 25		
23.84	6	2.98
Rainfall data for year 25		
23.84	24	5.47

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******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	0.00	0.000	0.785	0.600	0.471
32.0	52.0	23.84	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.00	0.000	32.0	52.0	9.23	0.187
14.30	0.600	32.0	52.0	9.23	0.187
9.54	0.400	98.0	98.0	0.20	0.957

Area-averaged catchment yield fraction, Y = 0.495
Area-averaged low loss fraction, Yb = 0.505
User entry of time of concentration = 0.305 (hours)
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Watershed area = 23.84(Ac.)
Catchment Lag time = 0.244 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 34.1530
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.505 (decimal)
VALLEY DEVELOPED S-Graph Selected

Computed peak 5-minute rainfall = 0.433(In)
Computed peak 30-minute rainfall = 0.887(In)
Specified peak 1-hour rainfall = 1.170(In)
Computed peak 3-hour rainfall = 2.076(In)
Specified peak 6-hour rainfall = 2.980(In)
Specified peak 24-hour rainfall = 5.470(In)

Rainfall depth area reduction factors:
Using a total area of 23.84(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.433(In)
30-minute factor = 0.999 Adjusted rainfall = 0.886(In)
1-hour factor = 0.999 Adjusted rainfall = 1.169(In)
3-hour factor = 1.000 Adjusted rainfall = 2.075(In)
6-hour factor = 1.000 Adjusted rainfall = 2.980(In)
24-hour factor = 1.000 Adjusted rainfall = 5.470(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 288.31 (CFS))	
1	2.357	6.796
2	14.391	34.695
3	37.247	65.896
4	65.933	82.708
5	83.817	51.562
6	92.658	25.490
7	96.912	12.265
8	98.411	4.322
9	99.025	1.772
10	99.639	1.770
11	100.000	1.040

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.4325	0.4325
2	0.5707	0.1382
3	0.6712	0.1005
4	0.7531	0.0819
5	0.8234	0.0703
6	0.8857	0.0623
7	0.9420	0.0563
8	0.9937	0.0517
9	1.0417	0.0479
10	1.0865	0.0448
11	1.1287	0.0422
12	1.1687	0.0400
13	1.2186	0.0499
14	1.2668	0.0481
15	1.3133	0.0465
16	1.3583	0.0451
17	1.4021	0.0437
18	1.4446	0.0425
19	1.4860	0.0414
20	1.5264	0.0404
21	1.5658	0.0394
22	1.6043	0.0385
23	1.6420	0.0377
24	1.6790	0.0369
25	1.7152	0.0362
26	1.7507	0.0355
27	1.7856	0.0349
28	1.8198	0.0343
29	1.8535	0.0337
30	1.8867	0.0331
31	1.9193	0.0326
32	1.9514	0.0321
33	1.9830	0.0316
34	2.0142	0.0312
35	2.0450	0.0308
36	2.0753	0.0303
37	2.1052	0.0299
38	2.1347	0.0295

39	2.1638	0.0291
40	2.1926	0.0288
41	2.2210	0.0284
42	2.2492	0.0281
43	2.2769	0.0278
44	2.3044	0.0275
45	2.3316	0.0272
46	2.3585	0.0269
47	2.3851	0.0266
48	2.4115	0.0264
49	2.4376	0.0261
50	2.4634	0.0258
51	2.4890	0.0256
52	2.5144	0.0254
53	2.5395	0.0251
54	2.5644	0.0249
55	2.5890	0.0247
56	2.6135	0.0245
57	2.6378	0.0243
58	2.6618	0.0241
59	2.6857	0.0239
60	2.7093	0.0237
61	2.7328	0.0235
62	2.7561	0.0233
63	2.7792	0.0231
64	2.8021	0.0229
65	2.8249	0.0228
66	2.8475	0.0226
67	2.8699	0.0224
68	2.8922	0.0223
69	2.9143	0.0221
70	2.9363	0.0220
71	2.9581	0.0218
72	2.9798	0.0217
73	2.9978	0.0181
74	3.0158	0.0179
75	3.0336	0.0178
76	3.0512	0.0177
77	3.0687	0.0175
78	3.0861	0.0174
79	3.1034	0.0173
80	3.1206	0.0172
81	3.1376	0.0170
82	3.1545	0.0169
83	3.1713	0.0168
84	3.1880	0.0167
85	3.2046	0.0166
86	3.2210	0.0165
87	3.2374	0.0164
88	3.2536	0.0163
89	3.2698	0.0161
90	3.2858	0.0160
91	3.3018	0.0159
92	3.3176	0.0158
93	3.3334	0.0158
94	3.3490	0.0157
95	3.3646	0.0156
96	3.3801	0.0155
97	3.3954	0.0154
98	3.4107	0.0153
99	3.4259	0.0152
100	3.4411	0.0151
101	3.4561	0.0150
102	3.4711	0.0150
103	3.4859	0.0149
104	3.5007	0.0148
105	3.5154	0.0147
106	3.5300	0.0146
107	3.5446	0.0146
108	3.5591	0.0145
109	3.5735	0.0144
110	3.5878	0.0143
111	3.6021	0.0143
112	3.6162	0.0142
113	3.6304	0.0141
114	3.6444	0.0140
115	3.6584	0.0140
116	3.6723	0.0139

117	3.6861	0.0138
118	3.6999	0.0138
119	3.7136	0.0137
120	3.7272	0.0136
121	3.7408	0.0136
122	3.7543	0.0135
123	3.7678	0.0135
124	3.7812	0.0134
125	3.7945	0.0133
126	3.8078	0.0133
127	3.8210	0.0132
128	3.8341	0.0132
129	3.8472	0.0131
130	3.8603	0.0130
131	3.8732	0.0130
132	3.8862	0.0129
133	3.8990	0.0129
134	3.9119	0.0128
135	3.9246	0.0128
136	3.9373	0.0127
137	3.9500	0.0127
138	3.9626	0.0126
139	3.9752	0.0126
140	3.9877	0.0125
141	4.0001	0.0125
142	4.0125	0.0124
143	4.0249	0.0124
144	4.0372	0.0123
145	4.0494	0.0123
146	4.0617	0.0122
147	4.0738	0.0122
148	4.0859	0.0121
149	4.0980	0.0121
150	4.1100	0.0120
151	4.1220	0.0120
152	4.1340	0.0119
153	4.1459	0.0119
154	4.1577	0.0119
155	4.1695	0.0118
156	4.1813	0.0118
157	4.1930	0.0117
158	4.2047	0.0117
159	4.2163	0.0116
160	4.2279	0.0116
161	4.2395	0.0116
162	4.2510	0.0115
163	4.2625	0.0115
164	4.2739	0.0114
165	4.2853	0.0114
166	4.2967	0.0114
167	4.3080	0.0113
168	4.3193	0.0113
169	4.3305	0.0112
170	4.3417	0.0112
171	4.3529	0.0112
172	4.3640	0.0111
173	4.3751	0.0111
174	4.3862	0.0111
175	4.3972	0.0110
176	4.4082	0.0110
177	4.4192	0.0110
178	4.4301	0.0109
179	4.4410	0.0109
180	4.4518	0.0109
181	4.4627	0.0108
182	4.4734	0.0108
183	4.4842	0.0108
184	4.4949	0.0107
185	4.5056	0.0107
186	4.5163	0.0107
187	4.5269	0.0106
188	4.5375	0.0106
189	4.5480	0.0106
190	4.5586	0.0105
191	4.5691	0.0105
192	4.5795	0.0105
193	4.5900	0.0104
194	4.6004	0.0104

195	4.6107	0.0104
196	4.6211	0.0103
197	4.6314	0.0103
198	4.6417	0.0103
199	4.6519	0.0103
200	4.6622	0.0102
201	4.6724	0.0102
202	4.6825	0.0102
203	4.6927	0.0101
204	4.7028	0.0101
205	4.7129	0.0101
206	4.7229	0.0101
207	4.7330	0.0100
208	4.7430	0.0100
209	4.7530	0.0100
210	4.7629	0.0100
211	4.7728	0.0099
212	4.7827	0.0099
213	4.7926	0.0099
214	4.8024	0.0098
215	4.8123	0.0098
216	4.8221	0.0098
217	4.8318	0.0098
218	4.8416	0.0097
219	4.8513	0.0097
220	4.8610	0.0097
221	4.8707	0.0097
222	4.8803	0.0096
223	4.8899	0.0096
224	4.8995	0.0096
225	4.9091	0.0096
226	4.9186	0.0095
227	4.9282	0.0095
228	4.9377	0.0095
229	4.9471	0.0095
230	4.9566	0.0095
231	4.9660	0.0094
232	4.9754	0.0094
233	4.9848	0.0094
234	4.9942	0.0094
235	5.0035	0.0093
236	5.0128	0.0093
237	5.0221	0.0093
238	5.0314	0.0093
239	5.0407	0.0093
240	5.0499	0.0092
241	5.0591	0.0092
242	5.0683	0.0092
243	5.0774	0.0092
244	5.0866	0.0091
245	5.0957	0.0091
246	5.1048	0.0091
247	5.1139	0.0091
248	5.1230	0.0091
249	5.1320	0.0090
250	5.1410	0.0090
251	5.1500	0.0090
252	5.1590	0.0090
253	5.1680	0.0090
254	5.1769	0.0089
255	5.1858	0.0089
256	5.1947	0.0089
257	5.2036	0.0089
258	5.2125	0.0089
259	5.2213	0.0088
260	5.2301	0.0088
261	5.2389	0.0088
262	5.2477	0.0088
263	5.2565	0.0088
264	5.2652	0.0087
265	5.2740	0.0087
266	5.2827	0.0087
267	5.2914	0.0087
268	5.3000	0.0087
269	5.3087	0.0087
270	5.3173	0.0086
271	5.3260	0.0086
272	5.3346	0.0086

273	5.3431	0.0086
274	5.3517	0.0086
275	5.3603	0.0085
276	5.3688	0.0085
277	5.3773	0.0085
278	5.3858	0.0085
279	5.3943	0.0085
280	5.4027	0.0085
281	5.4112	0.0084
282	5.4196	0.0084
283	5.4280	0.0084
284	5.4364	0.0084
285	5.4448	0.0084
286	5.4532	0.0084
287	5.4615	0.0083
288	5.4698	0.0083

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0083	0.0042	0.0041
2	0.0083	0.0042	0.0041
3	0.0084	0.0042	0.0041
4	0.0084	0.0042	0.0042
5	0.0084	0.0043	0.0042
6	0.0084	0.0043	0.0042
7	0.0085	0.0043	0.0042
8	0.0085	0.0043	0.0042
9	0.0085	0.0043	0.0042
10	0.0085	0.0043	0.0042
11	0.0086	0.0043	0.0042
12	0.0086	0.0043	0.0043
13	0.0086	0.0044	0.0043
14	0.0087	0.0044	0.0043
15	0.0087	0.0044	0.0043
16	0.0087	0.0044	0.0043
17	0.0087	0.0044	0.0043
18	0.0088	0.0044	0.0043
19	0.0088	0.0044	0.0044
20	0.0088	0.0045	0.0044
21	0.0089	0.0045	0.0044
22	0.0089	0.0045	0.0044
23	0.0089	0.0045	0.0044
24	0.0089	0.0045	0.0044
25	0.0090	0.0045	0.0044
26	0.0090	0.0045	0.0045
27	0.0090	0.0046	0.0045
28	0.0091	0.0046	0.0045
29	0.0091	0.0046	0.0045
30	0.0091	0.0046	0.0045
31	0.0092	0.0046	0.0045
32	0.0092	0.0046	0.0045
33	0.0092	0.0047	0.0046
34	0.0093	0.0047	0.0046
35	0.0093	0.0047	0.0046
36	0.0093	0.0047	0.0046
37	0.0094	0.0047	0.0046
38	0.0094	0.0047	0.0046
39	0.0094	0.0048	0.0047
40	0.0095	0.0048	0.0047
41	0.0095	0.0048	0.0047
42	0.0095	0.0048	0.0047
43	0.0096	0.0048	0.0047
44	0.0096	0.0048	0.0047
45	0.0096	0.0049	0.0048
46	0.0097	0.0049	0.0048
47	0.0097	0.0049	0.0048
48	0.0097	0.0049	0.0048
49	0.0098	0.0049	0.0048
50	0.0098	0.0050	0.0049
51	0.0099	0.0050	0.0049
52	0.0099	0.0050	0.0049
53	0.0100	0.0050	0.0049
54	0.0100	0.0050	0.0049
55	0.0100	0.0051	0.0050
56	0.0101	0.0051	0.0050
57	0.0101	0.0051	0.0050

58	0.0101	0.0051	0.0050
59	0.0102	0.0052	0.0050
60	0.0102	0.0052	0.0051
61	0.0103	0.0052	0.0051
62	0.0103	0.0052	0.0051
63	0.0104	0.0052	0.0051
64	0.0104	0.0053	0.0051
65	0.0105	0.0053	0.0052
66	0.0105	0.0053	0.0052
67	0.0106	0.0053	0.0052
68	0.0106	0.0054	0.0052
69	0.0107	0.0054	0.0053
70	0.0107	0.0054	0.0053
71	0.0108	0.0054	0.0053
72	0.0108	0.0055	0.0053
73	0.0109	0.0055	0.0054
74	0.0109	0.0055	0.0054
75	0.0110	0.0055	0.0054
76	0.0110	0.0056	0.0054
77	0.0111	0.0056	0.0055
78	0.0111	0.0056	0.0055
79	0.0112	0.0056	0.0055
80	0.0112	0.0057	0.0055
81	0.0113	0.0057	0.0056
82	0.0113	0.0057	0.0056
83	0.0114	0.0058	0.0056
84	0.0114	0.0058	0.0057
85	0.0115	0.0058	0.0057
86	0.0116	0.0058	0.0057
87	0.0116	0.0059	0.0058
88	0.0117	0.0059	0.0058
89	0.0118	0.0059	0.0058
90	0.0118	0.0060	0.0058
91	0.0119	0.0060	0.0059
92	0.0119	0.0060	0.0059
93	0.0120	0.0061	0.0060
94	0.0121	0.0061	0.0060
95	0.0122	0.0061	0.0060
96	0.0122	0.0062	0.0060
97	0.0123	0.0062	0.0061
98	0.0124	0.0062	0.0061
99	0.0125	0.0063	0.0062
100	0.0125	0.0063	0.0062
101	0.0126	0.0064	0.0062
102	0.0127	0.0064	0.0063
103	0.0128	0.0064	0.0063
104	0.0128	0.0065	0.0063
105	0.0129	0.0065	0.0064
106	0.0130	0.0066	0.0064
107	0.0131	0.0066	0.0065
108	0.0132	0.0066	0.0065
109	0.0133	0.0067	0.0066
110	0.0133	0.0067	0.0066
111	0.0135	0.0068	0.0067
112	0.0135	0.0068	0.0067
113	0.0136	0.0069	0.0067
114	0.0137	0.0069	0.0068
115	0.0138	0.0070	0.0068
116	0.0139	0.0070	0.0069
117	0.0140	0.0071	0.0069
118	0.0141	0.0071	0.0070
119	0.0143	0.0072	0.0071
120	0.0143	0.0072	0.0071
121	0.0145	0.0073	0.0072
122	0.0146	0.0074	0.0072
123	0.0147	0.0074	0.0073
124	0.0148	0.0075	0.0073
125	0.0150	0.0076	0.0074
126	0.0150	0.0076	0.0074
127	0.0152	0.0077	0.0075
128	0.0153	0.0077	0.0076
129	0.0155	0.0078	0.0077
130	0.0156	0.0079	0.0077
131	0.0158	0.0080	0.0078
132	0.0158	0.0080	0.0078
133	0.0160	0.0081	0.0079
134	0.0161	0.0082	0.0080
135	0.0164	0.0083	0.0081

136	0.0165	0.0083	0.0081
137	0.0167	0.0084	0.0083
138	0.0168	0.0085	0.0083
139	0.0170	0.0086	0.0084
140	0.0172	0.0087	0.0085
141	0.0174	0.0088	0.0086
142	0.0175	0.0089	0.0087
143	0.0178	0.0090	0.0088
144	0.0179	0.0091	0.0089
145	0.0217	0.0110	0.0107
146	0.0218	0.0110	0.0108
147	0.0221	0.0112	0.0109
148	0.0223	0.0113	0.0110
149	0.0226	0.0114	0.0112
150	0.0228	0.0115	0.0113
151	0.0231	0.0117	0.0114
152	0.0233	0.0118	0.0115
153	0.0237	0.0120	0.0117
154	0.0239	0.0121	0.0118
155	0.0243	0.0123	0.0120
156	0.0245	0.0124	0.0121
157	0.0249	0.0126	0.0123
158	0.0251	0.0127	0.0124
159	0.0256	0.0129	0.0127
160	0.0258	0.0131	0.0128
161	0.0264	0.0133	0.0130
162	0.0266	0.0135	0.0132
163	0.0272	0.0137	0.0134
164	0.0275	0.0139	0.0136
165	0.0281	0.0142	0.0139
166	0.0284	0.0144	0.0141
167	0.0291	0.0147	0.0144
168	0.0295	0.0149	0.0146
169	0.0303	0.0153	0.0150
170	0.0308	0.0155	0.0152
171	0.0316	0.0160	0.0157
172	0.0321	0.0162	0.0159
173	0.0331	0.0167	0.0164
174	0.0337	0.0170	0.0167
175	0.0349	0.0176	0.0173
176	0.0355	0.0180	0.0176
177	0.0369	0.0187	0.0183
178	0.0377	0.0191	0.0187
179	0.0394	0.0199	0.0195
180	0.0404	0.0204	0.0200
181	0.0425	0.0215	0.0210
182	0.0437	0.0221	0.0216
183	0.0465	0.0235	0.0230
184	0.0481	0.0243	0.0238
185	0.0400	0.0202	0.0198
186	0.0422	0.0213	0.0209
187	0.0479	0.0242	0.0237
188	0.0517	0.0261	0.0256
189	0.0623	0.0315	0.0308
190	0.0703	0.0355	0.0348
191	0.1005	0.0393	0.0612
192	0.1382	0.0393	0.0989
193	0.4325	0.0393	0.3933
194	0.0819	0.0393	0.0426
195	0.0563	0.0285	0.0279
196	0.0448	0.0227	0.0222
197	0.0499	0.0252	0.0247
198	0.0451	0.0228	0.0223
199	0.0414	0.0209	0.0205
200	0.0385	0.0195	0.0191
201	0.0362	0.0183	0.0179
202	0.0343	0.0173	0.0170
203	0.0326	0.0165	0.0161
204	0.0312	0.0158	0.0154
205	0.0299	0.0151	0.0148
206	0.0288	0.0145	0.0142
207	0.0278	0.0140	0.0137
208	0.0269	0.0136	0.0133
209	0.0261	0.0132	0.0129
210	0.0254	0.0128	0.0125
211	0.0247	0.0125	0.0122
212	0.0241	0.0122	0.0119
213	0.0235	0.0119	0.0116

214	0.0229	0.0116	0.0113
215	0.0224	0.0113	0.0111
216	0.0220	0.0111	0.0109
217	0.0181	0.0091	0.0089
218	0.0177	0.0089	0.0087
219	0.0173	0.0087	0.0085
220	0.0169	0.0085	0.0084
221	0.0166	0.0084	0.0082
222	0.0163	0.0082	0.0080
223	0.0159	0.0081	0.0079
224	0.0157	0.0079	0.0077
225	0.0154	0.0078	0.0076
226	0.0151	0.0076	0.0075
227	0.0149	0.0075	0.0074
228	0.0146	0.0074	0.0072
229	0.0144	0.0073	0.0071
230	0.0142	0.0072	0.0070
231	0.0140	0.0071	0.0069
232	0.0138	0.0070	0.0068
233	0.0136	0.0069	0.0067
234	0.0134	0.0068	0.0066
235	0.0132	0.0067	0.0065
236	0.0130	0.0066	0.0065
237	0.0129	0.0065	0.0064
238	0.0127	0.0064	0.0063
239	0.0126	0.0063	0.0062
240	0.0124	0.0063	0.0061
241	0.0123	0.0062	0.0061
242	0.0121	0.0061	0.0060
243	0.0120	0.0061	0.0059
244	0.0119	0.0060	0.0059
245	0.0117	0.0059	0.0058
246	0.0116	0.0059	0.0057
247	0.0115	0.0058	0.0057
248	0.0114	0.0057	0.0056
249	0.0112	0.0057	0.0056
250	0.0111	0.0056	0.0055
251	0.0110	0.0056	0.0055
252	0.0109	0.0055	0.0054
253	0.0108	0.0055	0.0054
254	0.0107	0.0054	0.0053
255	0.0106	0.0054	0.0053
256	0.0105	0.0053	0.0052
257	0.0104	0.0053	0.0052
258	0.0103	0.0052	0.0051
259	0.0103	0.0052	0.0051
260	0.0102	0.0051	0.0050
261	0.0101	0.0051	0.0050
262	0.0100	0.0051	0.0049
263	0.0099	0.0050	0.0049
264	0.0098	0.0050	0.0049
265	0.0098	0.0049	0.0048
266	0.0097	0.0049	0.0048
267	0.0096	0.0049	0.0048
268	0.0095	0.0048	0.0047
269	0.0095	0.0048	0.0047
270	0.0094	0.0048	0.0047
271	0.0093	0.0047	0.0046
272	0.0093	0.0047	0.0046
273	0.0092	0.0047	0.0046
274	0.0091	0.0046	0.0045
275	0.0091	0.0046	0.0045
276	0.0090	0.0046	0.0045
277	0.0090	0.0045	0.0044
278	0.0089	0.0045	0.0044
279	0.0088	0.0045	0.0044
280	0.0088	0.0044	0.0043
281	0.0087	0.0044	0.0043
282	0.0087	0.0044	0.0043
283	0.0086	0.0044	0.0043
284	0.0086	0.0043	0.0042
285	0.0085	0.0043	0.0042
286	0.0085	0.0043	0.0042
287	0.0084	0.0043	0.0042
288	0.0084	0.0042	0.0041

Total soil rain loss = 2.54(In)

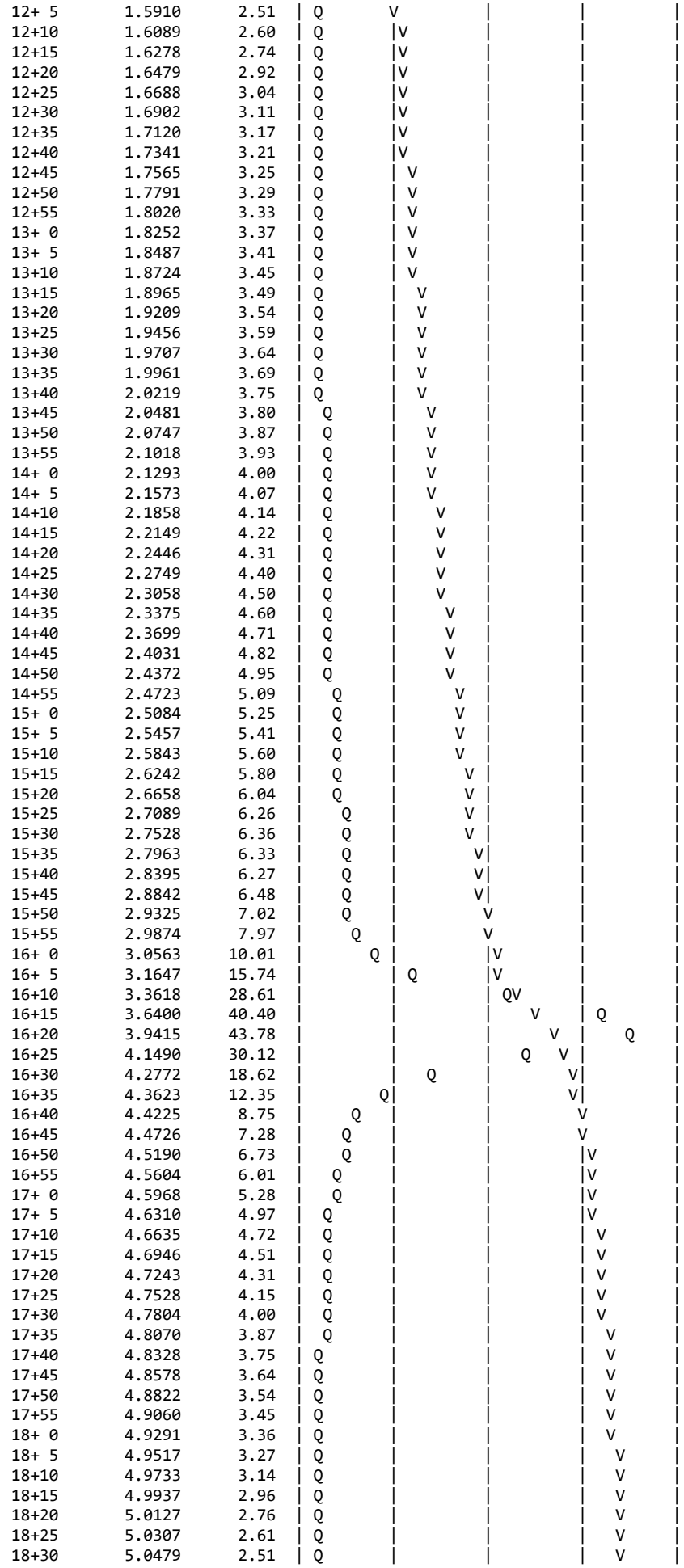
Total effective rainfall = 2.93(In)
Peak flow rate in flood hydrograph = 43.78(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 12.5 25.0 37.5 50.0
0+ 5	0.0002	0.03	Q
0+10	0.0014	0.17	Q
0+15	0.0044	0.44	Q
0+20	0.0098	0.78	Q
0+25	0.0167	1.00	Q
0+30	0.0243	1.11	Q
0+35	0.0323	1.16	Q
0+40	0.0405	1.18	Q
0+45	0.0487	1.19	Q
0+50	0.0570	1.20	Q
0+55	0.0653	1.21	Q
1+ 0	0.0737	1.22	Q
1+ 5	0.0821	1.22	Q
1+10	0.0905	1.22	Q
1+15	0.0990	1.23	Q
1+20	0.1075	1.23	Q
1+25	0.1160	1.23	Q
1+30	0.1245	1.24	Q
1+35	0.1331	1.24	Q
1+40	0.1416	1.25	Q
1+45	0.1503	1.25	|Q
1+50	0.1589	1.25	|Q
1+55	0.1676	1.26	|Q
2+ 0	0.1763	1.26	|Q
2+ 5	0.1850	1.27	|Q
2+10	0.1938	1.27	|Q
2+15	0.2025	1.28	|Q
2+20	0.2113	1.28	|Q
2+25	0.2202	1.28	|Q
2+30	0.2291	1.29	|Q
2+35	0.2380	1.29	|Q
2+40	0.2469	1.30	|Q
2+45	0.2559	1.30	|Q
2+50	0.2649	1.31	|Q
2+55	0.2739	1.31	|Q
3+ 0	0.2829	1.32	|Q
3+ 5	0.2920	1.32	|QV
3+10	0.3012	1.32	|QV
3+15	0.3103	1.33	|QV
3+20	0.3195	1.33	|QV
3+25	0.3287	1.34	|QV
3+30	0.3380	1.34	|QV
3+35	0.3473	1.35	|QV
3+40	0.3566	1.35	|QV
3+45	0.3659	1.36	|QV
3+50	0.3753	1.36	|QV
3+55	0.3848	1.37	|QV
4+ 0	0.3942	1.37	|QV
4+ 5	0.4037	1.38	|QV
4+10	0.4133	1.38	|QV
4+15	0.4228	1.39	|QV
4+20	0.4325	1.40	|QV
4+25	0.4421	1.40	|Q V
4+30	0.4518	1.41	|Q V
4+35	0.4615	1.41	|Q V
4+40	0.4713	1.42	|Q V
4+45	0.4811	1.42	|Q V
4+50	0.4909	1.43	|Q V
4+55	0.5008	1.44	|Q V
5+ 0	0.5107	1.44	|Q V
5+ 5	0.5207	1.45	|Q V
5+10	0.5307	1.45	|Q V
5+15	0.5408	1.46	|Q V
5+20	0.5509	1.47	|Q V
5+25	0.5610	1.47	|Q V
5+30	0.5712	1.48	|Q V

