Appendix I
Hydrology Report

CORDOVA ROAD
Industrial Complex

PRELIMINARY HYDROLOGY REPORT

APN; 0463-213-05, 06, 07, 08, & 09
0463-213-33, 34, 35, & 36
0463-213-16

Prepared for:

VVLIG Holdings, LLC
9040 Leslie Street, Suite 7
Richmond Hill, ON L4B 3M4

Prepared by:

David Evans and Associates
18484 Outer Highway 18 North, Suite 225
Apple Valley, CA 92307
Tel: (760) 524-9100
Attn: Bret Thorpe

Prepared Under the Supervision of:

Bret Thorpe, P.E. R.C.E. 82754

November 1, 2022
Job No: VVLI0000001

TUSTIN
17782 East 17th Street
Suite 200
Tustin, CA 92780
714.665.4500
Fax: 714.665.4501

SANTA CLARITA
25152 Springfield Court
Suite350
Santa Clarita, CA 91355-1096
661.284.7400
Fax 661.284.7401

TEMECULA
41951 Remington Avenue
Suite 130
Temecula, CA 92590-2553
951.294.9300
Fax: 951.294-9301

VICTORVILLE
18484 Outer Highway 18 North
Suite 225
Apple Valley, CA 92307
760.524.9100
Fax 760.524.9101

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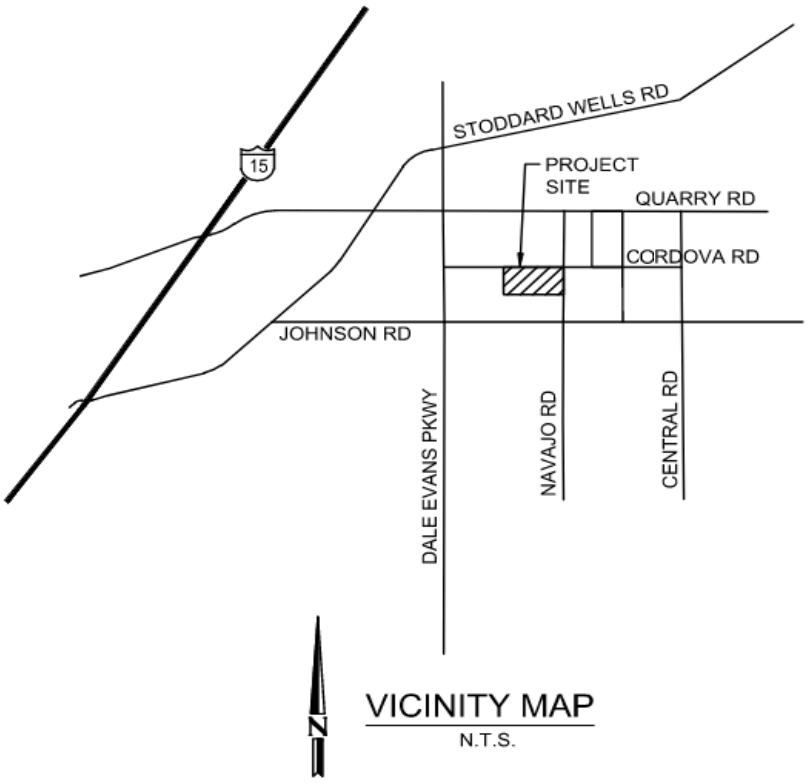
Section 1 - Introduction:

1.1. Location

The Project Owner is VVLIG Holdings, LLC, 9040 Leslie Street, Suite 7, Richmond Hill, ON L4B 3M4. The Hydrology Study is prepared by David Evans and Associates 18484 Outer Highway 18 North, Suite 225, Apple Valley, CA 92307 Phone No. (760) 524-9100.

The Project site is located within the Town of Apple Valley, South of Cordova Road, West of Navajo Road, East of Dachshund Avenue and North of the logical extension of Shepard Road.
APN No. 0463-213-05, 06, 07, 08, & 09; 0463-213-33, 34, 35, & 36; 0463-213-16
Latitude 34d 36m 22s, Longitude -117d 11m 35s.

Location map



1.2 Property Description:

1.2.1. Gross Land Acreage: 88.6 Acres, Net Land 85.3 Acres. A large warehouse type building is proposed as shown on the Developed Hydrology Exhibit in Appendix A.

1.2.2. The proposed Project site is vacant. The largest portion of the Project site slopes from east to west toward the unimproved Bell Mountain Wash at an approximate slope of 2.3% and consists of multiple flow paths, ridges, and sparse native desert plants.

The southerly portion of the Project site, consisting of approximately 18.5 acres, is within the Walmart distribution site offsite watershed and flows south westerly towards Johnson Road where its confluence with AVMPD (Apple Valley Masterplan of Drainage) line E-04, flows thru the Walmart Distribution Center south of Johnson Road and then flows south towards a dry lakebed south of the Apple Valley Airport.

1.2.3. The Project consists of a large warehouse building. The building covers approximately 32 acres with adjoining areas to include loading docks, parking lots, drive aisles, drainage improvements and landscaping. The site will be graded into one large pad area for the building and storm water from the paved/roof areas of the site will be picked up in catch basins and conveyed to detention basins or underground infiltration basin systems. Overflows will drain to storm drain or channels that will also intercept and convey the offsite flows around the building site to existing flow lines. The Project is a Regulated Project and will require a WQMP.

1.2.4 A portion of the offsite flows are proposed to be intercepted in Navajo Road and conveyed in a storm drain in Cordova Road similar to its existing flowline. The rest of the offsite flows will also be captured in Navajo Road conveyed south to a detention basin and outlet into the respective natural drainage course. The southerly portion of the offsite drainage will also drain to a detention basin.

1.2.5. The Project site lies northeast of the Mojave River and easterly of the Bell Mountain Wash, east of the I-15 Freeway. Approximately 66.8 acres of the Project site flows west to the Bell Mountain Wash and the Bell Mountain Wash flows southwest to the Mojave river, Upper Narrows to Lower Narrows, approximately 7.5 miles south of the Project site. The remaining 18.5 acres flows south toward a dry lakebed as described above in section 1.2.2. The entire site lies within an "D" Zone, "areas in which flood hazards are undetermined, but possible." Flood Insurance Rate Map (FIRM) No. 06071C5830H, Map revised August 28, 2008. This panel is not printed.

1.2.6. The receiving Water for 66.8 acres is the Mojave River, southwest of the Project site and the remaining 18.5 acres flows to a dry lakebed south of the Apple Valley Airport. Reference is made to the AVMPD. Excerpts can be found in Appendix B.

Section 2 - Hydrologic Analysis:

2.1. Conditions, Resources and Methods

2.1.1. The existing Project site is vacant.

The offsite area northeasterly of the Project site slopes up and is vacant. This offsite area drains through the Project site.

The proposed development for the site consists of a large box warehouse building.

Soil classification is Hydrologic Soils Group (HSG) "A", (50%), HSG "C", (43%), HSG "D", (7%). The soil classification boundary limit is based on the Web Soil Survey from the USDA Natural Resources Conservation Service included in Appendix 'B' of this report.

NOAA 14 was used for the 10-year and 100-year rainfall estimates. The ten year, 24-hour is 2.13 inches. The 100 year, 24-hour is 3.46 inches. See Section 2.2. Table of Results for runoff coefficients and/or loss rate parameters, and time of concentration.

2.1.2. As stated above, the NOAA Atlas 14 was used for the rainfall values and Soils was based on the Web Soil Survey from the USDA Natural Resources Conservation Service. USGS Topography Maps and the San Bernardino County Hydrology Manual were also used to determine watershed conditions.

2.2. Table of Results

Unit Hydrograph results

Condition	Area ID	10-yr Qp (cfs)	10-yr Volume (Ac ft/cf)	100-yr Qp (cfs)	100-yr Volume (Ac ft/cf)
Existing condition		35.2	2.9831	99.5	15.5735
Developed condition	A	89.13	12.6573	163.63	21.5546
Difference		**53.93**	**9.6742/421,408**	**64.13**	**5.9811/260,537**
Mitigated		**4.77**	**19.12/833,071**	**4.77**	**19.12/833,071**

Rational method results existing condition

Area ID	Q10 (cfs	Time of concentration (min) 10-yr	Q100 cfs	Time of concentration (min) 100-yr
A	5.7	27.35	13.0	25.597
B	7.2	29.22	121.9	26.29
D	6.7	38.61	26.3	32.77
E	4.2	19.83	10.2	19.83
F	4.6	28.75	13.6	26.68
G	4.6	50.6	17.9	41.48
H	8.0	34.24	24.4	30.2
Total	**41.0**	**50.6**	**277.30**	**41.48**

Rational method results developed condition

Area ID	Q10 (cfs	Time of concentration (min) 10-yr	Q100 cfs	Time of concentration (min) 100-yr	Comments
A	60.7	11.55	114.63	10.98	Underground basin
B	35.8	12.13	69.38	11.14	Basin A
C	17.36	15.97	32.62	15.44	Basin B/C
D	17.03	7.89	32.41	7.34	Basin C
Total	**130.89**	**15.97**	**249.04**	**15.44**	

Summary

The largest volume difference of predevelopment vs post development volume is the Q10, 24 hour, of 421,408 cubic feet as can been seen in the first Unit Hydrograph table above and that is the minimum retention required for this project The Town of Apple Valley requires not to exceed 90% of the pre-development volume, for the Q 100, 24 hour storm event, and 95% of the pre-developed volume in the Q10, 24-hour storm event, however, in this case, the Q10 post vs pre development volume is larger and will be the design volume mitigation used in this report.

The site will use one underground Contech infiltration systems and three above ground basins to capture the DCV and mitigate Hydromodification caused by the development ranging in size from 146,950 cubic feet to 408,010 cubic feet for a total of 833,071 cubic feet of storage and infiltration. Basin routing, infiltration and storage also mitigate Qpeak to below its existing Qpeak as seen in unit hydrograph table above, as well as the time of concentration (TC). This will also comply with the proposed mitigation in the Project's WQMP.

2.3. Drainage Maps

See Appendix B for the pre and post drainage maps.

Section 3 Proposed Drainage Design Concept:

3.1. Town of Apple Valley Drainage management guidelines.
The City's guidelines are to analyze the 10-year and 100-year storm events for 1 hour (rational method) and 24-hour durations (unit hydrograph). Then demonstrate the project will not exceed 90% of the pre-development runoff for the 100-year storm event and 5% of the 10-year storm event.. See section 2.2 Table of Results, and the following summary.

3.2. Stormwater Storage Provisions
The Project site proposes to use one proprietary Contech underground infiltration/retention systems and three above ground retention basins. The site proposes the following as to stormwater storage/retention.

Drainage Area	Required DCV* (CF)	Minimum detention/infiltration (CF)	Provided detention/infiltration system (CF)
DA-A1	80,095	164,595 UG basin	278,111 UG basin
DA-A2	47,798	66,972	146,950
DA-A3	65,103	164,951	408,010
Total	**192,993**	**396,518**	**833,071**

*Values from the WQMP report.

The total volume of retention and infiltration provided is 833,071 CF for the Project site drainage areas.

3.4 Drainage Structures

There will be onsite catch basins to collect the storm water and convey the storm flows to underground and above ground infiltration/and retention systems. Overflows will be conveyed to the proposed storm drain or channel for the offsite flow conveyance

Offsite flows are to be captured in streets and conveyed around the proposed buildings and outlet to their natural flowline as described in section 1.2.4 above.

Section 4 - References:

Bonadiman Civil Design Software, Version 7.0 & 7.1 was used for the 10-year & 100-year Hydrological Analysis.

- 10-year AMC II Unit hydrograph Method (developed and undeveloped)
- 10-year AMC II Unit Hydrograph Method (developed and undeveloped)
- Soil Type A
- Manning's Values Used
- Existing Surface n=0.035
- Proposed Surface n=0.015
- Unit Hydrograph n=0.020
- Project is in the Town of Apple Valley, CA

Drainage boundaries were derived using field topography, USGS Map for Apple Valley as shown on the hydrology map, provided in Appendix A of this report. See Appendix C for San Bernardino County Hydrology Manual and Town of Apple Valley technical references.

APPENDIX 'A'

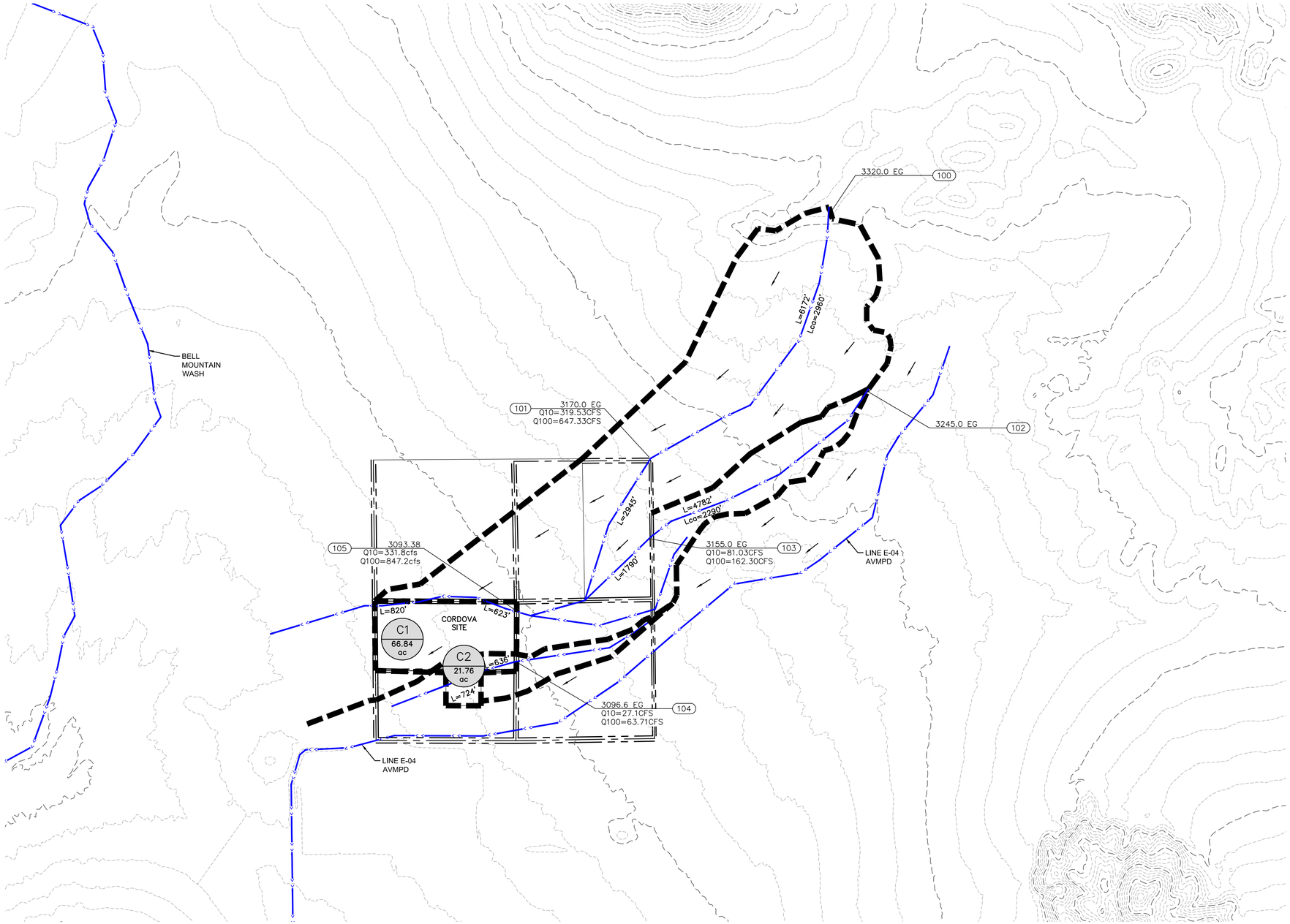
- Hydrology Maps

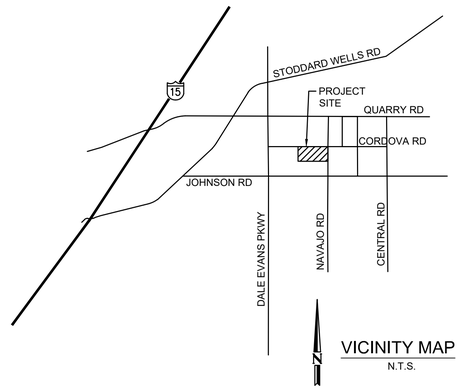
  Offsite existing condition hydrology map
  Onsite existing condition hydrology Map
  Onsite developed condition Hydrology Map

CORDOVA OFFSITE EXISTING CONDITION HYDROLOGY MAP

LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A / 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- DIRECTION OF FLOW
- FS ELEVATION / INV ELEVATION (NODE #) — CONCENTRATION/NODE ID
- —(XXXX)— EXISTING CONTOUR





VICINITY MAP
N.T.S.

CORDOVA SITE

AREA ID	AREA (AC)	OFFSITE LENGTH (FT)	ONSITE LENGTH (FT)
C1	66.84	15563	1443
C2	21.76	5400	1360

N

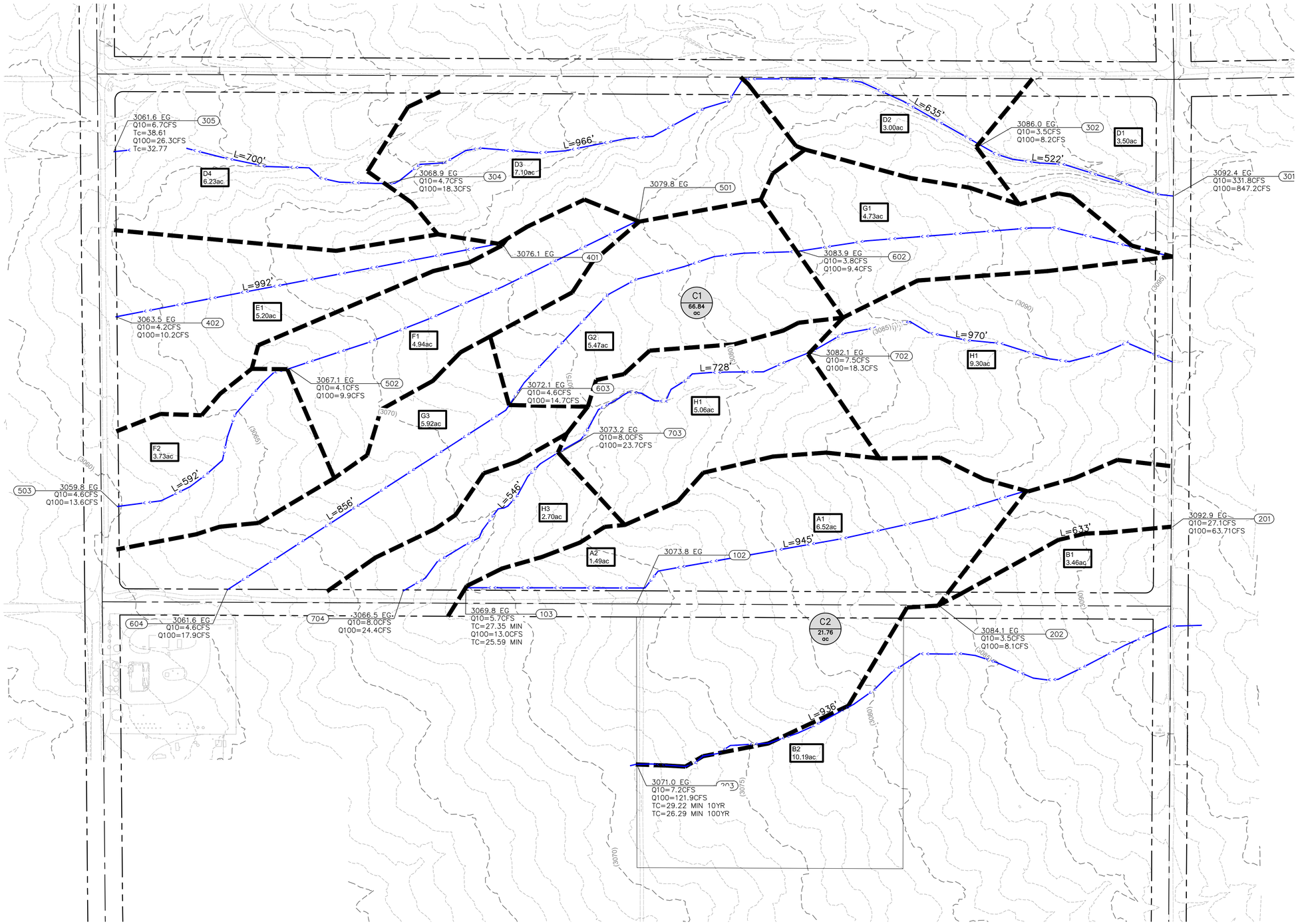
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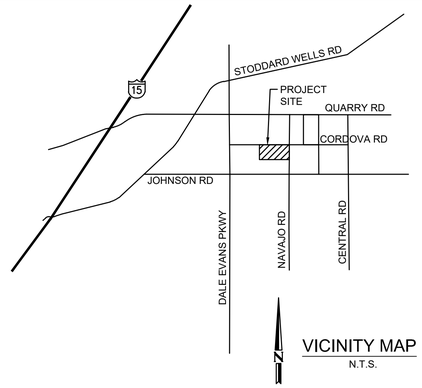
18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100

DAVID EVANS AND ASSOCIATES INC.

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CORDOVA SITE EXISTING CONDITION HYDROLOGY MAP





LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A / 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- FS ELEVATION / INV ELEVATION (NODE #) — CONCENTRATION/NODE ID
- (XXXX) — EXISTING CONTOUR

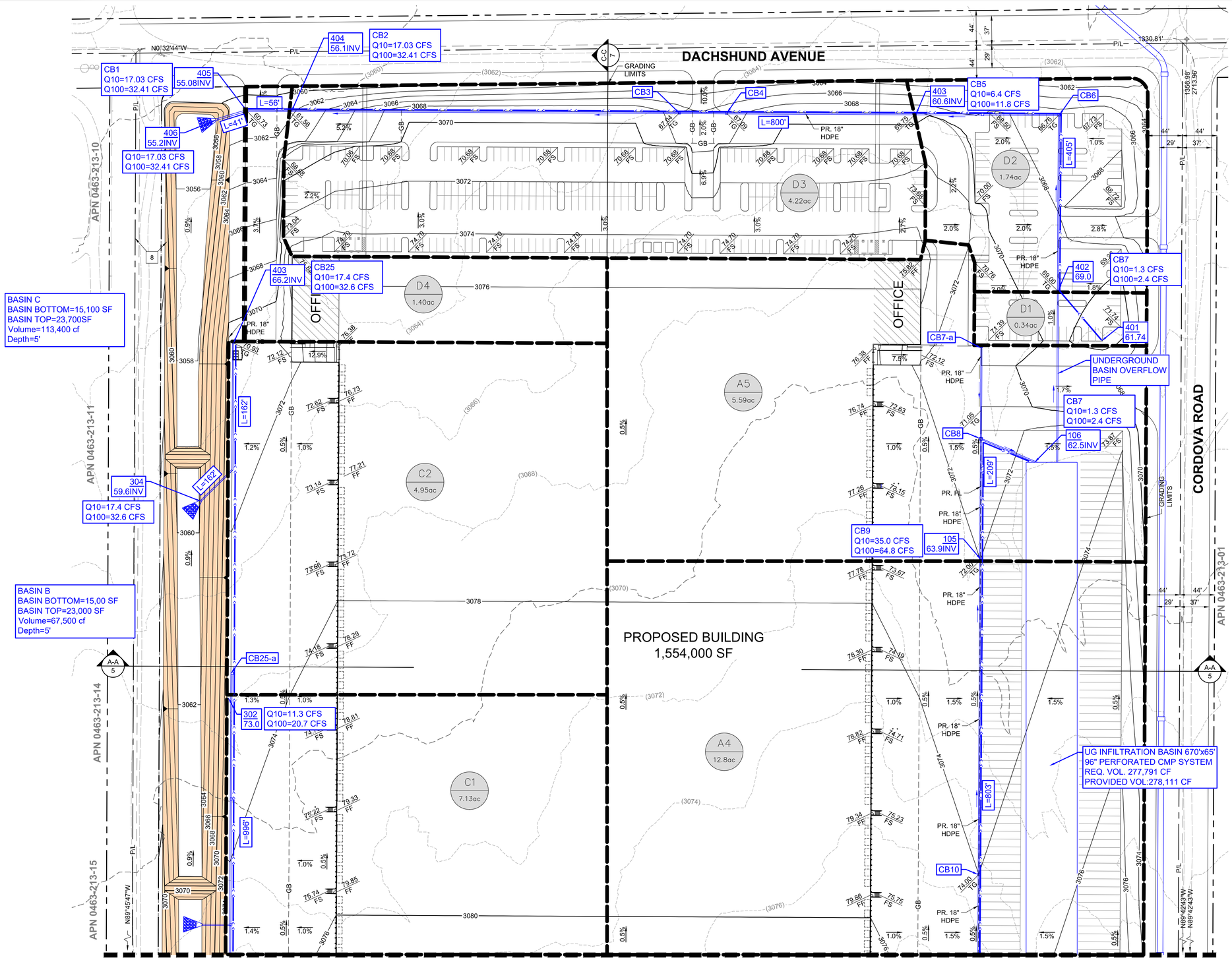
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Apple Valley California 92307
Phone: 760.524.9100

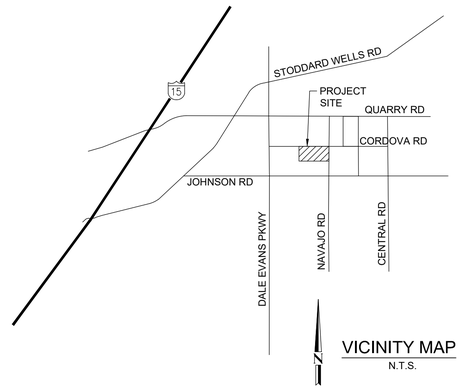
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ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
CB	CATCH BASIN
EG	EXISTING GROUND
EL.	ELEVATION
ELEC.	ELECTRIC
EX.	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOW LINE
FH	FIRE HYDRANT
FS	FINISH SURFACE
FUT.	FUTURE
GB	GRADE BREAK
GUY	GUY ANCHOR
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
P/L	PROPERTY LINE
PE	PAD ELEVATION
PP	POWER POLE
PS	PIPE SLOPE
PR.	PROPOSED
R/W	RIGHT OF WAY
ST.	STREET
SWR	SEWER
TG	TOP OF GRATE
TYP	TYPICAL
WTR	WATER



VICINITY MAP
N.T.S.

LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A / 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- DIRECTION OF FLOW
- FS ELEVATION / INV ELEVATION — NODE # — CONCENTRATION/NODE ID
- (XXXX) — EXISTING CONTOUR
- TOP / TOE — PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

EASEMENTS

8 — A 40' WIDE OFFER OF DEDICATION FOR PIPELINE, UTILITIES, ACCESS AND INCIDENTAL PURPOSES, RECORDED MAY 06, 1987 AS INSTRUMENT NO. 87-150726 OF OFFICIAL RECORDS.

NOT FOR CONSTRUCTION

DATE: 10/27/2022

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

ENGINEER
DAVID EVANS AND ASSOCIATES INC.
18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

CORDOVA ROAD INDUSTRIAL COMPLEX
APN: 0436-213-05 - 09, 16, 33 - 36

CORDOVA INDUSTRIAL COMPLEX DEVELOPED HYDROLOGY MAP

FILE NO.

DRAWING NO.

SH. 1 OF 3

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By: jla
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MATCHLINE SEE SHEET 1

APN 0463-213-15

APN 0463-213-17

APN 0463-213-26

CORDOVA ROAD

GRADING LIMITS

NOT FOR CONSTRUCTION

206
66.5
Q10=15.3 CFS
Q100=29.98 CFS

BASIN A1
BASIN BOTTOM=84,500 SF
BASIN TOP=117,200SF
Volume=251,100 cf
Depth=3.5'

PR. 18" HDPE

PR. HEADWALL
SPLASH OUTLET
INV. OUT = 66.50

205
70.5
CB24
Q10=15.3 CFS
Q100=29.98 CFS

BASIN A2
BASIN BOTTOM=51,300 SF
BASIN TOP=65,100 SF
Volume=202,500 cf
Depth=3.5'

206
66.5
Q10=20.5 CFS
Q100=39.4 CFS

CB23
Q10=20.5 CFS
Q100=39.4 CFS

205
70.9INV

L=618'

L=467'

L=396'

L=803'

L=400'

L=406'

301
81.9

104
68.6INV
CB11
Q10=35.0 CFS
Q100=64.75 CFS

103
71.0INV
CB12
Q10=24.5 CFS
Q100=44.8 CFS

C1
7.13ac

A4
12.8ac

A3
6.36ac

B5
10.63ac

B4
6.37ac

A2
6.39ac

PROPOSED BUILDING
1,554,000 SF

B-B
6-7

N0°05'33"W 665.07'

N89°45'47"W 1346.45'

N89°42'43"W 1356.98'
2713.96'

N89°42'43"W 678.49'

N89°47'23"W 670.59'

N0°08'04"E 664.74'

N89°45'47"W 673.23'

44'
29'
37'

EASEMENTS

5 A VARIABLE WIDTH EASEMENT FOR INGRESS, EGRESS AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED JUNE 5, 1984 AS INSTRUMENT NO. 84-131161 OF OFFICIAL RECORDS.

7 A 30' WIDE OFFER OF DEDICATION FOR PIPELINE, UTILITIES, ACCESS AND INCIDENTAL PURPOSES, RECORDED MAY 06, 1987 AS INSTRUMENT NO. 87-150725 OF OFFICIAL RECORDS.

8 A 40' WIDE OFFER OF DEDICATION FOR PIPELINE, UTILITIES, ACCESS AND INCIDENTAL PURPOSES, RECORDED MAY 06, 1987 AS INSTRUMENT NO. 87-150726 OF OFFICIAL RECORDS.

7 A VARIABLE WIDTH EASEMENT FOR INGRESS, EGRESS AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 24, 1972 AS BOOK 7866, PAGE 704 OF OFFICIAL RECORDS AND RECORDED FEBRUARY 24, 1972 AS BOOK 7866, PAGE 708 OF OFFICIAL RECORDS.

LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A / 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- DIRECTION OF FLOW
- FS ELEVATION / INV ELEVATION (NODE #) — CONCENTRATION/NODE ID
- (XXXX) — EXISTING CONTOUR

MATCHLINE SEE SHEET 3

ABBREVIATIONS

BFP	BACK FLOW PREVENTER	GUY	GUY ANCHOR
C/L	CENTERLINE	HP	HIGH POINT
C&G	CURB AND GUTTER	INV	INVERT
CB	CATCH BASIN	LF	LINEAR FEET
EG	EXISTING GROUND	LP	LOW POINT
EL.	ELEVATION	P/L	PROPERTY LINE
ELEC.	ELECTRIC	PE	PAD ELEVATION
EX.	EXISTING	PP	POWER POLE
FF	FINISH FLOOR	PS	PIPE SLOPE
FG	FINISH GRADE	PR.	PROPOSED
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FH	FIRE HYDRANT	ST.	STREET
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FUT.	FUTURE	TG	TOP OF GRATE
GB	GRADE BREAK	TYP	TYPICAL
		WTR	WATER

LEGEND

- TOP / TOE — PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

VICINITY MAP
N.T.S.

STODDARD WELLS RD
PROJECT SITE
QUARRY RD
CORDOVA RD
JOHNSON RD
DALE EVANS PKWY
NAVAJO RD
CENTRAL RD
15

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

ENGINEER

DAVID EVANS AND ASSOCIATES INC.

18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

DATE: 10/27/2022

CORDOVA ROAD INDUSTRIAL COMPLEX
APN: 0436-213-05 - 09, 16, 33 - 36

CORDOVA INDUSTRIAL COMPLEX DEVELOPED HYDROLOGY MAP

FILE NO.

DRAWING NO.
SH. 2 OF 3

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By: jla
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ABBREVIATIONS

BFP	BACK FLOW PREVENTER
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FS	FINISH SURFACE
FUT.	FUTURE
GB	GRADE BREAK
GUY	GUY ANCHOR
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
P/L	PROPERTY LINE
PE	PAD ELEVATION
PP	POWER POLE
PS	PIPE SLOPE
PR.	PROPOSED
R/W	RIGHT OF WAY
ST.	STREET
SWR	SEWER
TG	TOP OF GRATE
TYP	TYPICAL
WTR	WATER

MATCHLINE
SEE SHEET 2

PROPOSED BUILDING
1,554,000 SF

OFFICE

OFFICE

B4
6.37ac

B4
6.39ac

B3
2.55ac

A1
5.32ac

B2
2.54ac

B1
0.2ac

GRADING LIMITS

GRADING LIMITS

APN 0463-213-17

APN 0463-213-03

APN 0463-214-24

APN 0463-214-22

CORDOVA ROAD

RAMONA ROAD

P/L

PR. 18" HDPE

PR. FL

204
73.5INV

CB22
74.5INV

Q10=10.3 CFS
Q100=19.6 CFS

203
75.6INV

CB21
Q10=5.7 CFS
Q100=10.8 CFS

CB20

CB19

CB18

CB17

CB16

CB15

202
85.9

CB14, 80.2 INV
Q10=0.65 CFS
Q100=1.16 CFS

102
73.4INV

CB13
Q10=12.3 CFS
Q100=22.3 CFS

101
93.0

L=467'

L=273'

L=700'

L=406'

L=417'

L=62'

N89°45'47"W

N0°21'41"E

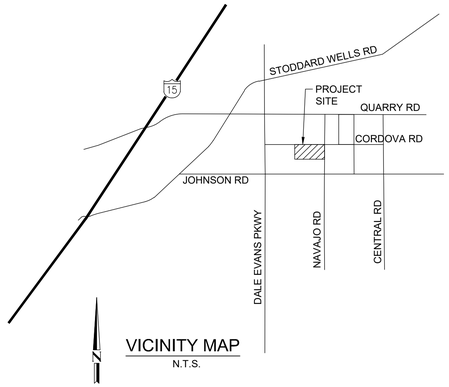
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1328.28'

EASEMENTS

5 A VARIABLE WIDTH EASEMENT FOR INGRESS, EGRESS AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED JUNE 5, 1984 AS INSTRUMENT NO. 84-131161 OF OFFICIAL RECORDS.

7 A VARIABLE WIDTH EASEMENT FOR INGRESS, EGRESS AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 24, 1972 AS BOOK 7866, PAGE 704 OF OFFICIAL RECORDS AND RECORDED FEBRUARY 24, 1972 AS BOOK 7866, PAGE 708 OF OFFICIAL RECORDS.



VICINITY MAP
N.T.S.

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A / 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- DIRECTION OF FLOW
- FS ELEVATION / INV ELEVATION — NODE # — CONCENTRATION/NODE ID
- (XXXX) — EXISTING CONTOUR
- TOP / TOE — PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- 6"/8" PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

NOT FOR CONSTRUCTION

ENGINEER

DAVID EVANS AND ASSOCIATES INC.

18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

DATE: 10/27/2022

CORDOVA ROAD INDUSTRIAL COMPLEX
APN: 0436-213-05 - 09, 16, 33 - 36

CORDOVA INDUSTRIAL COMPLEX DEVELOPED HYDROLOGY MAP

FILE NO.

DRAWING NO.

SH. 3 OF 3

Plot Date: 11/4/2022 10:33 AM
Save Date: 11/1/2022 3:53 PM
By: Brat Thorpe
By: Jla
File: P:\VV\VL0000000\11\0600INFO\0670Reports\Hydrology Report\Cardova Site Files\CAD\Developed-Cardova-hydrology Map-PAGE 3.dwg

APPENDIX 'B'

Reference Documents

San Bernardino County Hydrology Manual Reference Material
- NOAA 14 Point Precipitation Estimates
- Hydrologic Soils Group Map
- Figure C-3Curve Numbers
- AMC Map
- Contech underground detention vault worksheet
- Apple Valley Master Plan of Drainage (AVMPD) Line E-04 and index sheet.