5+35	0.5814	1.48	|Q V |	|	|	|
5+40	0.5917	1.49	|Q V |	|	|	|
5+45	0.6020	1.50	|Q V |	|	|	|
5+50	0.6123	1.50	|Q V |	|	|	|
5+55	0.6228	1.51	|Q V |	|	|	|
6+ 0	0.6332	1.52	|Q V |	|	|	|
6+ 5	0.6437	1.52	|Q V |	|	|	|
6+10	0.6543	1.53	|Q V |	|	|	|
6+15	0.6649	1.54	|Q V |	|	|	|
6+20	0.6755	1.55	|Q V |	|	|	|
6+25	0.6862	1.55	|Q V |	|	|	|
6+30	0.6970	1.56	|Q V |	|	|	|
6+35	0.7078	1.57	|Q V |	|	|	|
6+40	0.7186	1.58	|Q V |	|	|	|
6+45	0.7295	1.58	|Q V |	|	|	|
6+50	0.7405	1.59	|Q V |	|	|	|
6+55	0.7515	1.60	|Q V |	|	|	|
7+ 0	0.7626	1.61	|Q V |	|	|	|
7+ 5	0.7737	1.62	|Q V |	|	|	|
7+10	0.7849	1.62	|Q V |	|	|	|
7+15	0.7961	1.63	|Q V |	|	|	|
7+20	0.8074	1.64	|Q V |	|	|	|
7+25	0.8188	1.65	|Q V |	|	|	|
7+30	0.8302	1.66	|Q V |	|	|	|
7+35	0.8417	1.67	|Q V |	|	|	|
7+40	0.8532	1.68	|Q V |	|	|	|
7+45	0.8648	1.68	|Q V |	|	|	|
7+50	0.8765	1.69	|Q V |	|	|	|
7+55	0.8882	1.70	|Q V |	|	|	|
8+ 0	0.9000	1.71	|Q V |	|	|	|
8+ 5	0.9119	1.72	|Q V |	|	|	|
8+10	0.9238	1.73	|Q V |	|	|	|
8+15	0.9358	1.74	|Q V |	|	|	|
8+20	0.9479	1.75	|Q V |	|	|	|
8+25	0.9600	1.76	|Q V |	|	|	|
8+30	0.9722	1.77	|Q V |	|	|	|
8+35	0.9845	1.78	|Q V |	|	|	|
8+40	0.9969	1.80	|Q V |	|	|	|
8+45	1.0093	1.81	|Q V |	|	|	|
8+50	1.0219	1.82	|Q V |	|	|	|
8+55	1.0345	1.83	|Q V |	|	|	|
9+ 0	1.0471	1.84	|Q V |	|	|	|
9+ 5	1.0599	1.85	|Q V |	|	|	|
9+10	1.0727	1.86	|Q V |	|	|	|
9+15	1.0857	1.88	|Q V |	|	|	|
9+20	1.0987	1.89	|Q V |	|	|	|
9+25	1.1118	1.90	|Q V |	|	|	|
9+30	1.1250	1.92	|Q V |	|	|	|
9+35	1.1383	1.93	|Q V |	|	|	|
9+40	1.1516	1.94	|Q V |	|	|	|
9+45	1.1651	1.96	|Q V |	|	|	|
9+50	1.1787	1.97	|Q V |	|	|	|
9+55	1.1923	1.98	|Q V |	|	|	|
10+ 0	1.2061	2.00	|Q V |	|	|	|
10+ 5	1.2200	2.01	|Q V |	|	|	|
10+10	1.2340	2.03	|Q V |	|	|	|
10+15	1.2480	2.04	|Q V |	|	|	|
10+20	1.2622	2.06	|Q V |	|	|	|
10+25	1.2765	2.08	|Q V |	|	|	|
10+30	1.2910	2.09	|Q V |	|	|	|
10+35	1.3055	2.11	|Q V |	|	|	|
10+40	1.3202	2.13	|Q V|	|	|	|
10+45	1.3349	2.15	|Q V|	|	|	|
10+50	1.3499	2.16	|Q V|	|	|	|
10+55	1.3649	2.18	|Q V|	|	|	|
11+ 0	1.3801	2.20	|Q V|	|	|	|
11+ 5	1.3954	2.22	|Q V|	|	|	|
11+10	1.4108	2.24	|Q V|	|	|	|
11+15	1.4264	2.26	|Q V|	|	|	|
11+20	1.4421	2.28	|Q V|	|	|	|
11+25	1.4580	2.31	|Q V |	|	|	|
11+30	1.4740	2.33	|Q V |	|	|	|
11+35	1.4902	2.35	|Q V |	|	|	|
11+40	1.5066	2.37	|Q V |	|	|	|
11+45	1.5231	2.40	|Q V |	|	|	|
11+50	1.5398	2.42	|Q V |	|	|	|
11+55	1.5566	2.45	|Q V |	|	|	|
12+ 0	1.5737	2.48	|Q V |	|	|	|



```
  18+35       5.0647      2.44  |Q        |         |         |   V     |
  18+40       5.0811      2.38  |Q        |         |         |   V     |
  18+45       5.0972      2.33  |Q        |         |         |    V    |
  18+50       5.1129      2.28  |Q        |         |         |    V    |
  18+55       5.1283      2.24  |Q        |         |         |    V    |
  19+ 0       5.1435      2.20  |Q        |         |         |    V    |
  19+ 5       5.1584      2.16  |Q        |         |         |    V    |
  19+10       5.1730      2.13  |Q        |         |         |    V    |
  19+15       5.1874      2.09  |Q        |         |         |    V    |
  19+20       5.2016      2.06  |Q        |         |         |    V    |
  19+25       5.2156      2.03  |Q        |         |         |    V    |
  19+30       5.2293      2.00  |Q        |         |         |    V    |
  19+35       5.2429      1.97  |Q        |         |         |     V   |
  19+40       5.2562      1.94  |Q        |         |         |     V   |
  19+45       5.2694      1.91  |Q        |         |         |     V   |
  19+50       5.2824      1.89  |Q        |         |         |     V   |
  19+55       5.2952      1.86  |Q        |         |         |     V   |
  20+ 0       5.3079      1.84  |Q        |         |         |     V   |
  20+ 5       5.3204      1.82  |Q        |         |         |     V   |
  20+10       5.3328      1.79  |Q        |         |         |     V   |
  20+15       5.3450      1.77  |Q        |         |         |     V   |
  20+20       5.3570      1.75  |Q        |         |         |     V   |
  20+25       5.3690      1.73  |Q        |         |         |     V   |
  20+30       5.3808      1.71  |Q        |         |         |      V  |
  20+35       5.3924      1.69  |Q        |         |         |      V  |
  20+40       5.4040      1.67  |Q        |         |         |      V  |
  20+45       5.4154      1.66  |Q        |         |         |      V  |
  20+50       5.4266      1.64  |Q        |         |         |      V  |
  20+55       5.4378      1.62  |Q        |         |         |      V  |
  21+ 0       5.4489      1.61  |Q        |         |         |      V  |
  21+ 5       5.4598      1.59  |Q        |         |         |      V  |
  21+10       5.4707      1.57  |Q        |         |         |      V  |
  21+15       5.4814      1.56  |Q        |         |         |      V  |
  21+20       5.4921      1.55  |Q        |         |         |      V  |
  21+25       5.5026      1.53  |Q        |         |         |      V  |
  21+30       5.5131      1.52  |Q        |         |         |      V  |
  21+35       5.5234      1.50  |Q        |         |         |      V  |
  21+40       5.5337      1.49  |Q        |         |         |       V |
  21+45       5.5438      1.48  |Q        |         |         |       V |
  21+50       5.5539      1.46  |Q        |         |         |       V |
  21+55       5.5639      1.45  |Q        |         |         |       V |
  22+ 0       5.5738      1.44  |Q        |         |         |       V |
  22+ 5       5.5837      1.43  |Q        |         |         |       V |
  22+10       5.5934      1.42  |Q        |         |         |       V |
  22+15       5.6031      1.41  |Q        |         |         |       V |
  22+20       5.6127      1.39  |Q        |         |         |       V |
  22+25       5.6223      1.38  |Q        |         |         |       V |
  22+30       5.6317      1.37  |Q        |         |         |       V |
  22+35       5.6411      1.36  |Q        |         |         |       V |
  22+40       5.6504      1.35  |Q        |         |         |       V |
  22+45       5.6597      1.34  |Q        |         |         |       V |
  22+50       5.6689      1.33  |Q        |         |         |       V |
  22+55       5.6780      1.32  |Q        |         |         |        V|
  23+ 0       5.6870      1.31  |Q        |         |         |        V|
  23+ 5       5.6960      1.31  |Q        |         |         |        V|
  23+10       5.7049      1.30  |Q        |         |         |        V|
  23+15       5.7138      1.29  |Q        |         |         |        V|
  23+20       5.7226      1.28  |Q        |         |         |        V|
  23+25       5.7314      1.27  |Q        |         |         |        V|
  23+30       5.7401      1.26  |Q        |         |         |        V|
  23+35       5.7487      1.25  |Q        |         |         |        V|
  23+40       5.7573      1.25  Q         |         |         |        V|
  23+45       5.7658      1.24  Q         |         |         |        V|
  23+50       5.7743      1.23  Q         |         |         |        V|
  23+55       5.7827      1.22  Q         |         |         |        V|
  24+ 0       5.7911      1.22  Q         |         |         |        V|
  24+ 5       5.7992      1.18  Q         |         |         |        V|
  24+10       5.8063      1.03  Q         |         |         |        V|
  24+15       5.8115      0.75  Q         |         |         |        V|
  24+20       5.8143      0.41  Q         |         |         |        V|
  24+25       5.8156      0.19  Q         |         |         |        V|
  24+30       5.8162      0.09  Q         |         |         |        V|
  24+35       5.8165      0.04  Q         |         |         |        V|
  24+40       5.8166      0.02  Q         |         |         |        V|
  24+45       5.8167      0.01  Q         |         |         |        V|
  24+50       5.8167      0.00  Q         |         |         |         V
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 07/13/26

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6427

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
23.84	1	1.54
Rainfall data for year 100		
23.84	6	3.80
Rainfall data for year 100		
23.84	24	7.11

++

******** Area-averaged max loss rate, Fm ********

SCS curve No.(AMCII)	SCS curve NO.(AMC 3)	Area (Ac.)	Area Fraction	Fp(Fig C6) (In/Hr)	Ap (dec.)	Fm (In/Hr)
32.0	52.0	0.00	0.000	0.785	0.600	0.471
32.0	52.0	23.84	1.000	0.785	0.600	0.471

Area-averaged adjusted loss rate Fm (In/Hr) = 0.471

********* Area-Averaged low loss rate fraction, Yb **********

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
0.00	0.000	32.0	52.0	9.23	0.269
14.30	0.600	32.0	52.0	9.23	0.269
9.54	0.400	98.0	98.0	0.20	0.966

Area-averaged catchment yield fraction, Y = 0.548
Area-averaged low loss fraction, Yb = 0.452
User entry of time of concentration = 0.290 (hours)
++
Watershed area = 23.84(Ac.)
Catchment Lag time = 0.232 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 35.9195
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.471(In/Hr)
Average low loss rate fraction (Yb) = 0.452 (decimal)
VALLEY DEVELOPED S-Graph Selected

Computed peak 5-minute rainfall = 0.570(In)
Computed peak 30-minute rainfall = 1.167(In)
Specified peak 1-hour rainfall = 1.540(In)
Computed peak 3-hour rainfall = 2.679(In)
Specified peak 6-hour rainfall = 3.800(In)
Specified peak 24-hour rainfall = 7.110(In)

Rainfall depth area reduction factors:
Using a total area of 23.84(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.569(In)
30-minute factor = 0.999 Adjusted rainfall = 1.166(In)
1-hour factor = 0.999 Adjusted rainfall = 1.538(In)
3-hour factor = 1.000 Adjusted rainfall = 2.679(In)
6-hour factor = 1.000 Adjusted rainfall = 3.800(In)
24-hour factor = 1.000 Adjusted rainfall = 7.110(In)

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

Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 288.31 (CFS))	
1	2.552	7.357
2	15.891	38.460
3	40.833	71.912
4	70.094	84.363
5	86.545	47.430
6	94.226	22.145
7	97.641	9.847
8	98.649	2.907
9	99.296	1.864
10	100.000	0.932

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5693	0.5693
2	0.7512	0.1819
3	0.8835	0.1323
4	0.9913	0.1077
5	1.0838	0.0925
6	1.1658	0.0820
7	1.2399	0.0741
8	1.3080	0.0680
9	1.3711	0.0631
10	1.4301	0.0590
11	1.4857	0.0556
12	1.5383	0.0526
13	1.6017	0.0635
14	1.6628	0.0611
15	1.7218	0.0590
16	1.7788	0.0570
17	1.8341	0.0553
18	1.8878	0.0537
19	1.9401	0.0523
20	1.9910	0.0509
21	2.0406	0.0497
22	2.0891	0.0485
23	2.1366	0.0474
24	2.1830	0.0464
25	2.2285	0.0455
26	2.2730	0.0446
27	2.3168	0.0437
28	2.3597	0.0429
29	2.4019	0.0422
30	2.4434	0.0415
31	2.4842	0.0408
32	2.5243	0.0401
33	2.5638	0.0395
34	2.6028	0.0389
35	2.6412	0.0384
36	2.6790	0.0378
37	2.7163	0.0373
38	2.7530	0.0368
39	2.7893	0.0363

40	2.8252	0.0358
41	2.8606	0.0354
42	2.8955	0.0350
43	2.9301	0.0346
44	2.9642	0.0342
45	2.9980	0.0338
46	3.0314	0.0334
47	3.0645	0.0330
48	3.0972	0.0327
49	3.1296	0.0324
50	3.1616	0.0320
51	3.1933	0.0317
52	3.2247	0.0314
53	3.2559	0.0311
54	3.2867	0.0308
55	3.3172	0.0305
56	3.3475	0.0303
57	3.3775	0.0300
58	3.4073	0.0297
59	3.4368	0.0295
60	3.4660	0.0292
61	3.4950	0.0290
62	3.5238	0.0288
63	3.5523	0.0285
64	3.5806	0.0283
65	3.6087	0.0281
66	3.6366	0.0279
67	3.6643	0.0277
68	3.6918	0.0275
69	3.7191	0.0273
70	3.7461	0.0271
71	3.7730	0.0269
72	3.7997	0.0267
73	3.8235	0.0238
74	3.8471	0.0236
75	3.8705	0.0234
76	3.8937	0.0232
77	3.9168	0.0231
78	3.9397	0.0229
79	3.9624	0.0227
80	3.9850	0.0226
81	4.0075	0.0224
82	4.0298	0.0223
83	4.0519	0.0221
84	4.0739	0.0220
85	4.0957	0.0218
86	4.1174	0.0217
87	4.1390	0.0216
88	4.1604	0.0214
89	4.1817	0.0213
90	4.2029	0.0212
91	4.2240	0.0210
92	4.2449	0.0209
93	4.2657	0.0208
94	4.2863	0.0207
95	4.3069	0.0205
96	4.3273	0.0204
97	4.3476	0.0203
98	4.3678	0.0202
99	4.3879	0.0201
100	4.4079	0.0200
101	4.4278	0.0199
102	4.4475	0.0198
103	4.4672	0.0197
104	4.4867	0.0195
105	4.5062	0.0194
106	4.5255	0.0193
107	4.5448	0.0192
108	4.5639	0.0191
109	4.5830	0.0191
110	4.6019	0.0190
111	4.6208	0.0189
112	4.6395	0.0188
113	4.6582	0.0187
114	4.6768	0.0186
115	4.6953	0.0185
116	4.7137	0.0184
117	4.7320	0.0183

118	4.7503	0.0182
119	4.7684	0.0182
120	4.7865	0.0181
121	4.8045	0.0180
122	4.8224	0.0179
123	4.8402	0.0178
124	4.8580	0.0177
125	4.8756	0.0177
126	4.8932	0.0176
127	4.9107	0.0175
128	4.9282	0.0174
129	4.9455	0.0174
130	4.9628	0.0173
131	4.9800	0.0172
132	4.9972	0.0171
133	5.0143	0.0171
134	5.0313	0.0170
135	5.0482	0.0169
136	5.0651	0.0169
137	5.0819	0.0168
138	5.0986	0.0167
139	5.1153	0.0167
140	5.1319	0.0166
141	5.1484	0.0165
142	5.1649	0.0165
143	5.1813	0.0164
144	5.1976	0.0163
145	5.2139	0.0163
146	5.2301	0.0162
147	5.2463	0.0162
148	5.2624	0.0161
149	5.2784	0.0160
150	5.2944	0.0160
151	5.3103	0.0159
152	5.3262	0.0159
153	5.3420	0.0158
154	5.3577	0.0158
155	5.3734	0.0157
156	5.3891	0.0156
157	5.4047	0.0156
158	5.4202	0.0155
159	5.4357	0.0155
160	5.4511	0.0154
161	5.4665	0.0154
162	5.4818	0.0153
163	5.4971	0.0153
164	5.5123	0.0152
165	5.5274	0.0152
166	5.5426	0.0151
167	5.5576	0.0151
168	5.5726	0.0150
169	5.5876	0.0150
170	5.6025	0.0149
171	5.6174	0.0149
172	5.6322	0.0148
173	5.6470	0.0148
174	5.6617	0.0147
175	5.6764	0.0147
176	5.6910	0.0146
177	5.7056	0.0146
178	5.7202	0.0145
179	5.7347	0.0145
180	5.7491	0.0145
181	5.7636	0.0144
182	5.7779	0.0144
183	5.7923	0.0143
184	5.8065	0.0143
185	5.8208	0.0142
186	5.8350	0.0142
187	5.8491	0.0142
188	5.8633	0.0141
189	5.8773	0.0141
190	5.8914	0.0140
191	5.9054	0.0140
192	5.9193	0.0140
193	5.9332	0.0139
194	5.9471	0.0139
195	5.9609	0.0138

196	5.9747	0.0138
197	5.9885	0.0138
198	6.0022	0.0137
199	6.0159	0.0137
200	6.0295	0.0136
201	6.0431	0.0136
202	6.0567	0.0136
203	6.0702	0.0135
204	6.0837	0.0135
205	6.0972	0.0135
206	6.1106	0.0134
207	6.1240	0.0134
208	6.1374	0.0134
209	6.1507	0.0133
210	6.1640	0.0133
211	6.1772	0.0132
212	6.1904	0.0132
213	6.2036	0.0132
214	6.2168	0.0131
215	6.2299	0.0131
216	6.2429	0.0131
217	6.2560	0.0130
218	6.2690	0.0130
219	6.2820	0.0130
220	6.2949	0.0129
221	6.3079	0.0129
222	6.3207	0.0129
223	6.3336	0.0129
224	6.3464	0.0128
225	6.3592	0.0128
226	6.3720	0.0128
227	6.3847	0.0127
228	6.3974	0.0127
229	6.4100	0.0127
230	6.4227	0.0126
231	6.4353	0.0126
232	6.4479	0.0126
233	6.4604	0.0125
234	6.4729	0.0125
235	6.4854	0.0125
236	6.4979	0.0125
237	6.5103	0.0124
238	6.5227	0.0124
239	6.5351	0.0124
240	6.5474	0.0123
241	6.5597	0.0123
242	6.5720	0.0123
243	6.5843	0.0123
244	6.5965	0.0122
245	6.6087	0.0122
246	6.6209	0.0122
247	6.6330	0.0122
248	6.6452	0.0121
249	6.6573	0.0121
250	6.6693	0.0121
251	6.6814	0.0120
252	6.6934	0.0120
253	6.7054	0.0120
254	6.7174	0.0120
255	6.7293	0.0119
256	6.7412	0.0119
257	6.7531	0.0119
258	6.7650	0.0119
259	6.7768	0.0118
260	6.7886	0.0118
261	6.8004	0.0118
262	6.8122	0.0118
263	6.8239	0.0117
264	6.8356	0.0117
265	6.8473	0.0117
266	6.8590	0.0117
267	6.8706	0.0116
268	6.8822	0.0116
269	6.8938	0.0116
270	6.9054	0.0116
271	6.9169	0.0115
272	6.9285	0.0115
273	6.9400	0.0115

274	6.9515	0.0115
275	6.9629	0.0115
276	6.9743	0.0114
277	6.9857	0.0114
278	6.9971	0.0114
279	7.0085	0.0114
280	7.0198	0.0113
281	7.0312	0.0113
282	7.0425	0.0113
283	7.0537	0.0113
284	7.0650	0.0113
285	7.0762	0.0112
286	7.0874	0.0112
287	7.0986	0.0112
288	7.1098	0.0112

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0112	0.0050	0.0061
2	0.0112	0.0051	0.0061
3	0.0112	0.0051	0.0062
4	0.0113	0.0051	0.0062
5	0.0113	0.0051	0.0062
6	0.0113	0.0051	0.0062
7	0.0114	0.0051	0.0062
8	0.0114	0.0051	0.0062
9	0.0114	0.0052	0.0063
10	0.0115	0.0052	0.0063
11	0.0115	0.0052	0.0063
12	0.0115	0.0052	0.0063
13	0.0116	0.0052	0.0063
14	0.0116	0.0052	0.0064
15	0.0116	0.0053	0.0064
16	0.0117	0.0053	0.0064
17	0.0117	0.0053	0.0064
18	0.0117	0.0053	0.0064
19	0.0118	0.0053	0.0065
20	0.0118	0.0053	0.0065
21	0.0119	0.0054	0.0065
22	0.0119	0.0054	0.0065
23	0.0119	0.0054	0.0065
24	0.0120	0.0054	0.0066
25	0.0120	0.0054	0.0066
26	0.0120	0.0054	0.0066
27	0.0121	0.0055	0.0066
28	0.0121	0.0055	0.0066
29	0.0122	0.0055	0.0067
30	0.0122	0.0055	0.0067
31	0.0123	0.0055	0.0067
32	0.0123	0.0056	0.0067
33	0.0123	0.0056	0.0068
34	0.0124	0.0056	0.0068
35	0.0124	0.0056	0.0068
36	0.0125	0.0056	0.0068
37	0.0125	0.0057	0.0069
38	0.0125	0.0057	0.0069
39	0.0126	0.0057	0.0069
40	0.0126	0.0057	0.0069
41	0.0127	0.0057	0.0070
42	0.0127	0.0058	0.0070
43	0.0128	0.0058	0.0070
44	0.0128	0.0058	0.0070
45	0.0129	0.0058	0.0071
46	0.0129	0.0058	0.0071
47	0.0130	0.0059	0.0071
48	0.0130	0.0059	0.0071
49	0.0131	0.0059	0.0072
50	0.0131	0.0059	0.0072
51	0.0132	0.0060	0.0072
52	0.0132	0.0060	0.0072
53	0.0133	0.0060	0.0073
54	0.0133	0.0060	0.0073
55	0.0134	0.0061	0.0073
56	0.0134	0.0061	0.0074
57	0.0135	0.0061	0.0074
58	0.0135	0.0061	0.0074

59	0.0136	0.0062	0.0075
60	0.0136	0.0062	0.0075
61	0.0137	0.0062	0.0075
62	0.0138	0.0062	0.0075
63	0.0138	0.0063	0.0076
64	0.0139	0.0063	0.0076
65	0.0140	0.0063	0.0076
66	0.0140	0.0063	0.0077
67	0.0141	0.0064	0.0077
68	0.0141	0.0064	0.0077
69	0.0142	0.0064	0.0078
70	0.0142	0.0064	0.0078
71	0.0143	0.0065	0.0078
72	0.0144	0.0065	0.0079
73	0.0145	0.0065	0.0079
74	0.0145	0.0066	0.0079
75	0.0146	0.0066	0.0080
76	0.0146	0.0066	0.0080
77	0.0147	0.0067	0.0081
78	0.0148	0.0067	0.0081
79	0.0149	0.0067	0.0081
80	0.0149	0.0067	0.0082
81	0.0150	0.0068	0.0082
82	0.0151	0.0068	0.0083
83	0.0152	0.0069	0.0083
84	0.0152	0.0069	0.0083
85	0.0153	0.0069	0.0084
86	0.0154	0.0070	0.0084
87	0.0155	0.0070	0.0085
88	0.0155	0.0070	0.0085
89	0.0156	0.0071	0.0086
90	0.0157	0.0071	0.0086
91	0.0158	0.0071	0.0087
92	0.0159	0.0072	0.0087
93	0.0160	0.0072	0.0088
94	0.0160	0.0073	0.0088
95	0.0162	0.0073	0.0089
96	0.0162	0.0073	0.0089
97	0.0163	0.0074	0.0090
98	0.0164	0.0074	0.0090
99	0.0165	0.0075	0.0091
100	0.0166	0.0075	0.0091
101	0.0167	0.0076	0.0092
102	0.0168	0.0076	0.0092
103	0.0169	0.0077	0.0093
104	0.0170	0.0077	0.0093
105	0.0171	0.0078	0.0094
106	0.0172	0.0078	0.0094
107	0.0174	0.0079	0.0095
108	0.0174	0.0079	0.0096
109	0.0176	0.0080	0.0096
110	0.0177	0.0080	0.0097
111	0.0178	0.0081	0.0098
112	0.0179	0.0081	0.0098
113	0.0181	0.0082	0.0099
114	0.0182	0.0082	0.0099
115	0.0183	0.0083	0.0100
116	0.0184	0.0083	0.0101
117	0.0186	0.0084	0.0102
118	0.0187	0.0084	0.0102
119	0.0189	0.0085	0.0103
120	0.0190	0.0086	0.0104
121	0.0191	0.0087	0.0105
122	0.0192	0.0087	0.0105
123	0.0194	0.0088	0.0107
124	0.0195	0.0088	0.0107
125	0.0198	0.0089	0.0108
126	0.0199	0.0090	0.0109
127	0.0201	0.0091	0.0110
128	0.0202	0.0091	0.0111
129	0.0204	0.0092	0.0112
130	0.0205	0.0093	0.0113
131	0.0208	0.0094	0.0114
132	0.0209	0.0095	0.0115
133	0.0212	0.0096	0.0116
134	0.0213	0.0096	0.0117
135	0.0216	0.0098	0.0118
136	0.0217	0.0098	0.0119

137	0.0220	0.0099	0.0120
138	0.0221	0.0100	0.0121
139	0.0224	0.0101	0.0123
140	0.0226	0.0102	0.0124
141	0.0229	0.0104	0.0126
142	0.0231	0.0104	0.0126
143	0.0234	0.0106	0.0128
144	0.0236	0.0107	0.0129
145	0.0267	0.0121	0.0146
146	0.0269	0.0122	0.0147
147	0.0273	0.0123	0.0149
148	0.0275	0.0124	0.0151
149	0.0279	0.0126	0.0153
150	0.0281	0.0127	0.0154
151	0.0285	0.0129	0.0156
152	0.0288	0.0130	0.0158
153	0.0292	0.0132	0.0160
154	0.0295	0.0133	0.0162
155	0.0300	0.0136	0.0164
156	0.0303	0.0137	0.0166
157	0.0308	0.0139	0.0169
158	0.0311	0.0141	0.0170
159	0.0317	0.0143	0.0174
160	0.0320	0.0145	0.0176
161	0.0327	0.0148	0.0179
162	0.0330	0.0149	0.0181
163	0.0338	0.0153	0.0185
164	0.0342	0.0154	0.0187
165	0.0350	0.0158	0.0192
166	0.0354	0.0160	0.0194
167	0.0363	0.0164	0.0199
168	0.0368	0.0166	0.0201
169	0.0378	0.0171	0.0207
170	0.0384	0.0174	0.0210
171	0.0395	0.0179	0.0217
172	0.0401	0.0182	0.0220
173	0.0415	0.0188	0.0227
174	0.0422	0.0191	0.0231
175	0.0437	0.0198	0.0240
176	0.0446	0.0202	0.0244
177	0.0464	0.0210	0.0254
178	0.0474	0.0214	0.0260
179	0.0497	0.0225	0.0272
180	0.0509	0.0230	0.0279
181	0.0537	0.0243	0.0294
182	0.0553	0.0250	0.0303
183	0.0590	0.0267	0.0323
184	0.0611	0.0276	0.0335
185	0.0526	0.0238	0.0288
186	0.0556	0.0251	0.0304
187	0.0631	0.0285	0.0346
188	0.0680	0.0308	0.0373
189	0.0820	0.0371	0.0449
190	0.0925	0.0393	0.0533
191	0.1323	0.0393	0.0930
192	0.1819	0.0393	0.1426
193	0.5693	0.0393	0.5301
194	0.1077	0.0393	0.0685
195	0.0741	0.0335	0.0406
196	0.0590	0.0267	0.0323
197	0.0635	0.0287	0.0348
198	0.0570	0.0258	0.0312
199	0.0523	0.0236	0.0286
200	0.0485	0.0219	0.0266
201	0.0455	0.0206	0.0249
202	0.0429	0.0194	0.0235
203	0.0408	0.0184	0.0224
204	0.0389	0.0176	0.0213
205	0.0373	0.0168	0.0204
206	0.0358	0.0162	0.0196
207	0.0346	0.0156	0.0189
208	0.0334	0.0151	0.0183
209	0.0324	0.0146	0.0177
210	0.0314	0.0142	0.0172
211	0.0305	0.0138	0.0167
212	0.0297	0.0134	0.0163
213	0.0290	0.0131	0.0159
214	0.0283	0.0128	0.0155

215	0.0277	0.0125	0.0152
216	0.0271	0.0122	0.0148
217	0.0238	0.0107	0.0130
218	0.0232	0.0105	0.0127
219	0.0227	0.0103	0.0125
220	0.0223	0.0101	0.0122
221	0.0218	0.0099	0.0120
222	0.0214	0.0097	0.0117
223	0.0210	0.0095	0.0115
224	0.0207	0.0093	0.0113
225	0.0203	0.0092	0.0111
226	0.0200	0.0090	0.0109
227	0.0197	0.0089	0.0108
228	0.0193	0.0087	0.0106
229	0.0191	0.0086	0.0104
230	0.0188	0.0085	0.0103
231	0.0185	0.0084	0.0101
232	0.0182	0.0082	0.0100
233	0.0180	0.0081	0.0099
234	0.0177	0.0080	0.0097
235	0.0175	0.0079	0.0096
236	0.0173	0.0078	0.0095
237	0.0171	0.0077	0.0094
238	0.0169	0.0076	0.0092
239	0.0167	0.0075	0.0091
240	0.0165	0.0074	0.0090
241	0.0163	0.0074	0.0089
242	0.0161	0.0073	0.0088
243	0.0159	0.0072	0.0087
244	0.0158	0.0071	0.0086
245	0.0156	0.0070	0.0085
246	0.0154	0.0070	0.0085
247	0.0153	0.0069	0.0084
248	0.0151	0.0068	0.0083
249	0.0150	0.0068	0.0082
250	0.0148	0.0067	0.0081
251	0.0147	0.0066	0.0080
252	0.0145	0.0066	0.0080
253	0.0144	0.0065	0.0079
254	0.0143	0.0065	0.0078
255	0.0142	0.0064	0.0078
256	0.0140	0.0063	0.0077
257	0.0139	0.0063	0.0076
258	0.0138	0.0062	0.0076
259	0.0137	0.0062	0.0075
260	0.0136	0.0061	0.0074
261	0.0135	0.0061	0.0074
262	0.0134	0.0060	0.0073
263	0.0132	0.0060	0.0073
264	0.0131	0.0059	0.0072
265	0.0130	0.0059	0.0071
266	0.0129	0.0059	0.0071
267	0.0129	0.0058	0.0070
268	0.0128	0.0058	0.0070
269	0.0127	0.0057	0.0069
270	0.0126	0.0057	0.0069
271	0.0125	0.0056	0.0068
272	0.0124	0.0056	0.0068
273	0.0123	0.0056	0.0067
274	0.0122	0.0055	0.0067
275	0.0122	0.0055	0.0067
276	0.0121	0.0055	0.0066
277	0.0120	0.0054	0.0066
278	0.0119	0.0054	0.0065
279	0.0118	0.0054	0.0065
280	0.0118	0.0053	0.0064
281	0.0117	0.0053	0.0064
282	0.0116	0.0053	0.0064
283	0.0115	0.0052	0.0063
284	0.0115	0.0052	0.0063
285	0.0114	0.0052	0.0063
286	0.0113	0.0051	0.0062
287	0.0113	0.0051	0.0062
288	0.0112	0.0051	0.0061

Total soil rain loss = 2.92(In)
Total effective rainfall = 4.19(In)

Peak flow rate in flood hydrograph = 61.03(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0003	0.05	Q				
0+10	0.0022	0.28	Q				
0+15	0.0072	0.72	Q				
0+20	0.0157	1.24	Q				
0+25	0.0263	1.53	Q				
0+30	0.0378	1.67	Q				
0+35	0.0498	1.74	Q				
0+40	0.0619	1.76	VQ				
0+45	0.0741	1.78	VQ				
0+50	0.0865	1.79	VQ				
0+55	0.0988	1.79	VQ				
1+ 0	0.1112	1.80	VQ				
1+ 5	0.1236	1.80	VQ				
1+10	0.1361	1.81	VQ				
1+15	0.1486	1.81	VQ				
1+20	0.1611	1.82	VQ				
1+25	0.1737	1.83	VQ				
1+30	0.1863	1.83	VQ				
1+35	0.1989	1.84	VQ				
1+40	0.2116	1.84	|Q				
1+45	0.2244	1.85	|Q				
1+50	0.2371	1.85	|Q				
1+55	0.2500	1.86	|Q				
2+ 0	0.2628	1.87	|Q				
2+ 5	0.2757	1.87	|Q				
2+10	0.2886	1.88	|Q				
2+15	0.3016	1.88	|Q				
2+20	0.3146	1.89	|Q				
2+25	0.3277	1.90	|Q				
2+30	0.3408	1.90	|Q				
2+35	0.3540	1.91	|Q				
2+40	0.3672	1.92	|Q				
2+45	0.3804	1.92	|Q				
2+50	0.3937	1.93	|Q				
2+55	0.4070	1.94	|Q				
3+ 0	0.4204	1.94	|QV				
3+ 5	0.4338	1.95	|QV				
3+10	0.4473	1.96	|QV				
3+15	0.4608	1.96	|QV				
3+20	0.4743	1.97	|QV				
3+25	0.4879	1.98	|QV				
3+30	0.5016	1.98	|QV				
3+35	0.5153	1.99	|QV				
3+40	0.5291	2.00	|QV				
3+45	0.5429	2.00	|QV				
3+50	0.5567	2.01	|QV				
3+55	0.5706	2.02	|QV				
4+ 0	0.5846	2.03	|QV				
4+ 5	0.5986	2.03	|QV				
4+10	0.6127	2.04	|QV				
4+15	0.6268	2.05	|Q V				
4+20	0.6410	2.06	|Q V				
4+25	0.6552	2.07	|Q V				
4+30	0.6695	2.07	|Q V				
4+35	0.6838	2.08	|Q V				
4+40	0.6982	2.09	|Q V				
4+45	0.7126	2.10	|Q V				
4+50	0.7271	2.11	|Q V				
4+55	0.7417	2.11	|Q V				
5+ 0	0.7563	2.12	|Q V				
5+ 5	0.7710	2.13	|Q V				
5+10	0.7857	2.14	|Q V				
5+15	0.8005	2.15	|Q V				
5+20	0.8154	2.16	|Q V				
5+25	0.8303	2.17	|Q V				
5+30	0.8453	2.18	|Q V				
5+35	0.8604	2.19	|Q V				

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 5+40       0.8755      2.20  |Q  V     |          |          |          |
 5+45       0.8907      2.20  |Q  V     |          |          |          |
 5+50       0.9059      2.21  |Q  V     |          |          |          |
 5+55       0.9212      2.22  |Q  V     |          |          |          |
 6+ 0       0.9366      2.23  |Q  V     |          |          |          |
 6+ 5       0.9521      2.24  |Q  V     |          |          |          |
 6+10       0.9676      2.25  |Q  V     |          |          |          |
 6+15       0.9832      2.26  |Q  V     |          |          |          |
 6+20       0.9988      2.27  |Q  V     |          |          |          |
 6+25       1.0146      2.28  |Q  V     |          |          |          |
 6+30       1.0304      2.30  |Q  V     |          |          |          |
 6+35       1.0463      2.31  |Q   V    |          |          |          |
 6+40       1.0622      2.32  |Q   V    |          |          |          |
 6+45       1.0783      2.33  |Q   V    |          |          |          |
 6+50       1.0944      2.34  |Q   V    |          |          |          |
 6+55       1.1106      2.35  |Q   V    |          |          |          |
 7+ 0       1.1268      2.36  |Q   V    |          |          |          |
 7+ 5       1.1432      2.37  |Q   V    |          |          |          |
 7+10       1.1596      2.39  |Q   V    |          |          |          |
 7+15       1.1761      2.40  |Q   V    |          |          |          |
 7+20       1.1927      2.41  |Q   V    |          |          |          |
 7+25       1.2094      2.42  |Q   V    |          |          |          |
 7+30       1.2262      2.43  |Q   V    |          |          |          |
 7+35       1.2430      2.45  |Q    V   |          |          |          |
 7+40       1.2600      2.46  |Q    V   |          |          |          |
 7+45       1.2770      2.47  |Q    V   |          |          |          |
 7+50       1.2941      2.49  |Q    V   |          |          |          |
 7+55       1.3113      2.50  |Q    V   |          |          |          |
 8+ 0       1.3287      2.51  |Q    V   |          |          |          |
 8+ 5       1.3461      2.53  |Q    V   |          |          |          |
 8+10       1.3636      2.54  |Q    V   |          |          |          |
 8+15       1.3812      2.56  |Q    V   |          |          |          |
 8+20       1.3989      2.57  |Q    V   |          |          |          |
 8+25       1.4167      2.59  |Q    V   |          |          |          |
 8+30       1.4346      2.60  |Q    V   |          |          |          |
 8+35       1.4526      2.62  |Q     V  |          |          |          |
 8+40       1.4707      2.63  |Q     V  |          |          |          |
 8+45       1.4890      2.65  |Q     V  |          |          |          |
 8+50       1.5073      2.66  |Q     V  |          |          |          |
 8+55       1.5258      2.68  |Q     V  |          |          |          |
 9+ 0       1.5444      2.70  |Q     V  |          |          |          |
 9+ 5       1.5630      2.71  |Q     V  |          |          |          |
 9+10       1.5818      2.73  |Q     V  |          |          |          |
 9+15       1.6008      2.75  |Q     V  |          |          |          |
 9+20       1.6198      2.77  |Q     V  |          |          |          |
 9+25       1.6390      2.78  |Q     V  |          |          |          |
 9+30       1.6583      2.80  |Q      V |          |          |          |
 9+35       1.6778      2.82  |Q      V |          |          |          |
 9+40       1.6973      2.84  |Q      V |          |          |          |
 9+45       1.7170      2.86  |Q      V |          |          |          |
 9+50       1.7369      2.88  |Q      V |          |          |          |
 9+55       1.7569      2.90  |Q      V |          |          |          |
10+ 0       1.7770      2.92  |Q      V |          |          |          |
10+ 5       1.7973      2.94  |Q      V |          |          |          |
10+10       1.8177      2.97  |Q      V |          |          |          |
10+15       1.8383      2.99  |Q      V |          |          |          |
10+20       1.8590      3.01  |Q      V |          |          |          |
10+25       1.8799      3.03  |Q       V|          |          |          |
10+30       1.9010      3.06  |Q       V|          |          |          |
10+35       1.9222      3.08  |Q       V|          |          |          |
10+40       1.9436      3.11  |Q       V|          |          |          |
10+45       1.9652      3.13  |Q       V|          |          |          |
10+50       1.9870      3.16  |Q       V|          |          |          |
10+55       2.0089      3.19  |Q       V|          |          |          |
11+ 0       2.0311      3.21  |Q       V|          |          |          |
11+ 5       2.0534      3.24  |Q       V|          |          |          |
11+10       2.0759      3.27  |Q        V          |          |          |
11+15       2.0986      3.30  |Q        V          |          |          |
11+20       2.1216      3.33  |Q        V          |          |          |
11+25       2.1447      3.36  |Q        V          |          |          |
11+30       2.1681      3.39  |Q        V          |          |          |
11+35       2.1916      3.42  |Q        V          |          |          |
11+40       2.2155      3.46  |Q        V          |          |          |
11+45       2.2395      3.49  |Q        V          |          |          |
11+50       2.2638      3.53  | Q       V          |          |          |
11+55       2.2884      3.56  | Q       |V         |          |          |
12+ 0       2.3132      3.60  | Q       |V         |          |          |
12+ 5       2.3383      3.65  | Q       |V         |          |          |
```

12+10	2.3642	3.75	Q	V			
12+15	2.3910	3.90	Q	V			
12+20	2.4191	4.07	Q	V			
12+25	2.4479	4.19	Q	V			
12+30	2.4773	4.27	Q	V			
12+35	2.5071	4.33	Q	V			
12+40	2.5373	4.38	Q	V			
12+45	2.5678	4.43	Q	V			
12+50	2.5987	4.49	Q	V			
12+55	2.6300	4.54	Q	V			
13+ 0	2.6617	4.60	Q	V			
13+ 5	2.6938	4.66	Q	V			
13+10	2.7263	4.72	Q	V			
13+15	2.7592	4.78	Q	V			
13+20	2.7926	4.85	Q	V			
13+25	2.8265	4.92	Q	V			
13+30	2.8608	4.99	Q	V			
13+35	2.8957	5.06	Q	V			
13+40	2.9311	5.14	Q	V			
13+45	2.9671	5.23	Q	V			
13+50	3.0037	5.31	Q	V			
13+55	3.0409	5.40	Q	V			
14+ 0	3.0788	5.50	Q	V			
14+ 5	3.1174	5.60	Q	V			
14+10	3.1567	5.71	Q	V			
14+15	3.1968	5.83	Q	V			
14+20	3.2378	5.95	Q	V			
14+25	3.2797	6.08	Q	V			
14+30	3.3225	6.22	Q	V			
14+35	3.3664	6.37	Q	V			
14+40	3.4113	6.53	Q	V			
14+45	3.4574	6.70	Q	V			
14+50	3.5048	6.88	Q	V			
14+55	3.5536	7.08	Q	V			
15+ 0	3.6040	7.31	Q	V			
15+ 5	3.6560	7.55	Q	V			
15+10	3.7099	7.83	Q	V			
15+15	3.7658	8.13	Q	V			
15+20	3.8242	8.47	Q	V			
15+25	3.8848	8.80	Q	V			
15+30	3.9466	8.98	Q	V			
15+35	4.0084	8.97	Q	V			
15+40	4.0703	8.99	Q	V			
15+45	4.1352	9.41	Q	V			
15+50	4.2061	10.31	Q	V			
15+55	4.2880	11.89	Q	V			
16+ 0	4.3931	15.26	Q	V			
16+ 5	4.5587	24.04	Q	V			
16+10	4.8553	43.07	Q	VQ			
16+15	5.2638	59.32	V	Q			
16+20	5.6841	61.03	V	Q			
16+25	5.9575	39.69	Q	V			
16+30	6.1236	24.12	Q	V			
16+35	6.2334	15.94	Q	V			
16+40	6.3124	11.48	Q	V			
16+45	6.3812	9.99	Q	V			
16+50	6.4416	8.77	Q	V			
16+55	6.4948	7.73	Q	V			
17+ 0	6.5445	7.21	Q	V			
17+ 5	6.5913	6.80	Q	V			
17+10	6.6357	6.45	Q	V			
17+15	6.6781	6.15	Q	V			
17+20	6.7186	5.88	Q	V			
17+25	6.7575	5.65	Q	V			
17+30	6.7951	5.45	Q	V			
17+35	6.8313	5.26	Q	V			
17+40	6.8664	5.10	Q	V			
17+45	6.9005	4.95	Q	V			
17+50	6.9336	4.81	Q	V			
17+55	6.9659	4.68	Q	V			
18+ 0	6.9973	4.57	Q	V			
18+ 5	7.0279	4.45	Q	V			
18+10	7.0574	4.29	Q	V			
18+15	7.0855	4.08	Q	V			
18+20	7.1122	3.87	Q	V			
18+25	7.1378	3.71	Q	V			
18+30	7.1626	3.60	Q	V			
18+35	7.1868	3.51	Q	V			

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  18+40      7.2105     3.44  |Q       |         |         |   V     |
  18+45      7.2337     3.37  |Q       |         |         |   V     |
  18+50      7.2565     3.31  |Q       |         |         |    V    |
  18+55      7.2789     3.25  |Q       |         |         |    V    |
  19+ 0      7.3009     3.20  |Q       |         |         |    V    |
  19+ 5      7.3225     3.14  |Q       |         |         |    V    |
  19+10      7.3438     3.09  |Q       |         |         |    V    |
  19+15      7.3648     3.04  |Q       |         |         |    V    |
  19+20      7.3854     3.00  |Q       |         |         |    V    |
  19+25      7.4057     2.95  |Q       |         |         |    V    |
  19+30      7.4258     2.91  |Q       |         |         |    V    |
  19+35      7.4455     2.87  |Q       |         |         |    V    |
  19+40      7.4650     2.83  |Q       |         |         |     V   |
  19+45      7.4842     2.79  |Q       |         |         |     V   |
  19+50      7.5032     2.75  |Q       |         |         |     V   |
  19+55      7.5219     2.72  |Q       |         |         |     V   |
  20+ 0      7.5404     2.69  |Q       |         |         |     V   |
  20+ 5      7.5587     2.65  |Q       |         |         |     V   |
  20+10      7.5767     2.62  |Q       |         |         |     V   |
  20+15      7.5946     2.59  |Q       |         |         |     V   |
  20+20      7.6122     2.56  |Q       |         |         |     V   |
  20+25      7.6297     2.53  |Q       |         |         |     V   |
  20+30      7.6469     2.50  |Q       |         |         |     V   |
  20+35      7.6640     2.48  |Q       |         |         |     V   |
  20+40      7.6809     2.45  |Q       |         |         |      V  |
  20+45      7.6976     2.43  |Q       |         |         |      V  |
  20+50      7.7141     2.40  |Q       |         |         |      V  |
  20+55      7.7305     2.38  |Q       |         |         |      V  |
  21+ 0      7.7467     2.35  |Q       |         |         |      V  |
  21+ 5      7.7627     2.33  |Q       |         |         |      V  |
  21+10      7.7786     2.31  |Q       |         |         |      V  |
  21+15      7.7944     2.29  |Q       |         |         |      V  |
  21+20      7.8100     2.27  |Q       |         |         |      V  |
  21+25      7.8255     2.25  |Q       |         |         |      V  |
  21+30      7.8408     2.23  |Q       |         |         |      V  |
  21+35      7.8560     2.21  |Q       |         |         |      V  |
  21+40      7.8711     2.19  |Q       |         |         |      V  |
  21+45      7.8860     2.17  |Q       |         |         |       V |
  21+50      7.9009     2.15  |Q       |         |         |       V |
  21+55      7.9156     2.13  |Q       |         |         |       V |
  22+ 0      7.9301     2.12  |Q       |         |         |       V |
  22+ 5      7.9446     2.10  |Q       |         |         |       V |
  22+10      7.9590     2.08  |Q       |         |         |       V |
  22+15      7.9732     2.07  |Q       |         |         |       V |
  22+20      7.9873     2.05  |Q       |         |         |       V |
  22+25      8.0014     2.04  |Q       |         |         |       V |
  22+30      8.0153     2.02  |Q       |         |         |       V |
  22+35      8.0291     2.01  |Q       |         |         |       V |
  22+40      8.0428     1.99  |Q       |         |         |       V |
  22+45      8.0564     1.98  |Q       |         |         |       V |
  22+50      8.0700     1.96  |Q       |         |         |       V |
  22+55      8.0834     1.95  |Q       |         |         |        V|
  23+ 0      8.0967     1.94  |Q       |         |         |        V|
  23+ 5      8.1100     1.92  |Q       |         |         |        V|
  23+10      8.1232     1.91  |Q       |         |         |        V|
  23+15      8.1362     1.90  |Q       |         |         |        V|
  23+20      8.1492     1.89  |Q       |         |         |        V|
  23+25      8.1621     1.87  |Q       |         |         |        V|
  23+30      8.1750     1.86  |Q       |         |         |        V|
  23+35      8.1877     1.85  |Q       |         |         |        V|
  23+40      8.2004     1.84  |Q       |         |         |        V|
  23+45      8.2129     1.83  |Q       |         |         |        V|
  23+50      8.2255     1.82  |Q       |         |         |        V|
  23+55      8.2379     1.81  |Q       |         |         |        V|
  24+ 0      8.2503     1.79  |Q       |         |         |        V|
  24+ 5      8.2622     1.74  Q       |         |         |        V|
  24+10      8.2725     1.49  Q       |         |         |        V|
  24+15      8.2797     1.05  Q       |         |         |        V|
  24+20      8.2833     0.53  Q       |         |         |        V|
  24+25      8.2849     0.23  Q       |         |         |        V|
  24+30      8.2856     0.10  Q       |         |         |        V|
  24+35      8.2858     0.04  Q       |         |         |        V|
  24+40      8.2860     0.02  Q       |         |         |        V|
  24+45      8.2860     0.01  Q       |         |         |         V
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APPENDIX E

Soil Report Excerpts
(Infiltration Test Results)

ALBUS & ASSOCIATES
formerly Albus-Keefe & Associates, Inc.