NOAA Atlas 14, Volume 6, Version 2
Location name: Apple Valley, California, USA*
Latitude: 34.6061°, Longitude: -117.1927°
Elevation: 3081.73 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point 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	0.083 (0.068-0.101)	0.116 (0.096-0.143)	0.163 (0.134-0.200)	0.203 (0.165-0.252)	0.261 (0.206-0.335)	0.309 (0.239-0.405)	0.360 (0.271-0.483)	0.416 (0.305-0.573)	0.496 (0.349-0.712)	0.562 (0.383-0.835)
10-min	0.118 (0.098-0.145)	0.166 (0.137-0.204)	0.233 (0.191-0.287)	0.291 (0.237-0.361)	0.375 (0.295-0.480)	0.443 (0.342-0.580)	0.516 (0.389-0.692)	0.596 (0.437-0.821)	0.711 (0.500-1.02)	0.806 (0.548-1.20)
15-min	0.143 (0.118-0.176)	0.201 (0.166-0.247)	0.282 (0.232-0.347)	0.352 (0.287-0.437)	0.453 (0.357-0.581)	0.536 (0.414-0.701)	0.624 (0.471-0.837)	0.721 (0.529-0.993)	0.860 (0.605-1.23)	0.975 (0.663-1.45)
30-min	0.196 (0.162-0.241)	0.276 (0.227-0.339)	0.387 (0.317-0.476)	0.483 (0.393-0.599)	0.621 (0.489-0.796)	0.734 (0.567-0.961)	0.856 (0.645-1.15)	0.988 (0.724-1.36)	1.18 (0.830-1.69)	1.34 (0.909-1.98)
60-min	0.248 (0.204-0.304)	0.348 (0.286-0.428)	0.488 (0.401-0.601)	0.609 (0.496-0.756)	0.784 (0.617-1.00)	0.927 (0.715-1.21)	1.08 (0.814-1.45)	1.25 (0.914-1.72)	1.49 (1.05-2.13)	1.69 (1.15-2.50)
2-hr	0.351 (0.289-0.430)	0.474 (0.390-0.582)	0.645 (0.529-0.795)	0.792 (0.644-0.982)	1.00 (0.789-1.28)	1.17 (0.904-1.53)	1.35 (1.02-1.81)	1.55 (1.13-2.13)	1.82 (1.28-2.62)	2.05 (1.39-3.04)
3-hr	0.426 (0.351-0.522)	0.568 (0.467-0.698)	0.764 (0.627-0.941)	0.931 (0.758-1.16)	1.17 (0.921-1.50)	1.36 (1.05-1.78)	1.56 (1.18-2.10)	1.78 (1.31-2.45)	2.09 (1.47-3.00)	2.34 (1.59-3.47)
6-hr	0.579 (0.477-0.710)	0.765 (0.629-0.939)	1.02 (0.835-1.25)	1.23 (1.00-1.53)	1.53 (1.21-1.96)	1.77 (1.37-2.32)	2.02 (1.53-2.71)	2.29 (1.68-3.16)	2.67 (1.88-3.83)	2.97 (2.02-4.41)
12-hr	0.742 (0.611-0.910)	0.986 (0.811-1.21)	1.31 (1.08-1.62)	1.59 (1.29-1.97)	1.97 (1.55-2.52)	2.27 (1.75-2.97)	2.58 (1.95-3.46)	2.91 (2.13-4.01)	3.37 (2.37-4.83)	3.73 (2.54-5.54)
24-hr	0.975 (0.864-1.12)	1.31 (1.16-1.51)	1.76 (1.56-2.03)	2.13 (1.87-2.48)	2.64 (2.24-3.18)	3.04 (2.53-3.74)	3.46 (2.80-4.35)	3.89 (3.06-5.03)	4.48 (3.39-6.05)	4.95 (3.61-6.91)
2-day	1.15 (1.02-1.33)	1.58 (1.40-1.82)	2.14 (1.89-2.47)	2.60 (2.28-3.03)	3.23 (2.74-3.89)	3.73 (3.09-4.58)	4.23 (3.43-5.33)	4.76 (3.75-6.16)	5.48 (4.14-7.39)	6.04 (4.41-8.44)
3-day	1.25 (1.11-1.44)	1.73 (1.53-1.99)	2.36 (2.09-2.73)	2.88 (2.52-3.35)	3.59 (3.04-4.32)	4.14 (3.43-5.09)	4.70 (3.81-5.92)	5.28 (4.16-6.84)	6.09 (4.60-8.22)	6.72 (4.91-9.38)
4-day	1.33 (1.18-1.53)	1.84 (1.63-2.12)	2.52 (2.22-2.91)	3.07 (2.69-3.58)	3.83 (3.25-4.61)	4.42 (3.67-5.43)	5.01 (4.06-6.32)	5.64 (4.44-7.30)	6.49 (4.91-8.77)	7.16 (5.23-10.0)
7-day	1.45 (1.28-1.66)	1.99 (1.76-2.29)	2.71 (2.40-3.13)	3.31 (2.90-3.85)	4.12 (3.49-4.96)	4.75 (3.95-5.84)	5.40 (4.38-6.80)	6.08 (4.79-7.87)	7.01 (5.30-9.46)	7.73 (5.65-10.8)
10-day	1.53 (1.36-1.76)	2.10 (1.86-2.41)	2.85 (2.52-3.29)	3.47 (3.04-4.04)	4.33 (3.67-5.22)	5.00 (4.15-6.15)	5.69 (4.61-7.17)	6.41 (5.05-8.30)	7.40 (5.60-9.99)	8.18 (5.98-11.4)
20-day	1.75 (1.56-2.02)	2.41 (2.14-2.78)	3.30 (2.91-3.81)	4.03 (3.53-4.70)	5.06 (4.29-6.09)	5.87 (4.87-7.21)	6.71 (5.43-8.44)	7.58 (5.97-9.82)	8.80 (6.65-11.9)	9.76 (7.13-13.6)
30-day	1.98 (1.76-2.28)	2.73 (2.42-3.15)	3.76 (3.32-4.34)	4.62 (4.04-5.37)	5.82 (4.93-7.01)	6.78 (5.63-8.33)	7.77 (6.29-9.79)	8.82 (6.95-11.4)	10.3 (7.76-13.9)	11.4 (8.34-16.0)
45-day	2.33 (2.07-2.68)	3.22 (2.86-3.71)	4.45 (3.93-5.14)	5.49 (4.81-6.40)	6.97 (5.91-8.39)	8.16 (6.77-10.0)	9.40 (7.62-11.8)	10.7 (8.45-13.9)	12.6 (9.50-17.0)	14.0 (10.3-19.6)
60-day	2.56 (2.27-2.94)	3.53 (3.12-4.06)	4.87 (4.31-5.63)	6.03 (5.28-7.02)	7.68 (6.51-9.24)	9.02 (7.49-11.1)	10.4 (8.45-13.1)	11.9 (9.41-15.5)	14.1 (10.6-19.0)	15.8 (11.5-22.1)

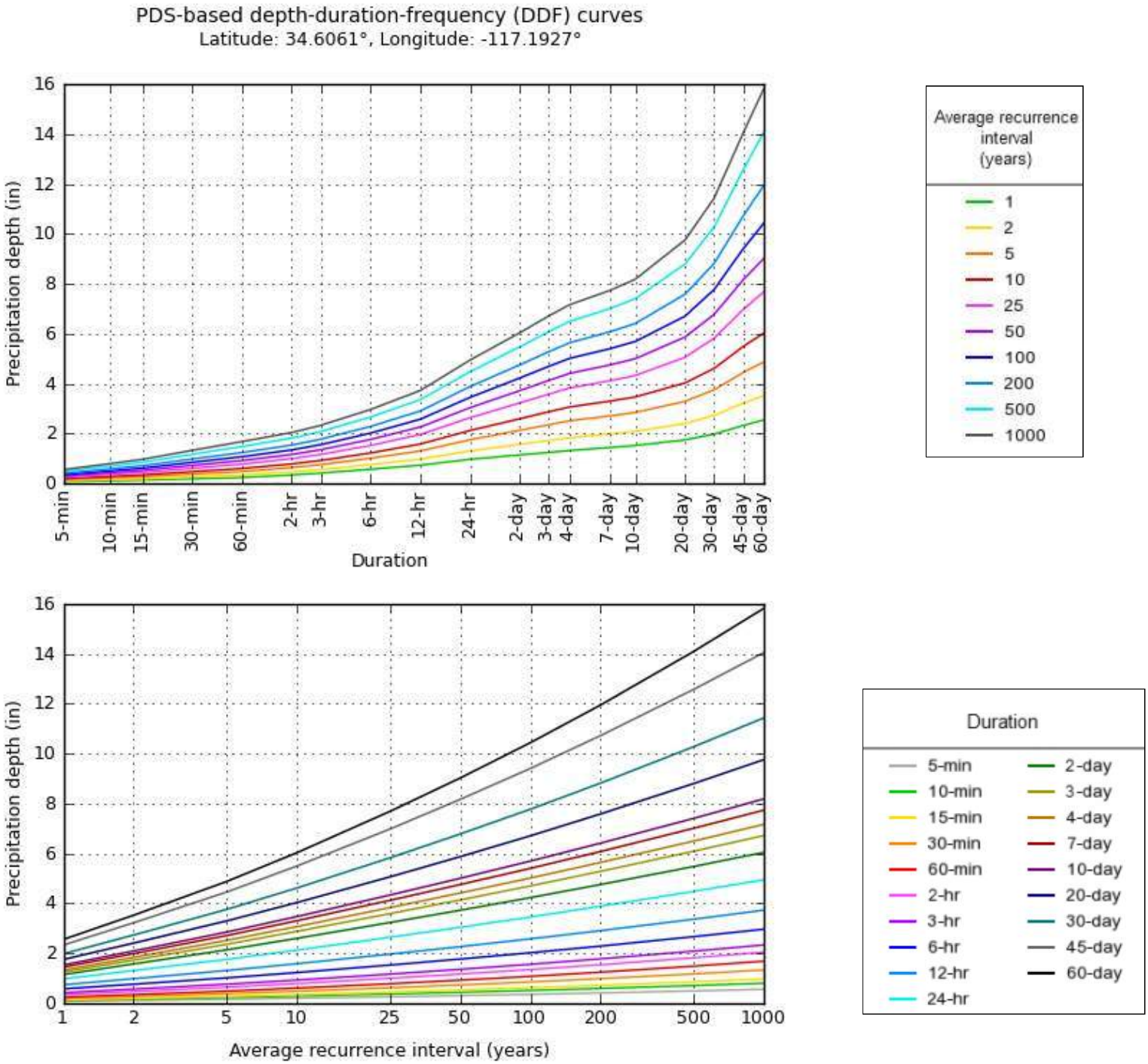
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



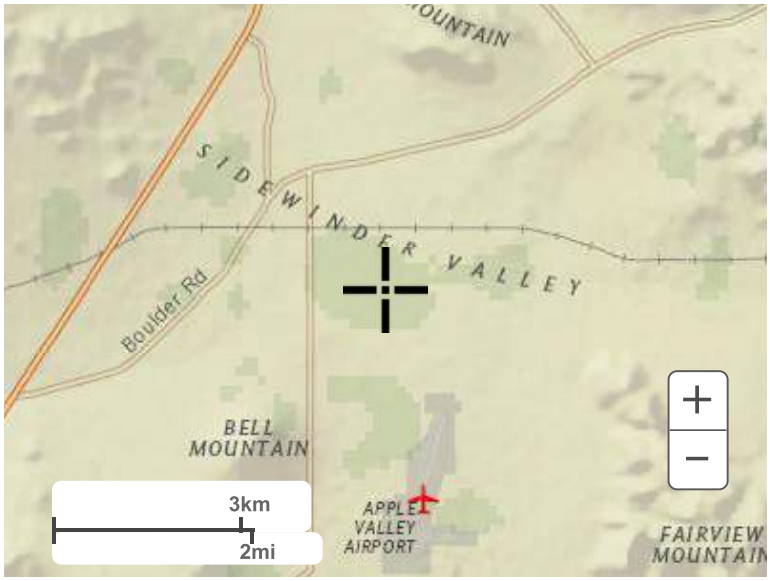
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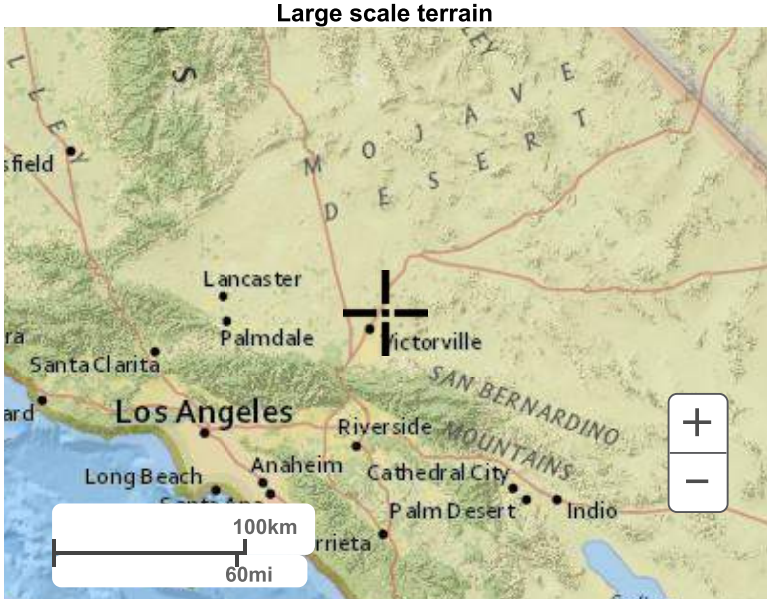
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Maps & aerials

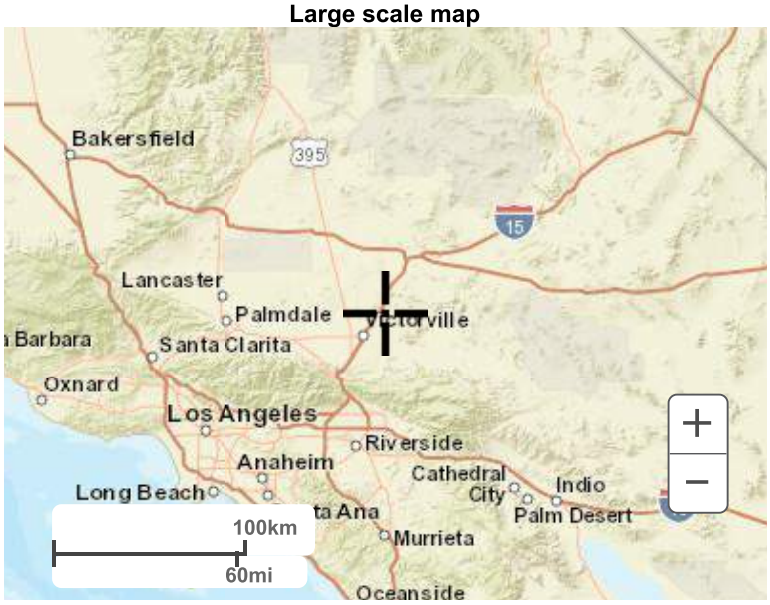
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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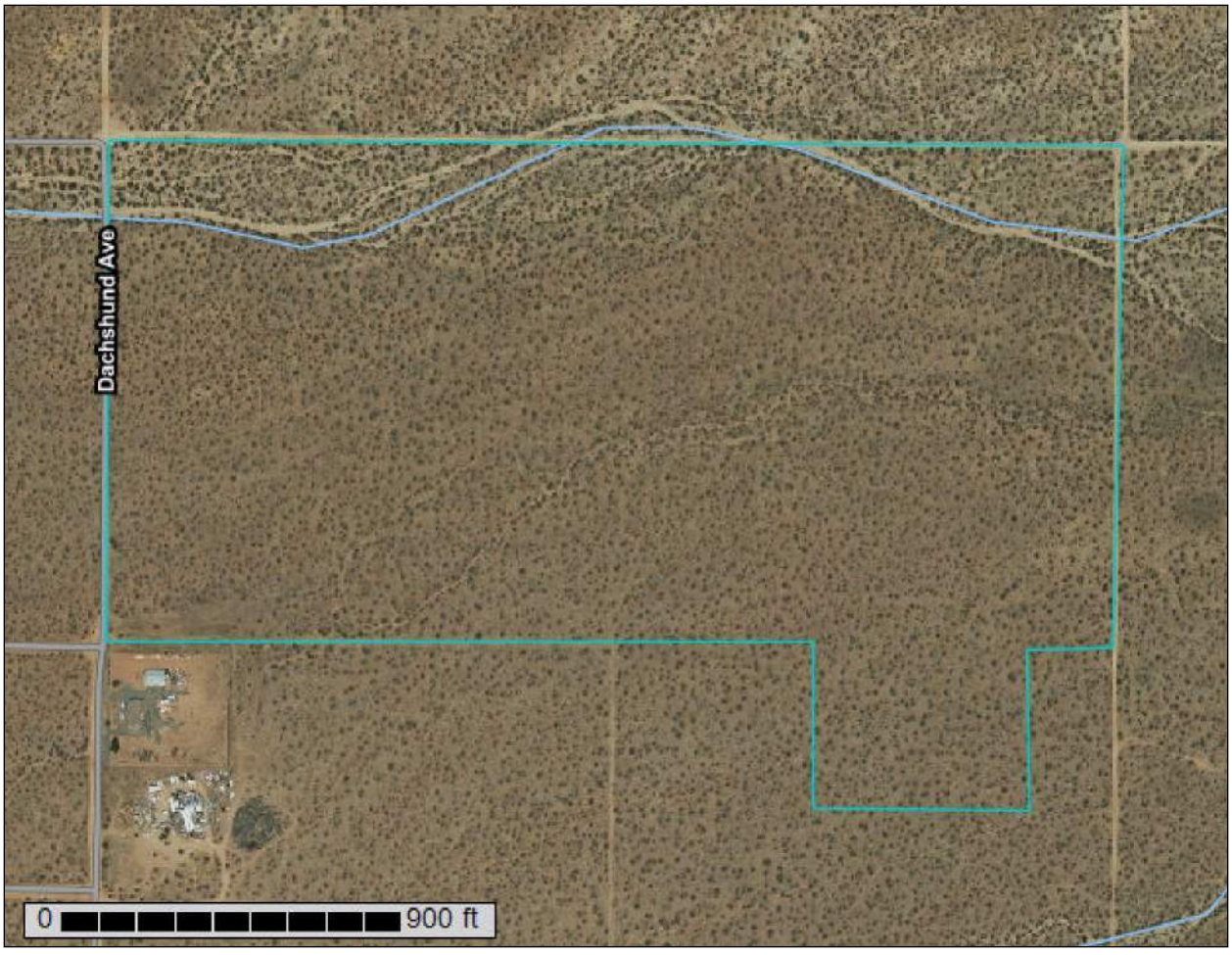
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Bernardino County, California, Mojave River Area



September 7, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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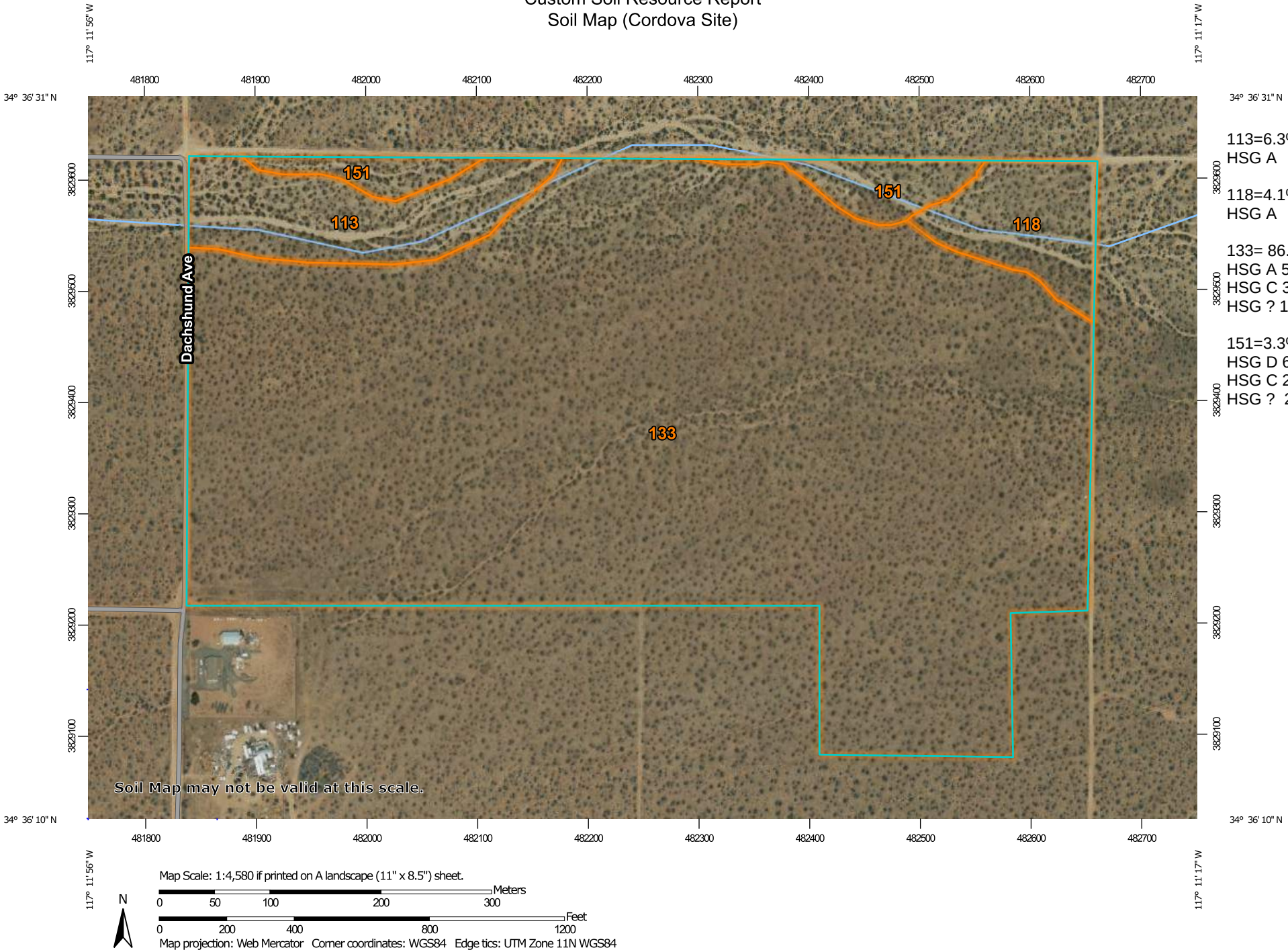
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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Cordova Site)



113=6.3%,
HSG A

118=4.1%,
HSG A

133= 86.3%,
HSG A 50%,
HSG C 35%,
HSG ? 15%

151=3.3%,
HSG D 60%
HSG C 20%
HSG ? 20%

Map Scale: 1:4,580 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 13, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 27, 2021—May 24, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Cordova Site)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
113	CAJON SAND, 2 TO 9 PERCENT SLOPES	5.5	6.3%
118	CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES*	3.6	4.1%
133	HELENDALE-BRYMAN LOAMY SANDS, 2 TO 5 PERCENT SLOPES*	75.4	86.3%
151	NEBONA-CUDDEBACK COMPLEX, 2 TO 9 PERCENT SLOPES*	2.9	3.3%
Totals for Area of Interest		**87.4**	**100.0%**

Map Unit Descriptions (Cordova Site)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Bernardino County, California, Mojave River Area

113—CAJON SAND, 2 TO 9 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hkrk
Elevation: 1,800 to 3,500 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 68 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cajon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

A - 0 to 6 inches: sand
C1 - 6 to 25 inches: sand
C2 - 25 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R030XF012CA - Sandy
Hydric soil rating: No

Minor Components

Cajon, gravelly surface

Percent of map unit: 5 percent

Landform: Alluvial fans

Helendale

Percent of map unit: 5 percent
Landform: Alluvial fans
Hydric soil rating: No

Kimberlina

Percent of map unit: 5 percent
Landform: Alluvial fans
Hydric soil rating: No

118—CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES*

Map Unit Setting

National map unit symbol: hkrq
Elevation: 2,800 to 3,300 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Cajon, gravelly surface, and similar soils: 55 percent
Arizo and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon, Gravelly Surface

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 6 inches: gravelly sand
H2 - 6 to 60 inches: gravelly sand

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R030XF028CA - COBBLY SANDY
Hydric soil rating: No

Description of Arizo

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 6 inches: gravelly loamy sand
H2 - 6 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: R030XF025CA - GRAVELLY COARSE LOAMY
Hydric soil rating: No

Minor Components

Helendale

Percent of map unit: 4 percent
Hydric soil rating: No

Bryman

Percent of map unit: 4 percent
Hydric soil rating: No

Joshua

Percent of map unit: 4 percent
Hydric soil rating: No

Cajon, clayey substratum
Percent of map unit: 3 percent

133—HELENDALE-BRYMAN LOAMY SANDS, 2 TO 5 PERCENT SLOPES*

Map Unit Setting
National map unit symbol: hks6
Elevation: 2,500 to 4,000 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Helendale and similar soils: 50 percent
Bryman and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Helendale

Setting
Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile
H1 - 0 to 6 inches: loamy sand
H2 - 6 to 30 inches: sandy loam
H3 - 30 to 66 inches: sandy loam
H4 - 66 to 99 inches: loamy sand

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R030XF012CA - Sandy
Hydric soil rating: No

Description of Bryman

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 12 inches: sandy loam
H3 - 12 to 44 inches: sandy clay loam
H4 - 44 to 60 inches: loamy sand

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R030XF012CA - Sandy
Hydric soil rating: No

Minor Components

Cajon

Percent of map unit: 5 percent
Hydric soil rating: No

Mohave variant

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 5 percent
Hydric soil rating: No

151—NEBONA-CUDDEBACK COMPLEX, 2 TO 9 PERCENT SLOPES*

Map Unit Setting

National map unit symbol: hkss
Elevation: 1,800 to 3,400 feet
Mean annual precipitation: 3 to 5 inches
Mean annual air temperature: 63 to 66 degrees F
Frost-free period: 200 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Nebona and similar soils: 60 percent
Cuddeback and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nebona

Setting

Landform: Fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 2 inches: sandy loam
H2 - 2 to 8 inches: fine sandy loam
H3 - 8 to 12 inches: indurated
H4 - 12 to 65 inches: stratified gravelly sand to loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 6 to 14 inches to duripan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 0.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D

Ecological site: R030XF030CA - DESERT PAVEMENT
Hydric soil rating: No

Description of Cuddeback

Setting

Landform: Inset fans
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 3 inches: sandy loam
H2 - 3 to 6 inches: sandy loam
H3 - 6 to 17 inches: gravelly sandy clay loam
H4 - 17 to 34 inches: gravelly sandy loam
H5 - 34 to 38 inches: indurated

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R030XG024CA - DESERT PAVEMENT
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 19 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Playas
Hydric soil rating: Yes

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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)

Figure ADD-1
Antecedent Moisture Condition (AMC)

5-day Rainfall - NOAA Atlas 14
(50% of Total Rainfall Prior to Peak)*

*1/2 (11-day - 1-day) =
1/2 (([10-day] + (1/10 ([20-day] - [10-day]))) - [1-day])

5 0 5 10 15
Miles

N
W E
S

Growing Season
- AMC I
- AMC II
- AMC III

Site

STATE HWY 127
I-15
US HWY 395
I-40
STATE HWY 247
STATE HWY 62

Baxter Valley
Ridgecrest
Boron
Barstow
Needles
Adelanto
George AFB
George AFB
Victorville
Apple Valley
Mountain View Acres
Hesperia
Wrightwood
Crestline
Lake Arrowhead
Running Springs
Big Bear City
Big Bear Lake
Yucca Valley
Morongo Valley
Joshua Tree
Twentynine Palms
Claremont
Havasu Lake
Big River

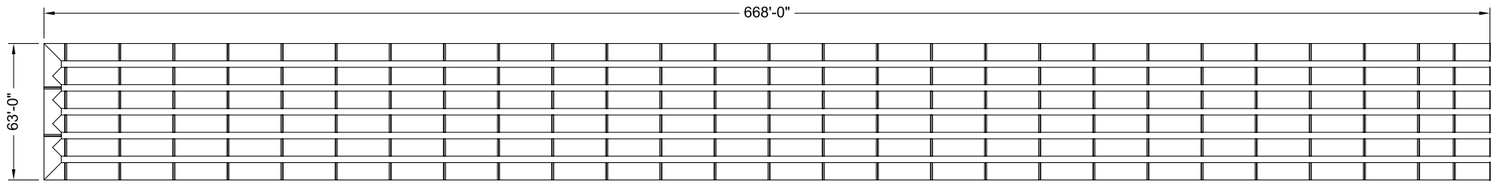
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 4,023 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 277,791 CF
- PIPE STORAGE VOLUME = 202,218 CF
- BACKFILL STORAGE VOLUME = 75,893 CF
- TOTAL STORAGE PROVIDED = 278,111 CF

PIPE DETAILS
- DIAMETER = 96"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"



NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE $2\frac{2}{3}$" x $\frac{1}{2}$" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

ASSEMBLY

SCALE: 1" = 70'

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DATE	REVISION DESCRIPTION	BY

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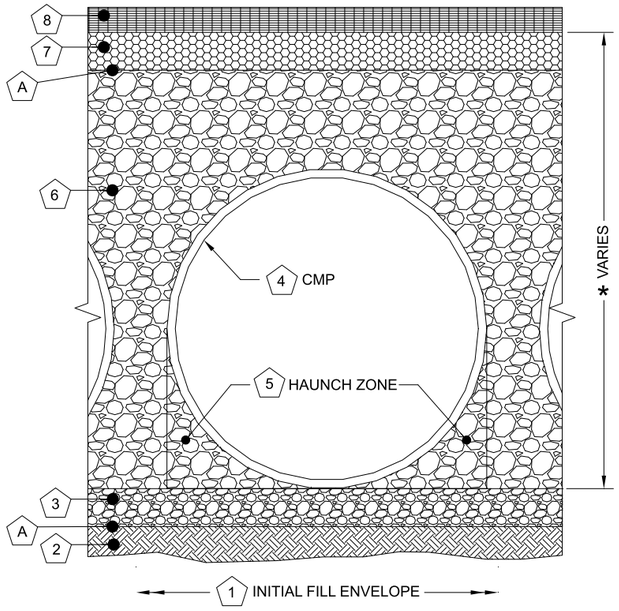
CONTECH® CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO23059 Cordova Complex
hz
Santa Ana, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
15164	23059	10/27/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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	Infiltration Systems - CMP Infiltration & CMP Perforated Drainage Pipe			
	Material Location	Description	Material Designation	Designation
8	Rigid or Flexible Pavement (if applicable)			
7	Road Base (if applicable			
A	Geotextile Layer	Non-Woven Geotextile	CONTECH C-40 or C-45	Engineer Decision for consideration to prevent soil migration into varying soil types. Wrap the trench only.
6	Backfill	Infiltration pipe systems have a pipe perforation sized of 3/8" diameter. An open graded, free draining stone, with a particle size of ½" – 2 ½" diameter is recommended.	AASHTO M 145-A-1 or AASHTO M 43 - 3, 4	Material shall be worked into the pipe haunches by means of shovel-slicing, rodding, air-tamper, vibratory rod, or other effective methods. Compaction of all placed fill material is necessary and shall be considered adequate when no further yielding of the material is observed under the compactor, or under foot, and the Project Engineer or his representative is satisfied with the level of compaction"
3	Bedding Stone	Well graded granular bedding material w/maximum particle size of 3"	AASHTO M43 - 3,357,4,467, 5, 56, 57	For soil aggregates larger than 3/8" a dedicated bedding layer is not required for CMP. Pipe may be placed on the trench bottom comprised of native suitable well graded & granular material. For Arch pipes it is recommended to be shaped to a relatively flat bottom or fine-grade the foundation to a slight v-shape. Soil aggregates less than 3/8" and unsuitable material should be over-excavated and re-placed with a 4"-6" layer of well graded & granular stone per the material designation.
A	Geotextile Layer	None	None	Contech does not recommend geotextiles be placed under the invert of Infiltration systems due to the propensity for geotextiles to clog over time.
*	Note: The listed AASHTO designations are for gradation only. The stone must also be angular and clean.			

1 MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT.

FOUNDATION/BEDDING PREPARATION

2 PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER.

5 HAUNCH ZONE MATERIAL SHALL BE PLACED AND UNIFORMLY COMPACTED WITHOUT SOFT SPOTS.

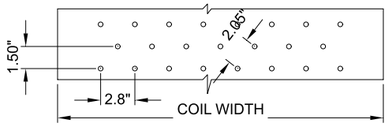
BACKFILL

MATERIAL SHALL BE PLACED IN 8"-10" MAXIMUM LIFTS. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE DEFLECTIONS WITHIN THE SYSTEM AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.

EQUIPMENT USED TO PLACE AND COMPACT THE BACKFILL SHALL BE OF A SIZE AND TYPE SO AS NOT TO DISTORT, DAMAGE, OR DISPLACE THE PIPE. ATTENTION MUST BE GIVEN TO PROVIDING ADEQUATE MINIMUM COVER FOR SUCH EQUIPMENT. MAINTAIN BALANCED LOADING ON ALL PIPES IN THE SYSTEM DURING ALL SUCH OPERATIONS.

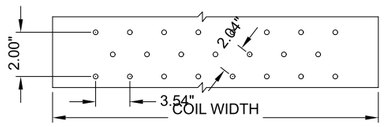
OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS. REFER TO TYPICAL BACKFILL DETAIL FOR MATERIAL REQUIRED.

2 2/3" x 1/2" CORRUGATION - STEEL AND ALUMINUM CMP EDGE SPACING EQUAL ON BOTH SIDES



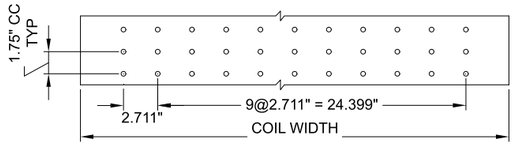
OPEN AREA = 3.76 SQ IN/SQ FT

3" x 1" CORRUGATION - STEEL AND ALUMINUM CMP (COIL PROVIDED FROM CONTECH LANTANA, FL PLANT)



OPEN AREA = 4.16 SQ IN/SQ FT

5" x 1" CORRUGATION - STEEL ONLY
EDGE SPACING EQUAL ON BOTH SIDES



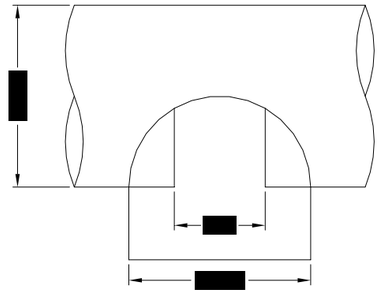
OPEN AREA = 3.33 SQ IN/SQ FT

NOTES:

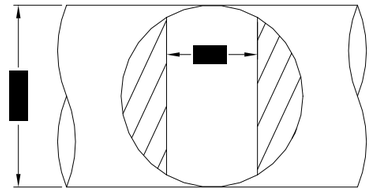
1. PERFORATIONS MEET AASHTO AND ASTM SPECIFICATIONS.
2. PERFORATION OPEN AREA PER SQUARE FOOT OF PIPE IS BASED ON THE NOMINAL DIAMETER AND LENGTH OF PIPE.
3. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
4. ALL HOLES ⌀3/8".

TYPICAL PERFORATION DETAIL

SCALE: N.T.S.



PLAN

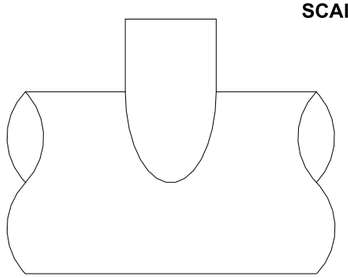


FRONT

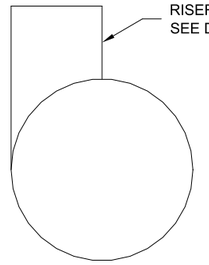
TYPICAL MANWAY DETAIL

SCALE: N.T.S.

NOTE:
MANWAY DETAIL APPLICABLE FOR CMP SYSTEMS WITH DIAMETERS 48" AND LARGER. MANWAYS MAY BE REQUIRED ON SMALLER SYSTEMS DEPENDING ON ACTUAL SITE SPECIFIC CONDITIONS.



ELEVATION

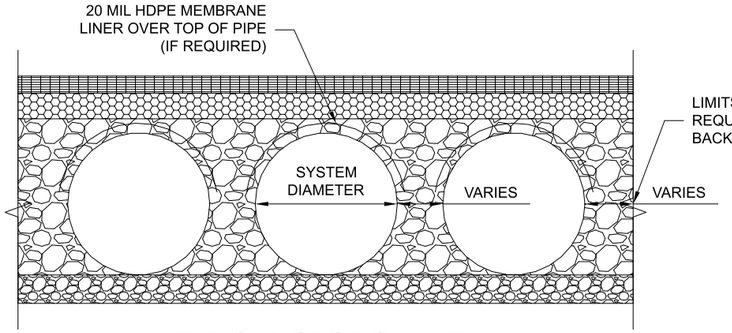


END

TYPICAL RISER DETAIL

SCALE: N.T.S.

NOTE:
LADDERS ARE OPTIONAL AND ARE NOT REQUIRED FOR ALL SYSTEMS.



TYPICAL SECTION VIEW

LINER OVER ROWS
SCALE: N.T.S.

NOTE: IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, AN HDPE MEMBRANE LINER IS RECOMMENDED WITH THE SYSTEM. THE IMPERMEABLE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

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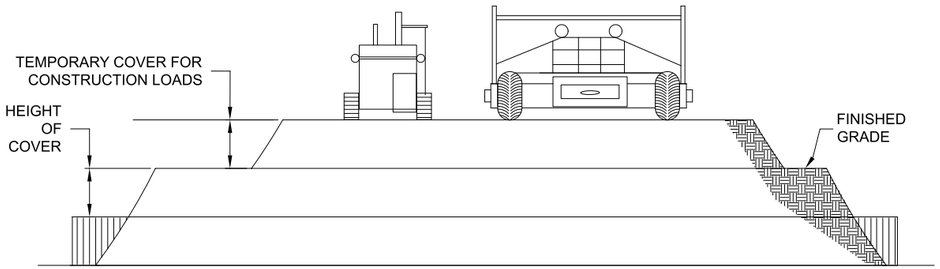
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CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO23059 Cordova Complex
hz
Santa Ana, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
15164	23059	10/27/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		

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CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

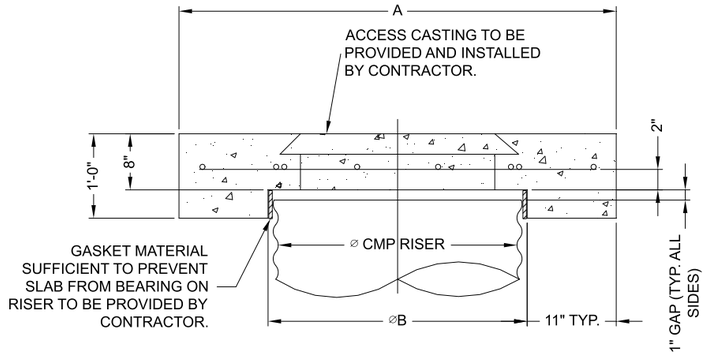
APPLICABLE POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSP'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.
REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

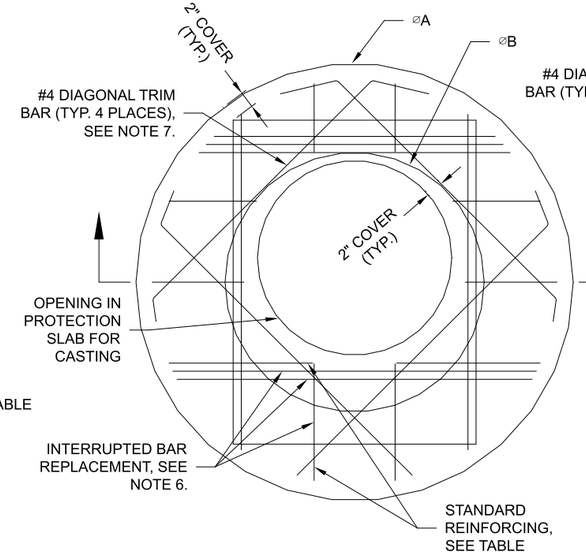
NOTE:
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.



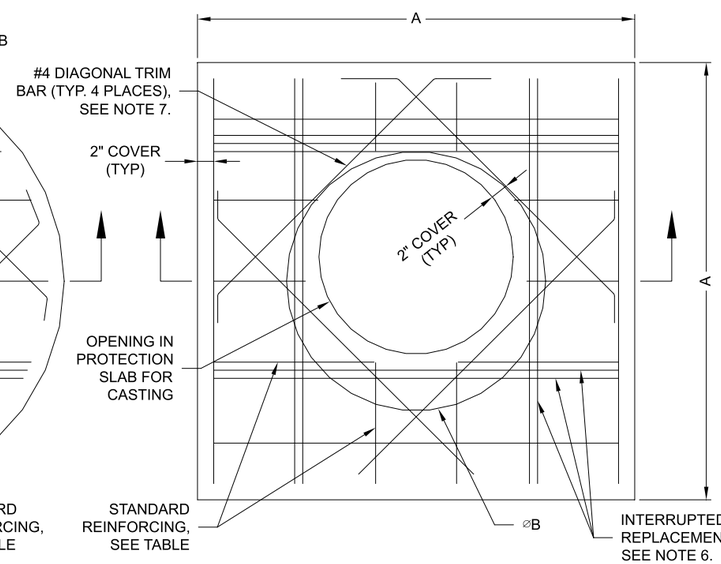
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO23059 Cordova Complex
hz
Santa Ana, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
15164	23059	10/27/2022
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SHEET NO.: 1		

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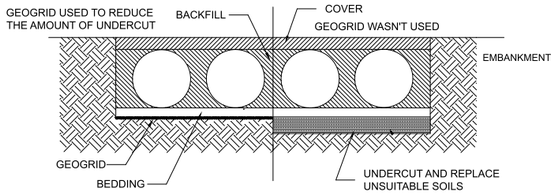
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

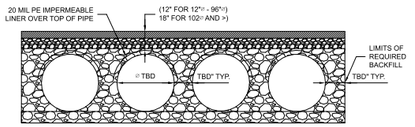


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

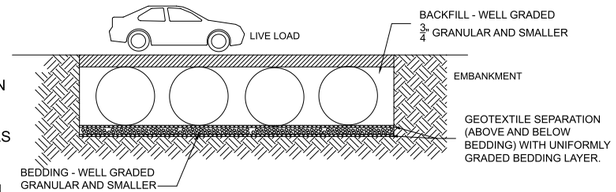
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

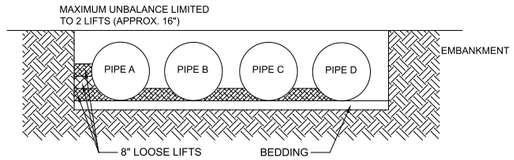
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



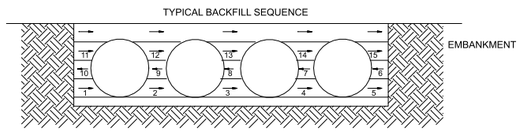
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

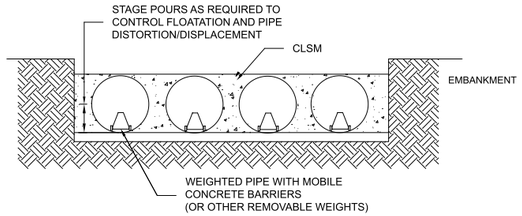


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

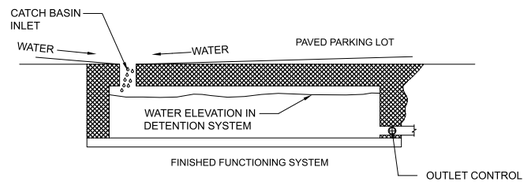


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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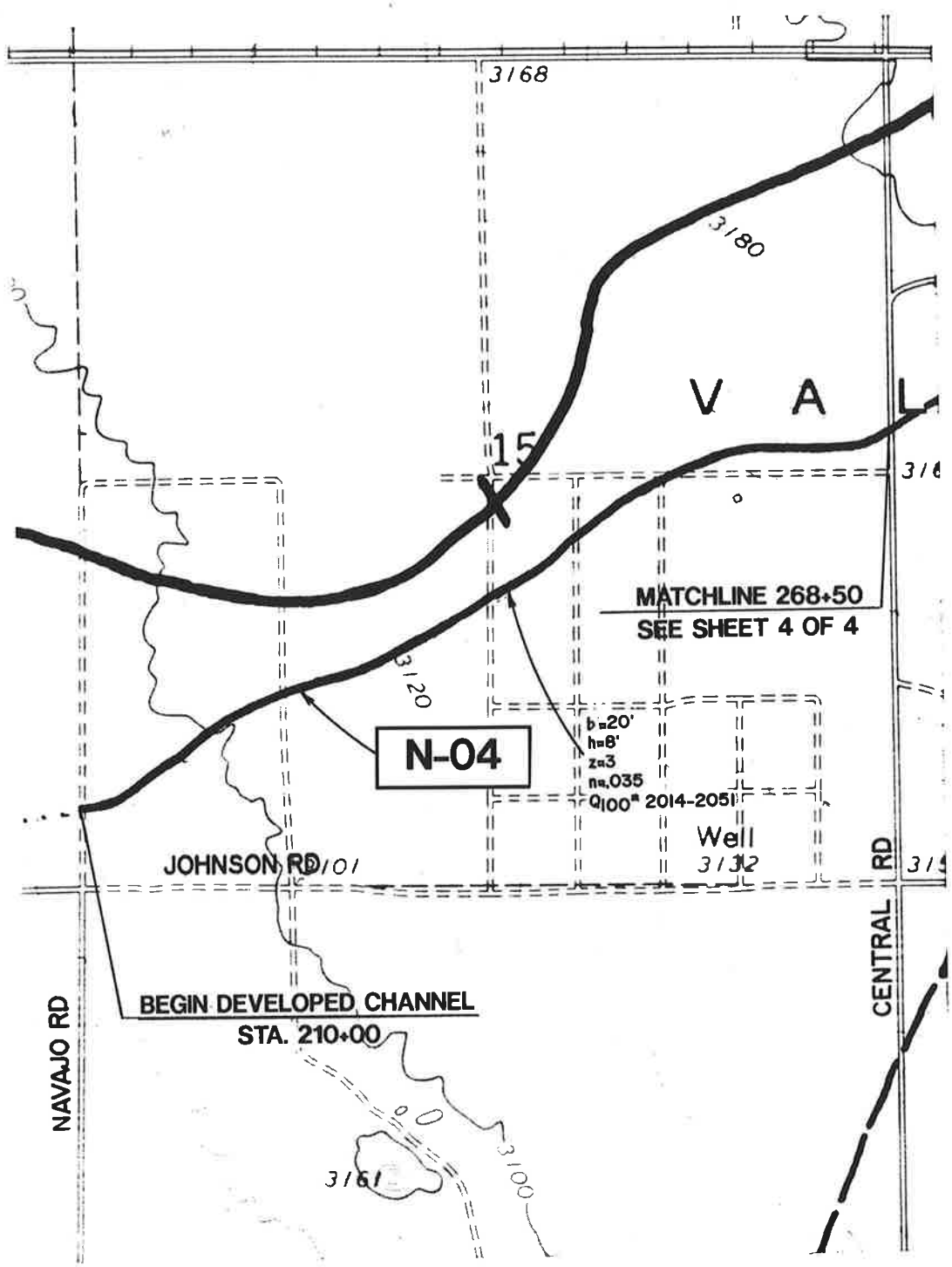
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS

CONTECH **DYODS** DRAWING

DYO23059 Cordova Complex
hz
Santa Ana, CA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
15164	23059	10/27/2022
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		



LEGEND			
	WATERSHED BOUNDARY	.....	DRY LAKE H.W.L.
	PROPOSED FACILITY	TTTTTT	LEVEE
	FACILITY SHOWN ELSEWHERE	—···—	N.D.C.

APPLE VALLEY MASTER PLAN OF DRAINAGE	COMPREHENSIVE STORM DRAIN PLAN LINE N-04 SHEET 3 OF 4	SCALE 1"=1000' WILLIAMSON & SCHMID

Appendix C

Rational Method Analysis

Onsite Existing condition, 10-Year and 100-Year events
Onsite Developed condition, 10-Year and 100-Year events

10 year
Existing Condition

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/12/22

Cordova Site
10-yr existing condition
subarea A1 A2
Area C2 (dry lakebed watershed)

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.428(In/Hr)
Initial subarea data:
Initial area flow distance = 945.000(Ft.)
Top (of initial area) elevation = 3091.000(Ft.)
Bottom (of initial area) elevation = 3074.900(Ft.)
Difference in elevation = 16.100(Ft.)
Slope = 0.01704 s(%)= 1.70
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.368 min.
Rainfall intensity = 1.395(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.624
Subarea runoff = 5.670(CFS)

```
Total initial stream area =        6.520(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.428(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.206(Ft.), Average velocity =   0.932(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.60
        2             88.00              0.00
        3            173.00              0.60
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      5.711(CFS)
  '     '        flow top width =     59.455(Ft.)
  '     '    velocity=    0.932(Ft/s)
  '     '        area =      6.130(Sq.Ft)
  '     '        Froude number =     0.511

Upstream point elevation =  3074.900(Ft.)
Downstream point elevation =  3069.900(Ft.)
Flow length =   502.000(Ft.)
Travel time  =    8.98 min.
Time of concentration =   27.35 min.
Depth of flow =   0.206(Ft.)
Average velocity =   0.932(Ft/s)
Total irregular channel flow =     5.711(CFS)
Irregular channel normal depth above invert elev. =   0.206(Ft.)
Average velocity of channel(s) =   0.932(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.428(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =      4.521(CFS)
therefore the upstream flow rate of Q =      5.670(CFS) is being used
Rainfall intensity =      1.056(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.535
```

```
Subarea runoff =      0.000(CFS) for    1.490(Ac.)
Total runoff =      5.670(CFS)
Effective area this stream =        8.01(Ac.)
Total Study Area (Main Stream No. 1) =        8.01(Ac.)
Area averaged Fm value =    0.428(In/Hr)
Depth of flow =   0.206(Ft.), Average velocity =   0.930(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      8.010(Ac.)
Runoff from this stream =      5.670(CFS)
Time of concentration =   27.35 min.
Rainfall intensity =     1.056(In/Hr)
Area averaged loss rate (Fm) =    0.4284(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      5.67     8.010     27.35    0.428      1.056
Qmax(1) =
           1.000 *    1.000 *     5.670) + =       5.670

Total of 1 streams to confluence:
Flow rates before confluence point:
       5.670
Maximum flow rates at confluence using above data:
        5.670
Area of streams before confluence:
        8.010
Effective area values after confluence:
        8.010
Results of confluence:
Total flow rate =      5.670(CFS)
Time of concentration =    27.348 min.
Effective stream area after confluence =      8.010(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.428(In/Hr)
Study area total (this main stream) =       8.01(Ac.)
End of computations, Total Study Area =            8.01 (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) = 1.000
Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/12/22

Cordova Site
10-yr existing
Area C2 (B1,B2) (dry lakebed watershed)

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.428(In/Hr)
Initial subarea data:
Initial area flow distance = 633.000(Ft.)
Top (of initial area) elevation = 3093.000(Ft.)
Bottom (of initial area) elevation = 3084.200(Ft.)
Difference in elevation = 8.800(Ft.)
Slope = 0.01390 s(%)= 1.39
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 16.297 min.
Rainfall intensity = 1.517(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.646

```
Subarea runoff =      3.486(CFS)
Total initial stream area =        3.560(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.428(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.234(Ft.), Average velocity =   1.207(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.50
        2             57.00              0.50
        3            101.00              0.00
        4            138.00              0.50
        5            192.00              1.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      5.367(CFS)
  '     '        flow top width =     37.955(Ft.)
  '     '    velocity=    1.207(Ft/s)
  '     '        area =      4.446(Sq.Ft)
  '     '        Froude number =     0.621

Upstream point elevation =  3084.200(Ft.)
Downstream point elevation =  3071.000(Ft.)
Flow length =   936.000(Ft.)
Travel time  =   12.92 min.
Time of concentration =   29.22 min.
Depth of flow =   0.234(Ft.)
Average velocity =   1.207(Ft/s)
Total irregular channel flow =     5.367(CFS)
Irregular channel normal depth above invert elev. =   0.234(Ft.)
Average velocity of channel(s) =   1.207(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.428(In/Hr)
Rainfall intensity =      1.008(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.517
```

```
Subarea runoff =      3.682(CFS) for   10.190(Ac.)
Total runoff =      7.169(CFS)
Effective area this stream =       13.75(Ac.)
Total Study Area (Main Stream No. 1) =       13.75(Ac.)
Area averaged Fm value =    0.428(In/Hr)
Depth of flow =   0.261(Ft.), Average velocity =   1.298(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.750(Ac.)
Runoff from this stream =      7.169(CFS)
Time of concentration =   29.22 min.
Rainfall intensity =     1.008(In/Hr)
Area averaged loss rate (Fm) =    0.4284(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      7.17    13.750     29.22    0.428      1.008
Qmax(1) =
           1.000 *    1.000 *     7.169) + =       7.169

Total of 1 streams to confluence:
Flow rates before confluence point:
       7.169
Maximum flow rates at confluence using above data:
        7.169
Area of streams before confluence:
       13.750
Effective area values after confluence:
       13.750
Results of confluence:
Total flow rate =      7.169(CFS)
Time of concentration =    29.221 min.
Effective stream area after confluence =     13.750(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.428(In/Hr)
Study area total (this main stream) =      13.75(Ac.)
End of computations, Total Study Area =           13.75 (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) = 1.000
Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/17/22

Cordova site
10-yr existing condition
Area D

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

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

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2) = 75.04
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.452(In/Hr)
Initial subarea data:
Initial area flow distance = 522.000(Ft.)
Top (of initial area) elevation = 3092.300(Ft.)
Bottom (of initial area) elevation = 3086.000(Ft.)
Difference in elevation = 6.300(Ft.)
Slope = 0.01207 s(%)= 1.21
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.520 min.
Rainfall intensity = 1.569(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.641

```
Subarea runoff =      3.518(CFS)
Total initial stream area =        3.500(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.452(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.228(Ft.), Average velocity =   1.150(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.00
        2             36.00              0.00
        3             45.00              0.00
        4             56.00              1.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      3.777(CFS)
  '     '        flow top width =     19.739(Ft.)
  '     '    velocity=    1.150(Ft/s)
  '     '        area =      3.283(Sq.Ft)
  '     '        Froude number =     0.497

Upstream point elevation =  3086.000(Ft.)
Downstream point elevation =  3080.900(Ft.)
Flow length =   635.000(Ft.)
Travel time  =    9.20 min.
Time of concentration =   24.72 min.
Depth of flow =   0.228(Ft.)
Average velocity =   1.150(Ft/s)
Total irregular channel flow =     3.776(CFS)
Irregular channel normal depth above invert elev. =   0.228(Ft.)
Average velocity of channel(s) =   1.150(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2)  = 75.04
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.452(In/Hr)
Rainfall intensity =      1.133(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.541
Subarea runoff =      0.463(CFS) for    3.000(Ac.)
```

```
Total runoff =      3.981(CFS)
Effective area this stream =        6.50(Ac.)
Total Study Area (Main Stream No. 1) =        6.50(Ac.)
Area averaged Fm value =    0.452(In/Hr)
Depth of flow =   0.235(Ft.), Average velocity =   1.168(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.261(Ft.), Average velocity =   1.217(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2             30.00              0.00
        3             53.00              0.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      4.397(CFS)
  '     '        flow top width =     27.671(Ft.)
  '     '    velocity=    1.217(Ft/s)
  '     '        area =      3.612(Sq.Ft)
  '     '        Froude number =     0.594

Upstream point elevation =  3080.900(Ft.)
Downstream point elevation =  3068.900(Ft.)
Flow length =   966.000(Ft.)
Travel time  =   13.22 min.
Time of concentration =   37.94 min.
Depth of flow =   0.261(Ft.)
Average velocity =   1.217(Ft/s)
Total irregular channel flow =     4.397(CFS)
Irregular channel normal depth above invert elev. =   0.261(Ft.)
Average velocity of channel(s) =   1.217(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2)  = 75.04
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.452(In/Hr)
Rainfall intensity =      0.839(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.415
Subarea runoff =      0.755(CFS) for    7.100(Ac.)
```

```
Total runoff =      4.736(CFS)
Effective area this stream =       13.60(Ac.)
Total Study Area (Main Stream No. 1) =       13.60(Ac.)
Area averaged Fm value =    0.452(In/Hr)
Depth of flow =   0.268(Ft.), Average velocity =   1.240(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.177(Ft.), Average velocity =  17.588(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             18.00              1.00
        3             31.00              0.00
        4             39.00              1.00
        5             62.00              1.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      5.776(CFS)
  '     '        flow top width =      3.714(Ft.)
  '     '    velocity=   17.589(Ft/s)
  '     '        area =      0.328(Sq.Ft)
  '     '        Froude number =    10.423

Upstream point elevation =  3068.900(Ft.)
Downstream point elevation =     0.000(Ft.)
Flow length =   700.000(Ft.)
Travel time  =    0.66 min.
Time of concentration =   38.61 min.
Depth of flow =   0.177(Ft.)
Average velocity =  17.588(Ft/s)
Total irregular channel flow =     5.776(CFS)
Irregular channel normal depth above invert elev. =   0.177(Ft.)
Average velocity of channel(s) =  17.588(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2)  = 75.04
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.452(In/Hr)
Rainfall intensity =      0.829(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
```

```
rational method)(Q=KCIA) is C = 0.409
Subarea runoff =      1.989(CFS) for    6.230(Ac.)
Total runoff =      6.725(CFS)
Effective area this stream =       19.83(Ac.)
Total Study Area (Main Stream No. 1) =       19.83(Ac.)
Area averaged Fm value =    0.452(In/Hr)
Depth of flow =   0.187(Ft.), Average velocity =  18.270(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     19.830(Ac.)
Runoff from this stream =      6.725(CFS)
Time of concentration =   38.61 min.
Rainfall intensity =     0.829(In/Hr)
Area averaged loss rate (Fm) =    0.4523(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      6.73    19.830     38.61    0.452      0.829
Qmax(1) =
           1.000 *    1.000 *     6.725) + =       6.725

Total of 1 streams to confluence:
Flow rates before confluence point:
       6.725
Maximum flow rates at confluence using above data:
        6.725
Area of streams before confluence:
       19.830
Effective area values after confluence:
       19.830
Results of confluence:
Total flow rate =      6.725(CFS)
Time of concentration =    38.608 min.
Effective stream area after confluence =     19.830(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.452(In/Hr)
Study area total (this main stream) =      19.83(Ac.)
End of computations, Total Study Area =           19.83 (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) = 1.000
Area averaged SCS curve number = 75.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/18/22

Cordova site
10-yr existing condition
Area E

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.428(In/Hr)
Initial subarea data:
Initial area flow distance = 992.000(Ft.)
Top (of initial area) elevation = 3076.100(Ft.)
Bottom (of initial area) elevation = 3063.400(Ft.)
Difference in elevation = 12.700(Ft.)
Slope = 0.01280 s(%)= 1.28
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.829 min.
Rainfall intensity = 1.322(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.608

```
Subarea runoff =      4.182(CFS)
Total initial stream area =        5.200(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.428(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station      402.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      5.200(Ac.)
Runoff from this stream =      4.182(CFS)
Time of concentration =   19.83 min.
Rainfall intensity =     1.322(In/Hr)
Area averaged loss rate (Fm) =    0.4284(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      4.18     5.200     19.83    0.428      1.322
Qmax(1) =
           1.000 *    1.000 *     4.182) + =       4.182

Total of 1 streams to confluence:
Flow rates before confluence point:
       4.182
Maximum flow rates at confluence using above data:
        4.182
Area of streams before confluence:
        5.200
Effective area values after confluence:
        5.200
Results of confluence:
Total flow rate =      4.182(CFS)
Time of concentration =    19.829 min.
Effective stream area after confluence =      5.200(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.428(In/Hr)
Study area total (this main stream) =       5.20(Ac.)
End of computations, Total Study Area =            5.20 (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) = 1.000
```

Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/18/22

Cordova site
10-yr existing
Area F

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 501.000 to Point/Station 502.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.428(In/Hr)
Initial subarea data:
Initial area flow distance = 957.000(Ft.)
Top (of initial area) elevation = 3080.000(Ft.)
Bottom (of initial area) elevation = 3067.000(Ft.)
Difference in elevation = 13.000(Ft.)
Slope = 0.01358 s(%)= 1.36
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.316 min.
Rainfall intensity = 1.346(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.614

```
Subarea runoff =      4.081(CFS)
Total initial stream area =        4.940(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.428(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.213(Ft.), Average velocity =   1.046(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.70
        2             52.00              0.00
        3            129.00              0.70
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      4.394(CFS)
  '     '        flow top width =     39.345(Ft.)
  '     '    velocity=    1.046(Ft/s)
  '     '        area =      4.200(Sq.Ft)
  '     '        Froude number =     0.564

Upstream point elevation =  3067.000(Ft.)
Downstream point elevation =  3059.900(Ft.)
Flow length =   592.000(Ft.)
Travel time  =    9.43 min.
Time of concentration =   28.75 min.
Depth of flow =   0.213(Ft.)
Average velocity =   1.046(Ft/s)
Total irregular channel flow =     4.394(CFS)
Irregular channel normal depth above invert elev. =   0.213(Ft.)
Average velocity of channel(s) =   1.046(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.428(In/Hr)
Rainfall intensity =      1.019(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.522
Subarea runoff =      0.529(CFS) for    3.730(Ac.)
Total runoff =      4.611(CFS)
```

```
Effective area this stream =        8.67(Ac.)
Total Study Area (Main Stream No. 1) =        8.67(Ac.)
Area averaged Fm value =    0.428(In/Hr)
Depth of flow =   0.217(Ft.), Average velocity =   1.059(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      8.670(Ac.)
Runoff from this stream =      4.611(CFS)
Time of concentration =   28.75 min.
Rainfall intensity =     1.019(In/Hr)
Area averaged loss rate (Fm) =    0.4284(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      4.61     8.670     28.75    0.428      1.019
Qmax(1) =
           1.000 *    1.000 *     4.611) + =       4.611

Total of 1 streams to confluence:
Flow rates before confluence point:
       4.611
Maximum flow rates at confluence using above data:
        4.611
Area of streams before confluence:
        8.670
Effective area values after confluence:
        8.670
Results of confluence:
Total flow rate =      4.611(CFS)
Time of concentration =    28.746 min.
Effective stream area after confluence =      8.670(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.428(In/Hr)
Study area total (this main stream) =       8.67(Ac.)
End of computations, Total Study Area =            8.67 (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) = 1.000
```

Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/18/22

Cordova site
10-yr existing
area G

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 601.000 to Point/Station 602.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.428(In/Hr)
Initial subarea data:
Initial area flow distance = 958.000(Ft.)
Top (of initial area) elevation = 3095.700(Ft.)
Bottom (of initial area) elevation = 3083.800(Ft.)
Difference in elevation = 11.900(Ft.)
Slope = 0.01242 s(%)= 1.24
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.673 min.
Rainfall intensity = 1.329(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.610

```
Subarea runoff =      3.835(CFS)
Total initial stream area =        4.730(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.428(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      602.000 to Point/Station      603.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.204(Ft.), Average velocity =   1.082(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2             40.00              0.00
        3             94.00              0.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      4.238(CFS)
  '     '        flow top width =     38.371(Ft.)
  '     '    velocity=    1.082(Ft/s)
  '     '        area =      3.916(Sq.Ft)
  '     '        Froude number =     0.597

Upstream point elevation =  3083.800(Ft.)
Downstream point elevation =  3072.000(Ft.)
Flow length =   866.000(Ft.)
Travel time  =   13.34 min.
Time of concentration =   33.01 min.
Depth of flow =   0.204(Ft.)
Average velocity =   1.082(Ft/s)
Total irregular channel flow =     4.238(CFS)
Irregular channel normal depth above invert elev. =   0.204(Ft.)
Average velocity of channel(s) =   1.082(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.428(In/Hr)
Rainfall intensity =      0.925(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.483
Subarea runoff =      0.726(CFS) for    5.470(Ac.)
Total runoff =      4.561(CFS)
```

```
Effective area this stream =       10.20(Ac.)
Total Study Area (Main Stream No. 1) =       10.20(Ac.)
Area averaged Fm value =    0.428(In/Hr)
Depth of flow =   0.210(Ft.), Average velocity =   1.102(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      603.000 to Point/Station      604.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.150(Ft.), Average velocity =   0.820(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.20
        2             55.00              0.00
        3            100.00              0.20
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      4.603(CFS)
  '     '        flow top width =     74.942(Ft.)
  '     '    velocity=    0.820(Ft/s)
  '     '        area =      5.616(Sq.Ft)
  '     '        Froude number =     0.528

Upstream point elevation =  3072.000(Ft.)
Downstream point elevation =  3061.800(Ft.)
Flow length =   865.000(Ft.)
Travel time  =   17.59 min.
Time of concentration =   50.60 min.
Depth of flow =   0.150(Ft.)
Average velocity =   0.820(Ft/s)
Total irregular channel flow =     4.603(CFS)
Irregular channel normal depth above invert elev. =   0.150(Ft.)
Average velocity of channel(s) =   0.820(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.428(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =      3.739(CFS)
therefore the upstream flow rate of Q =      4.561(CFS) is being used
Rainfall intensity =      0.686(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
```

```
rational method)(Q=KCIA) is C = 0.338
Subarea runoff =      0.000(CFS) for    5.920(Ac.)
Total runoff =      4.561(CFS)
Effective area this stream =       16.12(Ac.)
Total Study Area (Main Stream No. 1) =       16.12(Ac.)
Area averaged Fm value =    0.428(In/Hr)
Depth of flow =   0.149(Ft.), Average velocity =   0.818(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      603.000 to Point/Station      604.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     16.120(Ac.)
Runoff from this stream =      4.561(CFS)
Time of concentration =   50.60 min.
Rainfall intensity =     0.686(In/Hr)
Area averaged loss rate (Fm) =    0.4284(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      4.56    16.120     50.60    0.428      0.686
Qmax(1) =
           1.000 *    1.000 *     4.561) + =       4.561

Total of 1 streams to confluence:
Flow rates before confluence point:
       4.561
Maximum flow rates at confluence using above data:
        4.561
Area of streams before confluence:
       16.120
Effective area values after confluence:
       16.120
Results of confluence:
Total flow rate =      4.561(CFS)
Time of concentration =    50.602 min.
Effective stream area after confluence =     16.120(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.428(In/Hr)
Study area total (this main stream) =      16.12(Ac.)
End of computations, Total Study Area =           16.12 (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) = 1.000
Area averaged SCS curve number = 76.5

100 year
Existing Condition

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/12/22

Cordova Site
100-yr existing
subarea A1 A2
Area C2 (dry lakebed watershed)

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.157(In/Hr)
Initial subarea data:
Initial area flow distance = 945.000(Ft.)
Top (of initial area) elevation = 3091.000(Ft.)
Bottom (of initial area) elevation = 3074.900(Ft.)
Difference in elevation = 16.100(Ft.)
Slope = 0.01704 s(%)= 1.70
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.368 min.
Rainfall intensity = 2.473(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.843

```
Subarea runoff =     13.593(CFS)
Total initial stream area =        6.520(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.157(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.286(Ft.), Average velocity =   1.158(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.60
        2             88.00              0.00
        3            173.00              0.60
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     13.641(CFS)
  '     '        flow top width =     82.413(Ft.)
  '     '    velocity=    1.158(Ft/s)
  '     '        area =     11.778(Sq.Ft)
  '     '        Froude number =     0.540

Upstream point elevation =  3074.900(Ft.)
Downstream point elevation =  3069.900(Ft.)
Flow length =   502.000(Ft.)
Travel time  =    7.22 min.
Time of concentration =   25.59 min.
Depth of flow =   0.286(Ft.)
Average velocity =   1.158(Ft/s)
Total irregular channel flow =    13.641(CFS)
Irregular channel normal depth above invert elev. =   0.286(Ft.)
Average velocity of channel(s) =   1.158(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.157(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =     13.005(CFS)
therefore the upstream flow rate of Q =     13.593(CFS) is being used
Rainfall intensity =      1.961(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.828
Subarea runoff =      0.000(CFS) for    1.490(Ac.)
Total runoff =     13.593(CFS)
Effective area this stream =        8.01(Ac.)
Total Study Area (Main Stream No. 1) =        8.01(Ac.)
Area averaged Fm value =    0.157(In/Hr)
Depth of flow =   0.285(Ft.), Average velocity =   1.157(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      8.010(Ac.)
Runoff from this stream =     13.593(CFS)
Time of concentration =   25.59 min.
Rainfall intensity =     1.961(In/Hr)
Area averaged loss rate (Fm) =    0.1570(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     13.59     8.010     25.59    0.157      1.961
Qmax(1) =
           1.000 *    1.000 *    13.593) + =      13.593

Total of 1 streams to confluence:
Flow rates before confluence point:
      13.593
Maximum flow rates at confluence using above data:
       13.593
Area of streams before confluence:
        8.010
Effective area values after confluence:
        8.010
Results of confluence:
Total flow rate =     13.593(CFS)
Time of concentration =    25.591 min.
Effective stream area after confluence =      8.010(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.157(In/Hr)
Study area total (this main stream) =       8.01(Ac.)
End of computations, Total Study Area =            8.01 (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) = 1.000
Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/12/22

Cordova Site
100-yr existing
Area C2 (B1,B2) (dry lakebed watershed)

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.157(In/Hr)
Initial subarea data:
Initial area flow distance = 633.000(Ft.)
Top (of initial area) elevation = 3093.000(Ft.)
Bottom (of initial area) elevation = 3084.200(Ft.)
Difference in elevation = 8.800(Ft.)
Slope = 0.01390 s(%)= 1.39
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 16.297 min.
Rainfall intensity = 2.689(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.847
Subarea runoff =      8.114(CFS)
Total initial stream area =        3.560(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.157(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.345(Ft.), Average velocity =   1.562(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.50
        2             57.00              0.50
        3            101.00              0.00
        4            138.00              0.50
        5            192.00              1.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     15.043(CFS)
  '     '        flow top width =     55.864(Ft.)
  '     '    velocity=    1.562(Ft/s)
  '     '        area =      9.632(Sq.Ft)
  '     '        Froude number =     0.663

Upstream point elevation =  3084.200(Ft.)
Downstream point elevation =  3071.000(Ft.)
Flow length =   936.000(Ft.)
Travel time  =    9.99 min.
Time of concentration =   26.29 min.
Depth of flow =   0.345(Ft.)
Average velocity =   1.562(Ft/s)
Total irregular channel flow =    15.043(CFS)
Irregular channel normal depth above invert elev. =   0.345(Ft.)
Average velocity of channel(s) =   1.562(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.157(In/Hr)
Rainfall intensity =      1.925(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.827
Subarea runoff =     13.760(CFS) for   10.190(Ac.)
Total runoff =     21.874(CFS)
Effective area this stream =       13.75(Ac.)
Total Study Area (Main Stream No. 1) =       13.75(Ac.)
Area averaged Fm value =    0.157(In/Hr)
Depth of flow =   0.397(Ft.), Average velocity =   1.715(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.750(Ac.)
Runoff from this stream =     21.874(CFS)
Time of concentration =   26.29 min.
Rainfall intensity =     1.925(In/Hr)
Area averaged loss rate (Fm) =    0.1570(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     21.87    13.750     26.29    0.157      1.925
Qmax(1) =
           1.000 *    1.000 *    21.874) + =      21.874

Total of 1 streams to confluence:
Flow rates before confluence point:
      21.874
Maximum flow rates at confluence using above data:
       21.874
Area of streams before confluence:
       13.750
Effective area values after confluence:
       13.750
Results of confluence:
Total flow rate =     21.874(CFS)
Time of concentration =    26.285 min.
Effective stream area after confluence =     13.750(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.157(In/Hr)
Study area total (this main stream) =      13.75(Ac.)
End of computations, Total Study Area =           13.75 (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) = 1.000
Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/17/22

Cordova site
100-yr existing
Area D

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

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

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2) = 75.04
Adjusted SCS curve number for AMC 3 = 91.02
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.173(In/Hr)
Initial subarea data:
Initial area flow distance = 522.000(Ft.)
Top (of initial area) elevation = 3092.300(Ft.)
Bottom (of initial area) elevation = 3086.000(Ft.)
Difference in elevation = 6.300(Ft.)
Slope = 0.01207 s(%)= 1.21
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.520 min.
Rainfall intensity = 2.783(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.844
Subarea runoff =      8.220(CFS)
Total initial stream area =        3.500(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.173(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.371(Ft.), Average velocity =   1.505(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.00
        2             36.00              0.00
        3             45.00              0.00
        4             56.00              1.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      9.904(CFS)
  '     '        flow top width =     26.454(Ft.)
  '     '    velocity=    1.505(Ft/s)
  '     '        area =      6.583(Sq.Ft)
  '     '        Froude number =     0.531

Upstream point elevation =  3086.000(Ft.)
Downstream point elevation =  3080.900(Ft.)
Flow length =   635.000(Ft.)
Travel time  =    7.03 min.
Time of concentration =   22.55 min.
Depth of flow =   0.371(Ft.)
Average velocity =   1.505(Ft/s)
Total irregular channel flow =     9.904(CFS)
Irregular channel normal depth above invert elev. =   0.371(Ft.)
Average velocity of channel(s) =   1.505(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2)  = 75.04
Adjusted SCS curve number for AMC 3 = 91.02
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.173(In/Hr)
Rainfall intensity =      2.142(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
```

```
rational method)(Q=KCIA) is C = 0.827
Subarea runoff =      3.298(CFS) for    3.000(Ac.)
Total runoff =     11.518(CFS)
Effective area this stream =        6.50(Ac.)
Total Study Area (Main Stream No. 1) =        6.50(Ac.)
Area averaged Fm value =    0.173(In/Hr)
Depth of flow =   0.400(Ft.), Average velocity =   1.567(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.413(Ft.), Average velocity =   1.652(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2             30.00              0.00
        3             53.00              0.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     14.923(CFS)
  '     '        flow top width =     43.755(Ft.)
  '     '    velocity=    1.652(Ft/s)
  '     '        area =      9.031(Sq.Ft)
  '     '        Froude number =     0.641

Upstream point elevation =  3080.900(Ft.)
Downstream point elevation =  3068.900(Ft.)
Flow length =   966.000(Ft.)
Travel time  =    9.74 min.
Time of concentration =   32.30 min.
Depth of flow =   0.413(Ft.)
Average velocity =   1.652(Ft/s)
Total irregular channel flow =    14.923(CFS)
Irregular channel normal depth above invert elev. =   0.413(Ft.)
Average velocity of channel(s) =   1.652(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2)  = 75.04
Adjusted SCS curve number for AMC 3 = 91.02
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.173(In/Hr)
Rainfall intensity =      1.666(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.806
Subarea runoff =      6.754(CFS) for    7.100(Ac.)
Total runoff =     18.272(CFS)
Effective area this stream =       13.60(Ac.)
Total Study Area (Main Stream No. 1) =       13.60(Ac.)
Area averaged Fm value =    0.173(In/Hr)
Depth of flow =   0.445(Ft.), Average velocity =   1.738(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.294(Ft.), Average velocity =  24.666(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             18.00              1.00
        3             31.00              0.00
        4             39.00              1.00
        5             62.00              1.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     22.344(CFS)
  '     '        flow top width =      6.168(Ft.)
  '     '    velocity=   24.667(Ft/s)
  '     '        area =      0.906(Sq.Ft)
  '     '        Froude number =    11.343

Upstream point elevation =  3068.900(Ft.)
Downstream point elevation =     0.000(Ft.)
Flow length =   700.000(Ft.)
Travel time  =    0.47 min.
Time of concentration =   32.77 min.
Depth of flow =   0.294(Ft.)
Average velocity =  24.666(Ft/s)
Total irregular channel flow =    22.344(CFS)
Irregular channel normal depth above invert elev. =   0.294(Ft.)
Average velocity of channel(s) =  24.666(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.020
SCS curve number for soil(AMC 2)  = 75.04
```

```
Adjusted SCS curve number for AMC 3 = 91.02
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.173(In/Hr)
Rainfall intensity =      1.649(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.805
Subarea runoff =      8.069(CFS) for    6.230(Ac.)
Total runoff =     26.341(CFS)
Effective area this stream =       19.83(Ac.)
Total Study Area (Main Stream No. 1) =       19.83(Ac.)
Area averaged Fm value =    0.173(In/Hr)
Depth of flow =   0.312(Ft.), Average velocity =  25.703(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     19.830(Ac.)
Runoff from this stream =     26.341(CFS)
Time of concentration =   32.77 min.
Rainfall intensity =     1.649(In/Hr)
Area averaged loss rate (Fm) =    0.1733(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     26.34    19.830     32.77    0.173      1.649
Qmax(1) =
           1.000 *    1.000 *    26.341) + =      26.341

Total of 1 streams to confluence:
Flow rates before confluence point:
      26.341
Maximum flow rates at confluence using above data:
       26.341
Area of streams before confluence:
       19.830
Effective area values after confluence:
       19.830
Results of confluence:
Total flow rate =     26.341(CFS)
Time of concentration =    32.771 min.
Effective stream area after confluence =     19.830(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.173(In/Hr)
Study area total (this main stream) =      19.83(Ac.)
```

End of computations, Total Study Area = 19.83 (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) = 1.000
Area averaged SCS curve number = 75.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/18/22

Cordova site
100-yr existing
Area E

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.157(In/Hr)
Initial subarea data:
Initial area flow distance = 992.000(Ft.)
Top (of initial area) elevation = 3076.100(Ft.)
Bottom (of initial area) elevation = 3063.400(Ft.)
Difference in elevation = 12.700(Ft.)
Slope = 0.01280 s(%)= 1.28
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.829 min.
Rainfall intensity = 2.344(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.840
Subarea runoff =     10.237(CFS)
Total initial stream area =        5.200(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.157(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station      402.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      5.200(Ac.)
Runoff from this stream =     10.237(CFS)
Time of concentration =   19.83 min.
Rainfall intensity =     2.344(In/Hr)
Area averaged loss rate (Fm) =    0.1570(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     10.24     5.200     19.83    0.157      2.344
Qmax(1) =
           1.000 *    1.000 *    10.237) + =      10.237

Total of 1 streams to confluence:
Flow rates before confluence point:
      10.237
Maximum flow rates at confluence using above data:
       10.237
Area of streams before confluence:
        5.200
Effective area values after confluence:
        5.200
Results of confluence:
Total flow rate =     10.237(CFS)
Time of concentration =    19.829 min.
Effective stream area after confluence =      5.200(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.157(In/Hr)
Study area total (this main stream) =       5.20(Ac.)
End of computations, Total Study Area =            5.20 (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) = 1.000
Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/18/22

Cordova site
100-yr existing
Area F

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 501.000 to Point/Station 502.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.157(In/Hr)
Initial subarea data:
Initial area flow distance = 957.000(Ft.)
Top (of initial area) elevation = 3080.000(Ft.)
Bottom (of initial area) elevation = 3067.000(Ft.)
Difference in elevation = 13.000(Ft.)
Slope = 0.01358 s(%)= 1.36
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.316 min.
Rainfall intensity = 2.388(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.841
Subarea runoff =      9.918(CFS)
Total initial stream area =        4.940(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.157(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.309(Ft.), Average velocity =   1.340(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.70
        2             52.00              0.00
        3            129.00              0.70
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     11.811(CFS)
  '     '        flow top width =     57.005(Ft.)
  '     '    velocity=    1.340(Ft/s)
  '     '        area =      8.817(Sq.Ft)
  '     '        Froude number =     0.600