July 16, 2021
J.N.: 2954.00

Mr. Erik Pfahler
Borstein Enterprises
11766 Wilshire Boulevard, Suite 820
Los Angeles, CA 90025

Subject: **Preliminary Geotechnical Investigation, Southeast Corner of Phillips Boulevard and Pipeline Avenue (San Bernardino County APN Parcel Numbers 1013-111-01, 1013-161-01, and 1013-111-02), Chino, California.**

Dear Mr. Pfahler,

Pursuant to your request, ***Albus & Associates, Inc***. is pleased to present to you our preliminary geotechnical investigation report for the proposed development at the subject site. This report presents the results of our aerial photo and literature review, subsurface exploration, laboratory testing, and engineering analyses. Conclusions relevant to the feasibility of the proposed site development are also presented herein based on the findings of our work.

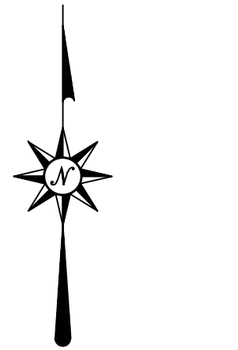
We appreciate this opportunity to be of service to you. If you should have any questions regarding the contents of this report, please do not hesitate to call.

Sincerely,

ALBUS & ASSOCIATES, INC.

David E. Albus
Principal Engineer





0 80 160 320

APPROX SCALE : 1" = 160'

EXPLANATION

(Locations Approximate)

B-22 - Exploratory Boring

P-2 - Exploratory Percolation Test Boring

ALBUS ASSOCIATES

GEOTECHNICAL MAP

Job No.: 2954.00	Date: 07/16/21	Plate: 1

LABORATORY TESTING PROGRAM

Soil Classification

Soils encountered within the exploratory borings were initially classified in the field in general accordance with the visual-manual procedures of the Unified Soil Classification System (ASTM D 2488). The samples were re-examined in the laboratory and classifications reviewed and then revised where appropriate. The assigned group symbols are presented on the Exploration Logs provided in Appendix A.

In-Situ Moisture Content and Dry Density

Moisture content and dry density of in-place soil materials were determined in representative strata. Test data are summarized on the Exploration Logs, Appendix A.

Atterberg Limits

Atterberg Limits (Liquid Limit, Plastic Limit, and Plasticity Index) were performed in accordance with Test Method ASTM D 4318. Pertinent test values are presented within Table B-1.

Percent Passing the No. 200 Sieve

Percent of material passing the No. 200 sieve was determined on selected samples to verify visual classifications performed in the field. These tests were performed in accordance with ASTM D1140. Test results are presented on Table B-1.

Maximum Dry Density and Optimum Moisture Content

Maximum dry density and optimum moisture content were performed on a representative sample of the site materials obtained from our field explorations. The test was performed in accordance with ASTM D 1557. Pertinent test values are given in Table B-1.

Expansion Potential

Expansion index testing was performed on a selected sample. The test was performed in accordance with ASTM D4829. The test result and expansion potential are presented in Table B-1.

Soluble Sulfate Content

A chemical analysis was performed on a selected sample to determine soluble sulfate content. This test was performed in our soil laboratory in accordance with California Test Method No 417. The test result is included in Table B-1.

Consolidation

Consolidation tests were performed for selected soil samples in general conformance with ASTM D 2435. Axial loads were applied in several increments to a laterally restrained 1-inch-high sample. Loads were applied in geometric progression by doubling the previous load, and the resulting deformations were recorded at selected time intervals. The specific test samples were inundated at selected loads to evaluate the effects of a sudden increase in moisture content (hydro-consolidation potential). Results of the tests are graphically presented on Plates B-1 to B-14.

Direct Shear

The Coulomb shear strength parameters, angle of internal friction and cohesion, were determined for a bulk sample and intact samples obtained from one our borings. The tests were performed in general conformance with Test Method ASTM D 3080. The bulk sample was remolded to 90 percent of maximum dry density and at the optimum moisture content. Three specimens were prepared for each test, artificially saturated, and then sheared under varied loads at an appropriate constant rate of strain. Results are graphically presented on Plates B-15 to B-17.

Corrosion

Select samples were tested for minimum resistivity, chloride, pH in accordance with California Test Method 643. Results of these tests are provided in Table B-1.

TABLE B-1
SUMMARY OF LABORATORY TEST RESULTS

Boring No.	Sample Depth (ft)	Soil Description	Test Results	
B-2	0-5	Silty Sand	Max. Dry Density (pcf): Opt. Moisture Content (%): Expansion Index: Expansion Potential: Soluble Sulfate Content: Sulfate Exposure: Passing No. 200 Sieve: PH: Chloride content (ppm): Resistivity (ohms):	122 11.5 1 Very Low 11 Negligible 23.3 7.4 45 3300
B-6	10	Silt with Sand	Liquid Limit (%): Plasticity Index (%):	20 2
B-9	4	Sand with Silt	Passing No. 200 Sieve:	16.7
B-9	15	Silt	Liquid Limit (%): Plasticity Index (%):	34 9
B-10	0-5	Silty Sand	Max. Dry Density (pcf): Opt. Moisture Content (%):	122 11.0

			Expansion Index: Expansion Potential: Soluble Sulfate Content: Sulfate Exposure: PH: Chloride content (ppm): Resistivity (ohms):	2 Very Low 11 Negligible 8.02 67.5 9000
B-10	20	Silt	Liquid Limit (%): Plasticity Index (%):	35 10
B-11	6	Sand trace Gravel	Passing No. 200 Sieve:	3.6
B-13	4	Gravelly Sand trace Silt	Passing No. 200 Sieve:	6.2
B-15	4	Sand with Silt	Passing No. 200 Sieve:	15.9
B-17	20	Silt with Sand trace Clay	Passing No. 200 Sieve:	80.3
B-18	0-5	Silty Sand	Max. Dry Density (pcf): Opt. Moisture Content (%): Expansion Index: Expansion Potential: Soluble Sulfate Content: Sulfate Exposure: Passing No. 200 Sieve: PH: Chloride content (ppm): Resistivity (ohms):	132 8.5 14 Very Low 11 Negligible 32.5 7.74 32.5 1500
B-18	4	Sand with Silt	Passing No. 200 Sieve:	24
B-20	6	Silty Sand trace Gravel	Passing No. 200 Sieve:	30.1

Note: Additional laboratory test results are provided on the boring logs provided in Appendix A.

APPENDIX F

Hydrograph Routing Calculation

FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 07/13/26

Program License Serial Number 6427

********** HYDROGRAPH INFORMATION **********

From study/file name: pplduh2.rte
**********HYDROGRAPH DATA**********
Number of intervals = 295
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 21.372 (CFS)
Total volume = 2.218 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

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Process from Point/Station 100.000 to Point/Station 110.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 295
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.200	0.073	2.020	0.066	0.080
0.400	0.147	5.500	0.128	0.166
0.600	0.223	6.090	0.202	0.244
1.500	0.582	19.250	0.516	0.648
1.600	0.624	20.190	0.554	0.694
2.100	0.835	24.350	0.751	0.919
2.600	1.055	27.900	0.959	1.151
3.600	1.518	29.540	1.416	1.620

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	5.3	10.69	16.03	21.37	Depth (Ft.)
0.083	0.02	0.00	0.000	O	|	|	|	|	0.00
0.167	0.11	0.01	0.000	O	|	|	|	|	0.00
0.250	0.26	0.04	0.001	O	|	|	|	|	0.00
0.333	0.36	0.09	0.003	O	|	|	|	|	0.01
0.417	0.41	0.14	0.005	O	|	|	|	|	0.01
0.500	0.42	0.19	0.007	O	|	|	|	|	0.02
0.583	0.43	0.23	0.008	O	|	|	|	|	0.02
0.667	0.43	0.26	0.009	O	|	|	|	|	0.03
0.750	0.43	0.29	0.011	O	|	|	|	|	0.03
0.833	0.43	0.32	0.011	O	|	|	|	|	0.03

0.917	0.43	0.34	0.012	0					0.03
1.000	0.43	0.35	0.013	0					0.03
1.083	0.44	0.37	0.013	0					0.04
1.167	0.44	0.38	0.014	0					0.04
1.250	0.44	0.39	0.014	0					0.04
1.333	0.44	0.40	0.014	0					0.04
1.417	0.44	0.41	0.015	0					0.04
1.500	0.44	0.41	0.015	0					0.04
1.583	0.44	0.42	0.015	0					0.04
1.667	0.45	0.42	0.015	0					0.04
1.750	0.45	0.43	0.015	0					0.04
1.833	0.45	0.43	0.016	0					0.04
1.917	0.45	0.43	0.016	0					0.04
2.000	0.45	0.44	0.016	0					0.04
2.083	0.45	0.44	0.016	0					0.04
2.167	0.46	0.44	0.016	0					0.04
2.250	0.46	0.44	0.016	0					0.04
2.333	0.46	0.45	0.016	0					0.04
2.417	0.46	0.45	0.016	0					0.04
2.500	0.46	0.45	0.016	0					0.04
2.583	0.46	0.45	0.016	0					0.04
2.667	0.46	0.45	0.016	0					0.05
2.750	0.47	0.46	0.017	0					0.05
2.833	0.47	0.46	0.017	0					0.05
2.917	0.47	0.46	0.017	0					0.05
3.000	0.47	0.46	0.017	0					0.05
3.083	0.47	0.46	0.017	0					0.05
3.167	0.48	0.47	0.017	0					0.05
3.250	0.48	0.47	0.017	0					0.05
3.333	0.48	0.47	0.017	0					0.05
3.417	0.48	0.47	0.017	0					0.05
3.500	0.48	0.47	0.017	0					0.05
3.583	0.48	0.47	0.017	0					0.05
3.667	0.49	0.48	0.017	0					0.05
3.750	0.49	0.48	0.017	0					0.05
3.833	0.49	0.48	0.017	0					0.05
3.917	0.49	0.48	0.017	0					0.05
4.000	0.49	0.48	0.017	0					0.05
4.083	0.50	0.49	0.018	0					0.05
4.167	0.50	0.49	0.018	0					0.05
4.250	0.50	0.49	0.018	0					0.05
4.333	0.50	0.49	0.018	0					0.05
4.417	0.50	0.49	0.018	0					0.05
4.500	0.51	0.50	0.018	0					0.05
4.583	0.51	0.50	0.018	0					0.05
4.667	0.51	0.50	0.018	0					0.05
4.750	0.51	0.50	0.018	0					0.05
4.833	0.51	0.50	0.018	0					0.05
4.917	0.52	0.51	0.018	0					0.05
5.000	0.52	0.51	0.018	0					0.05
5.083	0.52	0.51	0.018	0					0.05
5.167	0.52	0.51	0.019	0					0.05
5.250	0.53	0.51	0.019	0					0.05
5.333	0.53	0.52	0.019	0					0.05
5.417	0.53	0.52	0.019	0					0.05
5.500	0.53	0.52	0.019	0					0.05
5.583	0.54	0.52	0.019	0					0.05
5.667	0.54	0.53	0.019	0					0.05
5.750	0.54	0.53	0.019	0					0.05
5.833	0.54	0.53	0.019	0					0.05
5.917	0.55	0.53	0.019	0					0.05
6.000	0.55	0.54	0.019	0					0.05
6.083	0.55	0.54	0.019	0					0.05
6.167	0.55	0.54	0.020	0					0.05
6.250	0.56	0.54	0.020	0					0.05
6.333	0.56	0.55	0.020	0					0.05
6.417	0.56	0.55	0.020	0					0.05
6.500	0.57	0.55	0.020	0					0.05
6.583	0.57	0.55	0.020	0					0.05
6.667	0.57	0.56	0.020	0					0.06
6.750	0.57	0.56	0.020	0					0.06
6.833	0.58	0.56	0.020	0					0.06
6.917	0.58	0.56	0.020	0					0.06
7.000	0.58	0.57	0.021	0					0.06
7.083	0.59	0.57	0.021	0					0.06
7.167	0.59	0.57	0.021	0					0.06
7.250	0.59	0.58	0.021	0					0.06
7.333	0.60	0.58	0.021	0					0.06

7.417	0.60	0.58	0.021	O				0.06
7.500	0.60	0.59	0.021	O				0.06
7.583	0.61	0.59	0.021	O				0.06
7.667	0.61	0.59	0.021	O				0.06
7.750	0.61	0.60	0.022	O				0.06
7.833	0.62	0.60	0.022	O				0.06
7.917	0.62	0.60	0.022	O				0.06
8.000	0.62	0.61	0.022	O				0.06
8.083	0.63	0.61	0.022	O				0.06
8.167	0.63	0.61	0.022	O				0.06
8.250	0.63	0.62	0.022	O				0.06
8.333	0.64	0.62	0.022	O				0.06
8.417	0.64	0.62	0.023	O				0.06
8.500	0.65	0.63	0.023	O				0.06
8.583	0.65	0.63	0.023	O				0.06
8.667	0.66	0.63	0.023	O				0.06
8.750	0.66	0.64	0.023	O				0.06
8.833	0.66	0.64	0.023	O				0.06
8.917	0.67	0.65	0.023	OI				0.06
9.000	0.67	0.65	0.024	OI				0.06
9.083	0.68	0.66	0.024	OI				0.06
9.167	0.68	0.66	0.024	OI				0.07
9.250	0.69	0.66	0.024	OI				0.07
9.333	0.69	0.67	0.024	|O				0.07
9.417	0.70	0.67	0.024	|O				0.07
9.500	0.70	0.68	0.024	|O				0.07
9.583	0.71	0.68	0.025	|O				0.07
9.667	0.71	0.69	0.025	|O				0.07
9.750	0.72	0.69	0.025	|O				0.07
9.833	0.72	0.70	0.025	|O				0.07
9.917	0.73	0.70	0.025	|O				0.07
10.000	0.73	0.71	0.026	|O				0.07
10.083	0.74	0.71	0.026	|O				0.07
10.167	0.75	0.72	0.026	|O				0.07
10.250	0.75	0.72	0.026	|O				0.07
10.333	0.76	0.73	0.026	|O				0.07
10.417	0.76	0.73	0.027	|O				0.07
10.500	0.77	0.74	0.027	|O				0.07
10.583	0.78	0.75	0.027	|O				0.07
10.667	0.78	0.75	0.027	|O				0.07
10.750	0.79	0.76	0.027	|O				0.08
10.833	0.80	0.76	0.028	|O				0.08
10.917	0.81	0.77	0.028	|O				0.08
11.000	0.81	0.78	0.028	|O				0.08
11.083	0.82	0.78	0.028	|O				0.08
11.167	0.83	0.79	0.029	|O				0.08
11.250	0.84	0.80	0.029	|O				0.08
11.333	0.85	0.81	0.029	|O				0.08
11.417	0.85	0.81	0.029	|O				0.08
11.500	0.86	0.82	0.030	|O				0.08
11.583	0.87	0.83	0.030	|O				0.08
11.667	0.88	0.84	0.030	|O				0.08
11.750	0.89	0.85	0.031	|O				0.08
11.833	0.90	0.85	0.031	|O				0.08
11.917	0.91	0.86	0.031	|O				0.09
12.000	0.92	0.87	0.032	|O				0.09
12.083	0.94	0.88	0.032	|O				0.09
12.167	1.02	0.90	0.033	|O				0.09
12.250	1.14	0.93	0.034	|O				0.09
12.333	1.23	0.98	0.035	|O				0.10
12.417	1.27	1.02	0.037	|O				0.10
12.500	1.30	1.07	0.039	|O				0.11
12.583	1.31	1.11	0.040	|O				0.11
12.667	1.33	1.15	0.041	|O				0.11
12.750	1.34	1.18	0.043	|OI				0.12
12.833	1.36	1.21	0.044	|OI				0.12
12.917	1.37	1.24	0.045	|OI				0.12
13.000	1.39	1.26	0.046	|OI				0.12
13.083	1.41	1.29	0.046	|OI				0.13
13.167	1.42	1.31	0.047	|OI				0.13
13.250	1.44	1.33	0.048	|OI				0.13
13.333	1.46	1.35	0.049	| O				0.13
13.417	1.48	1.37	0.050	| O				0.14
13.500	1.50	1.39	0.050	| O				0.14
13.583	1.52	1.41	0.051	| O				0.14
13.667	1.54	1.43	0.052	| O				0.14
13.750	1.57	1.45	0.053	| O				0.14
13.833	1.59	1.48	0.053	| O				0.15

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13.917    1.62    1.50      0.054  | O     |       |       |       |     0.15
14.000    1.64    1.52      0.055  | O     |       |       |       |     0.15
14.083    1.67    1.54      0.056  | O     |       |       |       |     0.15
14.167    1.70    1.57      0.057  | O     |       |       |       |     0.16
14.250    1.73    1.60      0.058  | O     |       |       |       |     0.16
14.333    1.77    1.62      0.059  | O     |       |       |       |     0.16
14.417    1.81    1.65      0.060  | O     |       |       |       |     0.16
14.500    1.84    1.68      0.061  | O     |       |       |       |     0.17
14.583    1.89    1.71      0.062  | O     |       |       |       |     0.17
14.667    1.93    1.75      0.063  | O     |       |       |       |     0.17
14.750    1.98    1.78      0.064  | O     |       |       |       |     0.18
14.833    2.03    1.82      0.066  | OI    |       |       |       |     0.18
14.917    2.09    1.86      0.067  | OI    |       |       |       |     0.18
15.000    2.15    1.91      0.069  | OI    |       |       |       |     0.19
15.083    2.22    1.95      0.071  | OI    |       |       |       |     0.19
15.167    2.29    2.01      0.073  |  O    |       |       |       |     0.20
15.250    2.38    2.09      0.075  |  O    |       |       |       |     0.20
15.333    2.47    2.18      0.077  |  O    |       |       |       |     0.21
15.417    2.56    2.28      0.078  |  O    |       |       |       |     0.21
15.500    2.52    2.35      0.080  |  O    |       |       |       |     0.22
15.583    2.40    2.38      0.081  |  O    |       |       |       |     0.22
15.667    2.39    2.39      0.081  |  O    |       |       |       |     0.22
15.750    2.55    2.41      0.081  |  O    |       |       |       |     0.22
15.833    2.83    2.49      0.083  |  OI   |       |       |       |     0.23
15.917    3.27    2.64      0.086  |  OI   |       |       |       |     0.24
16.000    4.02    2.92      0.092  |   O I |       |       |       |     0.25
16.083    6.80    3.62      0.107  |    O  | I     |       |       |     0.29
16.167   15.10    5.53      0.151  |       O       |     I |       |     0.41
16.250   21.37    6.53      0.235  |       |O      |       |     I |     0.63
16.333   15.45    9.19      0.308  |       |   O   |      I|       |     0.81
16.417    7.95    9.75      0.323  |       |  I  O |       |       |     0.85
16.500    4.44    8.96      0.301  |    I  |   O   |       |       |     0.80
16.583    3.16    7.80      0.270  |   I   |  O    |       |       |     0.72
16.667    2.79    6.72      0.240  |   I   | O     |       |       |     0.64
16.750    2.42    6.02      0.214  |  I    |O      |       |       |     0.58
16.833    2.26    5.83      0.190  |  I    O       |       |       |     0.51
16.917    2.12    5.64      0.165  |  I    O       |       |       |     0.45
17.000    2.01    5.26      0.142  |  I   O|       |       |       |     0.39
17.083    1.91    4.34      0.122  | I   O |       |       |       |     0.33
17.167    1.83    3.65      0.108  | I  O  |       |       |       |     0.29
17.250    1.75    3.13      0.097  | I O   |       |       |       |     0.26
17.333    1.69    2.74      0.088  | I O   |       |       |       |     0.24
17.417    1.63    2.44      0.082  | IO    |       |       |       |     0.22
17.500    1.58    2.21      0.077  | IO    |       |       |       |     0.21
17.583    1.53    2.02      0.073  | IO    |       |       |       |     0.20
17.667    1.49    1.93      0.070  | O     |       |       |       |     0.19
17.750    1.45    1.85      0.067  | O     |       |       |       |     0.18
17.833    1.41    1.78      0.064  | O     |       |       |       |     0.18
17.917    1.38    1.71      0.062  | O     |       |       |       |     0.17
18.000    1.35    1.65      0.060  | O     |       |       |       |     0.16
18.083    1.31    1.60      0.058  |IO     |       |       |       |     0.16
18.167    1.22    1.54      0.056  |IO     |       |       |       |     0.15
18.250    1.08    1.47      0.053  |IO     |       |       |       |     0.15
18.333    0.98    1.40      0.050  |IO     |       |       |       |     0.14
18.417    0.93    1.32      0.048  |O      |       |       |       |     0.13
18.500    0.90    1.25      0.045  |O      |       |       |       |     0.12
18.583    0.88    1.19      0.043  |O      |       |       |       |     0.12
18.667    0.86    1.13      0.041  |O      |       |       |       |     0.11
18.750    0.84    1.08      0.039  |O      |       |       |       |     0.11
18.833    0.82    1.04      0.038  |O      |       |       |       |     0.10
18.917    0.81    1.00      0.036  |O      |       |       |       |     0.10
19.000    0.79    0.97      0.035  |O      |       |       |       |     0.10
19.083    0.78    0.93      0.034  |O      |       |       |       |     0.09
19.167    0.77    0.91      0.033  |O      |       |       |       |     0.09
19.250    0.75    0.88      0.032  |O      |       |       |       |     0.09
19.333    0.74    0.86      0.031  |O      |       |       |       |     0.08
19.417    0.73    0.84      0.030  |O      |       |       |       |     0.08
19.500    0.72    0.82      0.030  |O      |       |       |       |     0.08
19.583    0.71    0.80      0.029  |O      |       |       |       |     0.08
19.667    0.70    0.78      0.028  |O      |       |       |       |     0.08
19.750    0.69    0.77      0.028  |O      |       |       |       |     0.08
19.833    0.68    0.75      0.027  |O      |       |       |       |     0.07
19.917    0.67    0.74      0.027  |O      |       |       |       |     0.07
20.000    0.66    0.73      0.026  IO      |       |       |       |     0.07
20.083    0.65    0.71      0.026  IO      |       |       |       |     0.07
20.167    0.64    0.70      0.025  IO      |       |       |       |     0.07
20.250    0.64    0.69      0.025  IO      |       |       |       |     0.07
20.333    0.63    0.68      0.025  IO      |       |       |       |     0.07
```

20.417	0.62	0.67	0.024	IO	|	|	|	0.07
20.500	0.61	0.66	0.024	O	|	|	|	0.07
20.583	0.61	0.65	0.024	O	|	|	|	0.06
20.667	0.60	0.64	0.023	O	|	|	|	0.06
20.750	0.59	0.64	0.023	O	|	|	|	0.06
20.833	0.59	0.63	0.023	O	|	|	|	0.06
20.917	0.58	0.62	0.022	O	|	|	|	0.06
21.000	0.58	0.61	0.022	O	|	|	|	0.06
21.083	0.57	0.61	0.022	O	|	|	|	0.06
21.167	0.56	0.60	0.022	O	|	|	|	0.06
21.250	0.56	0.59	0.021	O	|	|	|	0.06
21.333	0.55	0.59	0.021	O	|	|	|	0.06
21.417	0.55	0.58	0.021	O	|	|	|	0.06
21.500	0.54	0.57	0.021	O	|	|	|	0.06
21.583	0.54	0.57	0.021	O	|	|	|	0.06
21.667	0.53	0.56	0.020	O	|	|	|	0.06
21.750	0.53	0.56	0.020	O	|	|	|	0.06
21.833	0.52	0.55	0.020	O	|	|	|	0.05
21.917	0.52	0.55	0.020	O	|	|	|	0.05
22.000	0.51	0.54	0.020	O	|	|	|	0.05
22.083	0.51	0.54	0.019	O	|	|	|	0.05
22.167	0.51	0.53	0.019	O	|	|	|	0.05
22.250	0.50	0.53	0.019	O	|	|	|	0.05
22.333	0.50	0.52	0.019	O	|	|	|	0.05
22.417	0.49	0.52	0.019	O	|	|	|	0.05
22.500	0.49	0.51	0.019	O	|	|	|	0.05
22.583	0.49	0.51	0.018	O	|	|	|	0.05
22.667	0.48	0.50	0.018	O	|	|	|	0.05
22.750	0.48	0.50	0.018	O	|	|	|	0.05
22.833	0.47	0.50	0.018	O	|	|	|	0.05
22.917	0.47	0.49	0.018	O	|	|	|	0.05
23.000	0.47	0.49	0.018	O	|	|	|	0.05
23.083	0.46	0.48	0.017	O	|	|	|	0.05
23.167	0.46	0.48	0.017	O	|	|	|	0.05
23.250	0.46	0.48	0.017	O	|	|	|	0.05
23.333	0.45	0.47	0.017	O	|	|	|	0.05
23.417	0.45	0.47	0.017	O	|	|	|	0.05
23.500	0.45	0.47	0.017	O	|	|	|	0.05
23.583	0.45	0.46	0.017	O	|	|	|	0.05
23.667	0.44	0.46	0.017	O	|	|	|	0.05
23.750	0.44	0.46	0.016	O	|	|	|	0.05
23.833	0.44	0.45	0.016	O	|	|	|	0.04
23.917	0.43	0.45	0.016	O	|	|	|	0.04
24.000	0.43	0.45	0.016	O	|	|	|	0.04
24.083	0.41	0.44	0.016	O	|	|	|	0.04
24.167	0.32	0.43	0.016	O	|	|	|	0.04
24.250	0.17	0.40	0.014	O	|	|	|	0.04
24.333	0.06	0.35	0.013	O	|	|	|	0.03
24.417	0.02	0.29	0.011	O	|	|	|	0.03
24.500	0.01	0.25	0.009	O	|	|	|	0.02
24.583	0.00	0.20	0.007	O	|	|	|	0.02
24.667	0.00	0.17	0.006	O	|	|	|	0.02
24.750	0.00	0.14	0.005	O	|	|	|	0.01
24.833	0.00	0.11	0.004	O	|	|	|	0.01
24.917	0.00	0.09	0.003	O	|	|	|	0.01
25.000	0.00	0.08	0.003	O	|	|	|	0.01
25.083	0.00	0.06	0.002	O	|	|	|	0.01
25.167	0.00	0.05	0.002	O	|	|	|	0.01
25.250	0.00	0.04	0.002	O	|	|	|	0.00
25.333	0.00	0.04	0.001	O	|	|	|	0.00
25.417	0.00	0.03	0.001	O	|	|	|	0.00
25.500	0.00	0.02	0.001	O	|	|	|	0.00
25.583	0.00	0.02	0.001	O	|	|	|	0.00
25.667	0.00	0.02	0.001	O	|	|	|	0.00
25.750	0.00	0.01	0.001	O	|	|	|	0.00
25.833	0.00	0.01	0.000	O	|	|	|	0.00
25.917	0.00	0.01	0.000	O	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 311
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 9.754 (CFS)
Total volume = 2.217 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 07/13/26

Program License Serial Number 6427

********** HYDROGRAPH INFORMATION **********

From study/file name: pplduh10.rte
**********HYDROGRAPH DATA**********
Number of intervals = 298
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 31.069 (CFS)
Total volume = 3.707 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 100.000 to Point/Station 110.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 298
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.200	0.073	2.020	0.066	0.080
0.400	0.147	5.500	0.128	0.166
0.600	0.223	6.090	0.202	0.244
1.500	0.582	19.250	0.516	0.648
1.600	0.624	20.190	0.554	0.694
2.100	0.835	24.350	0.751	0.919
2.600	1.055	27.900	0.959	1.151
3.600	1.518	29.540	1.416	1.620

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 7.8 15.53 23.30 31.07	Depth (Ft.)
0.083	0.02	0.00	0.000	O | | | |	0.00
0.167	0.09	0.01	0.000	O | | | |	0.00
0.250	0.24	0.04	0.001	O | | | |	0.00
0.333	0.44	0.09	0.003	O | | | |	0.01
0.417	0.58	0.16	0.006	O | | | |	0.02
0.500	0.66	0.24	0.009	O | | | |	0.02
0.583	0.70	0.32	0.012	O | | | |	0.03
0.667	0.72	0.39	0.014	O | | | |	0.04
0.750	0.72	0.45	0.016	O | | | |	0.04
0.833	0.73	0.49	0.018	O | | | |	0.05

0.917	0.73	0.54	0.019	O	|	|	|	0.05
1.000	0.74	0.57	0.021	O	|	|	|	0.06
1.083	0.74	0.60	0.022	O	|	|	|	0.06
1.167	0.74	0.62	0.023	O	|	|	|	0.06
1.250	0.74	0.64	0.023	O	|	|	|	0.06
1.333	0.75	0.66	0.024	O	|	|	|	0.07
1.417	0.75	0.68	0.024	O	|	|	|	0.07
1.500	0.75	0.69	0.025	O	|	|	|	0.07
1.583	0.75	0.70	0.025	O	|	|	|	0.07
1.667	0.76	0.71	0.026	O	|	|	|	0.07
1.750	0.76	0.72	0.026	O	|	|	|	0.07
1.833	0.76	0.73	0.026	O	|	|	|	0.07
1.917	0.76	0.73	0.026	O	|	|	|	0.07
2.000	0.77	0.74	0.027	O	|	|	|	0.07
2.083	0.77	0.74	0.027	O	|	|	|	0.07
2.167	0.77	0.75	0.027	O	|	|	|	0.07
2.250	0.77	0.75	0.027	O	|	|	|	0.07
2.333	0.78	0.76	0.027	O	|	|	|	0.07
2.417	0.78	0.76	0.027	O	|	|	|	0.08
2.500	0.78	0.76	0.028	O	|	|	|	0.08
2.583	0.78	0.77	0.028	O	|	|	|	0.08
2.667	0.79	0.77	0.028	O	|	|	|	0.08
2.750	0.79	0.77	0.028	O	|	|	|	0.08
2.833	0.79	0.78	0.028	O	|	|	|	0.08
2.917	0.80	0.78	0.028	O	|	|	|	0.08
3.000	0.80	0.78	0.028	O	|	|	|	0.08
3.083	0.80	0.79	0.028	O	|	|	|	0.08
3.167	0.80	0.79	0.028	O	|	|	|	0.08
3.250	0.81	0.79	0.029	O	|	|	|	0.08
3.333	0.81	0.79	0.029	O	|	|	|	0.08
3.417	0.81	0.80	0.029	O	|	|	|	0.08
3.500	0.82	0.80	0.029	O	|	|	|	0.08
3.583	0.82	0.80	0.029	O	|	|	|	0.08
3.667	0.82	0.81	0.029	O	|	|	|	0.08
3.750	0.83	0.81	0.029	O	|	|	|	0.08
3.833	0.83	0.81	0.029	O	|	|	|	0.08
3.917	0.83	0.82	0.029	O	|	|	|	0.08
4.000	0.83	0.82	0.030	O	|	|	|	0.08
4.083	0.84	0.82	0.030	O	|	|	|	0.08
4.167	0.84	0.82	0.030	O	|	|	|	0.08
4.250	0.84	0.83	0.030	O	|	|	|	0.08
4.333	0.85	0.83	0.030	O	|	|	|	0.08
4.417	0.85	0.83	0.030	O	|	|	|	0.08
4.500	0.85	0.84	0.030	O	|	|	|	0.08
4.583	0.86	0.84	0.030	O	|	|	|	0.08
4.667	0.86	0.84	0.031	O	|	|	|	0.08
4.750	0.87	0.85	0.031	O	|	|	|	0.08
4.833	0.87	0.85	0.031	O	|	|	|	0.08
4.917	0.87	0.85	0.031	O	|	|	|	0.08
5.000	0.88	0.86	0.031	O	|	|	|	0.08
5.083	0.88	0.86	0.031	O	|	|	|	0.09
5.167	0.88	0.86	0.031	O	|	|	|	0.09
5.250	0.89	0.87	0.031	O	|	|	|	0.09
5.333	0.89	0.87	0.032	O	|	|	|	0.09
5.417	0.89	0.88	0.032	O	|	|	|	0.09
5.500	0.90	0.88	0.032	O	|	|	|	0.09
5.583	0.90	0.88	0.032	O	|	|	|	0.09
5.667	0.91	0.89	0.032	O	|	|	|	0.09
5.750	0.91	0.89	0.032	O	|	|	|	0.09
5.833	0.92	0.89	0.032	O	|	|	|	0.09
5.917	0.92	0.90	0.032	O	|	|	|	0.09
6.000	0.92	0.90	0.033	O	|	|	|	0.09
6.083	0.93	0.91	0.033	O	|	|	|	0.09
6.167	0.93	0.91	0.033	O	|	|	|	0.09
6.250	0.94	0.91	0.033	O	|	|	|	0.09
6.333	0.94	0.92	0.033	O	|	|	|	0.09
6.417	0.95	0.92	0.033	O	|	|	|	0.09
6.500	0.95	0.93	0.034	O	|	|	|	0.09
6.583	0.95	0.93	0.034	O	|	|	|	0.09
6.667	0.96	0.94	0.034	O	|	|	|	0.09
6.750	0.96	0.94	0.034	O	|	|	|	0.09
6.833	0.97	0.95	0.034	O	|	|	|	0.09
6.917	0.97	0.95	0.034	OI	|	|	|	0.09
7.000	0.98	0.95	0.034	OI	|	|	|	0.09
7.083	0.98	0.96	0.035	OI	|	|	|	0.09
7.167	0.99	0.96	0.035	OI	|	|	|	0.10
7.250	0.99	0.97	0.035	OI	|	|	|	0.10
7.333	1.00	0.97	0.035	|O	|	|	|	0.10

7.417	1.00	0.98	0.035	O				0.10
7.500	1.01	0.98	0.036	O				0.10
7.583	1.02	0.99	0.036	O				0.10
7.667	1.02	0.99	0.036	O				0.10
7.750	1.03	1.00	0.036	O				0.10
7.833	1.03	1.00	0.036	O				0.10
7.917	1.04	1.01	0.036	O				0.10
8.000	1.04	1.02	0.037	O				0.10
8.083	1.05	1.02	0.037	O				0.10
8.167	1.06	1.03	0.037	O				0.10
8.250	1.06	1.03	0.037	O				0.10
8.333	1.07	1.04	0.038	O				0.10
8.417	1.08	1.04	0.038	O				0.10
8.500	1.08	1.05	0.038	O				0.10
8.583	1.09	1.06	0.038	O				0.10
8.667	1.10	1.06	0.038	O				0.11
8.750	1.10	1.07	0.039	O				0.11
8.833	1.11	1.07	0.039	O				0.11
8.917	1.12	1.08	0.039	O				0.11
9.000	1.12	1.09	0.039	O				0.11
9.083	1.13	1.09	0.040	O				0.11
9.167	1.14	1.10	0.040	O				0.11
9.250	1.15	1.11	0.040	O				0.11
9.333	1.15	1.12	0.040	O				0.11
9.417	1.16	1.12	0.041	O				0.11
9.500	1.17	1.13	0.041	O				0.11
9.583	1.18	1.14	0.041	O				0.11
9.667	1.19	1.15	0.041	O				0.11
9.750	1.19	1.15	0.042	O				0.11
9.833	1.20	1.16	0.042	O				0.11
9.917	1.21	1.17	0.042	O				0.12
10.000	1.22	1.18	0.043	O				0.12
10.083	1.23	1.19	0.043	O				0.12
10.167	1.24	1.19	0.043	O				0.12
10.250	1.25	1.20	0.043	O				0.12
10.333	1.26	1.21	0.044	O				0.12
10.417	1.27	1.22	0.044	O				0.12
10.500	1.28	1.23	0.044	O				0.12
10.583	1.29	1.24	0.045	O				0.12
10.667	1.30	1.25	0.045	O				0.12
10.750	1.31	1.26	0.046	O				0.12
10.833	1.32	1.27	0.046	O				0.13
10.917	1.34	1.28	0.046	O				0.13
11.000	1.35	1.29	0.047	O				0.13
11.083	1.36	1.30	0.047	O				0.13
11.167	1.37	1.31	0.047	O				0.13
11.250	1.38	1.32	0.048	O				0.13
11.333	1.40	1.34	0.048	O				0.13
11.417	1.41	1.35	0.049	O				0.13
11.500	1.43	1.36	0.049	O				0.13
11.583	1.44	1.37	0.050	O				0.14
11.667	1.45	1.39	0.050	O				0.14
11.750	1.47	1.40	0.051	O				0.14
11.833	1.48	1.41	0.051	O				0.14
11.917	1.50	1.43	0.052	O				0.14
12.000	1.52	1.44	0.052	O				0.14
12.083	1.54	1.46	0.053	O				0.14
12.167	1.60	1.48	0.053	O				0.15
12.250	1.69	1.51	0.054	O				0.15
12.333	1.81	1.55	0.056	O				0.15
12.417	1.91	1.60	0.058	O				0.16
12.500	1.96	1.66	0.060	OI				0.16
12.583	2.00	1.72	0.062	OI				0.17
12.667	2.03	1.77	0.064	OI				0.18
12.750	2.06	1.82	0.066	OI				0.18
12.833	2.08	1.86	0.067	OI				0.18
12.917	2.11	1.90	0.069	OI				0.19
13.000	2.13	1.94	0.070	OI				0.19
13.083	2.16	1.98	0.071	O				0.20
13.167	2.19	2.01	0.073	O				0.20
13.250	2.21	2.06	0.074	O				0.20
13.333	2.24	2.10	0.075	O				0.20
13.417	2.27	2.15	0.076	O				0.21
13.500	2.30	2.19	0.077	O				0.21
13.583	2.34	2.22	0.077	O				0.21
13.667	2.37	2.26	0.078	O				0.21
13.750	2.41	2.30	0.079	O				0.22
13.833	2.44	2.33	0.080	O				0.22

13.917	2.48	2.37	0.080	O					0.22
14.000	2.52	2.41	0.081	O					0.22
14.083	2.57	2.44	0.082	O					0.22
14.167	2.61	2.49	0.083	O					0.23
14.250	2.66	2.53	0.084	O					0.23
14.333	2.72	2.57	0.085	O					0.23
14.417	2.77	2.62	0.086	O					0.23
14.500	2.83	2.67	0.087	O					0.24
14.583	2.90	2.73	0.088	O					0.24
14.667	2.96	2.78	0.089	OI					0.24
14.750	3.04	2.84	0.090	OI					0.25
14.833	3.12	2.91	0.092	OI					0.25
14.917	3.20	2.98	0.093	O					0.26
15.000	3.29	3.05	0.095	O					0.26
15.083	3.40	3.13	0.097	O					0.26
15.167	3.51	3.22	0.099	O					0.27
15.250	3.64	3.32	0.101	O					0.27
15.333	3.78	3.43	0.103	O					0.28
15.417	3.91	3.55	0.105	OI					0.29
15.500	3.98	3.66	0.108	OI					0.29
15.583	3.96	3.75	0.110	OI					0.30
15.667	3.92	3.80	0.111	OI					0.30
15.750	4.01	3.85	0.112	OI					0.30
15.833	4.31	3.93	0.114	O					0.31
15.917	4.82	4.11	0.117	O					0.32
16.000	5.87	4.45	0.125	O I					0.34
16.083	9.40	5.34	0.144	O	I				0.39
16.167	17.99	5.91	0.199	O		I			0.54
16.250	26.78	8.99	0.302		O		I		0.80
16.333	31.07	13.46	0.424		O			I	1.10
16.417	23.11	16.51	0.507			O	I		1.31
16.500	14.46	17.02	0.521		I	O			1.35
16.583	9.19	15.86	0.489		I	O			1.27
16.667	6.36	14.04	0.440	I	O				1.14
16.750	4.77	12.14	0.388	I	O				1.01
16.833	4.34	10.44	0.342	I	O				0.90
16.917	3.82	9.02	0.303	I	O				0.80
17.000	3.36	7.80	0.270	I	O				0.72
17.083	3.17	6.78	0.242	I O					0.65
17.167	3.01	6.06	0.219	I O					0.59
17.250	2.87	5.90	0.198	I O					0.53
17.333	2.75	5.73	0.177	I O					0.48
17.417	2.64	5.58	0.157	I O					0.43
17.500	2.55	5.08	0.138	I O					0.38
17.583	2.46	4.36	0.123	I O					0.33
17.667	2.39	3.82	0.111	IO					0.30
17.750	2.32	3.41	0.103	IO					0.28
17.833	2.25	3.10	0.096	IO					0.26
17.917	2.20	2.85	0.091	O					0.25
18.000	2.14	2.66	0.087	O					0.24
18.083	2.09	2.51	0.083	O					0.23
18.167	2.00	2.38	0.081	O					0.22
18.250	1.88	2.26	0.078	IO					0.21
18.333	1.74	2.13	0.075	IO					0.21
18.417	1.63	2.01	0.073	IO					0.20
18.500	1.56	1.94	0.070	O					0.19
18.583	1.50	1.87	0.068	O					0.18
18.667	1.47	1.80	0.065	O					0.18
18.750	1.43	1.74	0.063	O					0.17
18.833	1.40	1.68	0.061	O					0.17
18.917	1.38	1.63	0.059	O					0.16
19.000	1.35	1.59	0.057	O					0.16
19.083	1.33	1.54	0.056	O					0.15
19.167	1.31	1.50	0.054	O					0.15
19.250	1.28	1.47	0.053	O					0.15
19.333	1.26	1.43	0.052	O					0.14
19.417	1.24	1.40	0.051	O					0.14
19.500	1.22	1.37	0.050	O					0.14
19.583	1.21	1.35	0.049	O					0.13
19.667	1.19	1.32	0.048	O					0.13
19.750	1.17	1.30	0.047	O					0.13
19.833	1.16	1.27	0.046	O					0.13
19.917	1.14	1.25	0.045	O					0.12
20.000	1.13	1.23	0.044	O					0.12
20.083	1.11	1.21	0.044	O					0.12
20.167	1.10	1.19	0.043	O					0.12
20.250	1.08	1.17	0.042	O					0.12
20.333	1.07	1.16	0.042	O					0.11

20.417	1.06	1.14	0.041	|O	|	|	|	0.11
20.500	1.05	1.13	0.041	|O	|	|	|	0.11
20.583	1.03	1.11	0.040	|O	|	|	|	0.11
20.667	1.02	1.10	0.040	|O	|	|	|	0.11
20.750	1.01	1.08	0.039	|O	|	|	|	0.11
20.833	1.00	1.07	0.039	|O	|	|	|	0.11
20.917	0.99	1.06	0.038	|O	|	|	|	0.10
21.000	0.98	1.04	0.038	|O	|	|	|	0.10
21.083	0.97	1.03	0.037	IO	|	|	|	0.10
21.167	0.96	1.02	0.037	IO	|	|	|	0.10
21.250	0.95	1.01	0.036	IO	|	|	|	0.10
21.333	0.94	1.00	0.036	IO	|	|	|	0.10
21.417	0.93	0.99	0.036	IO	|	|	|	0.10
21.500	0.92	0.98	0.035	IO	|	|	|	0.10
21.583	0.92	0.97	0.035	O	|	|	|	0.10
21.667	0.91	0.96	0.035	O	|	|	|	0.09
21.750	0.90	0.95	0.034	O	|	|	|	0.09
21.833	0.89	0.94	0.034	O	|	|	|	0.09
21.917	0.88	0.93	0.034	O	|	|	|	0.09
22.000	0.88	0.92	0.033	O	|	|	|	0.09
22.083	0.87	0.91	0.033	O	|	|	|	0.09
22.167	0.86	0.91	0.033	O	|	|	|	0.09
22.250	0.86	0.90	0.032	O	|	|	|	0.09
22.333	0.85	0.89	0.032	O	|	|	|	0.09
22.417	0.84	0.88	0.032	O	|	|	|	0.09
22.500	0.84	0.87	0.032	O	|	|	|	0.09
22.583	0.83	0.87	0.031	O	|	|	|	0.09
22.667	0.82	0.86	0.031	O	|	|	|	0.09
22.750	0.82	0.85	0.031	O	|	|	|	0.08
22.833	0.81	0.85	0.031	O	|	|	|	0.08
22.917	0.81	0.84	0.030	O	|	|	|	0.08
23.000	0.80	0.83	0.030	O	|	|	|	0.08
23.083	0.79	0.83	0.030	O	|	|	|	0.08
23.167	0.79	0.82	0.030	O	|	|	|	0.08
23.250	0.78	0.81	0.029	O	|	|	|	0.08
23.333	0.78	0.81	0.029	O	|	|	|	0.08
23.417	0.77	0.80	0.029	O	|	|	|	0.08
23.500	0.77	0.80	0.029	O	|	|	|	0.08
23.583	0.76	0.79	0.029	O	|	|	|	0.08
23.667	0.76	0.79	0.028	O	|	|	|	0.08
23.750	0.75	0.78	0.028	O	|	|	|	0.08
23.833	0.75	0.77	0.028	O	|	|	|	0.08
23.917	0.74	0.77	0.028	O	|	|	|	0.08
24.000	0.74	0.76	0.028	O	|	|	|	0.08
24.083	0.72	0.76	0.027	O	|	|	|	0.08
24.167	0.64	0.74	0.027	O	|	|	|	0.07
24.250	0.48	0.71	0.026	O	|	|	|	0.07
24.333	0.28	0.65	0.024	O	|	|	|	0.06
24.417	0.14	0.58	0.021	O	|	|	|	0.06
24.500	0.06	0.50	0.018	O	|	|	|	0.05
24.583	0.03	0.42	0.015	O	|	|	|	0.04
24.667	0.01	0.35	0.013	O	|	|	|	0.03
24.750	0.01	0.29	0.010	O	|	|	|	0.03
24.833	0.00	0.24	0.009	O	|	|	|	0.02
24.917	0.00	0.20	0.007	O	|	|	|	0.02
25.000	0.00	0.16	0.006	O	|	|	|	0.02
25.083	0.00	0.14	0.005	O	|	|	|	0.01
25.167	0.00	0.11	0.004	O	|	|	|	0.01
25.250	0.00	0.09	0.003	O	|	|	|	0.01
25.333	0.00	0.08	0.003	O	|	|	|	0.01
25.417	0.00	0.06	0.002	O	|	|	|	0.01
25.500	0.00	0.05	0.002	O	|	|	|	0.01
25.583	0.00	0.04	0.002	O	|	|	|	0.00
25.667	0.00	0.04	0.001	O	|	|	|	0.00
25.750	0.00	0.03	0.001	O	|	|	|	0.00
25.833	0.00	0.02	0.001	O	|	|	|	0.00
25.917	0.00	0.02	0.001	O	|	|	|	0.00
26.000	0.00	0.02	0.001	O	|	|	|	0.00
26.083	0.00	0.01	0.000	O	|	|	|	0.00
26.167	0.00	0.01	0.000	O	|	|	|	0.00
26.250	0.00	0.01	0.000	O	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 315
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 17.021 (CFS)
Total volume = 3.707 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 07/13/26

Program License Serial Number 6427

********** HYDROGRAPH INFORMATION **********

From study/file name: pplduh25.rte
**********HYDROGRAPH DATA**********
Number of intervals = 298
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 43.784 (CFS)
Total volume = 5.817 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 100.000 to Point/Station 110.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 298
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.200	0.073	2.020	0.066	0.080
0.400	0.147	5.500	0.128	0.166
0.600	0.223	6.090	0.202	0.244
1.500	0.582	19.250	0.516	0.648
1.600	0.624	20.190	0.554	0.694
2.100	0.835	24.350	0.751	0.919
2.600	1.055	27.900	0.959	1.151
3.600	1.518	29.540	1.416	1.620

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	10.9	21.89	32.84	43.78	Depth (Ft.)
0.083	0.03	0.00	0.000	O	|	|	|	|	0.00
0.167	0.17	0.02	0.001	O	|	|	|	|	0.00
0.250	0.44	0.07	0.003	O	|	|	|	|	0.01
0.333	0.78	0.16	0.006	O	|	|	|	|	0.02
0.417	1.00	0.29	0.011	O	|	|	|	|	0.03
0.500	1.11	0.42	0.015	O	|	|	|	|	0.04
0.583	1.16	0.55	0.020	O	|	|	|	|	0.05
0.667	1.18	0.66	0.024	O	|	|	|	|	0.06
0.750	1.19	0.75	0.027	O	|	|	|	|	0.07
0.833	1.20	0.83	0.030	O	|	|	|	|	0.08

0.917	1.21	0.89	0.032	O				0.09
1.000	1.22	0.95	0.034	O				0.09
1.083	1.22	1.00	0.036	O				0.10
1.167	1.22	1.04	0.037	O				0.10
1.250	1.23	1.07	0.039	O				0.11
1.333	1.23	1.10	0.040	O				0.11
1.417	1.23	1.12	0.040	O				0.11
1.500	1.24	1.14	0.041	O				0.11
1.583	1.24	1.16	0.042	O				0.11
1.667	1.25	1.17	0.042	O				0.12
1.750	1.25	1.19	0.043	O				0.12
1.833	1.25	1.20	0.043	O				0.12
1.917	1.26	1.21	0.044	O				0.12
2.000	1.26	1.22	0.044	O				0.12
2.083	1.27	1.23	0.044	O				0.12
2.167	1.27	1.23	0.045	O				0.12
2.250	1.28	1.24	0.045	O				0.12
2.333	1.28	1.25	0.045	O				0.12
2.417	1.28	1.25	0.045	O				0.12
2.500	1.29	1.26	0.045	O				0.12
2.583	1.29	1.26	0.046	O				0.13
2.667	1.30	1.27	0.046	O				0.13
2.750	1.30	1.27	0.046	O				0.13
2.833	1.31	1.28	0.046	O				0.13
2.917	1.31	1.28	0.046	O				0.13
3.000	1.32	1.29	0.047	O				0.13
3.083	1.32	1.29	0.047	O				0.13
3.167	1.32	1.30	0.047	O				0.13
3.250	1.33	1.30	0.047	O				0.13
3.333	1.33	1.31	0.047	O				0.13
3.417	1.34	1.31	0.047	O				0.13
3.500	1.34	1.32	0.048	O				0.13
3.583	1.35	1.32	0.048	O				0.13
3.667	1.35	1.33	0.048	O				0.13
3.750	1.36	1.33	0.048	O				0.13
3.833	1.36	1.34	0.048	O				0.13
3.917	1.37	1.34	0.049	OI				0.13
4.000	1.37	1.35	0.049	OI				0.13
4.083	1.38	1.35	0.049	OI				0.13
4.167	1.38	1.36	0.049	OI				0.13
4.250	1.39	1.36	0.049	OI				0.13
4.333	1.40	1.37	0.049	|O				0.14
4.417	1.40	1.37	0.050	|O				0.14
4.500	1.41	1.38	0.050	|O				0.14
4.583	1.41	1.38	0.050	|O				0.14
4.667	1.42	1.39	0.050	|O				0.14
4.750	1.42	1.39	0.050	|O				0.14
4.833	1.43	1.40	0.051	|O				0.14
4.917	1.44	1.41	0.051	|O				0.14
5.000	1.44	1.41	0.051	|O				0.14
5.083	1.45	1.42	0.051	|O				0.14
5.167	1.45	1.42	0.051	|O				0.14
5.250	1.46	1.43	0.052	|O				0.14
5.333	1.47	1.43	0.052	|O				0.14
5.417	1.47	1.44	0.052	|O				0.14
5.500	1.48	1.45	0.052	|O				0.14
5.583	1.48	1.45	0.052	|O				0.14
5.667	1.49	1.46	0.053	|O				0.14
5.750	1.50	1.46	0.053	|O				0.15
5.833	1.50	1.47	0.053	|O				0.15
5.917	1.51	1.48	0.053	|O				0.15
6.000	1.52	1.48	0.054	|O				0.15
6.083	1.52	1.49	0.054	|O				0.15
6.167	1.53	1.50	0.054	|O				0.15
6.250	1.54	1.50	0.054	|O				0.15
6.333	1.55	1.51	0.055	|O				0.15