Upstream point elevation =  3067.000(Ft.)
Downstream point elevation =  3059.900(Ft.)
Flow length =   592.000(Ft.)
Travel time  =    7.37 min.
Time of concentration =   26.68 min.
Depth of flow =   0.309(Ft.)
Average velocity =   1.340(Ft/s)
Total irregular channel flow =    11.811(CFS)
Irregular channel normal depth above invert elev. =   0.309(Ft.)
Average velocity of channel(s) =   1.340(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.157(In/Hr)
Rainfall intensity =      1.905(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.826
```

```
Subarea runoff =      3.718(CFS) for    3.730(Ac.)
Total runoff =     13.636(CFS)
Effective area this stream =        8.67(Ac.)
Total Study Area (Main Stream No. 1) =        8.67(Ac.)
Area averaged Fm value =    0.157(In/Hr)
Depth of flow =   0.326(Ft.), Average velocity =   1.389(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      8.670(Ac.)
Runoff from this stream =     13.636(CFS)
Time of concentration =   26.68 min.
Rainfall intensity =     1.905(In/Hr)
Area averaged loss rate (Fm) =    0.1570(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     13.64     8.670     26.68    0.157      1.905
Qmax(1) =
           1.000 *    1.000 *    13.636) + =      13.636

Total of 1 streams to confluence:
Flow rates before confluence point:
      13.636
Maximum flow rates at confluence using above data:
       13.636
Area of streams before confluence:
        8.670
Effective area values after confluence:
        8.670
Results of confluence:
Total flow rate =     13.636(CFS)
Time of concentration =    26.681 min.
Effective stream area after confluence =      8.670(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.157(In/Hr)
Study area total (this main stream) =       8.67(Ac.)
End of computations, Total Study Area =            8.67 (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) = 1.000
Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/18/22

Cordova site
100-yr existing
area G

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 601.000 to Point/Station 602.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.157(In/Hr)
Initial subarea data:
Initial area flow distance = 958.000(Ft.)
Top (of initial area) elevation = 3095.700(Ft.)
Bottom (of initial area) elevation = 3083.800(Ft.)
Difference in elevation = 11.900(Ft.)
Slope = 0.01242 s(%)= 1.24
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.673 min.
Rainfall intensity = 2.357(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.840
Subarea runoff =      9.367(CFS)
Total initial stream area =        4.730(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.157(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      602.000 to Point/Station      603.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.302(Ft.), Average velocity =   1.405(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2             40.00              0.00
        3             94.00              0.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     12.054(CFS)
  '     '        flow top width =     56.787(Ft.)
  '     '    velocity=    1.405(Ft/s)
  '     '        area =      8.576(Sq.Ft)
  '     '        Froude number =     0.637

Upstream point elevation =  3083.800(Ft.)
Downstream point elevation =  3072.000(Ft.)
Flow length =   866.000(Ft.)
Travel time  =   10.27 min.
Time of concentration =   29.94 min.
Depth of flow =   0.302(Ft.)
Average velocity =   1.405(Ft/s)
Total irregular channel flow =    12.054(CFS)
Irregular channel normal depth above invert elev. =   0.302(Ft.)
Average velocity of channel(s) =   1.405(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.157(In/Hr)
Rainfall intensity =      1.757(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.820
```

```
Subarea runoff =      5.320(CFS) for    5.470(Ac.)
Total runoff =     14.687(CFS)
Effective area this stream =       10.20(Ac.)
Total Study Area (Main Stream No. 1) =       10.20(Ac.)
Area averaged Fm value =    0.157(In/Hr)
Depth of flow =   0.325(Ft.), Average velocity =   1.477(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      603.000 to Point/Station      604.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.235(Ft.), Average velocity =   1.211(Ft/s)
!!Warning: Water is above left or right bank elevations
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.20
        2             55.00              0.00
        3            100.00              0.20
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     16.315(CFS)
  '     '        flow top width =    100.000(Ft.)
  '     '    velocity=    1.211(Ft/s)
  '     '        area =     13.468(Sq.Ft)
  '     '        Froude number =     0.582

Upstream point elevation =  3072.000(Ft.)
Downstream point elevation =  3061.800(Ft.)
Flow length =   865.000(Ft.)
Travel time  =   11.90 min.
Time of concentration =   41.84 min.
Depth of flow =   0.235(Ft.)
Average velocity =   1.211(Ft/s)
Total irregular channel flow =    16.315(CFS)
Irregular channel normal depth above invert elev. =   0.235(Ft.)
Average velocity of channel(s) =   1.211(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.157(In/Hr)
```

```
Rainfall intensity =      1.390(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.798
Subarea runoff =      3.201(CFS) for    5.920(Ac.)
Total runoff =     17.888(CFS)
Effective area this stream =       16.12(Ac.)
Total Study Area (Main Stream No. 1) =       16.12(Ac.)
Area averaged Fm value =    0.157(In/Hr)
Depth of flow =   0.242(Ft.), Average velocity =   1.257(Ft/s)
!!Warning: Water is above left or right bank elevations


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      603.000 to Point/Station      604.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     16.120(Ac.)
Runoff from this stream =     17.888(CFS)
Time of concentration =   41.84 min.
Rainfall intensity =     1.390(In/Hr)
Area averaged loss rate (Fm) =    0.1570(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     17.89    16.120     41.84    0.157      1.390
Qmax(1) =
           1.000 *    1.000 *    17.888) + =      17.888

Total of 1 streams to confluence:
Flow rates before confluence point:
      17.888
Maximum flow rates at confluence using above data:
       17.888
Area of streams before confluence:
       16.120
Effective area values after confluence:
       16.120
Results of confluence:
Total flow rate =     17.888(CFS)
Time of concentration =    41.844 min.
Effective stream area after confluence =     16.120(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.157(In/Hr)
Study area total (this main stream) =      16.12(Ac.)
End of computations, Total Study Area =           16.12 (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) = 1.000
Area averaged SCS curve number = 76.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/18/22

Cordova site
100-yr existing
Area H

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 701.000 to Point/Station 702.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.157(In/Hr)
Initial subarea data:
Initial area flow distance = 970.000(Ft.)
Top (of initial area) elevation = 3093.900(Ft.)
Bottom (of initial area) elevation = 3082.000(Ft.)
Difference in elevation = 11.900(Ft.)
Slope = 0.01227 s(%)= 1.23
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 19.820 min.
Rainfall intensity = 2.345(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.840
Subarea runoff =     18.314(CFS)
Total initial stream area =        9.300(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.157(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      702.000 to Point/Station      703.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.539(Ft.), Average velocity =   2.296(Ft/s)
!!Warning: Water is above left or right bank elevations
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.40
        2             16.00              0.00
        3             27.00              0.40
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     21.028(CFS)
  '     '        flow top width =     27.000(Ft.)
  '     '    velocity=    2.296(Ft/s)
  '     '        area =      9.160(Sq.Ft)
  '     '        Froude number =     0.695

Upstream point elevation =  3082.000(Ft.)
Downstream point elevation =  3073.000(Ft.)
Flow length =   728.000(Ft.)
Travel time  =    5.29 min.
Time of concentration =   25.11 min.
Depth of flow =   0.539(Ft.)
Average velocity =   2.296(Ft/s)
Total irregular channel flow =    21.028(CFS)
Irregular channel normal depth above invert elev. =   0.539(Ft.)
Average velocity of channel(s) =   2.296(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.157(In/Hr)
Rainfall intensity =      1.987(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.829
Subarea runoff =      5.342(CFS) for    5.060(Ac.)
Total runoff =     23.657(CFS)
Effective area this stream =       14.36(Ac.)
Total Study Area (Main Stream No. 1) =       14.36(Ac.)
Area averaged Fm value =    0.157(In/Hr)
Depth of flow =   0.564(Ft.), Average velocity =   2.406(Ft/s)
!!Warning: Water is above left or right bank elevations


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      703.000 to Point/Station      704.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.474(Ft.), Average velocity =   1.787(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.60
        2             33.00              0.00
        3             72.00              0.60
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     24.062(CFS)
  '     '        flow top width =     56.849(Ft.)
  '     '    velocity=    1.787(Ft/s)
  '     '        area =     13.466(Sq.Ft)
  '     '        Froude number =     0.647

Upstream point elevation =  3073.000(Ft.)
Downstream point elevation =  3066.400(Ft.)
Flow length =   546.000(Ft.)
Travel time  =    5.09 min.
Time of concentration =   30.20 min.
Depth of flow =   0.474(Ft.)
Average velocity =   1.787(Ft/s)
Total irregular channel flow =    24.062(CFS)
Irregular channel normal depth above invert elev. =   0.474(Ft.)
Average velocity of channel(s) =   1.787(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 76.50
Adjusted SCS curve number for AMC 3 = 91.90
```

```
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.157(In/Hr)
Rainfall intensity =      1.746(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.819
Subarea runoff =      0.747(CFS) for    2.700(Ac.)
Total runoff =     24.404(CFS)
Effective area this stream =       17.06(Ac.)
Total Study Area (Main Stream No. 1) =       17.06(Ac.)
Area averaged Fm value =    0.157(In/Hr)
Depth of flow =   0.476(Ft.), Average velocity =   1.793(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      703.000 to Point/Station      704.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     17.060(Ac.)
Runoff from this stream =     24.404(CFS)
Time of concentration =   30.20 min.
Rainfall intensity =     1.746(In/Hr)
Area averaged loss rate (Fm) =    0.1570(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     24.40    17.060     30.20    0.157      1.746
Qmax(1) =
           1.000 *    1.000 *    24.404) + =      24.404

Total of 1 streams to confluence:
Flow rates before confluence point:
      24.404
Maximum flow rates at confluence using above data:
       24.404
Area of streams before confluence:
       17.060
Effective area values after confluence:
       17.060
Results of confluence:
Total flow rate =     24.404(CFS)
Time of concentration =    30.199 min.
Effective stream area after confluence =     17.060(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.157(In/Hr)
Study area total (this main stream) =      17.06(Ac.)
End of computations, Total Study Area =           17.06 (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) = 1.000
Area averaged SCS curve number = 76.5

10 year
Developed Condition

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/28/22

Cordova site
10-yr developed condition
Area A-D

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.080(In/Hr)
Initial subarea data:
Initial area flow distance = 473.000(Ft.)
Top (of initial area) elevation = 93.000(Ft.)
Bottom (of initial area) elevation = 80.000(Ft.)
Difference in elevation = 13.000(Ft.)
Slope = 0.02748 s(%)= 2.75
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.328 min.
Rainfall intensity = 2.654(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.873

```
Subarea runoff =     12.320(CFS)
Total initial stream area =        5.320(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    73.400(Ft.)
Downstream point/station elevation =    71.000(Ft.)
Pipe length  =   406.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.320(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    12.320(CFS)
Normal flow depth in pipe =   14.91(In.)
Flow top width inside pipe =   23.29(In.)
Critical Depth =   15.13(In.)
Pipe flow velocity =      6.00(Ft/s)
Travel time through pipe =    1.13 min.
Time of concentration (TC) =     8.46 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     8.46 min.
Rainfall intensity =      2.401(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.870
Subarea runoff =     12.134(CFS) for    6.390(Ac.)
Total runoff =     24.454(CFS)
Effective area this stream =       11.71(Ac.)
Total Study Area (Main Stream No. 1) =       11.71(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
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```
Upstream point/station elevation =    71.000(Ft.)
Downstream point/station elevation =    68.600(Ft.)
Pipe length  =   400.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    24.454(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    24.454(CFS)
Normal flow depth in pipe =   19.73(In.)
Flow top width inside pipe =   28.47(In.)
Critical Depth =   20.23(In.)
Pipe flow velocity =      7.14(Ft/s)
Travel time through pipe =    0.93 min.
Time of concentration (TC) =     9.39 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     9.39 min.
Rainfall intensity =      2.231(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =     10.521(CFS) for    6.360(Ac.)
Total runoff =     34.975(CFS)
Effective area this stream =       18.07(Ac.)
Total Study Area (Main Stream No. 1) =       18.07(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    68.600(Ft.)
Downstream point/station elevation =    63.900(Ft.)
Pipe length  =   803.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    34.975(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    34.975(CFS)
Normal flow depth in pipe =   23.67(In.)
Flow top width inside pipe =   29.72(In.)
Critical Depth =   23.64(In.)
Pipe flow velocity =      7.67(Ft/s)
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```
Travel time through pipe =    1.75 min.
Time of concentration (TC) =    11.13 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    11.13 min.
Rainfall intensity =      1.980(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.863
Subarea runoff =     17.800(CFS) for   12.800(Ac.)
Total runoff =     52.775(CFS)
Effective area this stream =       30.87(Ac.)
Total Study Area (Main Stream No. 1) =       30.87(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    63.900(Ft.)
Downstream point/station elevation =    62.700(Ft.)
Pipe length  =   209.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    52.775(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    52.775(CFS)
Normal flow depth in pipe =   27.47(In.)
Flow top width inside pipe =   35.59(In.)
Critical Depth =   27.82(In.)
Pipe flow velocity =      8.46(Ft/s)
Travel time through pipe =    0.41 min.
Time of concentration (TC) =    11.55 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
```

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    11.55 min.
Rainfall intensity =      1.930(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.863
Subarea runoff =      7.925(CFS) for    5.590(Ac.)
Total runoff =     60.700(CFS)
Effective area this stream =       36.46(Ac.)
Total Study Area (Main Stream No. 1) =       36.46(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     36.460(Ac.)
Runoff from this stream =     60.700(CFS)
Time of concentration =   11.55 min.
Rainfall intensity =     1.930(In/Hr)
Area averaged loss rate (Fm) =    0.0804(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Initial subarea data:
Initial area flow distance =    62.000(Ft.)
Top (of initial area) elevation =    86.200(Ft.)
Bottom (of initial area) elevation =    85.900(Ft.)
Difference in elevation =     0.300(Ft.)
Slope =    0.00484  s(%)=       0.48
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    4.601 min.
Rainfall intensity =      3.675(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
```

```
Subarea runoff =      0.647(CFS)
Total initial stream area =        0.200(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    80.200(Ft.)
Downstream point/station elevation =    75.600(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.647(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.647(CFS)
Normal flow depth in pipe =    4.41(In.)
Flow top width inside pipe =    9.00(In.)
Critical Depth =    4.38(In.)
Pipe flow velocity =      3.01(Ft/s)
Travel time through pipe =    3.88 min.
Time of concentration (TC) =     8.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     8.48 min.
Rainfall intensity =      2.396(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.870
Subarea runoff =      5.063(CFS) for    2.540(Ac.)
Total runoff =      5.710(CFS)
Effective area this stream =        2.74(Ac.)
Total Study Area (Main Stream No. 1) =       39.20(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
```

```
Upstream point/station elevation =    75.600(Ft.)
Downstream point/station elevation =    73.500(Ft.)
Pipe length  =   273.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.710(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     5.710(CFS)
Normal flow depth in pipe =   10.25(In.)
Flow top width inside pipe =   17.82(In.)
Critical Depth =   11.07(In.)
Pipe flow velocity =      5.49(Ft/s)
Travel time through pipe =    0.83 min.
Time of concentration (TC) =     9.31 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      203.000 to Point/Station      204.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     9.31 min.
Rainfall intensity =      2.244(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =      4.593(CFS) for    2.550(Ac.)
Total runoff =     10.303(CFS)
Effective area this stream =        5.29(Ac.)
Total Study Area (Main Stream No. 1) =       41.75(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      205.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    73.500(Ft.)
Downstream point/station elevation =    70.900(Ft.)
Pipe length  =   467.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.303(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    10.303(CFS)
Normal flow depth in pipe =   15.16(In.)
Flow top width inside pipe =   18.81(In.)
Critical Depth =   14.36(In.)
Pipe flow velocity =      5.54(Ft/s)
```

```
Travel time through pipe =    1.41 min.
Time of concentration (TC) =    10.71 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      204.000 to Point/Station      205.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    10.71 min.
Rainfall intensity =      2.034(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.864
Subarea runoff =     10.199(CFS) for    6.370(Ac.)
Total runoff =     20.502(CFS)
Effective area this stream =       11.66(Ac.)
Total Study Area (Main Stream No. 1) =       48.12(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      206.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    70.900(Ft.)
Downstream point/station elevation =    66.500(Ft.)
Pipe length  =   618.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.502(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    20.502(CFS)
Normal flow depth in pipe =   18.00(In.)
Flow top width inside pipe =   25.46(In.)
Critical Depth =   19.01(In.)
Pipe flow velocity =      7.27(Ft/s)
Travel time through pipe =    1.42 min.
Time of concentration (TC) =    12.13 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      206.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
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```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    12.13 min.
Rainfall intensity =      1.865(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.861
Subarea runoff =     15.295(CFS) for   10.630(Ac.)
Total runoff =     35.798(CFS)
Effective area this stream =       22.29(Ac.)
Total Study Area (Main Stream No. 1) =       58.75(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      205.000 to Point/Station      206.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     22.290(Ac.)
Runoff from this stream =     35.798(CFS)
Time of concentration =   12.13 min.
Rainfall intensity =     1.865(In/Hr)
Area averaged loss rate (Fm) =    0.0804(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Initial subarea data:
Initial area flow distance =   986.000(Ft.)
Top (of initial area) elevation =    81.900(Ft.)
Bottom (of initial area) elevation =    73.000(Ft.)
Difference in elevation =     8.900(Ft.)
Slope =    0.00903  s(%)=       0.90
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.283 min.
Rainfall intensity =      1.848(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.861
```

```
Subarea runoff =     11.346(CFS)
Total initial stream area =        7.130(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    73.000(Ft.)
End of street segment elevation =    70.900(Ft.)
Length of street segment  =   488.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  55.000(Ft.)
Distance from crown to crossfall grade break  =  54.900(Ft.)
Slope from gutter to grade break (v/hz) =   0.013
Slope from grade break to crown (v/hz)  =   0.013
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.100(Ft.)
Gutter hike from flowline =  0.000(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 =     14.384(CFS)
Depth of flow =   0.408(Ft.), Average velocity =   2.236(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  31.459(Ft.)
Flow velocity =   2.24(Ft/s)
Travel time =    3.64 min.     TC =   15.92  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Rainfall intensity =      1.542(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.853
Subarea runoff =      6.013(CFS) for    6.070(Ac.)
Total runoff =     17.359(CFS)
Effective area this stream =       13.20(Ac.)
Total Study Area (Main Stream No. 1) =       71.95(Ac.)
Area averaged Fm value =    0.080(In/Hr)
Street flow at end of street =     17.359(CFS)
Half street flow at end of street =     17.359(CFS)
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```
Depth of flow =   0.438(Ft.), Average velocity =   2.344(Ft/s)
Flow width (from curb towards crown)=  33.756(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    66.200(Ft.)
Downstream point/station elevation =    57.500(Ft.)
Pipe length  =    57.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =    17.359(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    17.359(CFS)
Normal flow depth in pipe =   10.09(In.)
Flow top width inside pipe =   14.08(In.)
Critical depth could not be calculated.
Pipe flow velocity =     19.77(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    15.97 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =     13.200(Ac.)
Runoff from this stream =     17.359(CFS)
Time of concentration =   15.97 min.
Rainfall intensity =     1.538(In/Hr)
Area averaged loss rate (Fm) =    0.0804(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station      402.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Initial subarea data:
Initial area flow distance =    85.000(Ft.)
Top (of initial area) elevation =    71.740(Ft.)
Bottom (of initial area) elevation =    69.000(Ft.)
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Difference in elevation =     2.740(Ft.)
Slope =    0.03224  s(%)=       3.22
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    3.573 min.
Rainfall intensity =      4.388(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff =      1.318(CFS)
Total initial stream area =        0.340(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    66.800(Ft.)
Downstream point/station elevation =    60.600(Ft.)
Pipe length  =   405.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.318(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.318(CFS)
Normal flow depth in pipe =    5.26(In.)
Flow top width inside pipe =    8.87(In.)
Critical Depth =    6.35(In.)
Pipe flow velocity =      4.92(Ft/s)
Travel time through pipe =    1.37 min.
Time of concentration (TC) =     4.94 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     4.94 min.
Rainfall intensity =      3.495(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.879
Subarea runoff =      5.075(CFS) for    1.740(Ac.)
Total runoff =      6.393(CFS)
Effective area this stream =        2.08(Ac.)
Total Study Area (Main Stream No. 1) =       74.03(Ac.)
Area averaged Fm value =    0.080(In/Hr)
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    60.600(Ft.)
Downstream point/station elevation =    56.100(Ft.)
Pipe length  =   800.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.393(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.393(CFS)
Normal flow depth in pipe =   12.30(In.)
Flow top width inside pipe =   16.74(In.)
Critical Depth =   11.73(In.)
Pipe flow velocity =      4.97(Ft/s)
Travel time through pipe =    2.69 min.
Time of concentration (TC) =     7.63 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      404.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     7.63 min.
Rainfall intensity =      2.580(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.872
Subarea runoff =      7.779(CFS) for    4.220(Ac.)
Total runoff =     14.172(CFS)
Effective area this stream =        6.30(Ac.)
Total Study Area (Main Stream No. 1) =       78.25(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      405.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    56.000(Ft.)
Downstream point/station elevation =    55.800(Ft.)
Pipe length  =    56.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.172(CFS)
```

```
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    14.172(CFS)
Normal flow depth in pipe =   17.70(In.)
Flow top width inside pipe =   25.66(In.)
Critical Depth =   15.71(In.)
Pipe flow velocity =      5.13(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =     7.81 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      405.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     7.81 min.
Rainfall intensity =      2.538(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.872
Subarea runoff =      2.857(CFS) for    1.400(Ac.)
Total runoff =     17.029(CFS)
Effective area this stream =        7.70(Ac.)
Total Study Area (Main Stream No. 1) =       79.65(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      405.000 to Point/Station      406.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    55.800(Ft.)
Downstream point/station elevation =    55.200(Ft.)
Pipe length  =    41.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    17.029(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    17.029(CFS)
Normal flow depth in pipe =   15.40(In.)
Flow top width inside pipe =   18.57(In.)
Critical Depth =   18.16(In.)
Pipe flow velocity =      9.00(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =     7.89 min.
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      405.000 to Point/Station      406.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 4
Stream flow area =      7.700(Ac.)
Runoff from this stream =     17.029(CFS)
Time of concentration =    7.89 min.
Rainfall intensity =     2.521(In/Hr)
Area averaged loss rate (Fm) =    0.0804(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     60.70    36.460     11.55    0.080      1.930
2     35.80    22.290     12.13    0.080      1.865
3     17.36    13.200     15.97    0.080      1.538
4     17.03     7.700      7.89    0.080      2.521
Qmax(1) =
           1.000 *    1.000 *    60.700) +
           1.037 *    0.952 *    35.798) +
           1.269 *    0.723 *    17.359) +
           0.758 *    1.000 *    17.029) + =     124.862
Qmax(2) =
           0.965 *    1.000 *    60.700) +
           1.000 *    1.000 *    35.798) +
           1.224 *    0.760 *    17.359) +
           0.731 *    1.000 *    17.029) + =     122.944
Qmax(3) =
           0.788 *    1.000 *    60.700) +
           0.817 *    1.000 *    35.798) +
           1.000 *    1.000 *    17.359) +
           0.597 *    1.000 *    17.029) + =     104.621
Qmax(4) =
           1.319 *    0.683 *    60.700) +
           1.367 *    0.650 *    35.798) +
           1.674 *    0.494 *    17.359) +
           1.000 *    1.000 *    17.029) + =     117.900

Total of 4 streams to confluence:
Flow rates before confluence point:
      60.700      35.798      17.359      17.029
Maximum flow rates at confluence using above data:
      124.862      122.944      104.621      117.900
Area of streams before confluence:
       36.460       22.290       13.200        7.700
Effective area values after confluence:
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```
       74.924       76.476       79.650       53.616
Results of confluence:
Total flow rate =    124.862(CFS)
Time of concentration =    11.547 min.
Effective stream area after confluence =     74.924(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.080(In/Hr)
Study area total (this main stream) =      79.65(Ac.)
End of computations, Total Study Area =           79.65 (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) = 0.100
Area averaged SCS curve number =  50.5
```

100 year
Developed Condition

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/28/22

Cordova site
100-yr developed condition
Areas A-D

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.052(In/Hr)
Initial subarea data:
Initial area flow distance = 473.000(Ft.)
Top (of initial area) elevation = 93.000(Ft.)
Bottom (of initial area) elevation = 80.000(Ft.)
Difference in elevation = 13.000(Ft.)
Slope = 0.02748 s(%)= 2.75
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.328 min.
Rainfall intensity = 4.706(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff =     22.280(CFS)
Total initial stream area =        5.320(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    73.400(Ft.)
Downstream point/station elevation =    71.000(Ft.)
Pipe length  =   406.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.280(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    22.280(CFS)
Normal flow depth in pipe =   20.72(In.)
Flow top width inside pipe =   22.82(In.)
Critical Depth =   19.83(In.)
Pipe flow velocity =      6.81(Ft/s)
Travel time through pipe =    0.99 min.
Time of concentration (TC) =     8.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     8.32 min.
Rainfall intensity =      4.305(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =     22.536(CFS) for    6.390(Ac.)
Total runoff =     44.815(CFS)
Effective area this stream =       11.71(Ac.)
Total Study Area (Main Stream No. 1) =       11.71(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      103.000 to Point/Station      104.000
```

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

Upstream point/station elevation = 71.000(Ft.)
Downstream point/station elevation = 68.600(Ft.)
Pipe length = 400.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 44.815(CFS)
Nearest computed pipe diameter = 36.00(In.)
Calculated individual pipe flow = 44.815(CFS)
Normal flow depth in pipe = 25.92(In.)
Flow top width inside pipe = 32.33(In.)
Critical Depth = 26.18(In.)
Pipe flow velocity = 8.23(Ft/s)
Travel time through pipe = 0.81 min.
Time of concentration (TC) = 9.13 min.

++

Process from Point/Station 103.000 to Point/Station 104.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.052(In/Hr)
Time of concentration = 9.13 min.
Rainfall intensity = 4.034(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.888
Subarea runoff = 19.934(CFS) for 6.360(Ac.)
Total runoff = 64.749(CFS)
Effective area this stream = 18.07(Ac.)
Total Study Area (Main Stream No. 1) = 18.07(Ac.)
Area averaged Fm value = 0.052(In/Hr)

++

Process from Point/Station 104.000 to Point/Station 105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 68.600(Ft.)
Downstream point/station elevation = 63.900(Ft.)
Pipe length = 803.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 64.749(CFS)
Nearest computed pipe diameter = 42.00(In.)
Calculated individual pipe flow = 64.749(CFS)
Normal flow depth in pipe = 29.48(In.)

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Flow top width inside pipe =   38.42(In.)
Critical Depth =   30.29(In.)
Pipe flow velocity =      8.96(Ft/s)
Travel time through pipe =    1.49 min.
Time of concentration (TC) =    10.63 min.


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Process from Point/Station      104.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    10.63 min.
Rainfall intensity =      3.628(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.887
Subarea runoff =     34.594(CFS) for   12.800(Ac.)
Total runoff =     99.344(CFS)
Effective area this stream =       30.87(Ac.)
Total Study Area (Main Stream No. 1) =       30.87(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      105.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    63.900(Ft.)
Downstream point/station elevation =    62.700(Ft.)
Pipe length  =   209.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    99.344(CFS)
Nearest computed pipe diameter  =     48.00(In.)
Calculated individual pipe flow  =    99.344(CFS)
Normal flow depth in pipe =   36.00(In.)
Flow top width inside pipe =   41.57(In.)
Critical Depth =   36.26(In.)
Pipe flow velocity =      9.82(Ft/s)
Travel time through pipe =    0.35 min.
Time of concentration (TC) =    10.98 min.


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Process from Point/Station      105.000 to Point/Station      106.000
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**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.052(In/Hr)
Time of concentration = 10.98 min.
Rainfall intensity = 3.546(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.887
Subarea runoff = 15.283(CFS) for 5.590(Ac.)
Total runoff = 114.627(CFS)
Effective area this stream = 36.46(Ac.)
Total Study Area (Main Stream No. 1) = 36.46(Ac.)
Area averaged Fm value = 0.052(In/Hr)

++

Process from Point/Station 105.000 to Point/Station 106.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 36.460(Ac.)
Runoff from this stream = 114.627(CFS)
Time of concentration = 10.98 min.
Rainfall intensity = 3.546(In/Hr)
Area averaged loss rate (Fm) = 0.0525(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.052(In/Hr)
Initial subarea data:
Initial area flow distance = 62.000(Ft.)
Top (of initial area) elevation = 86.200(Ft.)
Bottom (of initial area) elevation = 85.900(Ft.)

```
Difference in elevation =     0.300(Ft.)
Slope =    0.00484  s(%)=       0.48
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    4.601 min.
Rainfall intensity =      6.518(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.893
Subarea runoff =      1.164(CFS)
Total initial stream area =        0.200(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.052(In/Hr)


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Process from Point/Station      202.000 to Point/Station      203.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    80.200(Ft.)
Downstream point/station elevation =    75.600(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.164(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.164(CFS)
Normal flow depth in pipe =    6.48(In.)
Flow top width inside pipe =    8.08(In.)
Critical Depth =    5.96(In.)
Pipe flow velocity =      3.42(Ft/s)
Travel time through pipe =    3.41 min.
Time of concentration (TC) =     8.01 min.


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Process from Point/Station      202.000 to Point/Station      203.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     8.01 min.
Rainfall intensity =      4.420(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =      9.607(CFS) for    2.540(Ac.)
Total runoff =     10.770(CFS)
Effective area this stream =        2.74(Ac.)
Total Study Area (Main Stream No. 1) =       39.20(Ac.)
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Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      203.000 to Point/Station      204.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    75.600(Ft.)
Downstream point/station elevation =    73.500(Ft.)
Pipe length  =   273.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.770(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    10.770(CFS)
Normal flow depth in pipe =   13.89(In.)
Flow top width inside pipe =   19.88(In.)
Critical Depth =   14.68(In.)
Pipe flow velocity =      6.38(Ft/s)
Travel time through pipe =    0.71 min.
Time of concentration (TC) =     8.73 min.


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Process from Point/Station      203.000 to Point/Station      204.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     8.73 min.
Rainfall intensity =      4.164(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.889
Subarea runoff =      8.805(CFS) for    2.550(Ac.)
Total runoff =     19.575(CFS)
Effective area this stream =        5.29(Ac.)
Total Study Area (Main Stream No. 1) =       41.75(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      204.000 to Point/Station      205.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    73.500(Ft.)
Downstream point/station elevation =    70.900(Ft.)
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Pipe length  =   467.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.575(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    19.575(CFS)
Normal flow depth in pipe =   19.08(In.)
Flow top width inside pipe =   24.59(In.)
Critical Depth =   18.58(In.)
Pipe flow velocity =      6.52(Ft/s)
Travel time through pipe =    1.19 min.
Time of concentration (TC) =     9.92 min.


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Process from Point/Station      204.000 to Point/Station      205.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     9.92 min.
Rainfall intensity =      3.807(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.888
Subarea runoff =     19.821(CFS) for    6.370(Ac.)
Total runoff =     39.397(CFS)
Effective area this stream =       11.66(Ac.)
Total Study Area (Main Stream No. 1) =       48.12(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      205.000 to Point/Station      206.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    70.900(Ft.)
Downstream point/station elevation =    66.500(Ft.)
Pipe length  =   618.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.397(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    39.397(CFS)
Normal flow depth in pipe =   24.09(In.)
Flow top width inside pipe =   29.30(In.)
Critical Depth =   25.06(In.)
Pipe flow velocity =      8.48(Ft/s)
Travel time through pipe =    1.21 min.
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Time of concentration (TC) =    11.14 min.


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Process from Point/Station      205.000 to Point/Station      206.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    11.14 min.
Rainfall intensity =      3.511(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.887
Subarea runoff =     29.986(CFS) for   10.630(Ac.)
Total runoff =     69.383(CFS)
Effective area this stream =       22.29(Ac.)
Total Study Area (Main Stream No. 1) =       58.75(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      205.000 to Point/Station      206.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     22.290(Ac.)
Runoff from this stream =     69.383(CFS)
Time of concentration =   11.14 min.
Rainfall intensity =     3.511(In/Hr)
Area averaged loss rate (Fm) =    0.0525(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


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Process from Point/Station      301.000 to Point/Station      302.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
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Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Initial subarea data:
Initial area flow distance =   986.000(Ft.)
Top (of initial area) elevation =    81.900(Ft.)
Bottom (of initial area) elevation =    73.000(Ft.)
Difference in elevation =     8.900(Ft.)
Slope =    0.00903  s(%)=       0.90
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.283 min.
Rainfall intensity =      3.278(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.886
Subarea runoff =     20.698(CFS)
Total initial stream area =        7.130(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.052(In/Hr)


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Process from Point/Station      302.000 to Point/Station      303.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    73.000(Ft.)
End of street segment elevation =    70.900(Ft.)
Length of street segment  =   488.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  55.000(Ft.)
Distance from crown to crossfall grade break  =  54.900(Ft.)
Slope from gutter to grade break (v/hz) =   0.013
Slope from grade break to crown (v/hz)  =   0.013
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.100(Ft.)
Gutter hike from flowline =  0.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     26.708(CFS)
Depth of flow =   0.514(Ft.), Average velocity =   2.610(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  39.675(Ft.)
Flow velocity =   2.61(Ft/s)
Travel time =    3.12 min.     TC =   15.40  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
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Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Rainfall intensity =      2.798(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.883
Subarea runoff =     11.921(CFS) for    6.070(Ac.)
Total runoff =     32.619(CFS)
Effective area this stream =       13.20(Ac.)
Total Study Area (Main Stream No. 1) =       71.95(Ac.)
Area averaged Fm value =    0.052(In/Hr)
Street flow at end of street =     32.619(CFS)
Half street flow at end of street =     32.619(CFS)
Depth of flow =   0.555(Ft.), Average velocity =   2.744(Ft/s)
Flow width (from curb towards crown)=  42.764(Ft.)


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Process from Point/Station      303.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    66.200(Ft.)
Downstream point/station elevation =    57.500(Ft.)
Pipe length  =    57.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =    32.619(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    32.619(CFS)
Normal flow depth in pipe =   13.57(In.)
Flow top width inside pipe =   15.51(In.)
Critical depth could not be calculated.
Pipe flow velocity =     22.83(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    15.44 min.


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Process from Point/Station      303.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =     13.200(Ac.)
Runoff from this stream =     32.619(CFS)
Time of concentration =   15.44 min.
Rainfall intensity =     2.793(In/Hr)
Area averaged loss rate (Fm) =    0.0525(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


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Process from Point/Station      401.000 to Point/Station      402.000
**** INITIAL AREA EVALUATION ****
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COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Initial subarea data:
Initial area flow distance =    85.000(Ft.)
Top (of initial area) elevation =    71.740(Ft.)
Bottom (of initial area) elevation =    69.000(Ft.)
Difference in elevation =     2.740(Ft.)
Slope =    0.03224  s(%)=       3.22
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    3.573 min.
Rainfall intensity =      7.781(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.894
Subarea runoff =      2.365(CFS)
Total initial stream area =        0.340(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.052(In/Hr)


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Process from Point/Station      402.000 to Point/Station      403.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =    66.800(Ft.)
Downstream point/station elevation =    60.600(Ft.)
Pipe length  =   405.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.365(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.365(CFS)
Normal flow depth in pipe =    6.26(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =    7.90(In.)
Pipe flow velocity =      5.71(Ft/s)
Travel time through pipe =    1.18 min.
Time of concentration (TC) =     4.75 min.


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Process from Point/Station      402.000 to Point/Station      403.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
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Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     4.75 min.
Rainfall intensity =      6.370(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.893
Subarea runoff =      9.462(CFS) for    1.740(Ac.)
Total runoff =     11.827(CFS)
Effective area this stream =        2.08(Ac.)
Total Study Area (Main Stream No. 1) =       74.03(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      403.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    60.600(Ft.)
Downstream point/station elevation =    56.100(Ft.)
Pipe length  =   800.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.827(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    11.827(CFS)
Normal flow depth in pipe =   17.11(In.)
Flow top width inside pipe =   16.32(In.)
Critical Depth =   15.37(In.)
Pipe flow velocity =      5.63(Ft/s)
Travel time through pipe =    2.37 min.
Time of concentration (TC) =     7.12 min.


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Process from Point/Station      403.000 to Point/Station      404.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     7.12 min.
Rainfall intensity =      4.801(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.890
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Subarea runoff =     15.097(CFS) for    4.220(Ac.)
Total runoff =     26.924(CFS)
Effective area this stream =        6.30(Ac.)
Total Study Area (Main Stream No. 1) =       78.25(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      404.000 to Point/Station      405.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    56.000(Ft.)
Downstream point/station elevation =    55.800(Ft.)
Pipe length  =    56.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    26.924(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    26.924(CFS)
Normal flow depth in pipe =   23.41(In.)
Flow top width inside pipe =   29.96(In.)
Critical Depth =   20.65(In.)
Pipe flow velocity =      5.98(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =     7.28 min.


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Process from Point/Station      404.000 to Point/Station      405.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     7.28 min.
Rainfall intensity =      4.729(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.890
Subarea runoff =      5.482(CFS) for    1.400(Ac.)
Total runoff =     32.406(CFS)
Effective area this stream =        7.70(Ac.)
Total Study Area (Main Stream No. 1) =       79.65(Ac.)
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station      405.000 to Point/Station      406.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =    55.800(Ft.)
Downstream point/station elevation =    55.200(Ft.)
Pipe length  =    41.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.406(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    32.406(CFS)
Normal flow depth in pipe =   19.38(In.)
Flow top width inside pipe =   24.30(In.)
Critical Depth =   23.48(In.)
Pipe flow velocity =     10.61(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =     7.34 min.


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Process from Point/Station      405.000 to Point/Station      406.000
**** CONFLUENCE OF MINOR STREAMS ****
_____________________________________________________________________
Along Main Stream number: 1 in normal stream number 4
Stream flow area =      7.700(Ac.)
Runoff from this stream =     32.406(CFS)
Time of concentration =    7.34 min.
Rainfall intensity =     4.700(In/Hr)
Area averaged loss rate (Fm) =    0.0525(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1    114.63    36.460     10.98    0.052      3.546
2     69.38    22.290     11.14    0.052      3.511
3     32.62    13.200     15.44    0.052      2.793
4     32.41     7.700      7.34    0.052      4.700
Qmax(1) =
           1.000 *    1.000 *   114.627) +
           1.010 *    0.986 *    69.383) +
           1.275 *    0.711 *    32.619) +
           0.752 *    1.000 *    32.406) + =     237.656
Qmax(2) =
           0.990 *    1.000 *   114.627) +
           1.000 *    1.000 *    69.383) +
           1.262 *    0.721 *    32.619) +
           0.744 *    1.000 *    32.406) + =     236.679
Qmax(3) =
           0.785 *    1.000 *   114.627) +
           0.792 *    1.000 *    69.383) +
```

```
           1.000 *    1.000 *    32.619) +
           0.590 *    1.000 *    32.406) + =     196.631
Qmax(4) =
           1.330 *    0.669 *   114.627) +
           1.344 *    0.659 *    69.383) +
           1.696 *    0.475 *    32.619) +
           1.000 *    1.000 *    32.406) + =     222.140

Total of 4 streams to confluence:
Flow rates before confluence point:
     114.627      69.383      32.619      32.406
Maximum flow rates at confluence using above data:
      237.656      236.679      196.631      222.140
Area of streams before confluence:
       36.460       22.290       13.200        7.700
Effective area values after confluence:
       75.526       75.969       79.650       53.053
Results of confluence:
Total flow rate =    237.656(CFS)
Time of concentration =    10.980 min.
Effective stream area after confluence =     75.526(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.052(In/Hr)
Study area total (this main stream) =      79.65(Ac.)
End of computations, Total Study Area =           79.65 (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) = 0.100
Area averaged SCS curve number =  50.5
```

APPENDIX 'D'

Unit Hydrograph Method Analysis

10-year Storm Event Offsite Existing condition, 24 hours
100-Year Storm Event Offsite Existing condition, 24 hours

10-year Storm Event Onsite Existing condition, 24 hours
100-Year Storm Event Onsite Existing condition, 24 hours

10-year Storm Event Onsite Developed condition, 24 hours
100-year Storm Event Onsite Developed condition, 24 hours

10 year
Offsite 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 10/02/22

++

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

Program License Serial Number 6385

Cordova site
10-yr existing condition
Area B1 offsite

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		
660.70	1	0.61
Rainfall data for year 10		
660.70	6	1.23
Rainfall data for year 10		
660.70	24	2.13

++

******** 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)
80.0	80.0	660.70	1.000	0.370	1.000	0.370

Area-averaged adjusted loss rate Fm (In/Hr) = 0.370

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
660.70	1.000	80.0	80.0	2.50	0.302

Area-averaged catchment yield fraction, Y = 0.302
Area-averaged low loss fraction, Yb = 0.698
++
Watercourse length = 10447.00(Ft.)
Length from concentration point to centroid = 6271.00(Ft.)
Elevation difference along watercourse = 237.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 660.70(Ac.)
Catchment Lag time = 0.468 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 17.8004
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.370(In/Hr)
Average low loss rate fraction (Yb) = 0.698 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.203(In)
Computed peak 30-minute rainfall = 0.483(In)
Specified peak 1-hour rainfall = 0.609(In)
Computed peak 3-hour rainfall = 0.931(In)
Specified peak 6-hour rainfall = 1.230(In)
Specified peak 24-hour rainfall = 2.130(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 660.70(Ac.) (Ref: fig. E-4)

5-minute factor = 0.969 Adjusted rainfall = 0.197(In)
30-minute factor = 0.969 Adjusted rainfall = 0.468(In)
1-hour factor = 0.969 Adjusted rainfall = 0.590(In)
3-hour factor = 0.996 Adjusted rainfall = 0.927(In)
6-hour factor = 0.998 Adjusted rainfall = 1.227(In)
24-hour factor = 0.999 Adjusted rainfall = 2.128(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 = 7990.34 (CFS))	
1	0.846	67.626
2	3.738	231.072
3	8.760	401.261
4	19.190	833.365
5	35.586	1310.080
6	48.502	1032.036
7	57.606	727.467
8	63.920	504.542
9	68.774	387.827
10	72.809	322.397
11	76.080	261.355
12	78.903	225.612
13	81.243	186.957
14	83.253	160.604
15	85.078	145.820
16	86.744	133.105
17	88.193	115.775
18	89.390	95.700
19	90.439	83.773
20	91.430	79.191
21	92.316	70.768
22	93.139	65.794
23	93.898	60.607
24	94.523	49.939
25	95.128	48.359
26	95.696	45.412
27	96.165	37.427
28	96.627	36.980
29	97.031	32.261
30	97.352	25.647
31	97.672	25.543
32	97.907	18.812
33	98.085	14.223
34	98.265	14.345
35	98.469	16.357
36	98.683	17.068
37	98.897	17.068
38	99.110	17.068
39	99.324	17.068
40	99.514	15.204
41	99.631	9.321
42	99.742	8.889

43	99.853	8.889
44	100.000	4.445

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1967	0.1967
2	0.2751	0.0784
3	0.3347	0.0596
4	0.3847	0.0500
5	0.4285	0.0439
6	0.4680	0.0395
7	0.4928	0.0248
8	0.5153	0.0225
9	0.5360	0.0207
10	0.5552	0.0192
11	0.5732	0.0180
12	0.5901	0.0169
13	0.6099	0.0198
14	0.6288	0.0189
15	0.6469	0.0181
16	0.6643	0.0174
17	0.6811	0.0168
18	0.6973	0.0162
19	0.7129	0.0157
20	0.7282	0.0152
21	0.7429	0.0148
22	0.7573	0.0144
23	0.7712	0.0140
24	0.7849	0.0136
25	0.7982	0.0133
26	0.8111	0.0130
27	0.8238	0.0127
28	0.8363	0.0124
29	0.8484	0.0122
30	0.8603	0.0119
31	0.8720	0.0117
32	0.8835	0.0115
33	0.8947	0.0113
34	0.9058	0.0111
35	0.9167	0.0109
36	0.9273	0.0107
37	0.9377	0.0103
38	0.9479	0.0102
39	0.9579	0.0100
40	0.9677	0.0099
41	0.9774	0.0097
42	0.9870	0.0096
43	0.9965	0.0094
44	1.0058	0.0093
45	1.0149	0.0092

46	1.0240	0.0091
47	1.0330	0.0089
48	1.0418	0.0088
49	1.0505	0.0087
50	1.0591	0.0086
51	1.0677	0.0085
52	1.0761	0.0084
53	1.0844	0.0083
54	1.0926	0.0082
55	1.1008	0.0081
56	1.1088	0.0081
57	1.1168	0.0080
58	1.1247	0.0079
59	1.1325	0.0078
60	1.1402	0.0077
61	1.1478	0.0076
62	1.1554	0.0076
63	1.1629	0.0075
64	1.1704	0.0074
65	1.1777	0.0074
66	1.1850	0.0073
67	1.1922	0.0072
68	1.1994	0.0072
69	1.2065	0.0071
70	1.2136	0.0070
71	1.2205	0.0070
72	1.2275	0.0069
73	1.2342	0.0067
74	1.2409	0.0067
75	1.2475	0.0066
76	1.2541	0.0066
77	1.2606	0.0065
78	1.2671	0.0065
79	1.2735	0.0064
80	1.2799	0.0064
81	1.2862	0.0063
82	1.2925	0.0063
83	1.2987	0.0062
84	1.3049	0.0062
85	1.3111	0.0061
86	1.3172	0.0061
87	1.3232	0.0061
88	1.3292	0.0060
89	1.3352	0.0060
90	1.3412	0.0059
91	1.3471	0.0059
92	1.3529	0.0059
93	1.3587	0.0058
94	1.3645	0.0058
95	1.3703	0.0057

96	1.3760	0.0057
97	1.3816	0.0057
98	1.3873	0.0056
99	1.3929	0.0056
100	1.3984	0.0056
101	1.4040	0.0055
102	1.4095	0.0055
103	1.4150	0.0055
104	1.4204	0.0054
105	1.4258	0.0054
106	1.4312	0.0054
107	1.4365	0.0053
108	1.4418	0.0053
109	1.4471	0.0053
110	1.4524	0.0053
111	1.4576	0.0052
112	1.4628	0.0052
113	1.4680	0.0052
114	1.4731	0.0051
115	1.4782	0.0051
116	1.4833	0.0051
117	1.4884	0.0051
118	1.4934	0.0050
119	1.4984	0.0050
120	1.5034	0.0050
121	1.5084	0.0050
122	1.5133	0.0049
123	1.5182	0.0049
124	1.5231	0.0049
125	1.5280	0.0049
126	1.5328	0.0048
127	1.5376	0.0048
128	1.5424	0.0048
129	1.5472	0.0048
130	1.5520	0.0048
131	1.5567	0.0047
132	1.5614	0.0047
133	1.5661	0.0047
134	1.5707	0.0047
135	1.5754	0.0046
136	1.5800	0.0046
137	1.5846	0.0046
138	1.5892	0.0046
139	1.5938	0.0046
140	1.5983	0.0045
141	1.6028	0.0045
142	1.6073	0.0045
143	1.6118	0.0045
144	1.6163	0.0045
145	1.6207	0.0044

146	1.6251	0.0044
147	1.6296	0.0044
148	1.6339	0.0044
149	1.6383	0.0044
150	1.6427	0.0044
151	1.6470	0.0043
152	1.6513	0.0043
153	1.6556	0.0043
154	1.6599	0.0043
155	1.6642	0.0043
156	1.6685	0.0043
157	1.6727	0.0042
158	1.6769	0.0042
159	1.6811	0.0042
160	1.6853	0.0042
161	1.6895	0.0042
162	1.6936	0.0042
163	1.6978	0.0041
164	1.7019	0.0041
165	1.7060	0.0041
166	1.7101	0.0041
167	1.7142	0.0041
168	1.7183	0.0041
169	1.7223	0.0041
170	1.7264	0.0040
171	1.7304	0.0040
172	1.7344	0.0040
173	1.7384	0.0040
174	1.7424	0.0040
175	1.7463	0.0040
176	1.7503	0.0040
177	1.7542	0.0039
178	1.7582	0.0039
179	1.7621	0.0039
180	1.7660	0.0039
181	1.7699	0.0039
182	1.7737	0.0039
183	1.7776	0.0039
184	1.7815	0.0038
185	1.7853	0.0038
186	1.7891	0.0038
187	1.7929	0.0038
188	1.7967	0.0038
189	1.8005	0.0038
190	1.8043	0.0038
191	1.8081	0.0038
192	1.8118	0.0038
193	1.8156	0.0037
194	1.8193	0.0037
195	1.8230	0.0037

196	1.8267	0.0037
197	1.8304	0.0037
198	1.8341	0.0037
199	1.8378	0.0037
200	1.8414	0.0037
201	1.8451	0.0036
202	1.8487	0.0036
203	1.8523	0.0036
204	1.8559	0.0036
205	1.8596	0.0036
206	1.8632	0.0036
207	1.8667	0.0036
208	1.8703	0.0036
209	1.8739	0.0036
210	1.8774	0.0036
211	1.8810	0.0035
212	1.8845	0.0035
213	1.8880	0.0035
214	1.8915	0.0035
215	1.8951	0.0035
216	1.8985	0.0035
217	1.9020	0.0035
218	1.9055	0.0035
219	1.9090	0.0035
220	1.9124	0.0035
221	1.9159	0.0034
222	1.9193	0.0034
223	1.9227	0.0034
224	1.9262	0.0034
225	1.9296	0.0034
226	1.9330	0.0034
227	1.9364	0.0034
228	1.9397	0.0034
229	1.9431	0.0034
230	1.9465	0.0034
231	1.9498	0.0034
232	1.9532	0.0033
233	1.9565	0.0033
234	1.9598	0.0033
235	1.9632	0.0033
236	1.9665	0.0033
237	1.9698	0.0033
238	1.9731	0.0033
239	1.9764	0.0033
240	1.9796	0.0033
241	1.9829	0.0033
242	1.9862	0.0033
243	1.9894	0.0033
244	1.9927	0.0032
245	1.9959	0.0032

246	1.9991	0.0032
247	2.0024	0.0032
248	2.0056	0.0032
249	2.0088	0.0032
250	2.0120	0.0032
251	2.0152	0.0032
252	2.0184	0.0032
253	2.0215	0.0032
254	2.0247	0.0032
255	2.0279	0.0032
256	2.0310	0.0032
257	2.0342	0.0031
258	2.0373	0.0031
259	2.0404	0.0031
260	2.0436	0.0031
261	2.0467	0.0031
262	2.0498	0.0031
263	2.0529	0.0031
264	2.0560	0.0031
265	2.0591	0.0031
266	2.0621	0.0031
267	2.0652	0.0031
268	2.0683	0.0031
269	2.0714	0.0031
270	2.0744	0.0031
271	2.0775	0.0030
272	2.0805	0.0030
273	2.0835	0.0030
274	2.0866	0.0030
275	2.0896	0.0030
276	2.0926	0.0030
277	2.0956	0.0030
278	2.0986	0.0030
279	2.1016	0.0030
280	2.1046	0.0030
281	2.1076	0.0030
282	2.1105	0.0030
283	2.1135	0.0030
284	2.1165	0.0030
285	2.1194	0.0030
286	2.1224	0.0029
287	2.1253	0.0029
288	2.1282	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0020	0.0009
2	0.0029	0.0021	0.0009

3	0.0030	0.0021	0.0009
4	0.0030	0.0021	0.0009
5	0.0030	0.0021	0.0009
6	0.0030	0.0021	0.0009
7	0.0030	0.0021	0.0009
8	0.0030	0.0021	0.0009
9	0.0030	0.0021	0.0009
10	0.0030	0.0021	0.0009
11	0.0030	0.0021	0.0009
12	0.0030	0.0021	0.0009
13	0.0031	0.0021	0.0009
14	0.0031	0.0021	0.0009
15	0.0031	0.0021	0.0009
16	0.0031	0.0022	0.0009
17	0.0031	0.0022	0.0009
18	0.0031	0.0022	0.0009
19	0.0031	0.0022	0.0009
20	0.0031	0.0022	0.0009
21	0.0031	0.0022	0.0009
22	0.0031	0.0022	0.0010
23	0.0032	0.0022	0.0010
24	0.0032	0.0022	0.0010
25	0.0032	0.0022	0.0010
26	0.0032	0.0022	0.0010
27	0.0032	0.0022	0.0010
28	0.0032	0.0022	0.0010
29	0.0032	0.0023	0.0010
30	0.0032	0.0023	0.0010
31	0.0033	0.0023	0.0010
32	0.0033	0.0023	0.0010
33	0.0033	0.0023	0.0010
34	0.0033	0.0023	0.0010
35	0.0033	0.0023	0.0010
36	0.0033	0.0023	0.0010
37	0.0033	0.0023	0.0010
38	0.0033	0.0023	0.0010
39	0.0034	0.0023	0.0010
40	0.0034	0.0023	0.0010
41	0.0034	0.0024	0.0010
42	0.0034	0.0024	0.0010
43	0.0034	0.0024	0.0010
44	0.0034	0.0024	0.0010
45	0.0034	0.0024	0.0010
46	0.0034	0.0024	0.0010
47	0.0035	0.0024	0.0010
48	0.0035	0.0024	0.0010
49	0.0035	0.0024	0.0011
50	0.0035	0.0024	0.0011
51	0.0035	0.0025	0.0011
52	0.0035	0.0025	0.0011

53	0.0036	0.0025	0.0011
54	0.0036	0.0025	0.0011
55	0.0036	0.0025	0.0011
56	0.0036	0.0025	0.0011
57	0.0036	0.0025	0.0011
58	0.0036	0.0025	0.0011
59	0.0036	0.0025	0.0011
60	0.0037	0.0026	0.0011
61	0.0037	0.0026	0.0011
62	0.0037	0.0026	0.0011
63	0.0037	0.0026	0.0011
64	0.0037	0.0026	0.0011
65	0.0038	0.0026	0.0011
66	0.0038	0.0026	0.0011
67	0.0038	0.0026	0.0011
68	0.0038	0.0027	0.0011
69	0.0038	0.0027	0.0012
70	0.0038	0.0027	0.0012
71	0.0039	0.0027	0.0012
72	0.0039	0.0027	0.0012
73	0.0039	0.0027	0.0012
74	0.0039	0.0027	0.0012
75	0.0039	0.0028	0.0012
76	0.0040	0.0028	0.0012
77	0.0040	0.0028	0.0012
78	0.0040	0.0028	0.0012
79	0.0040	0.0028	0.0012
80	0.0040	0.0028	0.0012
81	0.0041	0.0028	0.0012
82	0.0041	0.0028	0.0012
83	0.0041	0.0029	0.0012
84	0.0041	0.0029	0.0012
85	0.0042	0.0029	0.0013
86	0.0042	0.0029	0.0013
87	0.0042	0.0029	0.0013
88	0.0042	0.0029	0.0013
89	0.0043	0.0030	0.0013
90	0.0043	0.0030	0.0013
91	0.0043	0.0030	0.0013
92	0.0043	0.0030	0.0013
93	0.0044	0.0030	0.0013
94	0.0044	0.0031	0.0013
95	0.0044	0.0031	0.0013
96	0.0044	0.0031	0.0013
97	0.0045	0.0031	0.0013
98	0.0045	0.0031	0.0014
99	0.0045	0.0032	0.0014
100	0.0045	0.0032	0.0014
101	0.0046	0.0032	0.0014
102	0.0046	0.0032	0.0014

103	0.0046	0.0032	0.0014
104	0.0047	0.0033	0.0014
105	0.0047	0.0033	0.0014
106	0.0047	0.0033	0.0014
107	0.0048	0.0033	0.0014
108	0.0048	0.0033	0.0014
109	0.0048	0.0034	0.0015
110	0.0049	0.0034	0.0015
111	0.0049	0.0034	0.0015
112	0.0049	0.0034	0.0015
113	0.0050	0.0035	0.0015
114	0.0050	0.0035	0.0015
115	0.0051	0.0035	0.0015
116	0.0051	0.0036	0.0015
117	0.0051	0.0036	0.0016
118	0.0052	0.0036	0.0016
119	0.0052	0.0036	0.0016
120	0.0053	0.0037	0.0016
121	0.0053	0.0037	0.0016
122	0.0053	0.0037	0.0016
123	0.0054	0.0038	0.0016
124	0.0054	0.0038	0.0016
125	0.0055	0.0038	0.0017
126	0.0055	0.0039	0.0017
127	0.0056	0.0039	0.0017
128	0.0056	0.0039	0.0017
129	0.0057	0.0040	0.0017
130	0.0057	0.0040	0.0017
131	0.0058	0.0041	0.0018
132	0.0059	0.0041	0.0018
133	0.0059	0.0041	0.0018
134	0.0060	0.0042	0.0018
135	0.0061	0.0042	0.0018
136	0.0061	0.0043	0.0018
137	0.0062	0.0043	0.0019
138	0.0062	0.0044	0.0019
139	0.0063	0.0044	0.0019
140	0.0064	0.0044	0.0019
141	0.0065	0.0045	0.0020
142	0.0065	0.0046	0.0020
143	0.0066	0.0046	0.0020
144	0.0067	0.0047	0.0020
145	0.0069	0.0048	0.0021
146	0.0070	0.0049	0.0021
147	0.0071	0.0050	0.0021
148	0.0072	0.0050	0.0022
149	0.0073	0.0051	0.0022
150	0.0074	0.0051	0.0022
151	0.0075	0.0052	0.0023
152	0.0076	0.0053	0.0023

153	0.0077	0.0054	0.0023
154	0.0078	0.0054	0.0024
155	0.0080	0.0056	0.0024
156	0.0081	0.0056	0.0024
157	0.0082	0.0057	0.0025
158	0.0083	0.0058	0.0025
159	0.0085	0.0059	0.0026
160	0.0086	0.0060	0.0026
161	0.0088	0.0062	0.0027
162	0.0089	0.0062	0.0027
163	0.0092	0.0064	0.0028
164	0.0093	0.0065	0.0028
165	0.0096	0.0067	0.0029
166	0.0097	0.0068	0.0029
167	0.0100	0.0070	0.0030
168	0.0102	0.0071	0.0031
169	0.0107	0.0075	0.0032
170	0.0109	0.0076	0.0033
171	0.0113	0.0079	0.0034
172	0.0115	0.0080	0.0035
173	0.0119	0.0083	0.0036
174	0.0122	0.0085	0.0037
175	0.0127	0.0089	0.0038
176	0.0130	0.0091	0.0039
177	0.0136	0.0095	0.0041
178	0.0140	0.0098	0.0042
179	0.0148	0.0103	0.0045
180	0.0152	0.0106	0.0046
181	0.0162	0.0113	0.0049
182	0.0168	0.0117	0.0051
183	0.0181	0.0126	0.0055
184	0.0189	0.0132	0.0057
185	0.0169	0.0118	0.0051
186	0.0180	0.0126	0.0054
187	0.0207	0.0144	0.0063
188	0.0225	0.0157	0.0068
189	0.0395	0.0276	0.0119
190	0.0439	0.0306	0.0132
191	0.0596	0.0308	0.0288
192	0.0784	0.0308	0.0476
193	0.1967	0.0308	0.1659
194	0.0500	0.0308	0.0192
195	0.0248	0.0173	0.0075
196	0.0192	0.0134	0.0058
197	0.0198	0.0138	0.0060
198	0.0174	0.0121	0.0053
199	0.0157	0.0109	0.0047
200	0.0144	0.0100	0.0043
201	0.0133	0.0093	0.0040
202	0.0124	0.0087	0.0038

203	0.0117	0.0082	0.0035
204	0.0111	0.0077	0.0033
205	0.0103	0.0072	0.0031
206	0.0099	0.0069	0.0030
207	0.0094	0.0066	0.0029
208	0.0091	0.0063	0.0027
209	0.0087	0.0061	0.0026
210	0.0084	0.0059	0.0025
211	0.0081	0.0057	0.0025
212	0.0079	0.0055	0.0024
213	0.0076	0.0053	0.0023
214	0.0074	0.0052	0.0022
215	0.0072	0.0050	0.0022
216	0.0070	0.0049	0.0021
217	0.0067	0.0047	0.0020
218	0.0066	0.0046	0.0020
219	0.0064	0.0045	0.0019
220	0.0063	0.0044	0.0019
221	0.0061	0.0043	0.0019
222	0.0060	0.0042	0.0018
223	0.0059	0.0041	0.0018
224	0.0058	0.0040	0.0017
225	0.0057	0.0040	0.0017
226	0.0056	0.0039	0.0017
227	0.0055	0.0038	0.0017
228	0.0054	0.0038	0.0016
229	0.0053	0.0037	0.0016
230	0.0052	0.0036	0.0016
231	0.0051	0.0036	0.0015
232	0.0050	0.0035	0.0015
233	0.0050	0.0035	0.0015
234	0.0049	0.0034	0.0015
235	0.0048	0.0034	0.0015
236	0.0048	0.0033	0.0014
237	0.0047	0.0033	0.0014
238	0.0046	0.0032	0.0014
239	0.0046	0.0032	0.0014
240	0.0045	0.0031	0.0014
241	0.0044	0.0031	0.0013
242	0.0044	0.0031	0.0013
243	0.0043	0.0030	0.0013
244	0.0043	0.0030	0.0013
245	0.0042	0.0030	0.0013
246	0.0042	0.0029	0.0013
247	0.0041	0.0029	0.0013
248	0.0041	0.0029	0.0012
249	0.0041	0.0028	0.0012
250	0.0040	0.0028	0.0012
251	0.0040	0.0028	0.0012
252	0.0039	0.0027	0.0012

253	0.0039	0.0027	0.0012
254	0.0038	0.0027	0.0012
255	0.0038	0.0027	0.0012
256	0.0038	0.0026	0.0011
257	0.0037	0.0026	0.0011
258	0.0037	0.0026	0.0011
259	0.0037	0.0026	0.0011
260	0.0036	0.0025	0.0011
261	0.0036	0.0025	0.0011
262	0.0036	0.0025	0.0011
263	0.0035	0.0025	0.0011
264	0.0035	0.0025	0.0011
265	0.0035	0.0024	0.0011
266	0.0035	0.0024	0.0010
267	0.0034	0.0024	0.0010
268	0.0034	0.0024	0.0010
269	0.0034	0.0024	0.0010
270	0.0033	0.0023	0.0010
271	0.0033	0.0023	0.0010
272	0.0033	0.0023	0.0010
273	0.0033	0.0023	0.0010
274	0.0032	0.0023	0.0010
275	0.0032	0.0022	0.0010
276	0.0032	0.0022	0.0010
277	0.0032	0.0022	0.0010
278	0.0032	0.0022	0.0010
279	0.0031	0.0022	0.0009
280	0.0031	0.0022	0.0009
281	0.0031	0.0022	0.0009
282	0.0031	0.0021	0.0009
283	0.0030	0.0021	0.0009
284	0.0030	0.0021	0.0009
285	0.0030	0.0021	0.0009
286	0.0030	0.0021	0.0009
287	0.0030	0.0021	0.0009
288	0.0029	0.0021	0.0009

Total soil rain loss = 1.34(In)
Total effective rainfall = 0.79(In)
Peak flow rate in flood hydrograph = 331.78(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) 0 100.0 200.0 300.0 400.0

0+ 5	0.0004	0.06	Q				
0+10	0.0022	0.27	Q				
0+15	0.0065	0.62	Q				
0+20	0.0159	1.36	Q				
0+25	0.0333	2.53	Q				
0+30	0.0571	3.45	Q				
0+35	0.0854	4.11	Q				
0+40	0.1168	4.57	Q				
0+45	0.1507	4.93	Q				
0+50	0.1868	5.23	Q				
0+55	0.2245	5.48	Q				
1+ 0	0.2637	5.69	Q				
1+ 5	0.3042	5.88	Q				
1+10	0.3458	6.04	Q				
1+15	0.3884	6.19	Q				
1+20	0.4319	6.33	Q				
1+25	0.4764	6.45	Q				
1+30	0.5215	6.56	Q				
1+35	0.5674	6.65	Q				
1+40	0.6138	6.75	Q				
1+45	0.6609	6.83	Q				
1+50	0.7085	6.91	Q				
1+55	0.7566	6.99	Q				
2+ 0	0.8052	7.06	Q				
2+ 5	0.8543	7.13	Q				
2+10	0.9038	7.19	Q				
2+15	0.9537	7.25	Q				
2+20	1.0041	7.31	Q				
2+25	1.0548	7.36	Q				
2+30	1.1058	7.41	QV				
2+35	1.1572	7.46	QV				
2+40	1.2088	7.50	QV				
2+45	1.2608	7.54	QV				
2+50	1.3130	7.58	QV				
2+55	1.3655	7.62	QV				
3+ 0	1.4183	7.67	QV				
3+ 5	1.4714	7.71	QV				
3+10	1.5248	7.75	QV				
3+15	1.5785	7.80	QV				
3+20	1.6325	7.84	QV				
3+25	1.6868	7.88	QV				
3+30	1.7413	7.92	QV				
3+35	1.7961	7.96	QV				
3+40	1.8511	7.99	QV				
3+45	1.9064	8.02	QV				
3+50	1.9618	8.05	QV				
3+55	2.0175	8.08	QV				
4+ 0	2.0734	8.12	QV				
4+ 5	2.1295	8.15	QV				

4+10	2.1858	8.18	Q V	|	|	|	|
4+15	2.2424	8.21	Q V	|	|	|	|
4+20	2.2992	8.25	Q V	|	|	|	|
4+25	2.3562	8.28	Q V	|	|	|	|
4+30	2.4135	8.31	Q V	|	|	|	|
4+35	2.4710	8.35	Q V	|	|	|	|
4+40	2.5287	8.38	Q V	|	|	|	|
4+45	2.5867	8.42	Q V	|	|	|	|
4+50	2.6449	8.45	Q V	|	|	|	|
4+55	2.7034	8.49	Q V	|	|	|	|
5+ 0	2.7621	8.53	Q V	|	|	|	|
5+ 5	2.8211	8.56	Q V	|	|	|	|
5+10	2.8803	8.60	Q V	|	|	|	|
5+15	2.9398	8.64	Q V	|	|	|	|
5+20	2.9995	8.68	Q V	|	|	|	|
5+25	3.0596	8.71	Q V	|	|	|	|
5+30	3.1198	8.75	Q V	|	|	|	|
5+35	3.1804	8.79	Q V	|	|	|	|
5+40	3.2412	8.83	Q V	|	|	|	|
5+45	3.3023	8.87	Q V	|	|	|	|
5+50	3.3637	8.91	Q V	|	|	|	|
5+55	3.4254	8.96	Q V	|	|	|	|
6+ 0	3.4874	9.00	Q V	|	|	|	|
6+ 5	3.5496	9.04	Q V	|	|	|	|
6+10	3.6122	9.08	Q V	|	|	|	|
6+15	3.6750	9.13	Q V	|	|	|	|
6+20	3.7382	9.17	Q V	|	|	|	|
6+25	3.8017	9.22	Q V	|	|	|	|
6+30	3.8654	9.26	Q V	|	|	|	|
6+35	3.9295	9.31	Q V	|	|	|	|
6+40	3.9939	9.35	Q V	|	|	|	|
6+45	4.0587	9.40	Q V	|	|	|	|
6+50	4.1237	9.45	Q V	|	|	|	|
6+55	4.1891	9.50	Q V	|	|	|	|
7+ 0	4.2549	9.55	Q V	|	|	|	|
7+ 5	4.3210	9.59	Q V	|	|	|	|
7+10	4.3874	9.65	Q V	|	|	|	|
7+15	4.4542	9.70	Q V	|	|	|	|
7+20	4.5213	9.75	Q V	|	|	|	|
7+25	4.5888	9.80	Q V	|	|	|	|
7+30	4.6567	9.85	Q V	|	|	|	|
7+35	4.7249	9.91	Q V	|	|	|	|
7+40	4.7935	9.96	Q V	|	|	|	|
7+45	4.8625	10.02	|Q V	|	|	|	|
7+50	4.9319	10.08	|Q V	|	|	|	|
7+55	5.0017	10.13	|Q V	|	|	|	|
8+ 0	5.0719	10.19	|Q V	|	|	|	|
8+ 5	5.1425	10.25	|Q V	|	|	|	|
8+10	5.2135	10.31	|Q V	|	|	|	|
8+15	5.2850	10.37	|Q V	|	|	|	|

8+20	5.3568	10.43	|Q V	|	|	|	|
8+25	5.4291	10.50	|Q V	|	|	|	|
8+30	5.5019	10.56	|Q V	|	|	|	|
8+35	5.5751	10.63	|Q V	|	|	|	|
8+40	5.6487	10.69	|Q V	|	|	|	|
8+45	5.7228	10.76	|Q V	|	|	|	|
8+50	5.7974	10.83	|Q V	|	|	|	|
8+55	5.8725	10.90	|Q V	|	|	|	|
9+ 0	5.9480	10.97	|Q V	|	|	|	|
9+ 5	6.0241	11.04	|Q V	|	|	|	|
9+10	6.1006	11.12	|Q V	|	|	|	|
9+15	6.1777	11.19	|Q V	|	|	|	|
9+20	6.2553	11.27	|Q V	|	|	|	|
9+25	6.3335	11.35	|Q V	|	|	|	|
9+30	6.4121	11.42	|Q V	|	|	|	|
9+35	6.4914	11.50	|Q V	|	|	|	|
9+40	6.5712	11.59	|Q V	|	|	|	|
9+45	6.6515	11.67	|Q V	|	|	|	|
9+50	6.7325	11.76	|Q V	|	|	|	|
9+55	6.8141	11.84	|Q V	|	|	|	|
10+ 0	6.8962	11.93	|Q V	|	|	|	|
10+ 5	6.9790	12.02	|Q V	|	|	|	|
10+10	7.0625	12.11	|Q V	|	|	|	|
10+15	7.1465	12.21	|Q V	|	|	|	|
10+20	7.2313	12.30	|Q V	|	|	|	|
10+25	7.3167	12.40	|Q V	|	|	|	|
10+30	7.4028	12.50	|Q V	|	|	|	|
10+35	7.4896	12.61	|Q V	|	|	|	|
10+40	7.5772	12.71	|Q V	|	|	|	|
10+45	7.6655	12.82	|Q V	|	|	|	|
10+50	7.7545	12.93	|Q V	|	|	|	|
10+55	7.8443	13.04	|Q V	|	|	|	|
11+ 0	7.9349	13.16	|Q V	|	|	|	|
11+ 5	8.0263	13.27	|Q V	|	|	|	|
11+10	8.1186	13.39	|Q V	|	|	|	|
11+15	8.2117	13.52	|Q V	|	|	|	|
11+20	8.3057	13.64	|Q V	|	|	|	|
11+25	8.4005	13.78	|Q V	|	|	|	|
11+30	8.4963	13.91	|Q V	|	|	|	|
11+35	8.5930	14.05	|Q V	|	|	|	|
11+40	8.6907	14.19	|Q V	|	|	|	|
11+45	8.7894	14.33	|Q V	|	|	|	|
11+50	8.8891	14.48	|Q V	|	|	|	|
11+55	8.9899	14.63	|Q V	|	|	|	|
12+ 0	9.0917	14.79	|Q V	|	|	|	|
12+ 5	9.1947	14.95	|Q V	|	|	|	|
12+10	9.2989	15.13	|Q V	|	|	|	|
12+15	9.4044	15.31	|Q V	|	|	|	|
12+20	9.5113	15.52	|Q V	|	|	|	|
12+25	9.6198	15.76	|Q V	|	|	|	|

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12+30       9.7299     15.98  |Q      V |          |          |          |
12+35       9.8415     16.21  |Q       V|          |          |          |
12+40       9.9547     16.43  |Q       V|          |          |          |
12+45      10.0694     16.65  |Q       V|          |          |          |
12+50      10.1856     16.88  |Q       V|          |          |          |
12+55      10.3035     17.12  |Q       V|          |          |          |
13+ 0      10.4231     17.36  |Q       V|          |          |          |
13+ 5      10.5443     17.61  |Q       V|          |          |          |
13+10      10.6673     17.86  |Q       V|          |          |          |
13+15      10.7922     18.13  |Q       V|          |          |          |
13+20      10.9189     18.40  |Q        V          |          |          |
13+25      11.0477     18.69  |Q        V          |          |          |
13+30      11.1785     18.99  |Q        V          |          |          |
13+35      11.3114     19.30  |Q        V          |          |          |
13+40      11.4466     19.62  |Q        V          |          |          |
13+45      11.5841     19.97  |Q        V          |          |          |
13+50      11.7240     20.32  | Q       V          |          |          |
13+55      11.8665     20.69  | Q       V          |          |          |
14+ 0      12.0117     21.08  | Q       |V          |          |          |
14+ 5      12.1598     21.50  | Q       |V          |          |          |
14+10      12.3110     21.95  | Q       |V          |          |          |
14+15      12.4654     22.43  | Q       |V          |          |          |
14+20      12.6236     22.96  | Q       |V          |          |          |
14+25      12.7858     23.55  | Q       |V          |          |          |
14+30      12.9521     24.15  | Q       |V          |          |          |
14+35      13.1228     24.78  | Q       | V         |          |          |
14+40      13.2980     25.44  | Q       | V         |          |          |
14+45      13.4780     26.14  | Q       | V         |          |          |
14+50      13.6631     26.88  | Q       | V         |          |          |
14+55      13.8538     27.69  | Q       | V         |          |          |
15+ 0      14.0505     28.56  | Q       | V         |          |          |
15+ 5      14.2537     29.51  | Q       |  V        |          |          |
15+10      14.4641     30.54  |  Q      |  V        |          |          |
15+15      14.6824     31.70  |  Q      |  V        |          |          |
15+20      14.9095     32.97  |  Q      |  V        |          |          |
15+25      15.1459     34.34  |  Q      |  V        |          |          |
15+30      15.3917     35.69  |  Q      |   V       |          |          |
15+35      15.6473     37.11  |  Q      |   V       |          |          |
15+40      15.9111     38.31  |  Q      |   V       |          |          |
15+45      16.1840     39.63  |  Q      |   V       |          |          |
15+50      16.4761     42.41  |   Q     |    V      |          |          |
15+55      16.8059     47.88  |   Q     |    V      |          |          |
16+ 0      17.2161     59.57  |    Q    |    V      |          |          |
16+ 5      17.8188     87.51  |       Q |     V     |          |          |
16+10      18.7387    133.57  |         |  Q   V    |          |          |
16+15      20.0358    188.33  |         |       Q   |          |          |
16+20      21.8963    270.15  |         |         V      Q     |          |
16+25      24.1813    331.78  |         |         | V        |  Q       |
16+30      26.0783    275.44  |         |         |   V  Q   |          |
16+35      27.5313    210.97  |         |         |Q   V     |          |
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16+40	28.6578	163.56	|	|	Q |	V |	|
16+45	29.5959	136.21	|	| Q |	| V |	|
16+50	30.4133	118.69	|	|Q |	| V |	|
16+55	31.1260	103.48	|	Q |	| V |	|
17+ 0	31.7637	92.60	|	Q|	| V|	|
17+ 5	32.3314	82.42	|	Q |	| V|	|
17+10	32.8464	74.78	|	Q |	| V |	|
17+15	33.3234	69.26	|	Q |	| V |	|
17+20	33.7655	64.19	|	Q |	| |V |	|
17+25	34.1690	58.59	|	Q |	| |V |	|
17+30	34.5348	53.11	|	Q |	| |V |	|
17+35	34.8739	49.24	|	Q |	| | V |	|
17+40	35.1951	46.63	|	Q |	| | V |	|
17+45	35.4963	43.74	|	Q |	| | V |	|
17+50	35.7811	41.36	|	Q |	| | | V |	|
17+55	36.0496	38.98	| Q |	|	| | | V |	|
18+ 0	36.2986	36.16	| Q |	|	| | | V |	|
18+ 5	36.5370	34.62	| Q |	|	| | | V |	|
18+10	36.7639	32.94	| Q |	|	| | | V |	|
18+15	36.9755	30.72	| Q |	|	| | | | V |	|
18+20	37.1784	29.46	| Q |	|	| | | | V |	|
18+25	37.3688	27.66	| Q |	|	| | | | V |	|
18+30	37.5460	25.72	| Q |	|	| | | | V |	|
18+35	37.7158	24.65	| Q |	|	| | | | V |	|
18+40	37.8731	22.85	| Q |	|	| | | | V |	|
18+45	38.0217	21.57	| Q |	|	| | | | | V |	|
18+50	38.1672	21.13	| Q |	|	| | | | | V |	|
18+55	38.3120	21.01	| Q |	|	| | | | | V |	|
19+ 0	38.4546	20.71	| Q |	|	| | | | | V |	|
19+ 5	38.5941	20.26	| Q |	|	| | | | | V |	|
19+10	38.7304	19.79	|Q |	|	| | | | | V |	|
19+15	38.8627	19.21	|Q |	|	| | | | | V |	|
19+20	38.9885	18.28	|Q |	|	| | | | | V |	|
19+25	39.1050	16.90	|Q |	|	| | | | | | V |	|
19+30	39.2172	16.30	|Q |	|	| | | | | | V |	|
19+35	39.3253	15.70	|Q |	|	| | | | | | V |	|
19+40	39.4253	14.51	|Q |	|	| | | | | | V |	|
19+45	39.5179	13.46	|Q |	|	| | | | | | V |	|
19+50	39.6083	13.13	|Q |	|	| | | | | | V |	|
19+55	39.6969	12.87	|Q |	|	| | | | | | V |	|
20+ 0	39.7839	12.62	|Q |	|	| | | | | | V |	|
20+ 5	39.8692	12.39	|Q |	|	| | | | | | V |	|
20+10	39.9531	12.18	|Q |	|	| | | | | | V |	|
20+15	40.0356	11.98	|Q |	|	| | | | | | V |	|
20+20	40.1167	11.78	|Q |	|	| | | | | | | V |	|
20+25	40.1966	11.60	|Q |	|	| | | | | | | V |	|
20+30	40.2753	11.43	|Q |	|	| | | | | | | V |	|
20+35	40.3529	11.26	|Q |	|	| | | | | | | V |	|
20+40	40.4293	11.10	|Q |	|	| | | | | | | V |	|
20+45	40.5047	10.95	|Q |	|	| | | | | | | V |	|