6.417	1.55	1.52	0.055	|O				0.15
6.500	1.56	1.52	0.055	|O				0.15
6.583	1.57	1.53	0.055	|O				0.15
6.667	1.58	1.54	0.056	|O				0.15
6.750	1.58	1.55	0.056	|O				0.15
6.833	1.59	1.55	0.056	|O				0.15
6.917	1.60	1.56	0.056	|O				0.15
7.000	1.61	1.57	0.057	|O				0.16
7.083	1.62	1.58	0.057	|O				0.16
7.167	1.62	1.58	0.057	|O				0.16
7.250	1.63	1.59	0.057	|O				0.16
7.333	1.64	1.60	0.058	|O				0.16

7.417	1.65	1.61	0.058	O				0.16
7.500	1.66	1.61	0.058	O				0.16
7.583	1.67	1.62	0.059	O				0.16
7.667	1.68	1.63	0.059	O				0.16
7.750	1.68	1.64	0.059	O				0.16
7.833	1.69	1.65	0.060	O				0.16
7.917	1.70	1.66	0.060	O				0.16
8.000	1.71	1.67	0.060	O				0.16
8.083	1.72	1.68	0.061	O				0.17
8.167	1.73	1.68	0.061	O				0.17
8.250	1.74	1.69	0.061	O				0.17
8.333	1.75	1.70	0.062	O				0.17
8.417	1.76	1.71	0.062	O				0.17
8.500	1.77	1.72	0.062	O				0.17
8.583	1.78	1.73	0.063	O				0.17
8.667	1.80	1.74	0.063	O				0.17
8.750	1.81	1.75	0.063	O				0.17
8.833	1.82	1.76	0.064	O				0.17
8.917	1.83	1.77	0.064	O				0.18
9.000	1.84	1.78	0.064	O				0.18
9.083	1.85	1.80	0.065	O				0.18
9.167	1.86	1.81	0.065	O				0.18
9.250	1.88	1.82	0.066	O				0.18
9.333	1.89	1.83	0.066	O				0.18
9.417	1.90	1.84	0.067	O				0.18
9.500	1.92	1.85	0.067	O				0.18
9.583	1.93	1.86	0.067	O				0.18
9.667	1.94	1.88	0.068	O				0.19
9.750	1.96	1.89	0.068	O				0.19
9.833	1.97	1.90	0.069	O				0.19
9.917	1.98	1.92	0.069	O				0.19
10.000	2.00	1.93	0.070	O				0.19
10.083	2.01	1.94	0.070	O				0.19
10.167	2.03	1.96	0.071	O				0.19
10.250	2.04	1.97	0.071	O				0.20
10.333	2.06	1.98	0.072	O				0.20
10.417	2.08	2.00	0.072	O				0.20
10.500	2.09	2.01	0.073	O				0.20
10.583	2.11	2.04	0.073	O				0.20
10.667	2.13	2.06	0.074	O				0.20
10.750	2.15	2.08	0.074	O				0.20
10.833	2.16	2.10	0.075	O				0.20
10.917	2.18	2.12	0.075	O				0.21
11.000	2.20	2.14	0.076	O				0.21
11.083	2.22	2.16	0.076	O				0.21
11.167	2.24	2.18	0.076	O				0.21
11.250	2.26	2.20	0.077	O				0.21
11.333	2.28	2.22	0.077	O				0.21
11.417	2.31	2.24	0.078	O				0.21
11.500	2.33	2.26	0.078	O				0.21
11.583	2.35	2.28	0.079	O				0.22
11.667	2.37	2.31	0.079	O				0.22
11.750	2.40	2.33	0.080	O				0.22
11.833	2.42	2.35	0.080	O				0.22
11.917	2.45	2.37	0.081	O				0.22
12.000	2.48	2.40	0.081	O				0.22
12.083	2.51	2.43	0.082	O				0.22
12.167	2.60	2.46	0.082	O				0.23
12.250	2.74	2.52	0.084	OI				0.23
12.333	2.92	2.61	0.085	OI				0.23
12.417	3.04	2.71	0.088	OI				0.24
12.500	3.11	2.81	0.090	O				0.25
12.583	3.17	2.90	0.092	O				0.25
12.667	3.21	2.98	0.093	O				0.26
12.750	3.25	3.05	0.095	O				0.26
12.833	3.29	3.11	0.096	O				0.26
12.917	3.33	3.16	0.097	O				0.27
13.000	3.37	3.22	0.098	O				0.27
13.083	3.41	3.26	0.099	O				0.27
13.167	3.45	3.31	0.100	O				0.27
13.250	3.49	3.35	0.101	O				0.28
13.333	3.54	3.40	0.102	O				0.28
13.417	3.59	3.45	0.103	O				0.28
13.500	3.64	3.49	0.104	O				0.28
13.583	3.69	3.54	0.105	O				0.29
13.667	3.75	3.59	0.106	O				0.29
13.750	3.80	3.64	0.107	O				0.29
13.833	3.87	3.70	0.109	O				0.30

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13.917    3.93    3.75      0.110  | O     |       |       |       |     0.30
14.000    4.00    3.81      0.111  | O     |       |       |       |     0.30
14.083    4.07    3.87      0.112  | O     |       |       |       |     0.31
14.167    4.14    3.94      0.114  | OI    |       |       |       |     0.31
14.250    4.22    4.01      0.115  | OI    |       |       |       |     0.31
14.333    4.31    4.08      0.117  | OI    |       |       |       |     0.32
14.417    4.40    4.15      0.118  |  O    |       |       |       |     0.32
14.500    4.50    4.24      0.120  |  O    |       |       |       |     0.33
14.583    4.60    4.32      0.122  |  O    |       |       |       |     0.33
14.667    4.71    4.41      0.124  |  O    |       |       |       |     0.34
14.750    4.82    4.51      0.126  |  O    |       |       |       |     0.34
14.833    4.95    4.62      0.128  |  O    |       |       |       |     0.35
14.917    5.09    4.73      0.131  |  O    |       |       |       |     0.36
15.000    5.25    4.85      0.133  |  O    |       |       |       |     0.36
15.083    5.41    4.99      0.136  |  O    |       |       |       |     0.37
15.167    5.60    5.13      0.139  |  OI   |       |       |       |     0.38
15.250    5.80    5.29      0.143  |  OI   |       |       |       |     0.39
15.333    6.04    5.47      0.146  |  OI   |       |       |       |     0.40
15.417    6.26    5.53      0.151  |   O   |       |       |       |     0.41
15.500    6.36    5.57      0.156  |   O   |       |       |       |     0.42
15.583    6.33    5.61      0.161  |   O   |       |       |       |     0.44
15.667    6.27    5.65      0.166  |   O   |       |       |       |     0.45
15.750    6.48    5.68      0.171  |   O   |       |       |       |     0.46
15.833    7.02    5.74      0.178  |   OI  |       |       |       |     0.48
15.917    7.97    5.83      0.190  |   OI  |       |       |       |     0.51
16.000   10.01    6.00      0.211  |   O  I|       |       |       |     0.57
16.083   15.74    7.23      0.254  |    O  |  I    |       |       |     0.68
16.167   28.61   10.58      0.345  |      O|       |   I   |       |     0.91
16.250   40.40   15.94      0.492  |       |  O    |       |    I  |     1.27
16.333   43.78   20.80      0.655  |       |      O|       |      I|     1.67
16.417   30.12   22.86      0.759  |       |       O     I |       |     1.92
16.500   18.62   23.05      0.769  |       |    I  O       |       |     1.94
16.583   12.35   22.09      0.720  |       |I      O       |       |     1.83
16.667    8.75   20.62      0.646  |     I |      O|       |       |     1.65
16.750    7.28   18.65      0.566  |    I  |    O  |       |       |     1.46
16.833    6.73   16.04      0.495  |   I   |  O    |       |       |     1.28
16.917    6.01   13.88      0.435  |   I   | O     |       |       |     1.13
17.000    5.28   12.03      0.385  |  I    O       |       |       |     1.01
17.083    4.97   10.48      0.343  |  I   O|       |       |       |     0.90
17.167    4.72    9.22      0.308  |  I  O |       |       |       |     0.81
17.250    4.51    8.19      0.280  |  I O  |       |       |       |     0.74
17.333    4.31    7.34      0.257  |  I O  |       |       |       |     0.69
17.417    4.15    6.64      0.238  |  IO   |       |       |       |     0.64
17.500    4.00    6.08      0.222  | I O   |       |       |       |     0.60
17.583    3.87    5.97      0.208  | I O   |       |       |       |     0.56
17.667    3.75    5.86      0.193  | I O   |       |       |       |     0.52
17.750    3.64    5.75      0.179  | I O   |       |       |       |     0.48
17.833    3.54    5.63      0.164  | I O   |       |       |       |     0.45
17.917    3.45    5.52      0.150  | I O   |       |       |       |     0.41
18.000    3.36    5.03      0.137  | IO    |       |       |       |     0.37
18.083    3.27    4.56      0.127  | IO    |       |       |       |     0.35
18.167    3.14    4.18      0.119  | IO    |       |       |       |     0.32
18.250    2.96    3.87      0.112  | O     |       |       |       |     0.31
18.333    2.76    3.58      0.106  | O     |       |       |       |     0.29
18.417    2.61    3.33      0.101  |IO     |       |       |       |     0.28
18.500    2.51    3.12      0.096  |IO     |       |       |       |     0.26
18.583    2.44    2.94      0.093  |IO     |       |       |       |     0.25
18.667    2.38    2.79      0.089  |IO     |       |       |       |     0.24
18.750    2.33    2.67      0.087  |O      |       |       |       |     0.24
18.833    2.28    2.57      0.085  |O      |       |       |       |     0.23
18.917    2.24    2.48      0.083  |O      |       |       |       |     0.23
19.000    2.20    2.41      0.081  |O      |       |       |       |     0.22
19.083    2.16    2.35      0.080  |O      |       |       |       |     0.22
19.167    2.13    2.29      0.079  |O      |       |       |       |     0.22
19.250    2.09    2.24      0.078  |O      |       |       |       |     0.21
19.333    2.06    2.19      0.077  |O      |       |       |       |     0.21
19.417    2.03    2.15      0.076  |O      |       |       |       |     0.21
19.500    2.00    2.11      0.075  |O      |       |       |       |     0.21
19.583    1.97    2.08      0.074  |O      |       |       |       |     0.20
19.667    1.94    2.04      0.073  |O      |       |       |       |     0.20
19.750    1.91    2.01      0.073  |O      |       |       |       |     0.20
19.833    1.89    1.99      0.072  |O      |       |       |       |     0.20
19.917    1.86    1.97      0.071  |O      |       |       |       |     0.20
20.000    1.84    1.95      0.071  |O      |       |       |       |     0.19
20.083    1.82    1.93      0.070  |O      |       |       |       |     0.19
20.167    1.79    1.91      0.069  |O      |       |       |       |     0.19
20.250    1.77    1.89      0.068  |O      |       |       |       |     0.19
20.333    1.75    1.87      0.067  |O      |       |       |       |     0.18
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20.417	1.73	1.84	0.067	|O	|	|	|	0.18
20.500	1.71	1.82	0.066	|O	|	|	|	0.18
20.583	1.69	1.80	0.065	|O	|	|	|	0.18
20.667	1.67	1.78	0.064	|O	|	|	|	0.18
20.750	1.66	1.76	0.064	|O	|	|	|	0.17
20.833	1.64	1.74	0.063	|O	|	|	|	0.17
20.917	1.62	1.72	0.062	|O	|	|	|	0.17
21.000	1.61	1.70	0.062	|O	|	|	|	0.17
21.083	1.59	1.68	0.061	|O	|	|	|	0.17
21.167	1.57	1.67	0.060	|O	|	|	|	0.17
21.250	1.56	1.65	0.060	|O	|	|	|	0.16
21.333	1.55	1.63	0.059	|O	|	|	|	0.16
21.417	1.53	1.62	0.058	|O	|	|	|	0.16
21.500	1.52	1.60	0.058	|O	|	|	|	0.16
21.583	1.50	1.58	0.057	|O	|	|	|	0.16
21.667	1.49	1.57	0.057	|O	|	|	|	0.16
21.750	1.48	1.55	0.056	|O	|	|	|	0.15
21.833	1.46	1.54	0.056	|O	|	|	|	0.15
21.917	1.45	1.53	0.055	|O	|	|	|	0.15
22.000	1.44	1.51	0.055	|O	|	|	|	0.15
22.083	1.43	1.50	0.054	|O	|	|	|	0.15
22.167	1.42	1.49	0.054	|O	|	|	|	0.15
22.250	1.41	1.47	0.053	|O	|	|	|	0.15
22.333	1.39	1.46	0.053	|O	|	|	|	0.14
22.417	1.38	1.45	0.052	|O	|	|	|	0.14
22.500	1.37	1.44	0.052	|O	|	|	|	0.14
22.583	1.36	1.42	0.051	IO	|	|	|	0.14
22.667	1.35	1.41	0.051	IO	|	|	|	0.14
22.750	1.34	1.40	0.051	IO	|	|	|	0.14
22.833	1.33	1.39	0.050	IO	|	|	|	0.14
22.917	1.32	1.38	0.050	IO	|	|	|	0.14
23.000	1.31	1.37	0.049	IO	|	|	|	0.14
23.083	1.31	1.36	0.049	O	|	|	|	0.13
23.167	1.30	1.35	0.049	O	|	|	|	0.13
23.250	1.29	1.34	0.048	O	|	|	|	0.13
23.333	1.28	1.33	0.048	O	|	|	|	0.13
23.417	1.27	1.32	0.048	O	|	|	|	0.13
23.500	1.26	1.31	0.047	O	|	|	|	0.13
23.583	1.25	1.30	0.047	O	|	|	|	0.13
23.667	1.25	1.29	0.047	O	|	|	|	0.13
23.750	1.24	1.28	0.046	O	|	|	|	0.13
23.833	1.23	1.27	0.046	O	|	|	|	0.13
23.917	1.22	1.27	0.046	O	|	|	|	0.13
24.000	1.22	1.26	0.045	O	|	|	|	0.12
24.083	1.18	1.25	0.045	O	|	|	|	0.12
24.167	1.03	1.22	0.044	O	|	|	|	0.12
24.250	0.75	1.17	0.042	O	|	|	|	0.12
24.333	0.41	1.06	0.038	O	|	|	|	0.11
24.417	0.19	0.93	0.034	O	|	|	|	0.09
24.500	0.09	0.79	0.029	O	|	|	|	0.08
24.583	0.04	0.67	0.024	O	|	|	|	0.07
24.667	0.02	0.56	0.020	O	|	|	|	0.05
24.750	0.01	0.46	0.017	O	|	|	|	0.05
24.833	0.00	0.38	0.014	O	|	|	|	0.04
24.917	0.00	0.32	0.011	O	|	|	|	0.03
25.000	0.00	0.26	0.009	O	|	|	|	0.03
25.083	0.00	0.22	0.008	O	|	|	|	0.02
25.167	0.00	0.18	0.006	O	|	|	|	0.02
25.250	0.00	0.15	0.005	O	|	|	|	0.01
25.333	0.00	0.12	0.004	O	|	|	|	0.01
25.417	0.00	0.10	0.004	O	|	|	|	0.01
25.500	0.00	0.08	0.003	O	|	|	|	0.01
25.583	0.00	0.07	0.002	O	|	|	|	0.01
25.667	0.00	0.06	0.002	O	|	|	|	0.01
25.750	0.00	0.05	0.002	O	|	|	|	0.00
25.833	0.00	0.04	0.001	O	|	|	|	0.00
25.917	0.00	0.03	0.001	O	|	|	|	0.00
26.000	0.00	0.03	0.001	O	|	|	|	0.00
26.083	0.00	0.02	0.001	O	|	|	|	0.00
26.167	0.00	0.02	0.001	O	|	|	|	0.00
26.250	0.00	0.01	0.001	O	|	|	|	0.00
26.333	0.00	0.01	0.000	O	|	|	|	0.00
26.417	0.00	0.01	0.000	O	|	|	|	0.00
26.500	0.00	0.01	0.000	O	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 318

Time interval = 5.0 (Min.)

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                Maximum/Peak flow rate =       23.049 (CFS)
                Total volume =       5.816 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
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FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 07/13/26

Program License Serial Number 6427

********** HYDROGRAPH INFORMATION **********

From study/file name: pplduh100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 297
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 61.027 (CFS)
Total volume = 8.286 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 100.000 to Point/Station 110.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 297
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.200	0.073	2.020	0.066	0.080
0.400	0.147	5.500	0.128	0.166
0.600	0.223	6.090	0.202	0.244
1.500	0.582	19.250	0.516	0.648
1.600	0.624	20.190	0.554	0.694
2.100	0.835	24.350	0.751	0.919
2.600	1.055	27.900	0.959	1.151
3.600	1.518	29.540	1.416	1.620

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	15.3	30.51	45.77	61.03	Depth (Ft.)
0.083	0.05	0.00	0.000	O	|	|	|	|	0.00
0.167	0.28	0.03	0.001	O	|	|	|	|	0.00
0.250	0.72	0.11	0.004	O	|	|	|	|	0.01
0.333	1.24	0.26	0.010	O	|	|	|	|	0.03
0.417	1.53	0.46	0.017	O	|	|	|	|	0.05
0.500	1.67	0.66	0.024	O	|	|	|	|	0.07
0.583	1.74	0.84	0.030	O	|	|	|	|	0.08
0.667	1.76	1.00	0.036	O	|	|	|	|	0.10
0.750	1.78	1.13	0.041	O	|	|	|	|	0.11
0.833	1.79	1.25	0.045	O	|	|	|	|	0.12

0.917	1.79	1.34	0.048	O				0.13
1.000	1.80	1.42	0.051	O				0.14
1.083	1.80	1.49	0.054	O				0.15
1.167	1.81	1.54	0.056	O				0.15
1.250	1.81	1.59	0.057	O				0.16
1.333	1.82	1.63	0.059	O				0.16
1.417	1.83	1.66	0.060	O				0.16
1.500	1.83	1.69	0.061	O				0.17
1.583	1.84	1.72	0.062	O				0.17
1.667	1.84	1.74	0.063	O				0.17
1.750	1.85	1.76	0.063	O				0.17
1.833	1.85	1.77	0.064	O				0.18
1.917	1.86	1.79	0.065	O				0.18
2.000	1.87	1.80	0.065	O				0.18
2.083	1.87	1.81	0.066	O				0.18
2.167	1.88	1.82	0.066	O				0.18
2.250	1.88	1.83	0.066	O				0.18
2.333	1.89	1.84	0.067	O				0.18
2.417	1.90	1.85	0.067	O				0.18
2.500	1.90	1.86	0.067	O				0.18
2.583	1.91	1.87	0.068	OI				0.18
2.667	1.92	1.88	0.068	OI				0.19
2.750	1.92	1.88	0.068	OI				0.19
2.833	1.93	1.89	0.068	OI				0.19
2.917	1.94	1.90	0.069	OI				0.19
3.000	1.94	1.90	0.069	OI				0.19
3.083	1.95	1.91	0.069	|O				0.19
3.167	1.96	1.92	0.069	|O				0.19
3.250	1.96	1.93	0.070	|O				0.19
3.333	1.97	1.93	0.070	|O				0.19
3.417	1.98	1.94	0.070	|O				0.19
3.500	1.98	1.95	0.070	|O				0.19
3.583	1.99	1.95	0.071	|O				0.19
3.667	2.00	1.96	0.071	|O				0.19
3.750	2.00	1.97	0.071	|O				0.19
3.833	2.01	1.97	0.071	|O				0.20
3.917	2.02	1.98	0.072	|O				0.20
4.000	2.03	1.99	0.072	|O				0.20
4.083	2.03	2.00	0.072	|O				0.20
4.167	2.04	2.00	0.072	|O				0.20
4.250	2.05	2.01	0.073	|O				0.20
4.333	2.06	2.02	0.073	|O				0.20
4.417	2.07	2.03	0.073	|O				0.20
4.500	2.07	2.04	0.073	|O				0.20
4.583	2.08	2.05	0.074	|O				0.20
4.667	2.09	2.06	0.074	|O				0.20
4.750	2.10	2.07	0.074	|O				0.20
4.833	2.11	2.08	0.074	|O				0.20
4.917	2.11	2.09	0.074	|O				0.20
5.000	2.12	2.10	0.075	|O				0.20
5.083	2.13	2.10	0.075	|O				0.20
5.167	2.14	2.11	0.075	|O				0.21
5.250	2.15	2.12	0.075	|O				0.21
5.333	2.16	2.13	0.075	|O				0.21
5.417	2.17	2.14	0.076	|O				0.21
5.500	2.18	2.15	0.076	|O				0.21
5.583	2.19	2.16	0.076	|O				0.21
5.667	2.20	2.17	0.076	|O				0.21
5.750	2.20	2.18	0.076	|O				0.21
5.833	2.21	2.19	0.077	|O				0.21
5.917	2.22	2.19	0.077	|O				0.21
6.000	2.23	2.20	0.077	|O				0.21
6.083	2.24	2.21	0.077	|O				0.21
6.167	2.25	2.22	0.077	|O				0.21
6.250	2.26	2.23	0.078	|O				0.21
6.333	2.27	2.24	0.078	|O				0.21
6.417	2.28	2.25	0.078	|O				0.21
6.500	2.30	2.26	0.078	|O				0.21
6.583	2.31	2.27	0.078	|O				0.21
6.667	2.32	2.28	0.079	|O				0.22
6.750	2.33	2.29	0.079	|O				0.22
6.833	2.34	2.31	0.079	|O				0.22
6.917	2.35	2.32	0.079	|O				0.22
7.000	2.36	2.33	0.080	|O				0.22
7.083	2.37	2.34	0.080	|O				0.22
7.167	2.39	2.35	0.080	|O				0.22
7.250	2.40	2.36	0.080	|O				0.22
7.333	2.41	2.37	0.081	|O				0.22

7.417	2.42	2.39	0.081	O				0.22
7.500	2.43	2.40	0.081	O				0.22
7.583	2.45	2.41	0.081	O				0.22
7.667	2.46	2.42	0.082	O				0.22
7.750	2.47	2.43	0.082	O				0.22
7.833	2.49	2.45	0.082	O				0.22
7.917	2.50	2.46	0.082	O				0.23
8.000	2.51	2.47	0.083	O				0.23
8.083	2.53	2.49	0.083	O				0.23
8.167	2.54	2.50	0.083	O				0.23
8.250	2.56	2.51	0.083	O				0.23
8.333	2.57	2.53	0.084	O				0.23
8.417	2.59	2.54	0.084	O				0.23
8.500	2.60	2.56	0.084	O				0.23
8.583	2.62	2.57	0.085	O				0.23
8.667	2.63	2.59	0.085	O				0.23
8.750	2.65	2.60	0.085	O				0.23
8.833	2.66	2.62	0.086	O				0.23
8.917	2.68	2.63	0.086	O				0.24
9.000	2.70	2.65	0.086	O				0.24
9.083	2.71	2.66	0.087	O				0.24
9.167	2.73	2.68	0.087	O				0.24
9.250	2.75	2.70	0.087	O				0.24
9.333	2.77	2.71	0.088	O				0.24
9.417	2.78	2.73	0.088	O				0.24
9.500	2.80	2.75	0.088	O				0.24
9.583	2.82	2.77	0.089	O				0.24
9.667	2.84	2.78	0.089	O				0.24
9.750	2.86	2.80	0.090	O				0.25
9.833	2.88	2.82	0.090	O				0.25
9.917	2.90	2.84	0.090	O				0.25
10.000	2.92	2.86	0.091	O				0.25
10.083	2.94	2.88	0.091	O				0.25
10.167	2.97	2.90	0.092	O				0.25
10.250	2.99	2.92	0.092	O				0.25
10.333	3.01	2.94	0.093	O				0.25
10.417	3.03	2.97	0.093	O				0.25
10.500	3.06	2.99	0.094	O				0.26
10.583	3.08	3.01	0.094	O				0.26
10.667	3.11	3.04	0.095	O				0.26
10.750	3.13	3.06	0.095	O				0.26
10.833	3.16	3.08	0.096	O				0.26
10.917	3.19	3.11	0.096	O				0.26
11.000	3.21	3.13	0.097	O				0.26
11.083	3.24	3.16	0.097	O				0.27
11.167	3.27	3.19	0.098	O				0.27
11.250	3.30	3.21	0.098	O				0.27
11.333	3.33	3.24	0.099	O				0.27
11.417	3.36	3.27	0.100	O				0.27
11.500	3.39	3.30	0.100	O				0.27
11.583	3.42	3.33	0.101	O				0.28
11.667	3.46	3.36	0.102	O				0.28
11.750	3.49	3.39	0.102	O				0.28
11.833	3.53	3.43	0.103	O				0.28
11.917	3.56	3.46	0.104	O				0.28
12.000	3.60	3.49	0.104	O				0.28
12.083	3.65	3.53	0.105	O				0.29
12.167	3.75	3.58	0.106	O				0.29
12.250	3.90	3.65	0.108	OI				0.29
12.333	4.07	3.74	0.110	OI				0.30
12.417	4.19	3.85	0.112	O				0.31
12.500	4.27	3.95	0.114	O				0.31
12.583	4.33	4.05	0.116	O				0.32
12.667	4.38	4.14	0.118	O				0.32
12.750	4.43	4.21	0.120	O				0.33
12.833	4.49	4.28	0.121	O				0.33
12.917	4.54	4.35	0.122	O				0.33
13.000	4.60	4.41	0.124	O				0.34
13.083	4.66	4.47	0.125	O				0.34
13.167	4.72	4.53	0.126	O				0.34
13.250	4.78	4.59	0.128	O				0.35
13.333	4.85	4.65	0.129	O				0.35
13.417	4.92	4.72	0.130	O				0.36
13.500	4.99	4.78	0.132	O				0.36
13.583	5.06	4.85	0.133	O				0.36
13.667	5.14	4.92	0.135	O				0.37
13.750	5.23	5.00	0.136	O				0.37
13.833	5.31	5.07	0.138	O				0.38

13.917	5.40	5.15	0.140	O					0.38
14.000	5.50	5.24	0.141	O					0.38
14.083	5.60	5.32	0.143	O					0.39
14.167	5.71	5.42	0.145	O					0.40
14.250	5.83	5.50	0.147	OI					0.40
14.333	5.95	5.52	0.150	OI					0.41
14.417	6.08	5.55	0.153	OI					0.42
14.500	6.22	5.58	0.157	OI					0.43
14.583	6.37	5.62	0.162	OI					0.44
14.667	6.53	5.66	0.168	OI					0.45
14.750	6.70	5.71	0.174	OI					0.47
14.833	6.88	5.77	0.181	O					0.49
14.917	7.08	5.83	0.189	O					0.51
15.000	7.31	5.90	0.199	O					0.54
15.083	7.55	5.98	0.209	O					0.56
15.167	7.83	6.07	0.220	OI					0.59
15.250	8.13	6.43	0.232	OI					0.62
15.333	8.47	6.85	0.244	OI					0.65
15.417	8.80	7.25	0.255	OI					0.68
15.500	8.98	7.62	0.265	OI					0.70
15.583	8.97	7.92	0.273	O					0.73
15.667	8.99	8.16	0.279	O					0.74
15.750	9.41	8.39	0.286	O					0.76
15.833	10.31	8.72	0.295	OI					0.78
15.917	11.89	9.25	0.309	O I					0.82
16.000	15.26	10.22	0.336	O I					0.88
16.083	24.04	12.34	0.393	O	I				1.03
16.167	43.07	17.09	0.523	O		I			1.35
16.250	59.32	22.47	0.739		O			I	1.87
16.333	61.03	26.76	0.984		O			I	2.44
16.417	39.69	28.21	1.142		O	I			2.79
16.500	24.12	28.30	1.167		I O				2.84
16.583	15.94	28.10	1.111	I	O				2.72
16.667	11.48	27.25	1.015	I	O				2.51
16.750	9.99	25.51	0.907	I	O				2.26
16.833	8.77	23.70	0.802	I	O				2.02
16.917	7.73	21.73	0.702	I	O				1.79
17.000	7.21	19.89	0.610	I	O				1.57
17.083	6.80	17.36	0.530	I	O				1.37
17.167	6.45	14.95	0.465	I	O				1.21
17.250	6.15	13.01	0.412	I	O				1.07
17.333	5.88	11.45	0.369	I	O				0.97
17.417	5.65	10.17	0.334	I	O				0.88
17.500	5.45	9.14	0.306	I O					0.81
17.583	5.26	8.29	0.283	I O					0.75
17.667	5.10	7.59	0.264	IO					0.70
17.750	4.95	7.02	0.248	IO					0.66
17.833	4.81	6.54	0.235	IO					0.63
17.917	4.68	6.14	0.224	IO					0.60
18.000	4.57	6.02	0.214	IO					0.58
18.083	4.45	5.94	0.204	IO					0.55
18.167	4.29	5.86	0.193	IO					0.52
18.250	4.08	5.77	0.182	IO					0.49
18.333	3.87	5.68	0.170	O					0.46
18.417	3.71	5.58	0.157	IO					0.43
18.500	3.60	5.40	0.145	IO					0.39
18.583	3.51	4.89	0.134	IO					0.36
18.667	3.44	4.49	0.126	IO					0.34
18.750	3.37	4.19	0.119	IO					0.32
18.833	3.31	3.95	0.114	IO					0.31
18.917	3.25	3.77	0.110	O					0.30
19.000	3.20	3.61	0.107	O					0.29
19.083	3.14	3.49	0.104	O					0.28
19.167	3.09	3.39	0.102	O					0.28
19.250	3.04	3.30	0.100	O					0.27
19.333	3.00	3.22	0.099	O					0.27
19.417	2.95	3.15	0.097	O					0.27
19.500	2.91	3.09	0.096	O					0.26
19.583	2.87	3.03	0.095	O					0.26
19.667	2.83	2.98	0.093	O					0.26
19.750	2.79	2.93	0.092	O					0.25
19.833	2.75	2.89	0.091	O					0.25
19.917	2.72	2.85	0.091	O					0.25
20.000	2.69	2.81	0.090	O					0.25
20.083	2.65	2.77	0.089	O					0.24
20.167	2.62	2.73	0.088	O					0.24
20.250	2.59	2.70	0.087	O					0.24
20.333	2.56	2.66	0.087	O					0.24

20.417	2.53	2.63	0.086	|O	|	|	|	0.24
20.500	2.50	2.60	0.085	|O	|	|	|	0.23
20.583	2.48	2.57	0.085	|O	|	|	|	0.23
20.667	2.45	2.54	0.084	|O	|	|	|	0.23
20.750	2.43	2.51	0.083	|O	|	|	|	0.23
20.833	2.40	2.48	0.083	|O	|	|	|	0.23
20.917	2.38	2.46	0.082	|O	|	|	|	0.23
21.000	2.35	2.43	0.082	|O	|	|	|	0.22
21.083	2.33	2.41	0.081	|O	|	|	|	0.22
21.167	2.31	2.38	0.081	|O	|	|	|	0.22
21.250	2.29	2.36	0.080	|O	|	|	|	0.22
21.333	2.27	2.34	0.080	|O	|	|	|	0.22
21.417	2.25	2.31	0.079	|O	|	|	|	0.22
21.500	2.23	2.29	0.079	|O	|	|	|	0.22
21.583	2.21	2.27	0.078	|O	|	|	|	0.21
21.667	2.19	2.25	0.078	|O	|	|	|	0.21
21.750	2.17	2.23	0.077	|O	|	|	|	0.21
21.833	2.15	2.21	0.077	|O	|	|	|	0.21
21.917	2.13	2.19	0.077	|O	|	|	|	0.21
22.000	2.12	2.17	0.076	|O	|	|	|	0.21
22.083	2.10	2.16	0.076	|O	|	|	|	0.21
22.167	2.08	2.14	0.076	|O	|	|	|	0.21
22.250	2.07	2.12	0.075	|O	|	|	|	0.21
22.333	2.05	2.10	0.075	|O	|	|	|	0.20
22.417	2.04	2.09	0.074	|O	|	|	|	0.20
22.500	2.02	2.07	0.074	|O	|	|	|	0.20
22.583	2.01	2.06	0.074	|O	|	|	|	0.20
22.667	1.99	2.04	0.073	|O	|	|	|	0.20
22.750	1.98	2.02	0.073	|O	|	|	|	0.20
22.833	1.96	2.01	0.073	|O	|	|	|	0.20
22.917	1.95	2.00	0.072	|O	|	|	|	0.20
23.000	1.94	1.99	0.072	|O	|	|	|	0.20
23.083	1.92	1.98	0.072	|O	|	|	|	0.20
23.167	1.91	1.97	0.071	|O	|	|	|	0.20
23.250	1.90	1.96	0.071	IO	|	|	|	0.19
23.333	1.89	1.95	0.070	IO	|	|	|	0.19
23.417	1.87	1.94	0.070	IO	|	|	|	0.19
23.500	1.86	1.92	0.070	IO	|	|	|	0.19
23.583	1.85	1.91	0.069	IO	|	|	|	0.19
23.667	1.84	1.90	0.069	O	|	|	|	0.19
23.750	1.83	1.89	0.068	O	|	|	|	0.19
23.833	1.82	1.88	0.068	O	|	|	|	0.19
23.917	1.81	1.87	0.067	O	|	|	|	0.18
24.000	1.79	1.85	0.067	O	|	|	|	0.18
24.083	1.74	1.84	0.066	O	|	|	|	0.18
24.167	1.49	1.80	0.065	O	|	|	|	0.18
24.250	1.05	1.71	0.062	O	|	|	|	0.17
24.333	0.53	1.55	0.056	O	|	|	|	0.15
24.417	0.23	1.34	0.049	O	|	|	|	0.13
24.500	0.10	1.14	0.041	O	|	|	|	0.11
24.583	0.04	0.95	0.034	O	|	|	|	0.09
24.667	0.02	0.79	0.029	O	|	|	|	0.08
24.750	0.01	0.66	0.024	O	|	|	|	0.06
24.833	0.00	0.54	0.020	O	|	|	|	0.05
24.917	0.00	0.45	0.016	O	|	|	|	0.04
25.000	0.00	0.37	0.013	O	|	|	|	0.04
25.083	0.00	0.31	0.011	O	|	|	|	0.03
25.167	0.00	0.25	0.009	O	|	|	|	0.02
25.250	0.00	0.21	0.008	O	|	|	|	0.02
25.333	0.00	0.17	0.006	O	|	|	|	0.02
25.417	0.00	0.14	0.005	O	|	|	|	0.01
25.500	0.00	0.12	0.004	O	|	|	|	0.01
25.583	0.00	0.10	0.004	O	|	|	|	0.01
25.667	0.00	0.08	0.003	O	|	|	|	0.01
25.750	0.00	0.07	0.002	O	|	|	|	0.01
25.833	0.00	0.05	0.002	O	|	|	|	0.01
25.917	0.00	0.05	0.002	O	|	|	|	0.00
26.000	0.00	0.04	0.001	O	|	|	|	0.00
26.083	0.00	0.03	0.001	O	|	|	|	0.00
26.167	0.00	0.03	0.001	O	|	|	|	0.00
26.250	0.00	0.02	0.001	O	|	|	|	0.00
26.333	0.00	0.02	0.001	O	|	|	|	0.00
26.417	0.00	0.01	0.001	O	|	|	|	0.00
26.500	0.00	0.01	0.000	O	|	|	|	0.00
26.583	0.00	0.01	0.000	O	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 319