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   20+50      40.5791     10.80  |Q        |         |         |      V  |
   20+55      40.6526     10.66  |Q        |         |         |      V  |
   21+ 0      40.7251     10.53  |Q        |         |         |      V  |
   21+ 5      40.7967     10.40  |Q        |         |         |      V  |
   21+10      40.8674     10.27  |Q        |         |         |      V  |
   21+15      40.9373     10.15  |Q        |         |         |      V  |
   21+20      41.0063     10.03  |Q        |         |         |      V  |
   21+25      41.0746      9.91  Q         |         |         |      V  |
   21+30      41.1421      9.80  Q         |         |         |      V  |
   21+35      41.2089      9.70  Q         |         |         |       V |
   21+40      41.2750      9.59  Q         |         |         |       V |
   21+45      41.3404      9.49  Q         |         |         |       V |
   21+50      41.4051      9.39  Q         |         |         |       V |
   21+55      41.4691      9.30  Q         |         |         |       V |
   22+ 0      41.5325      9.21  Q         |         |         |       V |
   22+ 5      41.5953      9.12  Q         |         |         |       V |
   22+10      41.6575      9.03  Q         |         |         |       V |
   22+15      41.7191      8.94  Q         |         |         |       V |
   22+20      41.7801      8.86  Q         |         |         |       V |
   22+25      41.8406      8.78  Q         |         |         |       V |
   22+30      41.9005      8.70  Q         |         |         |       V |
   22+35      41.9599      8.62  Q         |         |         |       V |
   22+40      42.0187      8.55  Q         |         |         |       V |
   22+45      42.0771      8.47  Q         |         |         |       V |
   22+50      42.1350      8.40  Q         |         |         |       V |
   22+55      42.1923      8.33  Q         |         |         |       V |
   23+ 0      42.2493      8.26  Q         |         |         |        V|
   23+ 5      42.3057      8.20  Q         |         |         |        V|
   23+10      42.3617      8.13  Q         |         |         |        V|
   23+15      42.4172      8.07  Q         |         |         |        V|
   23+20      42.4724      8.00  Q         |         |         |        V|
   23+25      42.5270      7.94  Q         |         |         |        V|
   23+30      42.5813      7.88  Q         |         |         |        V|
   23+35      42.6352      7.82  Q         |         |         |        V|
   23+40      42.6887      7.76  Q         |         |         |        V|
   23+45      42.7417      7.71  Q         |         |         |        V|
   23+50      42.7944      7.65  Q         |         |         |        V|
   23+55      42.8467      7.60  Q         |         |         |        V|
   24+ 0      42.8987      7.54  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 10/02/22

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

Program License Serial Number 6385

Cordova site
10-yr existing
Area B2 offsite

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		
32.93	1	0.61
Rainfall data for year 10		
32.92	6	1.23
Rainfall data for year 10		
32.93	24	2.13

++

******** 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)
80.0	80.0	32.93	1.000	0.370	1.000	0.370

Area-averaged adjusted loss rate Fm (In/Hr) = 0.370

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
32.93	1.000	80.0	80.0	2.50	0.302

Area-averaged catchment yield fraction, Y = 0.302
Area-averaged low loss fraction, Yb = 0.698
++
Watercourse length = 3069.00(Ft.)
Length from concentration point to centroid = 2203.00(Ft.)
Elevation difference along watercourse = 40.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 32.93(Ac.)
Catchment Lag time = 0.219 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 37.9751
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.370(In/Hr)
Average low loss rate fraction (Yb) = 0.698 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.203(In)
Computed peak 30-minute rainfall = 0.483(In)
Specified peak 1-hour rainfall = 0.609(In)
Computed peak 3-hour rainfall = 0.931(In)
Specified peak 6-hour rainfall = 1.230(In)
Specified peak 24-hour rainfall = 2.130(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 32.93(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998 Adjusted rainfall = 0.203(In)
30-minute factor = 0.998 Adjusted rainfall = 0.482(In)
1-hour factor = 0.998 Adjusted rainfall = 0.608(In)
3-hour factor = 1.000 Adjusted rainfall = 0.931(In)
6-hour factor = 1.000 Adjusted rainfall = 1.230(In)
24-hour factor = 1.000 Adjusted rainfall = 2.130(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 = 398.25 (CFS))	
1	2.532	10.084
2	16.448	55.418
3	46.071	117.974
4	63.520	69.492
5	73.048	37.943
6	79.419	25.372
7	83.919	17.922
8	87.464	14.116
9	90.052	10.310
10	92.108	8.187
11	93.803	6.749
12	95.145	5.343
13	96.242	4.369
14	97.124	3.512
15	97.771	2.577
16	98.188	1.660
17	98.619	1.718
18	99.075	1.815
19	99.495	1.675
20	99.753	1.027
21	100.000	0.983

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2027	0.2027
2	0.2834	0.0808
3	0.3449	0.0614
4	0.3964	0.0515
5	0.4415	0.0452
6	0.4823	0.0407
7	0.5078	0.0255
8	0.5310	0.0232
9	0.5523	0.0213
10	0.5721	0.0198
11	0.5906	0.0185
12	0.6081	0.0174
13	0.6272	0.0192
14	0.6455	0.0183
15	0.6630	0.0175
16	0.6798	0.0168
17	0.6959	0.0162
18	0.7115	0.0156

19	0.7266	0.0151
20	0.7412	0.0146
21	0.7553	0.0141
22	0.7691	0.0137
23	0.7824	0.0134
24	0.7955	0.0130
25	0.8081	0.0127
26	0.8205	0.0124
27	0.8326	0.0121
28	0.8444	0.0118
29	0.8560	0.0116
30	0.8673	0.0113
31	0.8784	0.0111
32	0.8893	0.0109
33	0.9000	0.0107
34	0.9104	0.0105
35	0.9207	0.0103
36	0.9308	0.0101
37	0.9411	0.0103
38	0.9513	0.0101
39	0.9613	0.0100
40	0.9711	0.0098
41	0.9808	0.0097
42	0.9903	0.0095
43	0.9997	0.0094
44	1.0090	0.0093
45	1.0182	0.0092
46	1.0272	0.0090
47	1.0361	0.0089
48	1.0449	0.0088
49	1.0536	0.0087
50	1.0622	0.0086
51	1.0707	0.0085
52	1.0791	0.0084
53	1.0874	0.0083
54	1.0956	0.0082
55	1.1037	0.0081
56	1.1117	0.0080
57	1.1196	0.0079
58	1.1275	0.0079
59	1.1353	0.0078
60	1.1430	0.0077
61	1.1506	0.0076
62	1.1581	0.0075
63	1.1656	0.0075
64	1.1730	0.0074
65	1.1803	0.0073
66	1.1876	0.0073
67	1.1948	0.0072
68	1.2019	0.0071

69	1.2090	0.0071
70	1.2160	0.0070
71	1.2230	0.0070
72	1.2299	0.0069
73	1.2366	0.0067
74	1.2433	0.0067
75	1.2499	0.0066
76	1.2565	0.0066
77	1.2630	0.0065
78	1.2695	0.0065
79	1.2759	0.0064
80	1.2823	0.0064
81	1.2886	0.0063
82	1.2949	0.0063
83	1.3011	0.0062
84	1.3073	0.0062
85	1.3135	0.0061
86	1.3196	0.0061
87	1.3256	0.0061
88	1.3316	0.0060
89	1.3376	0.0060
90	1.3435	0.0059
91	1.3494	0.0059
92	1.3553	0.0059
93	1.3611	0.0058
94	1.3669	0.0058
95	1.3726	0.0057
96	1.3783	0.0057
97	1.3840	0.0057
98	1.3896	0.0056
99	1.3952	0.0056
100	1.4008	0.0056
101	1.4063	0.0055
102	1.4118	0.0055
103	1.4173	0.0055
104	1.4227	0.0054
105	1.4281	0.0054
106	1.4335	0.0054
107	1.4389	0.0053
108	1.4442	0.0053
109	1.4494	0.0053
110	1.4547	0.0053
111	1.4599	0.0052
112	1.4651	0.0052
113	1.4703	0.0052
114	1.4754	0.0051
115	1.4805	0.0051
116	1.4856	0.0051
117	1.4907	0.0051
118	1.4957	0.0050

119	1.5007	0.0050
120	1.5057	0.0050
121	1.5107	0.0050
122	1.5156	0.0049
123	1.5205	0.0049
124	1.5254	0.0049
125	1.5303	0.0049
126	1.5351	0.0048
127	1.5399	0.0048
128	1.5447	0.0048
129	1.5495	0.0048
130	1.5542	0.0047
131	1.5590	0.0047
132	1.5637	0.0047
133	1.5683	0.0047
134	1.5730	0.0047
135	1.5776	0.0046
136	1.5823	0.0046
137	1.5869	0.0046
138	1.5914	0.0046
139	1.5960	0.0046
140	1.6005	0.0045
141	1.6051	0.0045
142	1.6096	0.0045
143	1.6140	0.0045
144	1.6185	0.0045
145	1.6229	0.0044
146	1.6274	0.0044
147	1.6318	0.0044
148	1.6362	0.0044
149	1.6405	0.0044
150	1.6449	0.0044
151	1.6492	0.0043
152	1.6535	0.0043
153	1.6578	0.0043
154	1.6621	0.0043
155	1.6664	0.0043
156	1.6706	0.0043
157	1.6749	0.0042
158	1.6791	0.0042
159	1.6833	0.0042
160	1.6875	0.0042
161	1.6916	0.0042
162	1.6958	0.0042
163	1.6999	0.0041
164	1.7041	0.0041
165	1.7082	0.0041
166	1.7123	0.0041
167	1.7163	0.0041
168	1.7204	0.0041

169	1.7245	0.0040
170	1.7285	0.0040
171	1.7325	0.0040
172	1.7365	0.0040
173	1.7405	0.0040
174	1.7445	0.0040
175	1.7485	0.0040
176	1.7524	0.0040
177	1.7563	0.0039
178	1.7603	0.0039
179	1.7642	0.0039
180	1.7681	0.0039
181	1.7720	0.0039
182	1.7758	0.0039
183	1.7797	0.0039
184	1.7835	0.0038
185	1.7874	0.0038
186	1.7912	0.0038
187	1.7950	0.0038
188	1.7988	0.0038
189	1.8026	0.0038
190	1.8064	0.0038
191	1.8101	0.0038
192	1.8139	0.0037
193	1.8176	0.0037
194	1.8213	0.0037
195	1.8250	0.0037
196	1.8287	0.0037
197	1.8324	0.0037
198	1.8361	0.0037
199	1.8398	0.0037
200	1.8434	0.0037
201	1.8471	0.0036
202	1.8507	0.0036
203	1.8543	0.0036
204	1.8580	0.0036
205	1.8616	0.0036
206	1.8651	0.0036
207	1.8687	0.0036
208	1.8723	0.0036
209	1.8759	0.0036
210	1.8794	0.0036
211	1.8830	0.0035
212	1.8865	0.0035
213	1.8900	0.0035
214	1.8935	0.0035
215	1.8970	0.0035
216	1.9005	0.0035
217	1.9040	0.0035
218	1.9075	0.0035

219	1.9109	0.0035
220	1.9144	0.0035
221	1.9178	0.0034
222	1.9212	0.0034
223	1.9247	0.0034
224	1.9281	0.0034
225	1.9315	0.0034
226	1.9349	0.0034
227	1.9383	0.0034
228	1.9416	0.0034
229	1.9450	0.0034
230	1.9484	0.0034
231	1.9517	0.0034
232	1.9551	0.0033
233	1.9584	0.0033
234	1.9617	0.0033
235	1.9650	0.0033
236	1.9684	0.0033
237	1.9717	0.0033
238	1.9749	0.0033
239	1.9782	0.0033
240	1.9815	0.0033
241	1.9848	0.0033
242	1.9880	0.0033
243	1.9913	0.0033
244	1.9945	0.0032
245	1.9978	0.0032
246	2.0010	0.0032
247	2.0042	0.0032
248	2.0074	0.0032
249	2.0106	0.0032
250	2.0138	0.0032
251	2.0170	0.0032
252	2.0202	0.0032
253	2.0233	0.0032
254	2.0265	0.0032
255	2.0297	0.0032
256	2.0328	0.0031
257	2.0360	0.0031
258	2.0391	0.0031
259	2.0422	0.0031
260	2.0453	0.0031
261	2.0485	0.0031
262	2.0516	0.0031
263	2.0547	0.0031
264	2.0577	0.0031
265	2.0608	0.0031
266	2.0639	0.0031
267	2.0670	0.0031
268	2.0700	0.0031

269	2.0731	0.0031
270	2.0761	0.0030
271	2.0792	0.0030
272	2.0822	0.0030
273	2.0853	0.0030
274	2.0883	0.0030
275	2.0913	0.0030
276	2.0943	0.0030
277	2.0973	0.0030
278	2.1003	0.0030
279	2.1033	0.0030
280	2.1063	0.0030
281	2.1093	0.0030
282	2.1122	0.0030
283	2.1152	0.0030
284	2.1181	0.0030
285	2.1211	0.0030
286	2.1240	0.0029
287	2.1270	0.0029
288	2.1299	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0020	0.0009
2	0.0029	0.0021	0.0009
3	0.0030	0.0021	0.0009
4	0.0030	0.0021	0.0009
5	0.0030	0.0021	0.0009
6	0.0030	0.0021	0.0009
7	0.0030	0.0021	0.0009
8	0.0030	0.0021	0.0009
9	0.0030	0.0021	0.0009
10	0.0030	0.0021	0.0009
11	0.0030	0.0021	0.0009
12	0.0030	0.0021	0.0009
13	0.0030	0.0021	0.0009
14	0.0031	0.0021	0.0009
15	0.0031	0.0021	0.0009
16	0.0031	0.0021	0.0009
17	0.0031	0.0022	0.0009
18	0.0031	0.0022	0.0009
19	0.0031	0.0022	0.0009
20	0.0031	0.0022	0.0009
21	0.0031	0.0022	0.0009
22	0.0031	0.0022	0.0009
23	0.0032	0.0022	0.0010
24	0.0032	0.0022	0.0010
25	0.0032	0.0022	0.0010

26	0.0032	0.0022	0.0010
27	0.0032	0.0022	0.0010
28	0.0032	0.0022	0.0010
29	0.0032	0.0023	0.0010
30	0.0032	0.0023	0.0010
31	0.0033	0.0023	0.0010
32	0.0033	0.0023	0.0010
33	0.0033	0.0023	0.0010
34	0.0033	0.0023	0.0010
35	0.0033	0.0023	0.0010
36	0.0033	0.0023	0.0010
37	0.0033	0.0023	0.0010
38	0.0033	0.0023	0.0010
39	0.0034	0.0023	0.0010
40	0.0034	0.0023	0.0010
41	0.0034	0.0024	0.0010
42	0.0034	0.0024	0.0010
43	0.0034	0.0024	0.0010
44	0.0034	0.0024	0.0010
45	0.0034	0.0024	0.0010
46	0.0034	0.0024	0.0010
47	0.0035	0.0024	0.0010
48	0.0035	0.0024	0.0010
49	0.0035	0.0024	0.0011
50	0.0035	0.0024	0.0011
51	0.0035	0.0025	0.0011
52	0.0035	0.0025	0.0011
53	0.0036	0.0025	0.0011
54	0.0036	0.0025	0.0011
55	0.0036	0.0025	0.0011
56	0.0036	0.0025	0.0011
57	0.0036	0.0025	0.0011
58	0.0036	0.0025	0.0011
59	0.0036	0.0025	0.0011
60	0.0037	0.0026	0.0011
61	0.0037	0.0026	0.0011
62	0.0037	0.0026	0.0011
63	0.0037	0.0026	0.0011
64	0.0037	0.0026	0.0011
65	0.0037	0.0026	0.0011
66	0.0038	0.0026	0.0011
67	0.0038	0.0026	0.0011
68	0.0038	0.0026	0.0011
69	0.0038	0.0027	0.0012
70	0.0038	0.0027	0.0012
71	0.0039	0.0027	0.0012
72	0.0039	0.0027	0.0012
73	0.0039	0.0027	0.0012
74	0.0039	0.0027	0.0012
75	0.0039	0.0027	0.0012

76	0.0040	0.0028	0.0012
77	0.0040	0.0028	0.0012
78	0.0040	0.0028	0.0012
79	0.0040	0.0028	0.0012
80	0.0040	0.0028	0.0012
81	0.0041	0.0028	0.0012
82	0.0041	0.0028	0.0012
83	0.0041	0.0029	0.0012
84	0.0041	0.0029	0.0012
85	0.0042	0.0029	0.0013
86	0.0042	0.0029	0.0013
87	0.0042	0.0029	0.0013
88	0.0042	0.0029	0.0013
89	0.0043	0.0030	0.0013
90	0.0043	0.0030	0.0013
91	0.0043	0.0030	0.0013
92	0.0043	0.0030	0.0013
93	0.0044	0.0030	0.0013
94	0.0044	0.0031	0.0013
95	0.0044	0.0031	0.0013
96	0.0044	0.0031	0.0013
97	0.0045	0.0031	0.0013
98	0.0045	0.0031	0.0014
99	0.0045	0.0032	0.0014
100	0.0045	0.0032	0.0014
101	0.0046	0.0032	0.0014
102	0.0046	0.0032	0.0014
103	0.0046	0.0032	0.0014
104	0.0047	0.0033	0.0014
105	0.0047	0.0033	0.0014
106	0.0047	0.0033	0.0014
107	0.0048	0.0033	0.0014
108	0.0048	0.0033	0.0014
109	0.0048	0.0034	0.0015
110	0.0049	0.0034	0.0015
111	0.0049	0.0034	0.0015
112	0.0049	0.0034	0.0015
113	0.0050	0.0035	0.0015
114	0.0050	0.0035	0.0015
115	0.0051	0.0035	0.0015
116	0.0051	0.0036	0.0015
117	0.0051	0.0036	0.0016
118	0.0052	0.0036	0.0016
119	0.0052	0.0036	0.0016
120	0.0053	0.0037	0.0016
121	0.0053	0.0037	0.0016
122	0.0053	0.0037	0.0016
123	0.0054	0.0038	0.0016
124	0.0054	0.0038	0.0016
125	0.0055	0.0038	0.0017

126	0.0055	0.0039	0.0017
127	0.0056	0.0039	0.0017
128	0.0056	0.0039	0.0017
129	0.0057	0.0040	0.0017
130	0.0057	0.0040	0.0017
131	0.0058	0.0041	0.0018
132	0.0059	0.0041	0.0018
133	0.0059	0.0041	0.0018
134	0.0060	0.0042	0.0018
135	0.0061	0.0042	0.0018
136	0.0061	0.0043	0.0018
137	0.0062	0.0043	0.0019
138	0.0062	0.0044	0.0019
139	0.0063	0.0044	0.0019
140	0.0064	0.0044	0.0019
141	0.0065	0.0045	0.0020
142	0.0065	0.0046	0.0020
143	0.0066	0.0046	0.0020
144	0.0067	0.0047	0.0020
145	0.0069	0.0048	0.0021
146	0.0070	0.0049	0.0021
147	0.0071	0.0049	0.0021
148	0.0071	0.0050	0.0022
149	0.0073	0.0051	0.0022
150	0.0073	0.0051	0.0022
151	0.0075	0.0052	0.0023
152	0.0075	0.0053	0.0023
153	0.0077	0.0054	0.0023
154	0.0078	0.0054	0.0023
155	0.0079	0.0055	0.0024
156	0.0080	0.0056	0.0024
157	0.0082	0.0057	0.0025
158	0.0083	0.0058	0.0025
159	0.0085	0.0059	0.0026
160	0.0086	0.0060	0.0026
161	0.0088	0.0061	0.0027
162	0.0089	0.0062	0.0027
163	0.0092	0.0064	0.0028
164	0.0093	0.0065	0.0028
165	0.0095	0.0067	0.0029
166	0.0097	0.0068	0.0029
167	0.0100	0.0070	0.0030
168	0.0101	0.0071	0.0031
169	0.0101	0.0071	0.0031
170	0.0103	0.0072	0.0031
171	0.0107	0.0074	0.0032
172	0.0109	0.0076	0.0033
173	0.0113	0.0079	0.0034
174	0.0116	0.0081	0.0035
175	0.0121	0.0084	0.0037

176	0.0124	0.0086	0.0037
177	0.0130	0.0091	0.0039
178	0.0134	0.0093	0.0040
179	0.0141	0.0099	0.0043
180	0.0146	0.0102	0.0044
181	0.0156	0.0109	0.0047
182	0.0162	0.0113	0.0049
183	0.0175	0.0122	0.0053
184	0.0183	0.0128	0.0055
185	0.0174	0.0122	0.0053
186	0.0185	0.0129	0.0056
187	0.0213	0.0149	0.0064
188	0.0232	0.0162	0.0070
189	0.0407	0.0284	0.0123
190	0.0452	0.0308	0.0144
191	0.0614	0.0308	0.0306
192	0.0808	0.0308	0.0499
193	0.2027	0.0308	0.1719
194	0.0515	0.0308	0.0207
195	0.0255	0.0178	0.0077
196	0.0198	0.0138	0.0060
197	0.0192	0.0134	0.0058
198	0.0168	0.0117	0.0051
199	0.0151	0.0105	0.0046
200	0.0137	0.0096	0.0042
201	0.0127	0.0089	0.0038
202	0.0118	0.0082	0.0036
203	0.0111	0.0077	0.0034
204	0.0105	0.0073	0.0032
205	0.0103	0.0072	0.0031
206	0.0098	0.0069	0.0030
207	0.0094	0.0066	0.0028
208	0.0090	0.0063	0.0027
209	0.0087	0.0061	0.0026
210	0.0084	0.0059	0.0025
211	0.0081	0.0057	0.0024
212	0.0079	0.0055	0.0024
213	0.0076	0.0053	0.0023
214	0.0074	0.0052	0.0022
215	0.0072	0.0050	0.0022
216	0.0070	0.0049	0.0021
217	0.0067	0.0047	0.0020
218	0.0066	0.0046	0.0020
219	0.0064	0.0045	0.0019
220	0.0063	0.0044	0.0019
221	0.0061	0.0043	0.0019
222	0.0060	0.0042	0.0018
223	0.0059	0.0041	0.0018
224	0.0058	0.0040	0.0017
225	0.0057	0.0040	0.0017

226	0.0056	0.0039	0.0017
227	0.0055	0.0038	0.0017
228	0.0054	0.0037	0.0016
229	0.0053	0.0037	0.0016
230	0.0052	0.0036	0.0016
231	0.0051	0.0036	0.0015
232	0.0050	0.0035	0.0015
233	0.0050	0.0035	0.0015
234	0.0049	0.0034	0.0015
235	0.0048	0.0034	0.0015
236	0.0047	0.0033	0.0014
237	0.0047	0.0033	0.0014
238	0.0046	0.0032	0.0014
239	0.0046	0.0032	0.0014
240	0.0045	0.0031	0.0014
241	0.0044	0.0031	0.0013
242	0.0044	0.0031	0.0013
243	0.0043	0.0030	0.0013
244	0.0043	0.0030	0.0013
245	0.0042	0.0030	0.0013
246	0.0042	0.0029	0.0013
247	0.0041	0.0029	0.0013
248	0.0041	0.0029	0.0012
249	0.0040	0.0028	0.0012
250	0.0040	0.0028	0.0012
251	0.0040	0.0028	0.0012
252	0.0039	0.0027	0.0012
253	0.0039	0.0027	0.0012
254	0.0038	0.0027	0.0012
255	0.0038	0.0027	0.0012
256	0.0038	0.0026	0.0011
257	0.0037	0.0026	0.0011
258	0.0037	0.0026	0.0011
259	0.0037	0.0026	0.0011
260	0.0036	0.0025	0.0011
261	0.0036	0.0025	0.0011
262	0.0036	0.0025	0.0011
263	0.0035	0.0025	0.0011
264	0.0035	0.0024	0.0011
265	0.0035	0.0024	0.0011
266	0.0035	0.0024	0.0010
267	0.0034	0.0024	0.0010
268	0.0034	0.0024	0.0010
269	0.0034	0.0024	0.0010
270	0.0033	0.0023	0.0010
271	0.0033	0.0023	0.0010
272	0.0033	0.0023	0.0010
273	0.0033	0.0023	0.0010
274	0.0032	0.0023	0.0010
275	0.0032	0.0022	0.0010

276	0.0032	0.0022	0.0010
277	0.0032	0.0022	0.0010
278	0.0031	0.0022	0.0010
279	0.0031	0.0022	0.0009
280	0.0031	0.0022	0.0009
281	0.0031	0.0022	0.0009
282	0.0031	0.0021	0.0009
283	0.0030	0.0021	0.0009
284	0.0030	0.0021	0.0009
285	0.0030	0.0021	0.0009
286	0.0030	0.0021	0.0009
287	0.0030	0.0021	0.0009
288	0.0029	0.0021	0.0009

Total soil rain loss = 1.33(In)
Total effective rainfall = 0.80(In)
Peak flow rate in flood hydrograph = 27.08(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

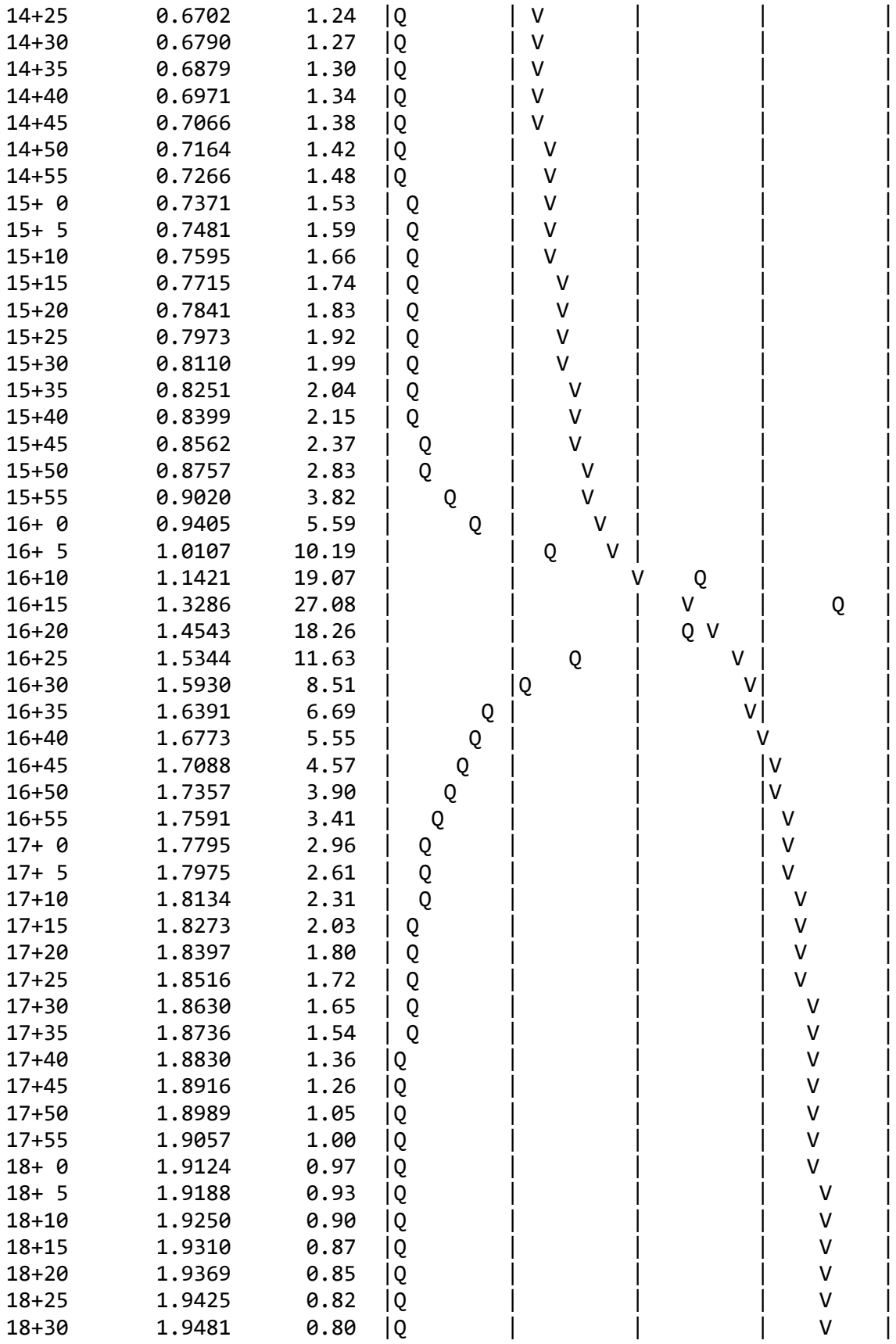
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0001	0.01	Q	|	|	|	|
0+10	0.0005	0.06	Q	|	|	|	|
0+15	0.0016	0.16	Q	|	|	|	|
0+20	0.0031	0.22	Q	|	|	|	|
0+25	0.0049	0.26	Q	|	|	|	|
0+30	0.0069	0.28	Q	|	|	|	|
0+35	0.0089	0.30	Q	|	|	|	|
0+40	0.0111	0.31	Q	|	|	|	|
0+45	0.0133	0.32	Q	|	|	|	|
0+50	0.0156	0.33	Q	|	|	|	|
0+55	0.0179	0.34	Q	|	|	|	|
1+ 0	0.0203	0.34	Q	|	|	|	|
1+ 5	0.0227	0.35	Q	|	|	|	|
1+10	0.0251	0.35	Q	|	|	|	|
1+15	0.0276	0.36	Q	|	|	|	|
1+20	0.0300	0.36	Q	|	|	|	|
1+25	0.0325	0.36	Q	|	|	|	|
1+30	0.0350	0.36	Q	|	|	|	|
1+35	0.0376	0.37	Q	|	|	|	|
1+40	0.0401	0.37	Q	|	|	|	|
1+45	0.0427	0.37	Q	|	|	|	|
1+50	0.0452	0.37	Q	|	|	|	|

1+55	0.0478	0.37	Q	|	|	|	|
2+ 0	0.0504	0.38	Q	|	|	|	|
2+ 5	0.0530	0.38	Q	|	|	|	|
2+10	0.0556	0.38	QV	|	|	|	|
2+15	0.0582	0.38	QV	|	|	|	|
2+20	0.0608	0.38	QV	|	|	|	|
2+25	0.0635	0.38	QV	|	|	|	|
2+30	0.0661	0.38	QV	|	|	|	|
2+35	0.0688	0.39	QV	|	|	|	|
2+40	0.0714	0.39	QV	|	|	|	|
2+45	0.0741	0.39	QV	|	|	|	|
2+50	0.0768	0.39	QV	|	|	|	|
2+55	0.0795	0.39	QV	|	|	|	|
3+ 0	0.0822	0.39	QV	|	|	|	|
3+ 5	0.0849	0.39	QV	|	|	|	|
3+10	0.0876	0.40	QV	|	|	|	|
3+15	0.0904	0.40	QV	|	|	|	|
3+20	0.0931	0.40	QV	|	|	|	|
3+25	0.0959	0.40	QV	|	|	|	|
3+30	0.0986	0.40	QV	|	|	|	|
3+35	0.1014	0.40	QV	|	|	|	|
3+40	0.1042	0.40	QV	|	|	|	|
3+45	0.1070	0.41	QV	|	|	|	|
3+50	0.1098	0.41	Q V	|	|	|	|
3+55	0.1126	0.41	Q V	|	|	|	|
4+ 0	0.1154	0.41	Q V	|	|	|	|
4+ 5	0.1183	0.41	Q V	|	|	|	|
4+10	0.1211	0.41	Q V	|	|	|	|
4+15	0.1240	0.42	Q V	|	|	|	|
4+20	0.1269	0.42	Q V	|	|	|	|
4+25	0.1298	0.42	Q V	|	|	|	|
4+30	0.1327	0.42	Q V	|	|	|	|
4+35	0.1356	0.42	Q V	|	|	|	|
4+40	0.1385	0.43	Q V	|	|	|	|
4+45	0.1415	0.43	Q V	|	|	|	|
4+50	0.1444	0.43	Q V	|	|	|	|
4+55	0.1474	0.43	Q V	|	|	|	|
5+ 0	0.1504	0.43	Q V	|	|	|	|
5+ 5	0.1534	0.43	Q V	|	|	|	|
5+10	0.1564	0.44	Q V	|	|	|	|
5+15	0.1594	0.44	Q V	|	|	|	|
5+20	0.1624	0.44	Q V	|	|	|	|
5+25	0.1655	0.44	Q V	|	|	|	|
5+30	0.1685	0.44	Q V	|	|	|	|
5+35	0.1716	0.45	Q V	|	|	|	|
5+40	0.1747	0.45	Q V	|	|	|	|
5+45	0.1778	0.45	Q V	|	|	|	|
5+50	0.1809	0.45	Q V	|	|	|	|
5+55	0.1841	0.46	Q V	|	|	|	|
6+ 0	0.1872	0.46	Q V	|	|	|	|

6+ 5	0.1904	0.46	Q	V				
6+10	0.1936	0.46	Q	V				
6+15	0.1968	0.46	Q	V				
6+20	0.2000	0.47	Q	V				
6+25	0.2032	0.47	Q	V				
6+30	0.2064	0.47	Q	V				
6+35	0.2097	0.47	Q	V				
6+40	0.2130	0.48	Q	V				
6+45	0.2163	0.48	Q	V				
6+50	0.2196	0.48	Q	V				
6+55	0.2229	0.48	Q	V				
7+ 0	0.2263	0.49	Q	V				
7+ 5	0.2296	0.49	Q	V				
7+10	0.2330	0.49	Q	V				
7+15	0.2364	0.49	Q	V				
7+20	0.2399	0.50	Q	V				
7+25	0.2433	0.50	Q	V				
7+30	0.2468	0.50	Q	V				
7+35	0.2502	0.51	Q	V				
7+40	0.2537	0.51	Q	V				
7+45	0.2573	0.51	Q	V				
7+50	0.2608	0.51	Q	V				
7+55	0.2644	0.52	Q	V				
8+ 0	0.2679	0.52	Q	V				
8+ 5	0.2716	0.52	Q	V				
8+10	0.2752	0.53	Q	V				
8+15	0.2788	0.53	Q	V				
8+20	0.2825	0.53	Q	V				
8+25	0.2862	0.54	Q	V				
8+30	0.2899	0.54	Q	V				
8+35	0.2937	0.54	Q	V				
8+40	0.2974	0.55	Q	V				
8+45	0.3012	0.55	Q	V				
8+50	0.3050	0.55	Q	V				
8+55	0.3089	0.56	Q	V				
9+ 0	0.3128	0.56	Q	V				
9+ 5	0.3167	0.57	Q	V				
9+10	0.3206	0.57	Q	V				
9+15	0.3245	0.57	Q	V				
9+20	0.3285	0.58	Q	V				
9+25	0.3325	0.58	Q	V				
9+30	0.3366	0.59	Q	V				
9+35	0.3406	0.59	Q	V				
9+40	0.3447	0.60	Q	V				
9+45	0.3489	0.60	Q	V				
9+50	0.3530	0.60	Q	V				
9+55	0.3572	0.61	Q	V				
10+ 0	0.3614	0.61	Q	V				
10+ 5	0.3657	0.62	Q	V				
10+10	0.3700	0.62	Q	V				

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10+15       0.3743      0.63  Q     V   |          |          |          |
10+20       0.3787      0.63  Q     V   |          |          |          |
10+25       0.3831      0.64  Q      V  |          |          |          |
10+30       0.3875      0.64  Q      V  |          |          |          |
10+35       0.3920      0.65  Q      V  |          |          |          |
10+40       0.3965      0.66  Q      V  |          |          |          |
10+45       0.4011      0.66  Q      V  |          |          |          |
10+50       0.4057      0.67  Q      V  |          |          |          |
10+55       0.4103      0.67  Q      V  |          |          |          |
11+ 0       0.4150      0.68  Q      V  |          |          |          |
11+ 5       0.4197      0.69  Q      V  |          |          |          |
11+10       0.4245      0.69  Q      V  |          |          |          |
11+15       0.4293      0.70  Q      V  |          |          |          |
11+20       0.4342      0.71  Q      V  |          |          |          |
11+25       0.4391      0.71  Q       V |          |          |          |
11+30       0.4441      0.72  Q       V |          |          |          |
11+35       0.4491      0.73  Q       V |          |          |          |
11+40       0.4542      0.74  Q       V |          |          |          |
11+45       0.4593      0.75  Q       V |          |          |          |
11+50       0.4645      0.75  |Q      V |          |          |          |
11+55       0.4698      0.76  |Q      V |          |          |          |
12+ 0       0.4751      0.77  |Q      V |          |          |          |
12+ 5       0.4804      0.78  |Q      V |          |          |          |
12+10       0.4859      0.79  |Q      V |          |          |          |
12+15       0.4914      0.80  |Q      V |          |          |          |
12+20       0.4970      0.82  |Q       V|          |          |          |
12+25       0.5027      0.83  |Q       V|          |          |          |
12+30       0.5085      0.84  |Q       V|          |          |          |
12+35       0.5144      0.85  |Q       V|          |          |          |
12+40       0.5203      0.86  |Q       V|          |          |          |
12+45       0.5263      0.87  |Q       V|          |          |          |
12+50       0.5324      0.89  |Q       V|          |          |          |
12+55       0.5386      0.90  |Q       V|          |          |          |
13+ 0       0.5449      0.91  |Q       V|          |          |          |
13+ 5       0.5513      0.93  |Q        V          |          |          |
13+10       0.5578      0.94  |Q        V          |          |          |
13+15       0.5644      0.96  |Q        V          |          |          |
13+20       0.5711      0.97  |Q        V          |          |          |
13+25       0.5779      0.99  |Q        V          |          |          |
13+30       0.5848      1.01  |Q        V          |          |          |
13+35       0.5919      1.02  |Q        V          |          |          |
13+40       0.5990      1.04  |Q        V          |          |          |
13+45       0.6064      1.06  |Q        |V         |          |          |
13+50       0.6138      1.08  |Q        |V         |          |          |
13+55       0.6214      1.11  |Q        |V         |          |          |
14+ 0       0.6292      1.13  |Q        |V         |          |          |
14+ 5       0.6372      1.15  |Q        |V         |          |          |
14+10       0.6452      1.17  |Q        |V         |          |          |
14+15       0.6534      1.19  |Q        |V         |          |          |
14+20       0.6617      1.21  |Q        | V        |          |          |
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18+35       1.9534      0.78  |Q        |          |          |    V     |
18+40       1.9587      0.76  |Q        |          |          |    V     |
18+45       1.9638      0.75  Q         |          |          |    V     |
18+50       1.9689      0.73  Q         |          |          |     V    |
18+55       1.9738      0.71  Q         |          |          |     V    |
19+ 0       1.9786      0.70  Q         |          |          |     V    |
19+ 5       1.9833      0.69  Q         |          |          |     V    |
19+10       1.9880      0.67  Q         |          |          |     V    |
19+15       1.9925      0.66  Q         |          |          |     V    |
19+20       1.9970      0.65  Q         |          |          |     V    |
19+25       2.0014      0.64  Q         |          |          |     V    |
19+30       2.0057      0.63  Q         |          |          |     V    |
19+35       2.0099      0.62  Q         |          |          |     V    |
19+40       2.0141      0.61  Q         |          |          |     V    |
19+45       2.0182      0.60  Q         |          |          |     V    |
19+50       2.0223      0.59  Q         |          |          |     V    |
19+55       2.0263      0.58  Q         |          |          |      V   |
20+ 0       2.0302      0.57  Q         |          |          |      V   |
20+ 5       2.0341      0.56  Q         |          |          |      V   |
20+10       2.0380      0.56  Q         |          |          |      V   |
20+15       2.0417      0.55  Q         |          |          |      V   |
20+20       2.0455      0.54  Q         |          |          |      V   |
20+25       2.0492      0.54  Q         |          |          |      V   |
20+30       2.0528      0.53  Q         |          |          |      V   |
20+35       2.0564      0.52  Q         |          |          |      V   |
20+40       2.0600      0.52  Q         |          |          |      V   |
20+45       2.0635      0.51  Q         |          |          |      V   |
20+50       2.0669      0.50  Q         |          |          |      V   |
20+55       2.0704      0.50  Q         |          |          |      V   |
21+ 0       2.0738      0.49  Q         |          |          |      V   |
21+ 5       2.0771      0.49  Q         |          |          |      V   |
21+10       2.0804      0.48  Q         |          |          |       V  |
21+15       2.0837      0.48  Q         |          |          |       V  |
21+20       2.0870      0.47  Q         |          |          |       V  |
21+25       2.0902      0.47  Q         |          |          |       V  |
21+30       2.0934      0.46  Q         |          |          |       V  |
21+35       2.0966      0.46  Q         |          |          |       V  |
21+40       2.0997      0.45  Q         |          |          |       V  |
21+45       2.1028      0.45  Q         |          |          |       V  |
21+50       2.1058      0.45  Q         |          |          |       V  |
21+55       2.1089      0.44  Q         |          |          |       V  |
22+ 0       2.1119      0.44  Q         |          |          |       V  |
22+ 5       2.1149      0.43  Q         |          |          |       V  |
22+10       2.1178      0.43  Q         |          |          |       V  |
22+15       2.1208      0.43  Q         |          |          |       V  |
22+20       2.1237      0.42  Q         |          |          |       V  |
22+25       2.1266      0.42  Q         |          |          |       V  |
22+30       2.1294      0.42  Q         |          |          |       V  |
22+35       2.1323      0.41  Q         |          |          |       V  |
22+40       2.1351      0.41  Q         |          |          |        V |
```

22+45	2.1379	0.41	Q	|	|	|	V|
22+50	2.1406	0.40	Q	|	|	|	V|
22+55	2.1434	0.40	Q	|	|	|	V|
23+ 0	2.1461	0.40	Q	|	|	|	V|
23+ 5	2.1488	0.39	Q	|	|	|	V|
23+10	2.1515	0.39	Q	|	|	|	V|
23+15	2.1542	0.39	Q	|	|	|	V|
23+20	2.1568	0.38	Q	|	|	|	V|
23+25	2.1595	0.38	Q	|	|	|	V|
23+30	2.1621	0.38	Q	|	|	|	V|
23+35	2.1647	0.38	Q	|	|	|	V|
23+40	2.1672	0.37	Q	|	|	|	V|
23+45	2.1698	0.37	Q	|	|	|	V|
23+50	2.1723	0.37	Q	|	|	|	V|
23+55	2.1748	0.37	Q	|	|	|	V|
24+ 0	2.1773	0.36	Q	|	|	|	V|

100 year
Offsite 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 10/02/22

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

Program License Serial Number 6385

Cordova site
100-yr existing condition
Area B1 offsite

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		
660.70	1	1.08
Rainfall data for year 100		
660.70	6	2.02
Rainfall data for year 100		
660.70	24	3.46

++

******** 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)
80.0	94.0	660.70	1.000	0.117	1.000	0.117

Area-averaged adjusted loss rate Fm (In/Hr) = 0.117

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
660.70	1.000	80.0	94.0	0.64	0.808

Area-averaged catchment yield fraction, Y = 0.808
Area-averaged low loss fraction, Yb = 0.192
++
Watercourse length = 10447.00(Ft.)
Length from concentration point to centroid = 6271.00(Ft.)
Elevation difference along watercourse = 237.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 660.70(Ac.)
Catchment Lag time = 0.468 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 17.8004
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.117(In/Hr)
Average low loss rate fraction (Yb) = 0.192 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.360(In)
Computed peak 30-minute rainfall = 0.856(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.560(In)
Specified peak 6-hour rainfall = 2.020(In)
Specified peak 24-hour rainfall = 3.460(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 660.70(Ac.) (Ref: fig. E-4)

5-minute factor = 0.969 Adjusted rainfall = 0.349(In)
30-minute factor = 0.969 Adjusted rainfall = 0.829(In)
1-hour factor = 0.969 Adjusted rainfall = 1.047(In)
3-hour factor = 0.996 Adjusted rainfall = 1.554(In)
6-hour factor = 0.998 Adjusted rainfall = 2.016(In)
24-hour factor = 0.999 Adjusted rainfall = 3.457(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 = 7990.34 (CFS))	
1	0.846	67.626
2	3.738	231.072
3	8.760	401.261
4	19.190	833.365
5	35.586	1310.080
6	48.502	1032.036
7	57.606	727.467
8	63.920	504.542
9	68.774	387.827
10	72.809	322.397
11	76.080	261.355
12	78.903	225.612
13	81.243	186.957
14	83.253	160.604
15	85.078	145.820
16	86.744	133.105
17	88.193	115.775
18	89.390	95.700
19	90.439	83.773
20	91.430	79.191
21	92.316	70.768
22	93.139	65.794
23	93.898	60.607
24	94.523	49.939
25	95.128	48.359
26	95.696	45.412
27	96.165	37.427
28	96.627	36.980
29	97.031	32.261
30	97.352	25.647
31	97.672	25.543
32	97.907	18.812
33	98.085	14.223
34	98.265	14.345
35	98.469	16.357
36	98.683	17.068
37	98.897	17.068
38	99.110	17.068
39	99.324	17.068
40	99.514	15.204
41	99.631	9.321
42	99.742	8.889

43	99.853	8.889
44	100.000	4.445

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3489	0.3489
2	0.4877	0.1389
3	0.5933	0.1056
4	0.6818	0.0885
5	0.7595	0.0777
6	0.8295	0.0700
7	0.8735	0.0440
8	0.9135	0.0400
9	0.9503	0.0368
10	0.9845	0.0342
11	1.0165	0.0320
12	1.0466	0.0301
13	1.0771	0.0306
14	1.1062	0.0291
15	1.1340	0.0278
16	1.1607	0.0266
17	1.1863	0.0256
18	1.2109	0.0246
19	1.2347	0.0238
20	1.2577	0.0230
21	1.2800	0.0223
22	1.3016	0.0216
23	1.3226	0.0210
24	1.3430	0.0204
25	1.3628	0.0199
26	1.3822	0.0194
27	1.4011	0.0189
28	1.4195	0.0185
29	1.4376	0.0180
30	1.4552	0.0176
31	1.4725	0.0173
32	1.4894	0.0169
33	1.5060	0.0166
34	1.5223	0.0163
35	1.5382	0.0160
36	1.5539	0.0157
37	1.5699	0.0161
38	1.5857	0.0158
39	1.6013	0.0155
40	1.6166	0.0153
41	1.6316	0.0151
42	1.6465	0.0148
43	1.6611	0.0146
44	1.6755	0.0144
45	1.6897	0.0142

46	1.7037	0.0140
47	1.7175	0.0138
48	1.7311	0.0136
49	1.7446	0.0135
50	1.7579	0.0133
51	1.7710	0.0131
52	1.7840	0.0130
53	1.7968	0.0128
54	1.8094	0.0127
55	1.8219	0.0125
56	1.8343	0.0124
57	1.8465	0.0122
58	1.8586	0.0121
59	1.8706	0.0120
60	1.8824	0.0118
61	1.8942	0.0117
62	1.9058	0.0116
63	1.9172	0.0115
64	1.9286	0.0114
65	1.9399	0.0113
66	1.9510	0.0112
67	1.9621	0.0110
68	1.9730	0.0109
69	1.9839	0.0108
70	1.9946	0.0107
71	2.0053	0.0107
72	2.0158	0.0106
73	2.0267	0.0108
74	2.0374	0.0108
75	2.0481	0.0107
76	2.0587	0.0106
77	2.0692	0.0105
78	2.0796	0.0104
79	2.0899	0.0103
80	2.1002	0.0103
81	2.1104	0.0102
82	2.1205	0.0101
83	2.1305	0.0100
84	2.1404	0.0100
85	2.1503	0.0099
86	2.1601	0.0098
87	2.1699	0.0097
88	2.1795	0.0097
89	2.1891	0.0096
90	2.1987	0.0095
91	2.2082	0.0095
92	2.2176	0.0094
93	2.2269	0.0093
94	2.2362	0.0093
95	2.2454	0.0092

96	2.2546	0.0092
97	2.2637	0.0091
98	2.2728	0.0091
99	2.2817	0.0090
100	2.2907	0.0089
101	2.2996	0.0089
102	2.3084	0.0088
103	2.3172	0.0088
104	2.3259	0.0087
105	2.3346	0.0087
106	2.3432	0.0086
107	2.3518	0.0086
108	2.3603	0.0085
109	2.3688	0.0085
110	2.3772	0.0084
111	2.3856	0.0084
112	2.3940	0.0083
113	2.4023	0.0083
114	2.4105	0.0082
115	2.4187	0.0082
116	2.4269	0.0082
117	2.4350	0.0081
118	2.4431	0.0081
119	2.4511	0.0080
120	2.4591	0.0080
121	2.4671	0.0080
122	2.4750	0.0079
123	2.4828	0.0079
124	2.4907	0.0078
125	2.4985	0.0078
126	2.5062	0.0078
127	2.5139	0.0077
128	2.5216	0.0077
129	2.5293	0.0076
130	2.5369	0.0076
131	2.5445	0.0076
132	2.5520	0.0075
133	2.5595	0.0075
134	2.5670	0.0075
135	2.5744	0.0074
136	2.5818	0.0074
137	2.5892	0.0074
138	2.5965	0.0073
139	2.6038	0.0073
140	2.6111	0.0073
141	2.6184	0.0072
142	2.6256	0.0072
143	2.6327	0.0072
144	2.6399	0.0071
145	2.6470	0.0071

146	2.6541	0.0071
147	2.6612	0.0071
148	2.6682	0.0070
149	2.6752	0.0070
150	2.6822	0.0070
151	2.6891	0.0069
152	2.6960	0.0069
153	2.7029	0.0069
154	2.7098	0.0069
155	2.7166	0.0068
156	2.7234	0.0068
157	2.7302	0.0068
158	2.7369	0.0068
159	2.7437	0.0067
160	2.7504	0.0067
161	2.7570	0.0067
162	2.7637	0.0067
163	2.7703	0.0066
164	2.7769	0.0066
165	2.7835	0.0066
166	2.7900	0.0066
167	2.7966	0.0065
168	2.8031	0.0065
169	2.8096	0.0065
170	2.8160	0.0065
171	2.8224	0.0064
172	2.8289	0.0064
173	2.8352	0.0064
174	2.8416	0.0064
175	2.8480	0.0063
176	2.8543	0.0063
177	2.8606	0.0063
178	2.8669	0.0063
179	2.8731	0.0063
180	2.8793	0.0062
181	2.8856	0.0062
182	2.8918	0.0062
183	2.8979	0.0062
184	2.9041	0.0062
185	2.9102	0.0061
186	2.9163	0.0061
187	2.9224	0.0061
188	2.9285	0.0061
189	2.9345	0.0061
190	2.9406	0.0060
191	2.9466	0.0060
192	2.9526	0.0060
193	2.9585	0.0060
194	2.9645	0.0060
195	2.9704	0.0059

196	2.9763	0.0059
197	2.9822	0.0059
198	2.9881	0.0059
199	2.9940	0.0059
200	2.9998	0.0058
201	3.0057	0.0058
202	3.0115	0.0058
203	3.0173	0.0058
204	3.0230	0.0058
205	3.0288	0.0058
206	3.0345	0.0057
207	3.0403	0.0057
208	3.0460	0.0057
209	3.0517	0.0057
210	3.0573	0.0057
211	3.0630	0.0057
212	3.0686	0.0056
213	3.0743	0.0056
214	3.0799	0.0056
215	3.0855	0.0056
216	3.0910	0.0056
217	3.0966	0.0056
218	3.1021	0.0055
219	3.1077	0.0055
220	3.1132	0.0055
221	3.1187	0.0055
222	3.1242	0.0055
223	3.1296	0.0055
224	3.1351	0.0055
225	3.1405	0.0054
226	3.1459	0.0054
227	3.1514	0.0054
228	3.1567	0.0054
229	3.1621	0.0054
230	3.1675	0.0054
231	3.1728	0.0054
232	3.1782	0.0053
233	3.1835	0.0053
234	3.1888	0.0053
235	3.1941	0.0053
236	3.1994	0.0053
237	3.2047	0.0053
238	3.2099	0.0053
239	3.2152	0.0052
240	3.2204	0.0052
241	3.2256	0.0052
242	3.2308	0.0052
243	3.2360	0.0052
244	3.2412	0.0052
245	3.2463	0.0052

246	3.2515	0.0051
247	3.2566	0.0051
248	3.2617	0.0051
249	3.2668	0.0051
250	3.2719	0.0051
251	3.2770	0.0051
252	3.2821	0.0051
253	3.2872	0.0051
254	3.2922	0.0050
255	3.2973	0.0050
256	3.3023	0.0050
257	3.3073	0.0050
258	3.3123	0.0050
259	3.3173	0.0050
260	3.3223	0.0050
261	3.3272	0.0050
262	3.3322	0.0050
263	3.3371	0.0049
264	3.3421	0.0049
265	3.3470	0.0049
266	3.3519	0.0049
267	3.3568	0.0049
268	3.3617	0.0049
269	3.3665	0.0049
270	3.3714	0.0049
271	3.3763	0.0049
272	3.3811	0.0048
273	3.3859	0.0048
274	3.3908	0.0048
275	3.3956	0.0048
276	3.4004	0.0048
277	3.4052	0.0048
278	3.4099	0.0048
279	3.4147	0.0048
280	3.4195	0.0048
281	3.4242	0.0047
282	3.4289	0.0047
283	3.4337	0.0047
284	3.4384	0.0047
285	3.4431	0.0047
286	3.4478	0.0047
287	3.4525	0.0047
288	3.4571	0.0047

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0047	0.0009	0.0038
2	0.0047	0.0009	0.0038

3	0.0047	0.0009	0.0038
4	0.0047	0.0009	0.0038
5	0.0047	0.0009	0.0038
6	0.0047	0.0009	0.0038
7	0.0048	0.0009	0.0039
8	0.0048	0.0009	0.0039
9	0.0048	0.0009	0.0039
10	0.0048	0.0009	0.0039
11	0.0048	0.0009	0.0039
12	0.0048	0.0009	0.0039
13	0.0049	0.0009	0.0039
14	0.0049	0.0009	0.0039
15	0.0049	0.0009	0.0040
16	0.0049	0.0009	0.0040
17	0.0049	0.0009	0.0040
18	0.0049	0.0009	0.0040
19	0.0050	0.0010	0.0040
20	0.0050	0.0010	0.0040
21	0.0050	0.0010	0.0040
22	0.0050	0.0010	0.0041
23	0.0050	0.0010	0.0041
24	0.0050	0.0010	0.0041
25	0.0051	0.0010	0.0041
26	0.0051	0.0010	0.0041
27	0.0051	0.0010	0.0041
28	0.0051	0.0010	0.0041
29	0.0051	0.0010	0.0042
30	0.0052	0.0010	0.0042
31	0.0052	0.0010	0.0042
32	0.0052	0.0010	0.0042
33	0.0052	0.0010	0.0042
34	0.0052	0.0010	0.0042
35	0.0053	0.0010	0.0043
36	0.0053	0.0010	0.0043
37	0.0053	0.0010	0.0043
38	0.0053	0.0010	0.0043
39	0.0054	0.0010	0.0043
40	0.0054	0.0010	0.0043
41	0.0054	0.0010	0.0044
42	0.0054	0.0010	0.0044
43	0.0054	0.0010	0.0044
44	0.0055	0.0010	0.0044
45	0.0055	0.0011	0.0044
46	0.0055	0.0011	0.0044
47	0.0055	0.0011	0.0045
48	0.0055	0.0011	0.0045
49	0.0056	0.0011	0.0045
50	0.0056	0.0011	0.0045
51	0.0056	0.0011	0.0045
52	0.0056	0.0011	0.0046

53	0.0057	0.0011	0.0046
54	0.0057	0.0011	0.0046
55	0.0057	0.0011	0.0046
56	0.0057	0.0011	0.0046
57	0.0058	0.0011	0.0047
58	0.0058	0.0011	0.0047
59	0.0058	0.0011	0.0047
60	0.0058	0.0011	0.0047
61	0.0059	0.0011	0.0048
62	0.0059	0.0011	0.0048
63	0.0059	0.0011	0.0048
64	0.0060	0.0011	0.0048
65	0.0060	0.0011	0.0048
66	0.0060	0.0012	0.0049
67	0.0061	0.0012	0.0049
68	0.0061	0.0012	0.0049
69	0.0061	0.0012	0.0049
70	0.0061	0.0012	0.0050
71	0.0062	0.0012	0.0050
72	0.0062	0.0012	0.0050
73	0.0062	0.0012	0.0050
74	0.0063	0.0012	0.0051
75	0.0063	0.0012	0.0051
76	0.0063	0.0012	0.0051
77	0.0064	0.0012	0.0051
78	0.0064	0.0012	0.0052
79	0.0064	0.0012	0.0052
80	0.0065	0.0012	0.0052
81	0.0065	0.0012	0.0053
82	0.0065	0.0013	0.0053
83	0.0066	0.0013	0.0053
84	0.0066	0.0013	0.0053
85	0.0067	0.0013	0.0054
86	0.0067	0.0013	0.0054
87	0.0067	0.0013	0.0054
88	0.0068	0.0013	0.0055
89	0.0068	0.0013	0.0055
90	0.0068	0.0013	0.0055
91	0.0069	0.0013	0.0056
92	0.0069	0.0013	0.0056
93	0.0070	0.0013	0.0056
94	0.0070	0.0013	0.0057
95	0.0071	0.0014	0.0057
96	0.0071	0.0014	0.0057
97	0.0071	0.0014	0.0058
98	0.0072	0.0014	0.0058
99	0.0072	0.0014	0.0059
100	0.0073	0.0014	0.0059
101	0.0073	0.0014	0.0059
102	0.0074	0.0014	0.0060

103	0.0074	0.0014	0.0060
104	0.0075	0.0014	0.0060
105	0.0075	0.0014	0.0061
106	0.0076	0.0015	0.0061
107	0.0076	0.0015	0.0062
108	0.0077	0.0015	0.0062
109	0.0078	0.0015	0.0063
110	0.0078	0.0015	0.0063
111	0.0079	0.0015	0.0064
112	0.0079	0.0015	0.0064
113	0.0080	0.0015	0.0065
114	0.0080	0.0015	0.0065
115	0.0081	0.0016	0.0066
116	0.0082	0.0016	0.0066
117	0.0082	0.0016	0.0067
118	0.0083	0.0016	0.0067
119	0.0084	0.0016	0.0068
120	0.0084	0.0016	0.0068
121	0.0085	0.0016	0.0069
122	0.0086	0.0016	0.0069
123	0.0087	0.0017	0.0070
124	0.0087	0.0017	0.0071
125	0.0088	0.0017	0.0071
126	0.0089	0.0017	0.0072
127	0.0090	0.0017	0.0073
128	0.0091	0.0017	0.0073
129	0.0092	0.0018	0.0074
130	0.0092	0.0018	0.0075
131	0.0093	0.0018	0.0076
132	0.0094	0.0018	0.0076
133	0.0095	0.0018	0.0077
134	0.0096	0.0018	0.0078
135	0.0097	0.0019	0.0079
136	0.0098	0.0019	0.0079
137	0.0100	0.0019	0.0080
138	0.0100	0.0019	0.0081
139	0.0102	0.0020	0.0082
140	0.0103	0.0020	0.0083
141	0.0104	0.0020	0.0084
142	0.0105	0.0020	0.0085
143	0.0107	0.0020	0.0086
144	0.0108	0.0021	0.0087
145	0.0106	0.0020	0.0085
146	0.0107	0.0020	0.0086
147	0.0108	0.0021	0.0088
148	0.0109	0.0021	0.0088
149	0.0112	0.0021	0.0090
150	0.0113	0.0022	0.0091
151	0.0115	0.0022	0.0093
152	0.0116	0.0022	0.0094

153	0.0118	0.0023	0.0096
154	0.0120	0.0023	0.0097
155	0.0122	0.0023	0.0099
156	0.0124	0.0024	0.0100
157	0.0127	0.0024	0.0102
158	0.0128	0.0025	0.0104
159	0.0131	0.0025	0.0106
160	0.0133	0.0025	0.0107
161	0.0136	0.0026	0.0110
162	0.0138	0.0026	0.0112
163	0.0142	0.0027	0.0115
164	0.0144	0.0028	0.0116
165	0.0148	0.0028	0.0120
166	0.0151	0.0029	0.0122
167	0.0155	0.0030	0.0126
168	0.0158	0.0030	0.0128
169	0.0157	0.0030	0.0127
170	0.0160	0.0031	0.0129
171	0.0166	0.0032	0.0134
172	0.0169	0.0032	0.0137
173	0.0176	0.0034	0.0143
174	0.0180	0.0035	0.0146
175	0.0189	0.0036	0.0153
176	0.0194	0.0037	0.0157
177	0.0204	0.0039	0.0165
178	0.0210	0.0040	0.0170
179	0.0223	0.0043	0.0180
180	0.0230	0.0044	0.0186
181	0.0246	0.0047	0.0199
182	0.0256	0.0049	0.0207
183	0.0278	0.0053	0.0225
184	0.0291	0.0056	0.0235
185	0.0301	0.0058	0.0243
186	0.0320	0.0061	0.0258
187	0.0368	0.0071	0.0297
188	0.0400	0.0077	0.0323
189	0.0700	0.0098	0.0602
190	0.0777	0.0098	0.0679
191	0.1056	0.0098	0.0958
192	0.1389	0.0098	0.1291
193	0.3489	0.0098	0.3391
194	0.0885	0.0098	0.0788
195	0.0440	0.0084	0.0356
196	0.0342	0.0066	0.0276
197	0.0306	0.0059	0.0247
198	0.0266	0.0051	0.0215
199	0.0238	0.0046	0.0192
200	0.0216	0.0041	0.0175
201	0.0199	0.0038	0.0161
202	0.0185	0.0035	0.0149

203	0.0173	0.0033	0.0140
204	0.0163	0.0031	0.0131
205	0.0161	0.0031	0.0130
206	0.0153	0.0029	0.0124
207	0.0146	0.0028	0.0118
208	0.0140	0.0027	0.0113
209	0.0135	0.0026	0.0109
210	0.0130	0.0025	0.0105
211	0.0125	0.0024	0.0101
212	0.0121	0.0023	0.0098
213	0.0117	0.0022	0.0095
214	0.0114	0.0022	0.0092
215	0.0110	0.0021	0.0089
216	0.0107	0.0021	0.0087
217	0.0108	0.0021	0.0088
218	0.0106	0.0020	0.0086
219	0.0103	0.0020	0.0084
220	0.0101	0.0019	0.0082
221	0.0099	0.0019	0.0080
222	0.0097	0.0019	0.0078
223	0.0095	0.0018	0.0077
224	0.0093	0.0018	0.0075
225	0.0091	0.0017	0.0074
226	0.0089	0.0017	0.0072
227	0.0088	0.0017	0.0071
228	0.0086	0.0017	0.0070
229	0.0085	0.0016	0.0069
230	0.0083	0.0016	0.0067
231	0.0082	0.0016	0.0066
232	0.0081	0.0015	0.0065
233	0.0080	0.0015	0.0064
234	0.0078	0.0015	0.0063
235	0.0077	0.0015	0.0062
236	0.0076	0.0015	0.0062
237	0.0075	0.0014	0.0061
238	0.0074	0.0014	0.0060
239	0.0073	0.0014	0.0059
240	0.0072	0.0014	0.0058
241	0.0071	0.0014	0.0058
242	0.0070	0.0013	0.0057
243	0.0069	0.0013	0.0056
244	0.0069	0.0013	0.0055
245	0.0068	0.0013	0.0055
246	0.0067	0.0013	0.0054
247	0.0066	0.0013	0.0054
248	0.0066	0.0013	0.0053
249	0.0065	0.0012	0.0052
250	0.0064	0.0012	0.0052
251	0.0063	0.0012	0.0051
252	0.0063	0.0012	0.0051

253	0.0062	0.0012	0.0050
254	0.0062	0.0012	0.0050
255	0.0061	0.0012	0.0049
256	0.0060	0.0012	0.0049
257	0.0060	0.0011	0.0048
258	0.0059	0.0011	0.0048
259	0.0059	0.0011	0.0047
260	0.0058	0.0011	0.0047
261	0.0058	0.0011	0.0047
262	0.0057	0.0011	0.0046
263	0.0057	0.0011	0.0046
264	0.0056	0.0011	0.0045
265	0.0056	0.0011	0.0045
266	0.0055	0.0011	0.0045
267	0.0055	0.0010	0.0044
268	0.0054	0.0010	0.0044
269	0.0054	0.0010	0.0043
270	0.0053	0.0010	0.0043
271	0.0053	0.0010	0.0043
272	0.0053	0.0010	0.0042
273	0.0052	0.0010	0.0042
274	0.0052	0.0010	0.0042
275	0.0051	0.0010	0.0042
276	0.0051	0.0010	0.0041
277	0.0051	0.0010	0.0041
278	0.0050	0.0010	0.0041
279	0.0050	0.0010	0.0040
280	0.0050	0.0009	0.0040
281	0.0049	0.0009	0.0040
282	0.0049	0.0009	0.0039
283	0.0049	0.0009	0.0039
284	0.0048	0.0009	0.0039
285	0.0048	0.0009	0.0039
286	0.0048	0.0009	0.0038
287	0.0047	0.0009	0.0038
288	0.0047	0.0009	0.0038

Total soil rain loss = 0.56(In)
Total effective rainfall = 2.89(In)
Peak flow rate in flood hydrograph = 847.23(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

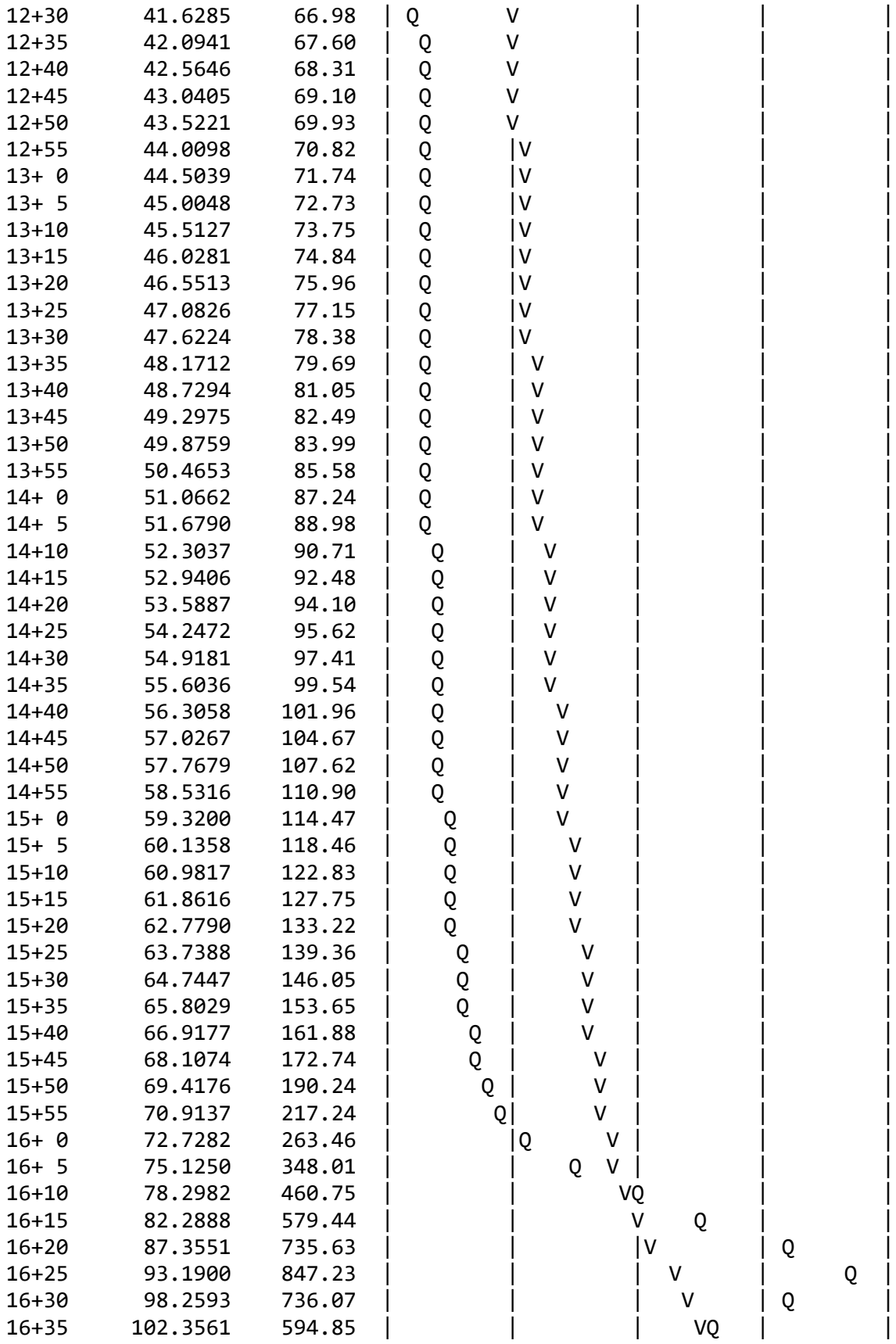
Hydrograph in 5 Minute intervals ((CFS))