```
                Time interval =    5.0 (Min.)
                Maximum/Peak flow rate =       28.297 (CFS)
                Total volume =       8.286 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
****************************************************************************

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

APPENDIX F

Hydraulic Calculations

Box Full

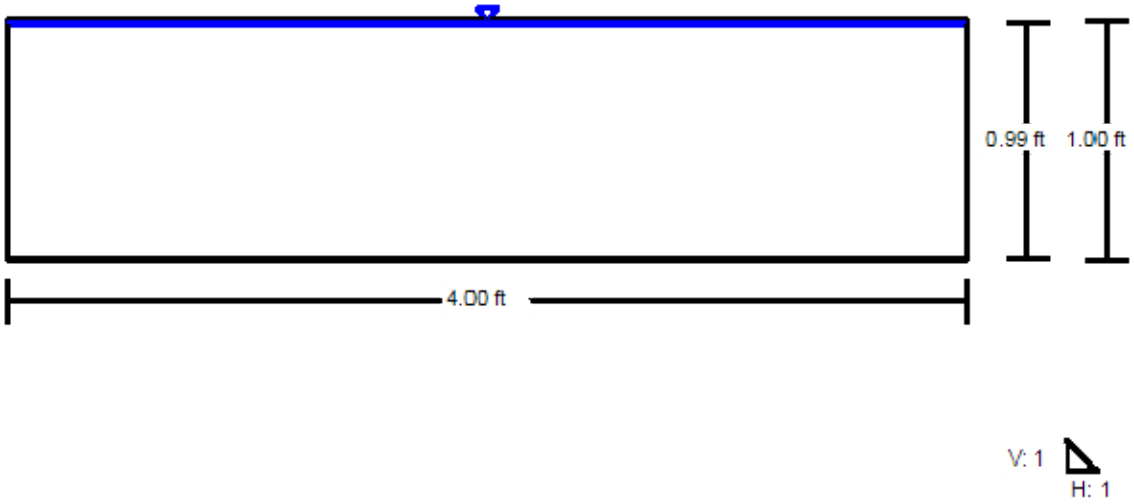
Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.014	
Channel Slope	0.00550	ft/ft
Normal Depth	0.99	ft
Height	1.00	ft
Bottom Width	4.00	ft
Discharge	23.68	ft³/s

Cross Section Image



Down Drain

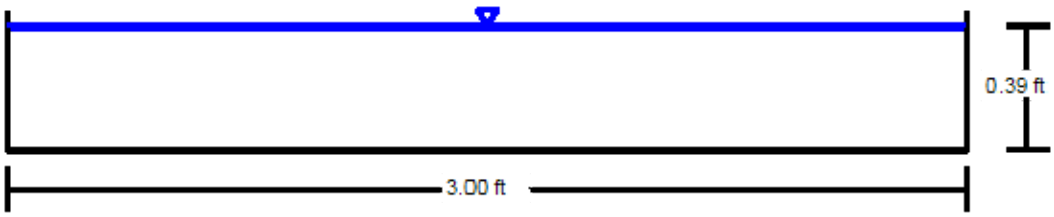
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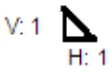
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.33000	ft/ft
Normal Depth	0.39	ft
Bottom Width	3.00	ft
Discharge	30.52	ft³/s

Cross Section Image





Concrete Ditch

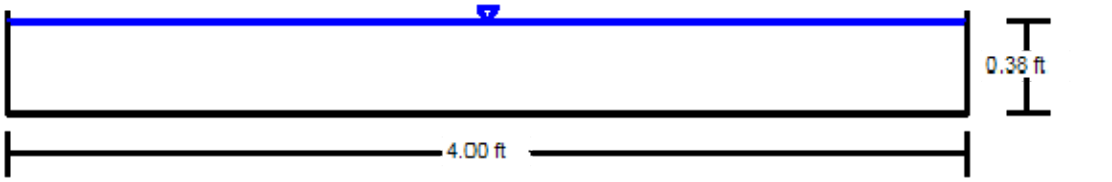
Project Description

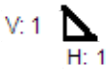
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.015	
Channel Slope	0.00400	ft/ft
Normal Depth	0.38	ft
Bottom Width	4.00	ft
Discharge	4.48	ft³/s

Cross Section Image





Pkwy Drain

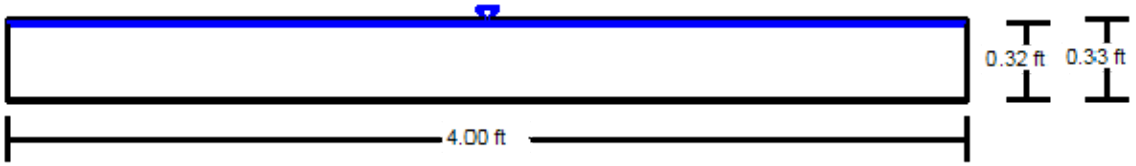
Project Description

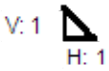
Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.014	
Channel Slope	0.02000	ft/ft
Normal Depth	0.32	ft
Height	0.33	ft
Bottom Width	4.00	ft
Discharge	8.14	ft³/s

Cross Section Image





Catch Basin

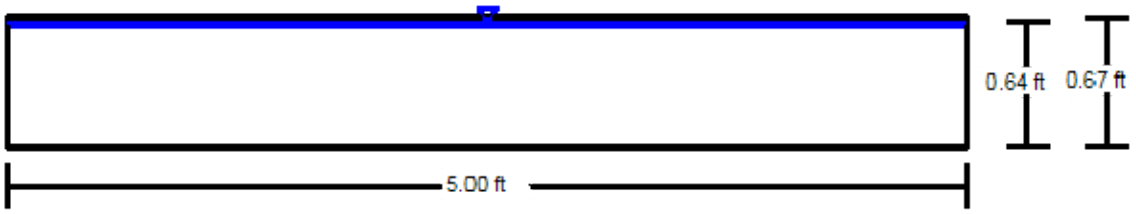
Project Description

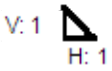
Friction Method	Manning Formula
Solve For	Normal Depth

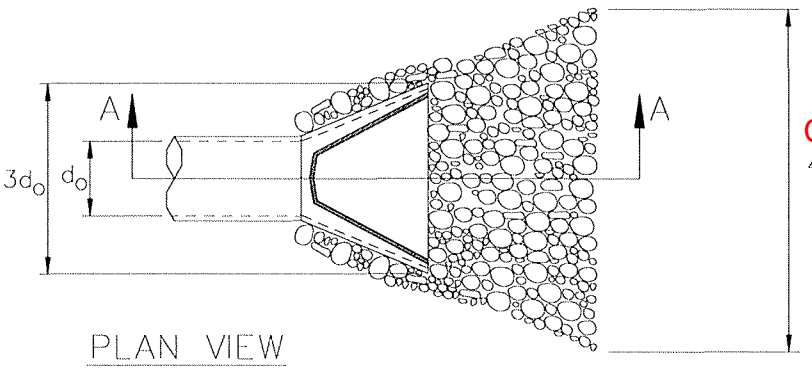
Input Data

Roughness Coefficient	0.014	
Channel Slope	0.02000	ft/ft
Normal Depth	0.64	ft
Height	0.67	ft
Bottom Width	5.00	ft
Discharge	30.52	ft³/s

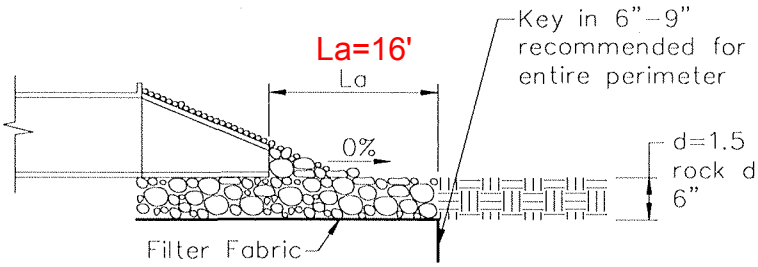
Cross Section Image







PLAN VIEW



SECTION A–A

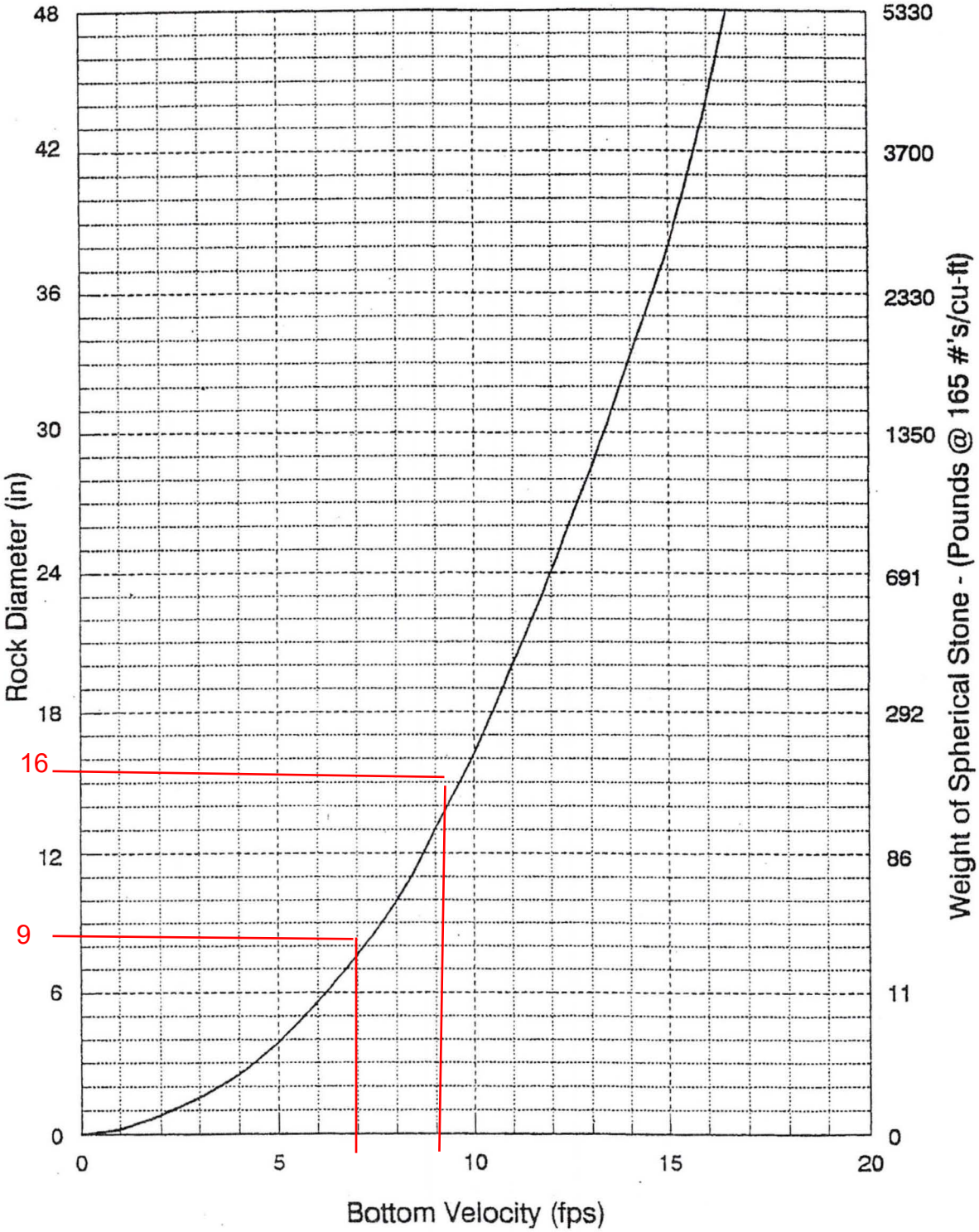
The constructed riprap having dimensions of 16' long x 8' wide x 12" deep & with D50 of 8" met the minimum dimensions recommended by CASQA.

Pipe Diameter inches	Discharge ft³/s	Apron Length, La ft	Rip Rap D_{50} Diameter Min inches
12	5	10	4
	10	13	6
18	10	10	6
	20	16	8
	30	23	12
	40	26	16
24	30	16	8
	40	26	8
	50	26	12
	60	30	16

Design Q=30.5 cfs → Constructed 16' Long Min. 8" Diameter Constructed

For larger or higher flows consult a Registered Civil Engineer
Source: USDA - SCS

RIPRAP ROCK SIZE



For rock with specific gravity = 2.65

Source: Bureau of Reclamation

APPENDIX G

Street Capacity Calculations

Section#1-Q10

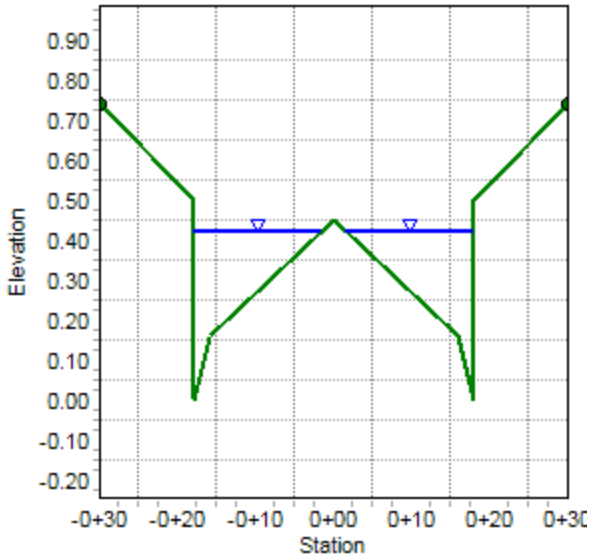
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Normal Depth	0.42	ft
Discharge	14.43	ft³/s

Cross Section Image



Section #1-Q25

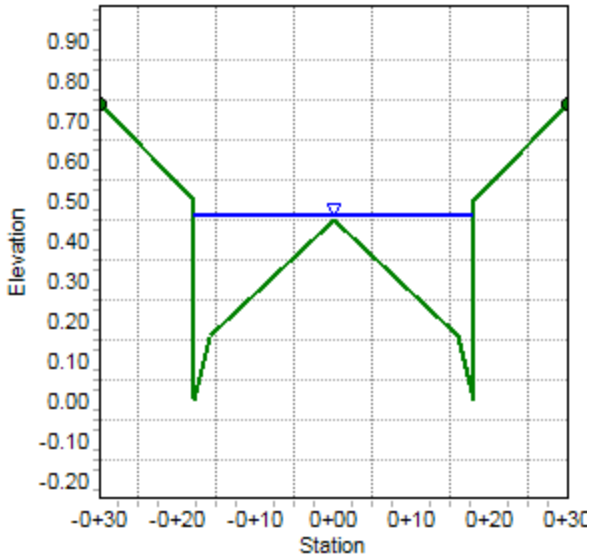
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Normal Depth	0.46	ft
Discharge	20.33	ft³/s

Cross Section Image



Section#2-Q10

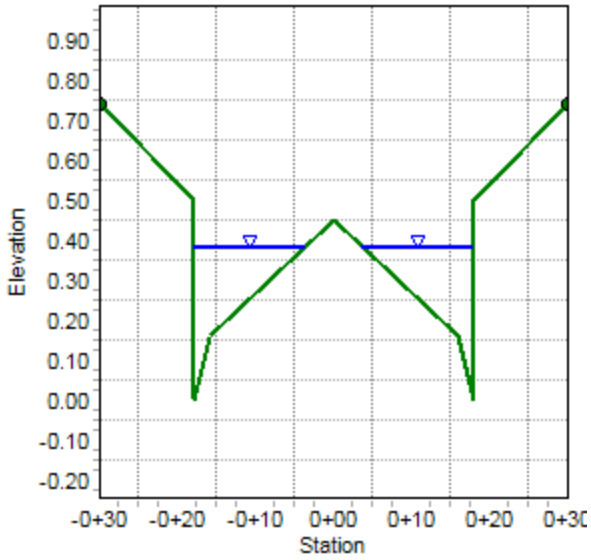
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Normal Depth	0.38	ft
Discharge	10.40	ft³/s

Cross Section Image



Section#2-Q25

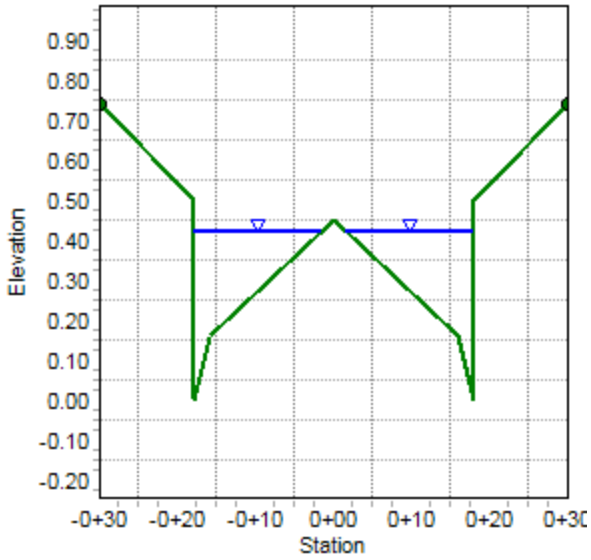
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01000	ft/ft
Normal Depth	0.42	ft
Discharge	14.65	ft³/s

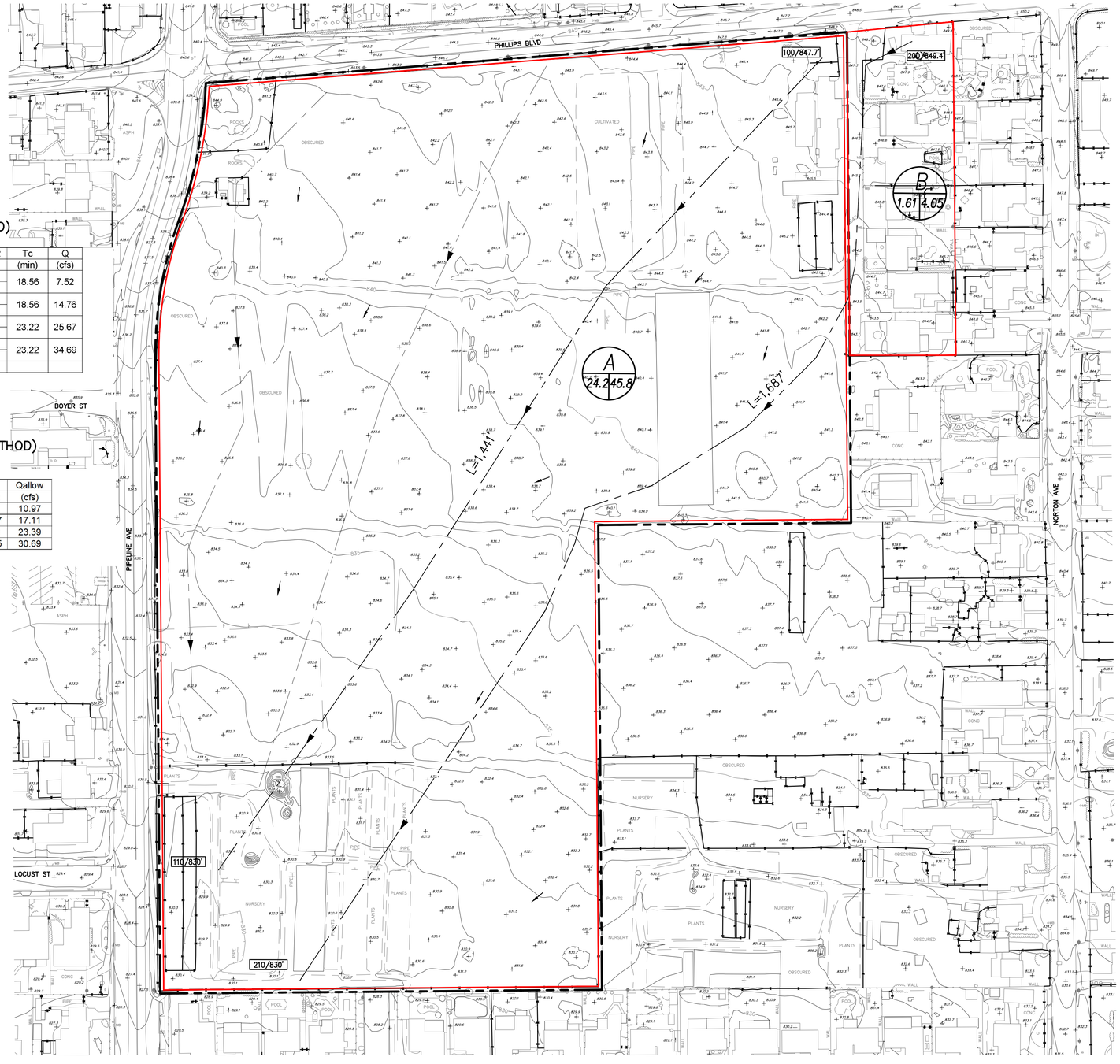
Cross Section Image



EXISTING HYDROLOGY MAP

TENTATIVE TRACT NO. 20849

COUNTY OF SAN BERNADINO, STATE OF CALIFORNIA



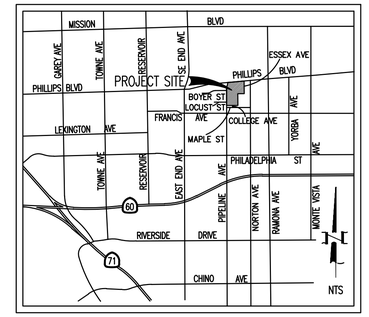
EXISTING HYDROLOGY (RATIONAL METHOD)

Frequency	Subarea	Area	1-hr	AMC	Imp	Length	Elev.1	Elev.2	Tc	Q
		(ac)	(in)			(ft)			(min)	(cfs)
2-yr	A	24.16	0.6	I	0.1	1441	847.7	830	18.56	7.52
	B (offsite)	1.61			0.5	1687	849.4	830		
10-yr	A	24.16	0.79	I	0.1	1441	847.7	830	18.56	14.76
	B (offsite)	1.61			0.5	1687	849.4	830		
25-yr	A	24.16	0.95	II	0.1	1441	847.7	830	23.22	25.67
	B (offsite)	1.61			0.5	1687	849.4	830		
100-yr	A	24.16	1.17	II	0.1	1441	847.7	830	23.22	34.69
	B (offsite)	1.61			0.5	1687	849.4	830		
Total		25.77								

EXISTING HYDROLOGY (UNIT HYDROGRAPH METHOD)

(Soil Type=A, Imp=0.1)

Frequency	Area	1-hr	6-hr	24-hr	AMC	CN[1]	Tc	Q	Qallow
	(ac)	(in)	(in)	(in)			(min)	(cfs)	(cfs)
2-yr	25.77	0.6	1.59	2.81	I	67	18.56	12.1	10.97
10-yr	25.77	0.79	2.06	3.7	I	67	18.56	18.87	17.11
25-yr	25.77	0.95	2.45	4.44	II	67	23.22	25.8	23.39
100-yr	25.77	1.17	2.98	5.47	II	67	23.22	33.85	30.69



VICINITY MAP

HYDROLOGY DATA

100-YR 1 HOUR RAIN.....1.54 INCH

SOIL GROUP.....A

STUDY FREQUENCY.....100-YR

LAND USE.....FARM LAND

CURVE NUMBER (CN).....50

ANTECEDENT MOISTURE CONDITION (AMC).....3

LEGEND

200/49' HYDROLOGY NODE/ELEVATION (FT)

L=573' FLOW PATH LENGTH (FT)

FLOW ARROW

FLOW PATH

SUBAREA BOUNDARY

PROJECT BOUNDARY

SCALE: 1" = 80'

NO.	DATE	REVISIONS	APPROVED BY
			DESIGNER
			DESIGNED BY:
			DRAFTED BY:
			CHECKED BY:

APPLICANT:
BORSTEIN ENTERPRISES
11726 SAN VICENTE BLVD., SUITE 300
LOS ANGELES, CA 90049
CONTACT: ERIK PFAHLER
PHONE: (310) 582-1991 x203

REGISTERED PROFESSIONAL ENGINEER
SIEW HUAT NG
NO.46026
EXP.12-31-26
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED BY:
UNITED CIVIL, INC.
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AGOURA HILLS, CA 91301
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SIEW HUAT NG
R.C.E. 46026 EXP. 12-31-2026
7/13/2026
DATE

PRELIMINARY HYDROLOGY STUDY FOR
TENTATIVE TRACT NO. 20849
EXISTING HYDROLOGY
NERIO FARMS
PHILLIPS BLVD AND PIPELINE AVE
CHINO, CA

PROJECT NO.

SHEET 1
OF 1

PROPOSED HYDROLOGY MAP

TENTATIVE TRACT NO. 20849

COUNTY OF SAN BERNADINO, STATE OF CALIFORNIA

PROPOSED HYDROLOGY (RATIONAL MEHTOD)

(Soil Type=A)

Frequency	Subarea	Area	1-hr	AMC	Imp	Length	Elev.1	Elev.2	Tc	Q
		(ac)	(in)			(ft)			(min)	(cfs)
2-yr	A	11.07	0.6	I	0.4	1,764	845.5	830.5	13.82	11.91
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
10-yr	A	11.07	0.95	II	0.4	1,764	845.5	830.5	19.37	27.00
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
25-yr	A	11.07	1.17	III	0.4	1,764	845.5	830.5	18.31	39.89
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
100-yr	A	11.07	1.54	III	0.4	1,764	845.5	830.5	17.39	57.37
	B	10.64				1,944	849.4	830.5		
	C	2.13				594	833.7	830.3		
	to street[1]	1.93								
Total		25.77								

[1] Areas that drain towards offsite streets. Not included in onsite storm drain calculations.

PROPOSED HYDROLOGY (UNIT HYDROGRAPH METHOD)

(Soil Type=A, Imp=0.4)

Frequency	Area	1-hr	6-hr	24-hr	AMC	CN[1]	Tc	Q
	(ac)	(in)	(in)	(in)			(min)	(cfs)
2yr	23.84	0.6	1.59	2.81	I	32	13.82	21.37
10-yr	23.84	0.95	2.45	4.44	II	32	19.37	31.07
25-yr	23.84	1.17	2.98	5.47	III	32	18.31	43.78
100-yr	23.84	1.54	3.8	7.11	III	32	17.39	61.03

DETENTION BASIN STAGE–VOLUME–DISCHARGE RELATION

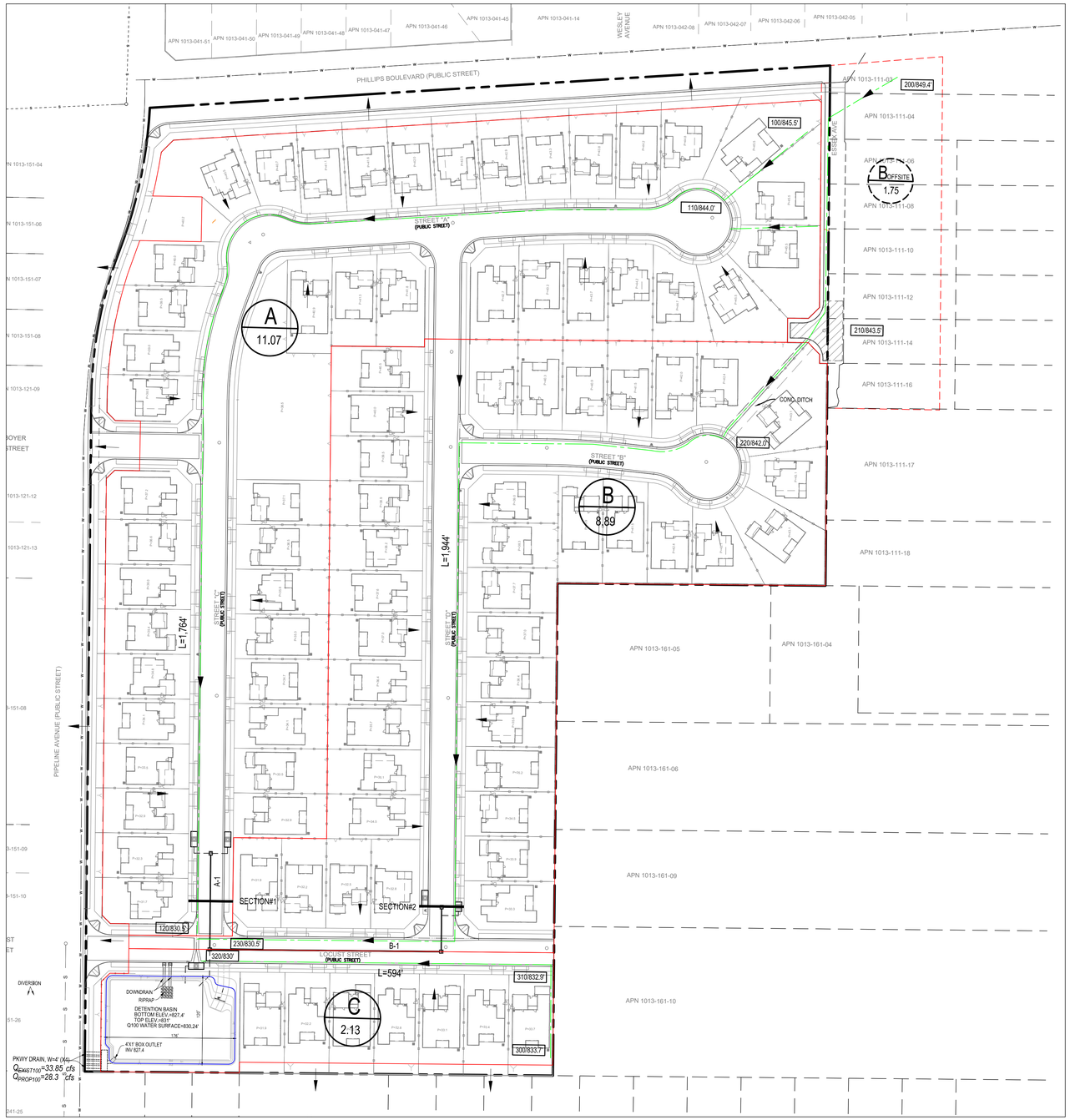
Stage	Depth	Area	Volume	Cumulative Volume	Cumulative Volume	Q_{out}[2]
(ft)	(ft)	(sf)	(cf)	(cf)	(ac-ft)	(cfs)
827.4[1]	0	15,685	0	0	0.000	0
827.6	0.2	16,042	3,173	3,173	0.073	2.02
827.8	0.4	16,400	3,244	6,417	0.147	5.5
828	0.6	16,756	3,316	9,733	0.223	6.09
828.9	1.5	17,974	15,628	25,361	0.582	19.25
829	1.6	18,109	1,804	27,165	0.624	20.19
829.5	2.1	18,784	9,223	36,388	0.835	24.35
830	2.6	19,459	9,5,61	45,949	1.055	27.90
831	3.6	20,868	2,0164	66,113	1.518	29.54

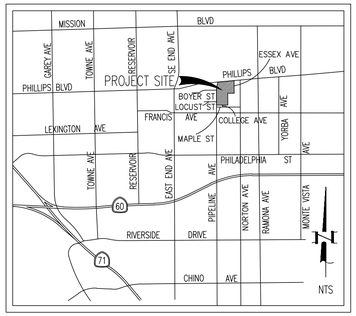
[1] Invert of outlet opening (4'x1')
[2] See Table 7

DETENTION BASIN ROUTING RESULTS

Frequency	Area	Q_{in}	Q_{out}	Q_{allow}	H_{max}	V_{in}	V_{remain}	Draw-down[1]
	(ac)	(cfs)	(cfs)	(ft)	(ft)	(ac-ft)	(ac-ft)	(hr)
2-yr	23.84	21.37	9.75	10.97	0.85	2.22	0	8.75
10-yr	23.84	31.07	17.02	17.11	1.35	3.71	0	9.08
25-yr	23.84	43.78	23.05	23.39	1.94	5.82	0	9.25
100-yr	23.84	61.03	28.30	30.69	2.84	8.29	0	9.42

[1] From time reaching peak depth to empty





VICINITY MAP

HYDROLOGY DATA

100–YR 1 HOUR RAIN.....1.54 INCH
SOIL GROUP.....A
STUDY FREQUENCY.....100–YR
LAND USE.....RESIDENTIAL (3–4 DWL/AC)
CURVE NUMBER (CN).....32
ANTECEDENT MOISTURE CONDITION (AMC).....3

LEGEND



200/49' HYDROLOGY NODE/ELEVATION (FT)
L=573' FLOW PATH LENGTH (FT)
FLOW ARROW
FLOW PATH
SUBAREA BOUNDARY
SUBAREA BOUNDARY (OFFSITE)
PROJECT BOUNDARY
100–YR WATER LEVEL



SCALE: 1" = 80'
0 40 80 160 240

NO.	DATE	REVISIONS	APPROVED BY

DESIGNER
DESIGNED BY:
DRAFTED BY:
CHECKED BY:

REGISTERED PROFESSIONAL ENGINEER SIEW HUAT NG NO.46026 EXP.12-31-26 CIVIL STATE OF CALIFORNIA

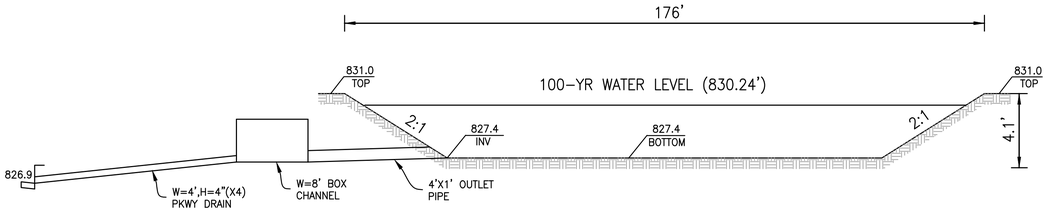
UNITED CIVIL, INC.
30141 AGOURA ROAD, SUITE 215
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R.C.E. 46026 EXP. 12–31–2026

7/13/2026
DATE

PRELIMINARY HYDROLOGY STUDY FOR
TENTATIVE TRACT NO. 20849
PROPOSED HYDROLOGY
NERIO FARMS
PHILLIPS BLVD AND PIPELINE AVE
CHINO, CA

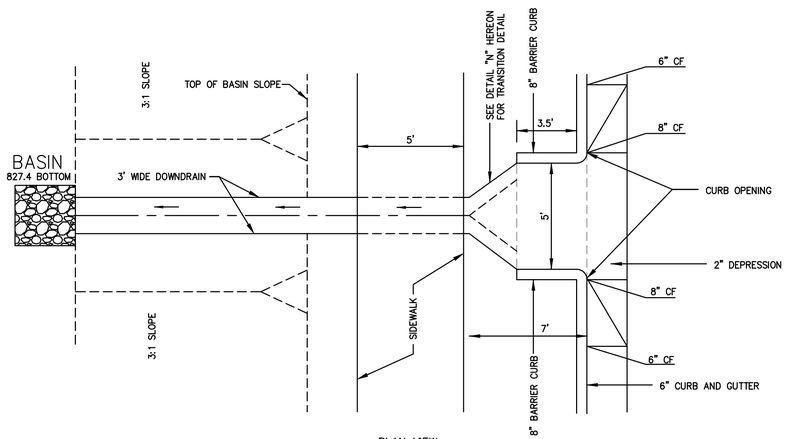
PROJECT NO.

SHEET 1
OF 2

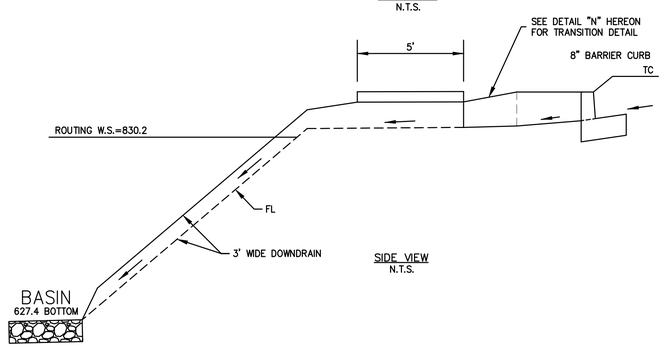


A DETENTION BASIN SECTION

N.T.S



PLAN VIEW
N.T.S.



SIDE VIEW
N.T.S.

B CURB OPENING DETAIL

N.T.S.

NO.	DATE	REVISIONS	APPROVED BY

DESIGNER
DESIGNED BY:
DRAFTED BY:
CHECKED BY:

REGISTERED PROFESSIONAL ENGINEER
SIEW HUAT NG
NO.46026
EXP.12-31-26
CIVIL
STATE OF CALIFORNIA

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PRELIMINARY HYDROLOGY STUDY FOR
TENTATIVE TRACT NO. 20849

PROPOSED HYDROLOGY

NERIO FARMS
PHILLIPS BLVD AND PIPELINE AVE
CHINO, CA

PROJECT NO.

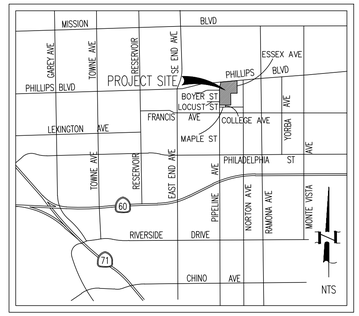
SHEET 2
OF 2

STORM DRAIN DIAGRAM

TENTATIVE TRACT NO. 20849

COUNTY OF SAN BERNADINO, STATE OF CALIFORNIA





VICINITY MAP

LEGEND

- FLOW ARROW
- FLOW PATH
- SUBAREA BOUNDARY
- SUBAREA BOUNDARY (OFFSITE)
- PROJECT BOUNDARY
- PROPOSED STORM DRAIN

SCALE: 1" = 80'

0 40 80 160 240

NO.	DATE	REVISIONS	APPROVED BY
			DESIGNER
			DESIGNED BY:
			DRAFTED BY:
			CHECKED BY:

REGISTERED PROFESSIONAL ENGINEER SIEW HUAT NG NO.46026 EXP.12-31-26 CIVIL STATE OF CALIFORNIA

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DATE

PRELIMINARY HYDROLOGY STUDY FOR
TENTATIVE TRACT NO. 20849
STORM DRAIN DIAGRAM
NERIO FARMS
PHILLIPS BLVD AND PIPELINE AVE
CHINO, CA

PROJECT NO.

SHEET _____
OF _____