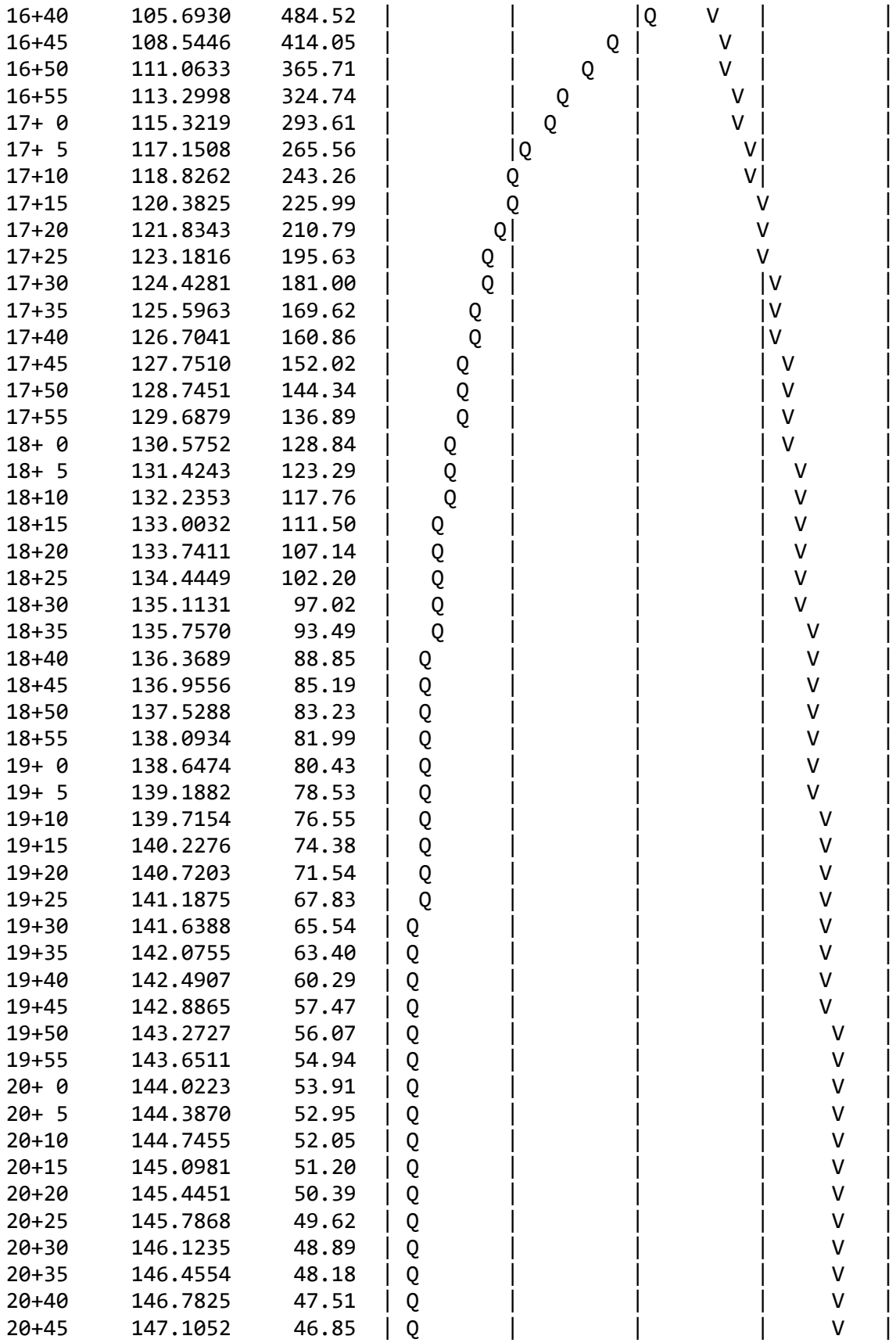
Time(h+m) Volume Ac.Ft Q(CFS) 0 225.0 450.0 675.0 900.0

0+ 5	0.0018	0.26	Q				
0+10	0.0095	1.13	Q				
0+15	0.0278	2.65	Q				
0+20	0.0678	5.81	Q				
0+25	0.1420	10.77	Q				
0+30	0.2432	14.71	Q				
0+35	0.3638	17.50	Q				
0+40	0.4978	19.46	Q				
0+45	0.6424	20.99	Q				
0+50	0.7958	22.28	Q				
0+55	0.9565	23.34	VQ				
1+ 0	1.1236	24.27	VQ				
1+ 5	1.2962	25.05	VQ				
1+10	1.4735	25.74	VQ				
1+15	1.6551	26.38	VQ				
1+20	1.8409	26.97	VQ				
1+25	2.0303	27.50	VQ				
1+30	2.2228	27.95	VQ				
1+35	2.4181	28.36	VQ				
1+40	2.6161	28.76	VQ				
1+45	2.8167	29.12	VQ				
1+50	3.0197	29.47	VQ				
1+55	3.2250	29.80	VQ				
2+ 0	3.4322	30.10	VQ				
2+ 5	3.6415	30.38	VQ				
2+10	3.8527	30.66	VQ				
2+15	4.0656	30.91	|Q				
2+20	4.2802	31.16	|Q				
2+25	4.4964	31.39	|Q				
2+30	4.7140	31.60	|Q				
2+35	4.9331	31.81	|Q				
2+40	5.1535	32.00	|Q				
2+45	5.3751	32.17	|Q				
2+50	5.5978	32.34	|Q				
2+55	5.8218	32.52	|Q				
3+ 0	6.0471	32.71	|Q				
3+ 5	6.2737	32.90	|Q				
3+10	6.5015	33.08	|Q				
3+15	6.7307	33.27	|Q				
3+20	6.9611	33.46	|Q				
3+25	7.1927	33.62	|Q				
3+30	7.4253	33.78	|Q				
3+35	7.6591	33.95	|Q				
3+40	7.8940	34.10	|Q				
3+45	8.1297	34.23	|QV				
3+50	8.3664	34.37	|QV				
3+55	8.6040	34.50	|QV				
4+ 0	8.8426	34.64	|QV				
4+ 5	9.0821	34.78	|QV				

4+10	9.3226	34.92	|QV	|	|	|	|
4+15	9.5641	35.06	|QV	|	|	|	|
4+20	9.8066	35.21	|QV	|	|	|	|
4+25	10.0500	35.35	|QV	|	|	|	|
4+30	10.2945	35.50	|QV	|	|	|	|
4+35	10.5400	35.65	|QV	|	|	|	|
4+40	10.7866	35.80	|QV	|	|	|	|
4+45	11.0342	35.95	|QV	|	|	|	|
4+50	11.2828	36.10	|QV	|	|	|	|
4+55	11.5325	36.26	|QV	|	|	|	|
5+ 0	11.7834	36.42	|QV	|	|	|	|
5+ 5	12.0353	36.58	|Q V	|	|	|	|
5+10	12.2883	36.74	|Q V	|	|	|	|
5+15	12.5424	36.90	|Q V	|	|	|	|
5+20	12.7977	37.06	|Q V	|	|	|	|
5+25	13.0541	37.23	|Q V	|	|	|	|
5+30	13.3117	37.40	|Q V	|	|	|	|
5+35	13.5704	37.57	|Q V	|	|	|	|
5+40	13.8304	37.74	|Q V	|	|	|	|
5+45	14.0915	37.92	|Q V	|	|	|	|
5+50	14.3539	38.10	|Q V	|	|	|	|
5+55	14.6175	38.28	|Q V	|	|	|	|
6+ 0	14.8824	38.46	|Q V	|	|	|	|
6+ 5	15.1485	38.64	|Q V	|	|	|	|
6+10	15.4159	38.83	|Q V	|	|	|	|
6+15	15.6846	39.02	|Q V	|	|	|	|
6+20	15.9546	39.21	|Q V	|	|	|	|
6+25	16.2260	39.40	|Q V	|	|	|	|
6+30	16.4987	39.60	|Q V	|	|	|	|
6+35	16.7728	39.80	|Q V	|	|	|	|
6+40	17.0482	40.00	|Q V	|	|	|	|
6+45	17.3251	40.20	|Q V	|	|	|	|
6+50	17.6034	40.41	|Q V	|	|	|	|
6+55	17.8831	40.62	|Q V	|	|	|	|
7+ 0	18.1643	40.83	|Q V	|	|	|	|
7+ 5	18.4470	41.05	|Q V	|	|	|	|
7+10	18.7312	41.26	|Q V	|	|	|	|
7+15	19.0169	41.49	|Q V	|	|	|	|
7+20	19.3042	41.71	|Q V	|	|	|	|
7+25	19.5930	41.94	|Q V	|	|	|	|
7+30	19.8835	42.17	|Q V	|	|	|	|
7+35	20.1755	42.41	|Q V	|	|	|	|
7+40	20.4692	42.64	|Q V	|	|	|	|
7+45	20.7646	42.89	|Q V	|	|	|	|
7+50	21.0616	43.13	|Q V	|	|	|	|
7+55	21.3604	43.38	|Q V	|	|	|	|
8+ 0	21.6609	43.63	|Q V	|	|	|	|
8+ 5	21.9632	43.89	|Q V	|	|	|	|
8+10	22.2673	44.15	|Q V	|	|	|	|
8+15	22.5732	44.42	|Q V	|	|	|	|

8+20	22.8810	44.69	Q V			
8+25	23.1906	44.96	Q V			
8+30	23.5022	45.24	Q V			
8+35	23.8157	45.52	Q V			
8+40	24.1312	45.81	Q V			
8+45	24.4487	46.11	Q V			
8+50	24.7683	46.40	Q V			
8+55	25.0900	46.71	Q V			
9+ 0	25.4138	47.01	Q V			
9+ 5	25.7397	47.33	Q V			
9+10	26.0678	47.65	Q V			
9+15	26.3982	47.97	Q V			
9+20	26.7309	48.30	Q V			
9+25	27.0659	48.64	Q V			
9+30	27.4032	48.98	Q V			
9+35	27.7430	49.33	Q V			
9+40	28.0852	49.69	Q V			
9+45	28.4299	50.05	Q V			
9+50	28.7772	50.42	Q V			
9+55	29.1271	50.80	Q V			
10+ 0	29.4796	51.19	Q V			
10+ 5	29.8348	51.58	Q V			
10+10	30.1928	51.98	Q V			
10+15	30.5537	52.39	Q V			
10+20	30.9174	52.81	Q V			
10+25	31.2840	53.24	Q V			
10+30	31.6537	53.67	Q V			
10+35	32.0265	54.12	Q V			
10+40	32.4023	54.58	Q V			
10+45	32.7815	55.05	Q V			
10+50	33.1638	55.52	Q V			
10+55	33.5496	56.01	Q V			
11+ 0	33.9388	56.51	Q V			
11+ 5	34.3316	57.03	Q V			
11+10	34.7279	57.55	Q V			
11+15	35.1280	58.09	Q V			
11+20	35.5319	58.64	Q V			
11+25	35.9396	59.21	Q V			
11+30	36.3514	59.79	Q V			
11+35	36.7673	60.39	Q V			
11+40	37.1873	60.99	Q V			
11+45	37.6118	61.63	Q V			
11+50	38.0406	62.27	Q V			
11+55	38.4741	62.94	Q V			
12+ 0	38.9122	63.62	Q V			
12+ 5	39.3551	64.31	Q V			
12+10	39.8025	64.96	Q V			
12+15	40.2542	65.58	Q V			
12+20	40.7093	66.09	Q V			
12+25	41.1672	66.49	Q V			





20+50	147.4236	46.22	Q				V
20+55	147.7378	45.62	Q				V
21+ 0	148.0480	45.04	Q				V
21+ 5	148.3543	44.48	Q				V
21+10	148.6569	43.94	Q				V
21+15	148.9560	43.42	Q				V
21+20	149.2515	42.92	Q				V
21+25	149.5437	42.42	Q				V
21+30	149.8326	41.95	Q				V
21+35	150.1183	41.49	Q				V
21+40	150.4010	41.04	Q				V
21+45	150.6806	40.60	Q				V
21+50	150.9573	40.18	Q				V
21+55	151.2312	39.77	Q				V
22+ 0	151.5023	39.37	Q				V
22+ 5	151.7708	38.98	Q				V
22+10	152.0366	38.60	Q				V
22+15	152.2999	38.23	Q				V
22+20	152.5606	37.87	Q				V
22+25	152.8190	37.51	Q				V
22+30	153.0750	37.17	Q				V
22+35	153.3287	36.84	Q				V
22+40	153.5802	36.51	Q				V
22+45	153.8294	36.19	Q				V
22+50	154.0766	35.88	Q				V
22+55	154.3216	35.58	Q				V
23+ 0	154.5646	35.28	Q				V
23+ 5	154.8055	34.99	Q				V
23+10	155.0446	34.71	Q				V
23+15	155.2817	34.43	Q				V
23+20	155.5169	34.15	Q				V
23+25	155.7503	33.89	Q				V
23+30	155.9818	33.63	Q				V
23+35	156.2117	33.37	Q				V
23+40	156.4398	33.12	Q				V
23+45	156.6662	32.87	Q				V
23+50	156.8909	32.63	Q				V
23+55	157.1141	32.40	Q				V
24+ 0	157.3356	32.17	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 10/02/22

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

Program License Serial Number 6385

Cordova site
100-yr existing condition
Area B2 offsite

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		
32.93	1	1.08
Rainfall data for year 100		
32.92	6	2.02
Rainfall data for year 100		
32.93	24	3.46

++

******** 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)
80.0	94.0	32.93	1.000	0.117	1.000	0.117

Area-averaged adjusted loss rate Fm (In/Hr) = 0.117

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
32.93	1.000	80.0	94.0	0.64	0.808

Area-averaged catchment yield fraction, Y = 0.808
Area-averaged low loss fraction, Yb = 0.192
++
Watercourse length = 3069.00(Ft.)
Length from concentration point to centroid = 2203.00(Ft.)
Elevation difference along watercourse = 40.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 32.93(Ac.)
Catchment Lag time = 0.219 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 37.9751
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.117(In/Hr)
Average low loss rate fraction (Yb) = 0.192 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.360(In)
Computed peak 30-minute rainfall = 0.856(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.560(In)
Specified peak 6-hour rainfall = 2.020(In)
Specified peak 24-hour rainfall = 3.460(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 32.93(Ac.) (Ref: fig. E-4)

5-minute factor = 0.998 Adjusted rainfall = 0.359(In)
30-minute factor = 0.998 Adjusted rainfall = 0.855(In)
1-hour factor = 0.998 Adjusted rainfall = 1.078(In)
3-hour factor = 1.000 Adjusted rainfall = 1.560(In)
6-hour factor = 1.000 Adjusted rainfall = 2.020(In)
24-hour factor = 1.000 Adjusted rainfall = 3.460(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 = 398.25 (CFS))	
1	2.532	10.084
2	16.448	55.418
3	46.071	117.974
4	63.520	69.492
5	73.048	37.943
6	79.419	25.372
7	83.919	17.922
8	87.464	14.116
9	90.052	10.310
10	92.108	8.187
11	93.803	6.749
12	95.145	5.343
13	96.242	4.369
14	97.124	3.512
15	97.771	2.577
16	98.188	1.660
17	98.619	1.718
18	99.075	1.815
19	99.495	1.675
20	99.753	1.027
21	100.000	0.983

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3594	0.3594
2	0.5025	0.1431
3	0.6113	0.1088
4	0.7026	0.0912
5	0.7826	0.0800
6	0.8547	0.0721
7	0.9000	0.0453
8	0.9412	0.0412
9	0.9792	0.0379
10	1.0144	0.0352
11	1.0473	0.0329
12	1.0783	0.0310
13	1.1077	0.0294
14	1.1356	0.0279
15	1.1623	0.0266
16	1.1878	0.0255
17	1.2122	0.0244
18	1.2357	0.0235

19	1.2583	0.0226
20	1.2802	0.0219
21	1.3014	0.0212
22	1.3219	0.0205
23	1.3418	0.0199
24	1.3611	0.0193
25	1.3799	0.0188
26	1.3982	0.0183
27	1.4160	0.0178
28	1.4334	0.0174
29	1.4504	0.0170
30	1.4670	0.0166
31	1.4833	0.0162
32	1.4992	0.0159
33	1.5148	0.0156
34	1.5300	0.0153
35	1.5450	0.0150
36	1.5597	0.0147
37	1.5757	0.0160
38	1.5915	0.0157
39	1.6070	0.0155
40	1.6222	0.0152
41	1.6372	0.0150
42	1.6520	0.0148
43	1.6665	0.0146
44	1.6809	0.0144
45	1.6950	0.0141
46	1.7090	0.0140
47	1.7228	0.0138
48	1.7363	0.0136
49	1.7497	0.0134
50	1.7630	0.0132
51	1.7760	0.0131
52	1.7890	0.0129
53	1.8017	0.0128
54	1.8143	0.0126
55	1.8268	0.0125
56	1.8391	0.0123
57	1.8513	0.0122
58	1.8633	0.0120
59	1.8752	0.0119
60	1.8870	0.0118
61	1.8987	0.0117
62	1.9102	0.0115
63	1.9217	0.0114
64	1.9330	0.0113
65	1.9442	0.0112
66	1.9553	0.0111
67	1.9663	0.0110
68	1.9772	0.0109

69	1.9880	0.0108
70	1.9987	0.0107
71	2.0093	0.0106
72	2.0198	0.0105
73	2.0306	0.0108
74	2.0414	0.0108
75	2.0521	0.0107
76	2.0626	0.0106
77	2.0731	0.0105
78	2.0835	0.0104
79	2.0939	0.0103
80	2.1041	0.0103
81	2.1143	0.0102
82	2.1244	0.0101
83	2.1344	0.0100
84	2.1444	0.0099
85	2.1542	0.0099
86	2.1640	0.0098
87	2.1738	0.0097
88	2.1834	0.0097
89	2.1930	0.0096
90	2.2026	0.0095
91	2.2121	0.0095
92	2.2215	0.0094
93	2.2308	0.0093
94	2.2401	0.0093
95	2.2493	0.0092
96	2.2585	0.0092
97	2.2676	0.0091
98	2.2766	0.0090
99	2.2856	0.0090
100	2.2946	0.0089
101	2.3034	0.0089
102	2.3123	0.0088
103	2.3210	0.0088
104	2.3298	0.0087
105	2.3384	0.0087
106	2.3471	0.0086
107	2.3556	0.0086
108	2.3641	0.0085
109	2.3726	0.0085
110	2.3811	0.0084
111	2.3894	0.0084
112	2.3978	0.0083
113	2.4061	0.0083
114	2.4143	0.0082
115	2.4225	0.0082
116	2.4307	0.0082
117	2.4388	0.0081
118	2.4468	0.0081

119	2.4549	0.0080
120	2.4629	0.0080
121	2.4708	0.0079
122	2.4787	0.0079
123	2.4866	0.0079
124	2.4944	0.0078
125	2.5022	0.0078
126	2.5100	0.0078
127	2.5177	0.0077
128	2.5254	0.0077
129	2.5330	0.0076
130	2.5406	0.0076
131	2.5482	0.0076
132	2.5557	0.0075
133	2.5632	0.0075
134	2.5707	0.0075
135	2.5781	0.0074
136	2.5855	0.0074
137	2.5929	0.0074
138	2.6002	0.0073
139	2.6075	0.0073
140	2.6148	0.0073
141	2.6220	0.0072
142	2.6292	0.0072
143	2.6364	0.0072
144	2.6435	0.0071
145	2.6506	0.0071
146	2.6577	0.0071
147	2.6648	0.0071
148	2.6718	0.0070
149	2.6788	0.0070
150	2.6858	0.0070
151	2.6927	0.0069
152	2.6996	0.0069
153	2.7065	0.0069
154	2.7133	0.0069
155	2.7202	0.0068
156	2.7270	0.0068
157	2.7337	0.0068
158	2.7405	0.0067
159	2.7472	0.0067
160	2.7539	0.0067
161	2.7606	0.0067
162	2.7672	0.0066
163	2.7738	0.0066
164	2.7804	0.0066
165	2.7870	0.0066
166	2.7935	0.0065
167	2.8001	0.0065
168	2.8066	0.0065

169	2.8130	0.0065
170	2.8195	0.0065
171	2.8259	0.0064
172	2.8323	0.0064
173	2.8387	0.0064
174	2.8451	0.0064
175	2.8514	0.0063
176	2.8577	0.0063
177	2.8640	0.0063
178	2.8703	0.0063
179	2.8765	0.0062
180	2.8828	0.0062
181	2.8890	0.0062
182	2.8952	0.0062
183	2.9013	0.0062
184	2.9075	0.0061
185	2.9136	0.0061
186	2.9197	0.0061
187	2.9258	0.0061
188	2.9318	0.0061
189	2.9379	0.0060
190	2.9439	0.0060
191	2.9499	0.0060
192	2.9559	0.0060
193	2.9619	0.0060
194	2.9678	0.0059
195	2.9738	0.0059
196	2.9797	0.0059
197	2.9856	0.0059
198	2.9914	0.0059
199	2.9973	0.0059
200	3.0031	0.0058
201	3.0089	0.0058
202	3.0148	0.0058
203	3.0205	0.0058
204	3.0263	0.0058
205	3.0321	0.0058
206	3.0378	0.0057
207	3.0435	0.0057
208	3.0492	0.0057
209	3.0549	0.0057
210	3.0606	0.0057
211	3.0662	0.0057
212	3.0718	0.0056
213	3.0775	0.0056
214	3.0831	0.0056
215	3.0886	0.0056
216	3.0942	0.0056
217	3.0998	0.0056
218	3.1053	0.0055

219	3.1108	0.0055
220	3.1163	0.0055
221	3.1218	0.0055
222	3.1273	0.0055
223	3.1328	0.0055
224	3.1382	0.0054
225	3.1436	0.0054
226	3.1491	0.0054
227	3.1545	0.0054
228	3.1599	0.0054
229	3.1652	0.0054
230	3.1706	0.0054
231	3.1759	0.0053
232	3.1813	0.0053
233	3.1866	0.0053
234	3.1919	0.0053
235	3.1972	0.0053
236	3.2024	0.0053
237	3.2077	0.0053
238	3.2130	0.0052
239	3.2182	0.0052
240	3.2234	0.0052
241	3.2286	0.0052
242	3.2338	0.0052
243	3.2390	0.0052
244	3.2442	0.0052
245	3.2493	0.0052
246	3.2545	0.0051
247	3.2596	0.0051
248	3.2647	0.0051
249	3.2698	0.0051
250	3.2749	0.0051
251	3.2800	0.0051
252	3.2851	0.0051
253	3.2901	0.0051
254	3.2952	0.0050
255	3.3002	0.0050
256	3.3052	0.0050
257	3.3102	0.0050
258	3.3152	0.0050
259	3.3202	0.0050
260	3.3252	0.0050
261	3.3301	0.0050
262	3.3351	0.0049
263	3.3400	0.0049
264	3.3449	0.0049
265	3.3498	0.0049
266	3.3547	0.0049
267	3.3596	0.0049
268	3.3645	0.0049

269	3.3694	0.0049
270	3.3742	0.0049
271	3.3791	0.0048
272	3.3839	0.0048
273	3.3887	0.0048
274	3.3936	0.0048
275	3.3984	0.0048
276	3.4032	0.0048
277	3.4079	0.0048
278	3.4127	0.0048
279	3.4175	0.0048
280	3.4222	0.0048
281	3.4270	0.0047
282	3.4317	0.0047
283	3.4364	0.0047
284	3.4411	0.0047
285	3.4458	0.0047
286	3.4505	0.0047
287	3.4552	0.0047
288	3.4599	0.0047

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0047	0.0009	0.0038
2	0.0047	0.0009	0.0038
3	0.0047	0.0009	0.0038
4	0.0047	0.0009	0.0038
5	0.0047	0.0009	0.0038
6	0.0047	0.0009	0.0038
7	0.0048	0.0009	0.0038
8	0.0048	0.0009	0.0039
9	0.0048	0.0009	0.0039
10	0.0048	0.0009	0.0039
11	0.0048	0.0009	0.0039
12	0.0048	0.0009	0.0039
13	0.0049	0.0009	0.0039
14	0.0049	0.0009	0.0039
15	0.0049	0.0009	0.0040
16	0.0049	0.0009	0.0040
17	0.0049	0.0009	0.0040
18	0.0049	0.0009	0.0040
19	0.0050	0.0010	0.0040
20	0.0050	0.0010	0.0040
21	0.0050	0.0010	0.0040
22	0.0050	0.0010	0.0040
23	0.0050	0.0010	0.0041
24	0.0050	0.0010	0.0041
25	0.0051	0.0010	0.0041

26	0.0051	0.0010	0.0041
27	0.0051	0.0010	0.0041
28	0.0051	0.0010	0.0041
29	0.0051	0.0010	0.0042
30	0.0052	0.0010	0.0042
31	0.0052	0.0010	0.0042
32	0.0052	0.0010	0.0042
33	0.0052	0.0010	0.0042
34	0.0052	0.0010	0.0042
35	0.0053	0.0010	0.0043
36	0.0053	0.0010	0.0043
37	0.0053	0.0010	0.0043
38	0.0053	0.0010	0.0043
39	0.0053	0.0010	0.0043
40	0.0054	0.0010	0.0043
41	0.0054	0.0010	0.0044
42	0.0054	0.0010	0.0044
43	0.0054	0.0010	0.0044
44	0.0054	0.0010	0.0044
45	0.0055	0.0011	0.0044
46	0.0055	0.0011	0.0044
47	0.0055	0.0011	0.0045
48	0.0055	0.0011	0.0045
49	0.0056	0.0011	0.0045
50	0.0056	0.0011	0.0045
51	0.0056	0.0011	0.0045
52	0.0056	0.0011	0.0046
53	0.0057	0.0011	0.0046
54	0.0057	0.0011	0.0046
55	0.0057	0.0011	0.0046
56	0.0057	0.0011	0.0046
57	0.0058	0.0011	0.0047
58	0.0058	0.0011	0.0047
59	0.0058	0.0011	0.0047
60	0.0058	0.0011	0.0047
61	0.0059	0.0011	0.0047
62	0.0059	0.0011	0.0048
63	0.0059	0.0011	0.0048
64	0.0059	0.0011	0.0048
65	0.0060	0.0011	0.0048
66	0.0060	0.0012	0.0049
67	0.0060	0.0012	0.0049
68	0.0061	0.0012	0.0049
69	0.0061	0.0012	0.0049
70	0.0061	0.0012	0.0050
71	0.0062	0.0012	0.0050
72	0.0062	0.0012	0.0050
73	0.0062	0.0012	0.0050
74	0.0062	0.0012	0.0051
75	0.0063	0.0012	0.0051

76	0.0063	0.0012	0.0051
77	0.0064	0.0012	0.0051
78	0.0064	0.0012	0.0052
79	0.0064	0.0012	0.0052
80	0.0065	0.0012	0.0052
81	0.0065	0.0012	0.0053
82	0.0065	0.0013	0.0053
83	0.0066	0.0013	0.0053
84	0.0066	0.0013	0.0053
85	0.0066	0.0013	0.0054
86	0.0067	0.0013	0.0054
87	0.0067	0.0013	0.0054
88	0.0067	0.0013	0.0055
89	0.0068	0.0013	0.0055
90	0.0068	0.0013	0.0055
91	0.0069	0.0013	0.0056
92	0.0069	0.0013	0.0056
93	0.0070	0.0013	0.0056
94	0.0070	0.0013	0.0057
95	0.0071	0.0014	0.0057
96	0.0071	0.0014	0.0057
97	0.0071	0.0014	0.0058
98	0.0072	0.0014	0.0058
99	0.0072	0.0014	0.0058
100	0.0073	0.0014	0.0059
101	0.0073	0.0014	0.0059
102	0.0074	0.0014	0.0060
103	0.0074	0.0014	0.0060
104	0.0075	0.0014	0.0060
105	0.0075	0.0014	0.0061
106	0.0076	0.0015	0.0061
107	0.0076	0.0015	0.0062
108	0.0077	0.0015	0.0062
109	0.0078	0.0015	0.0063
110	0.0078	0.0015	0.0063
111	0.0079	0.0015	0.0064
112	0.0079	0.0015	0.0064
113	0.0080	0.0015	0.0065
114	0.0080	0.0015	0.0065
115	0.0081	0.0016	0.0066
116	0.0082	0.0016	0.0066
117	0.0082	0.0016	0.0067
118	0.0083	0.0016	0.0067
119	0.0084	0.0016	0.0068
120	0.0084	0.0016	0.0068
121	0.0085	0.0016	0.0069
122	0.0086	0.0016	0.0069
123	0.0087	0.0017	0.0070
124	0.0087	0.0017	0.0071
125	0.0088	0.0017	0.0071

126	0.0089	0.0017	0.0072
127	0.0090	0.0017	0.0073
128	0.0090	0.0017	0.0073
129	0.0092	0.0018	0.0074
130	0.0092	0.0018	0.0075
131	0.0093	0.0018	0.0076
132	0.0094	0.0018	0.0076
133	0.0095	0.0018	0.0077
134	0.0096	0.0018	0.0078
135	0.0097	0.0019	0.0079
136	0.0098	0.0019	0.0079
137	0.0099	0.0019	0.0080
138	0.0100	0.0019	0.0081
139	0.0102	0.0020	0.0082
140	0.0103	0.0020	0.0083
141	0.0104	0.0020	0.0084
142	0.0105	0.0020	0.0085
143	0.0107	0.0020	0.0086
144	0.0108	0.0021	0.0087
145	0.0105	0.0020	0.0085
146	0.0106	0.0020	0.0086
147	0.0108	0.0021	0.0087
148	0.0109	0.0021	0.0088
149	0.0111	0.0021	0.0090
150	0.0112	0.0021	0.0091
151	0.0114	0.0022	0.0092
152	0.0115	0.0022	0.0093
153	0.0118	0.0023	0.0095
154	0.0119	0.0023	0.0096
155	0.0122	0.0023	0.0098
156	0.0123	0.0024	0.0100
157	0.0126	0.0024	0.0102
158	0.0128	0.0024	0.0103
159	0.0131	0.0025	0.0106
160	0.0132	0.0025	0.0107
161	0.0136	0.0026	0.0110
162	0.0138	0.0026	0.0111
163	0.0141	0.0027	0.0114
164	0.0144	0.0028	0.0116
165	0.0148	0.0028	0.0119
166	0.0150	0.0029	0.0121
167	0.0155	0.0030	0.0125
168	0.0157	0.0030	0.0127
169	0.0147	0.0028	0.0119
170	0.0150	0.0029	0.0121
171	0.0156	0.0030	0.0126
172	0.0159	0.0030	0.0129
173	0.0166	0.0032	0.0134
174	0.0170	0.0033	0.0137
175	0.0178	0.0034	0.0144

176	0.0183	0.0035	0.0148
177	0.0193	0.0037	0.0156
178	0.0199	0.0038	0.0161
179	0.0212	0.0041	0.0171
180	0.0219	0.0042	0.0177
181	0.0235	0.0045	0.0190
182	0.0244	0.0047	0.0198
183	0.0266	0.0051	0.0215
184	0.0279	0.0054	0.0226
185	0.0310	0.0059	0.0251
186	0.0329	0.0063	0.0266
187	0.0379	0.0073	0.0307
188	0.0412	0.0079	0.0333
189	0.0721	0.0098	0.0623
190	0.0800	0.0098	0.0703
191	0.1088	0.0098	0.0990
192	0.1431	0.0098	0.1333
193	0.3594	0.0098	0.3497
194	0.0912	0.0098	0.0814
195	0.0453	0.0087	0.0367
196	0.0352	0.0068	0.0285
197	0.0294	0.0056	0.0238
198	0.0255	0.0049	0.0206
199	0.0226	0.0043	0.0183
200	0.0205	0.0039	0.0166
201	0.0188	0.0036	0.0152
202	0.0174	0.0033	0.0141
203	0.0162	0.0031	0.0131
204	0.0153	0.0029	0.0123
205	0.0160	0.0031	0.0129
206	0.0152	0.0029	0.0123
207	0.0146	0.0028	0.0118
208	0.0140	0.0027	0.0113
209	0.0134	0.0026	0.0108
210	0.0129	0.0025	0.0104
211	0.0125	0.0024	0.0101
212	0.0120	0.0023	0.0097
213	0.0117	0.0022	0.0094
214	0.0113	0.0022	0.0091
215	0.0110	0.0021	0.0089
216	0.0107	0.0021	0.0086
217	0.0108	0.0021	0.0088
218	0.0106	0.0020	0.0086
219	0.0103	0.0020	0.0084
220	0.0101	0.0019	0.0082
221	0.0099	0.0019	0.0080
222	0.0097	0.0019	0.0078
223	0.0095	0.0018	0.0077
224	0.0093	0.0018	0.0075
225	0.0091	0.0017	0.0074

226	0.0089	0.0017	0.0072
227	0.0088	0.0017	0.0071
228	0.0086	0.0017	0.0070
229	0.0085	0.0016	0.0069
230	0.0083	0.0016	0.0067
231	0.0082	0.0016	0.0066
232	0.0081	0.0015	0.0065
233	0.0079	0.0015	0.0064
234	0.0078	0.0015	0.0063
235	0.0077	0.0015	0.0062
236	0.0076	0.0015	0.0061
237	0.0075	0.0014	0.0061
238	0.0074	0.0014	0.0060
239	0.0073	0.0014	0.0059
240	0.0072	0.0014	0.0058
241	0.0071	0.0014	0.0057
242	0.0070	0.0013	0.0057
243	0.0069	0.0013	0.0056
244	0.0069	0.0013	0.0055
245	0.0068	0.0013	0.0055
246	0.0067	0.0013	0.0054
247	0.0066	0.0013	0.0054
248	0.0065	0.0013	0.0053
249	0.0065	0.0012	0.0052
250	0.0064	0.0012	0.0052
251	0.0063	0.0012	0.0051
252	0.0063	0.0012	0.0051
253	0.0062	0.0012	0.0050
254	0.0061	0.0012	0.0050
255	0.0061	0.0012	0.0049
256	0.0060	0.0012	0.0049
257	0.0060	0.0011	0.0048
258	0.0059	0.0011	0.0048
259	0.0059	0.0011	0.0047
260	0.0058	0.0011	0.0047
261	0.0058	0.0011	0.0046
262	0.0057	0.0011	0.0046
263	0.0057	0.0011	0.0046
264	0.0056	0.0011	0.0045
265	0.0056	0.0011	0.0045
266	0.0055	0.0011	0.0045
267	0.0055	0.0010	0.0044
268	0.0054	0.0010	0.0044
269	0.0054	0.0010	0.0043
270	0.0053	0.0010	0.0043
271	0.0053	0.0010	0.0043
272	0.0052	0.0010	0.0042
273	0.0052	0.0010	0.0042
274	0.0052	0.0010	0.0042
275	0.0051	0.0010	0.0041

276	0.0051	0.0010	0.0041
277	0.0051	0.0010	0.0041
278	0.0050	0.0010	0.0041
279	0.0050	0.0010	0.0040
280	0.0049	0.0009	0.0040
281	0.0049	0.0009	0.0040
282	0.0049	0.0009	0.0039
283	0.0048	0.0009	0.0039
284	0.0048	0.0009	0.0039
285	0.0048	0.0009	0.0039
286	0.0048	0.0009	0.0038
287	0.0047	0.0009	0.0038
288	0.0047	0.0009	0.0038

Total soil rain loss = 0.56(In)
Total effective rainfall = 2.90(In)
Peak flow rate in flood hydrograph = 63.71(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

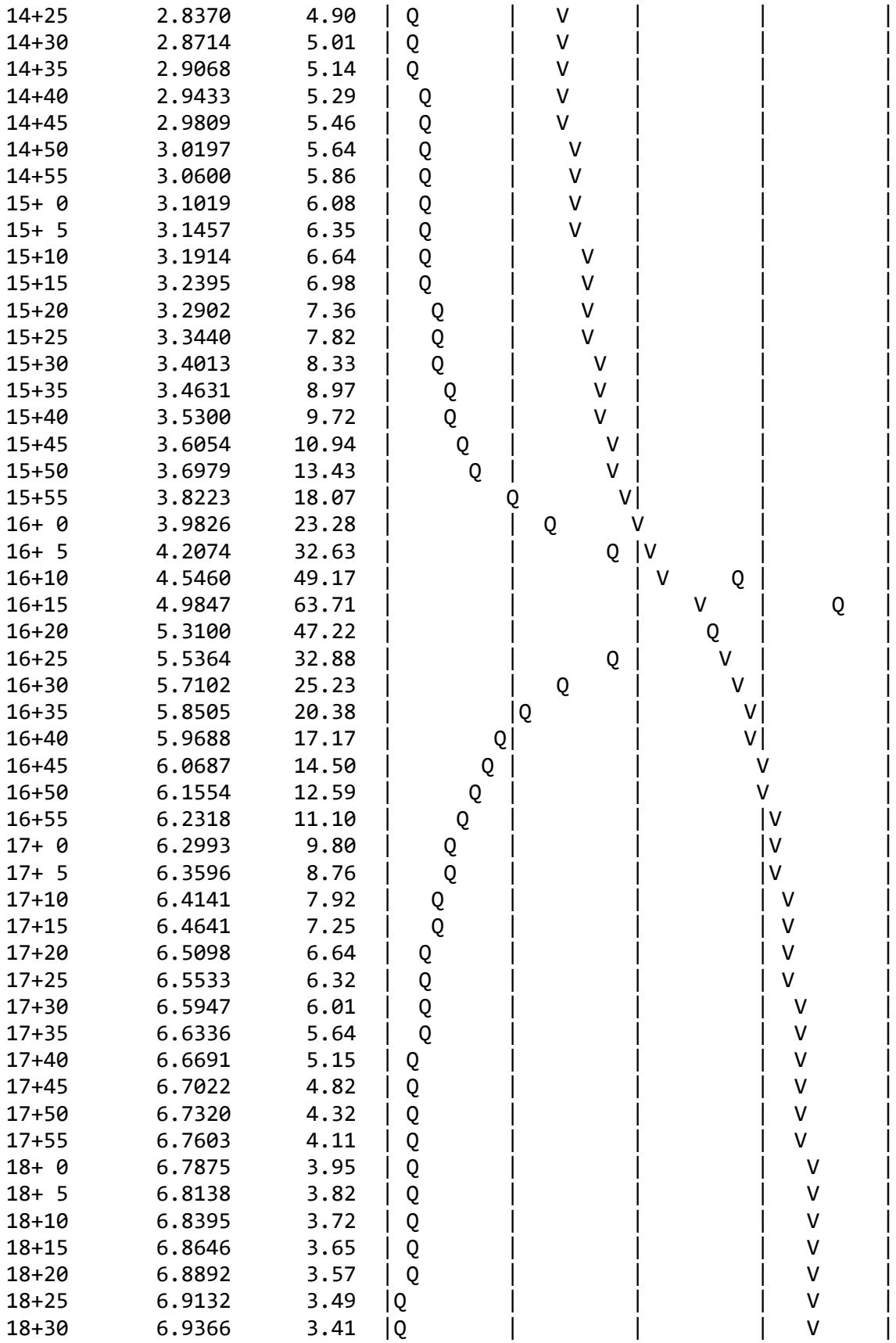
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0003	0.04	Q	|	|	|	|
0+10	0.0020	0.25	Q	|	|	|	|
0+15	0.0067	0.69	Q	|	|	|	|
0+20	0.0133	0.96	Q	|	|	|	|
0+25	0.0209	1.10	Q	|	|	|	|
0+30	0.0292	1.20	Q	|	|	|	|
0+35	0.0380	1.27	Q	|	|	|	|
0+40	0.0472	1.33	Q	|	|	|	|
0+45	0.0566	1.38	Q	|	|	|	|
0+50	0.0663	1.41	Q	|	|	|	|
0+55	0.0763	1.44	Q	|	|	|	|
1+ 0	0.0864	1.47	Q	|	|	|	|
1+ 5	0.0966	1.49	Q	|	|	|	|
1+10	0.1070	1.50	Q	|	|	|	|
1+15	0.1174	1.52	Q	|	|	|	|
1+20	0.1280	1.53	Q	|	|	|	|
1+25	0.1386	1.54	Q	|	|	|	|
1+30	0.1493	1.56	Q	|	|	|	|
1+35	0.1601	1.57	Q	|	|	|	|
1+40	0.1710	1.58	Q	|	|	|	|
1+45	0.1819	1.59	Q	|	|	|	|
1+50	0.1928	1.59	Q	|	|	|	|

1+55	0.2038	1.60	QV	|	|	|	|
2+ 0	0.2149	1.60	QV	|	|	|	|
2+ 5	0.2259	1.61	QV	|	|	|	|
2+10	0.2370	1.61	QV	|	|	|	|
2+15	0.2482	1.62	QV	|	|	|	|
2+20	0.2594	1.63	QV	|	|	|	|
2+25	0.2706	1.63	QV	|	|	|	|
2+30	0.2819	1.64	QV	|	|	|	|
2+35	0.2932	1.64	QV	|	|	|	|
2+40	0.3046	1.65	QV	|	|	|	|
2+45	0.3160	1.66	QV	|	|	|	|
2+50	0.3274	1.66	QV	|	|	|	|
2+55	0.3389	1.67	QV	|	|	|	|
3+ 0	0.3504	1.67	QV	|	|	|	|
3+ 5	0.3620	1.68	QV	|	|	|	|
3+10	0.3736	1.69	QV	|	|	|	|
3+15	0.3853	1.69	QV	|	|	|	|
3+20	0.3970	1.70	QV	|	|	|	|
3+25	0.4088	1.71	Q V	|	|	|	|
3+30	0.4206	1.71	Q V	|	|	|	|
3+35	0.4324	1.72	Q V	|	|	|	|
3+40	0.4443	1.73	Q V	|	|	|	|
3+45	0.4562	1.73	Q V	|	|	|	|
3+50	0.4682	1.74	Q V	|	|	|	|
3+55	0.4803	1.75	Q V	|	|	|	|
4+ 0	0.4924	1.76	|QV	|	|	|	|
4+ 5	0.5045	1.76	|QV	|	|	|	|
4+10	0.5167	1.77	|QV	|	|	|	|
4+15	0.5290	1.78	|QV	|	|	|	|
4+20	0.5412	1.79	|QV	|	|	|	|
4+25	0.5536	1.79	|QV	|	|	|	|
4+30	0.5660	1.80	|QV	|	|	|	|
4+35	0.5784	1.81	|QV	|	|	|	|
4+40	0.5910	1.82	|QV	|	|	|	|
4+45	0.6035	1.82	|Q V	|	|	|	|
4+50	0.6161	1.83	|Q V	|	|	|	|
4+55	0.6288	1.84	|Q V	|	|	|	|
5+ 0	0.6415	1.85	|Q V	|	|	|	|
5+ 5	0.6543	1.86	|Q V	|	|	|	|
5+10	0.6672	1.87	|Q V	|	|	|	|
5+15	0.6801	1.87	|Q V	|	|	|	|
5+20	0.6930	1.88	|Q V	|	|	|	|
5+25	0.7061	1.89	|Q V	|	|	|	|
5+30	0.7191	1.90	|Q V	|	|	|	|
5+35	0.7323	1.91	|Q V	|	|	|	|
5+40	0.7455	1.92	|Q V	|	|	|	|
5+45	0.7588	1.93	|Q V	|	|	|	|
5+50	0.7721	1.94	|Q V	|	|	|	|
5+55	0.7855	1.95	|Q V	|	|	|	|
6+ 0	0.7990	1.96	|Q V	|	|	|	|

6+ 5	0.8125	1.97	|Q V |	|	|	|
6+10	0.8261	1.97	|Q V |	|	|	|
6+15	0.8398	1.98	|Q V |	|	|	|
6+20	0.8535	1.99	|Q V |	|	|	|
6+25	0.8673	2.01	|Q V |	|	|	|
6+30	0.8812	2.02	|Q V |	|	|	|
6+35	0.8952	2.03	|Q V |	|	|	|
6+40	0.9092	2.04	|Q V |	|	|	|
6+45	0.9233	2.05	|Q V |	|	|	|
6+50	0.9375	2.06	|Q V |	|	|	|
6+55	0.9517	2.07	|Q V |	|	|	|
7+ 0	0.9660	2.08	|Q V |	|	|	|
7+ 5	0.9804	2.09	|Q V |	|	|	|
7+10	0.9949	2.10	|Q V |	|	|	|
7+15	1.0095	2.12	|Q V |	|	|	|
7+20	1.0241	2.13	|Q V |	|	|	|
7+25	1.0389	2.14	|Q V |	|	|	|
7+30	1.0537	2.15	|Q V |	|	|	|
7+35	1.0686	2.16	|Q V |	|	|	|
7+40	1.0836	2.18	|Q V |	|	|	|
7+45	1.0987	2.19	|Q V |	|	|	|
7+50	1.1138	2.20	|Q V |	|	|	|
7+55	1.1291	2.22	|Q V |	|	|	|
8+ 0	1.1444	2.23	|Q V |	|	|	|
8+ 5	1.1599	2.24	|Q V |	|	|	|
8+10	1.1754	2.26	|Q V |	|	|	|
8+15	1.1911	2.27	|Q V |	|	|	|
8+20	1.2068	2.28	|Q V |	|	|	|
8+25	1.2226	2.30	|Q V |	|	|	|
8+30	1.2386	2.31	|Q V |	|	|	|
8+35	1.2546	2.33	|Q V |	|	|	|
8+40	1.2708	2.34	|Q V |	|	|	|
8+45	1.2870	2.36	|Q V |	|	|	|
8+50	1.3034	2.38	|Q V |	|	|	|
8+55	1.3199	2.39	|Q V |	|	|	|
9+ 0	1.3365	2.41	|Q V |	|	|	|
9+ 5	1.3532	2.43	|Q V |	|	|	|
9+10	1.3700	2.44	|Q V |	|	|	|
9+15	1.3869	2.46	|Q V |	|	|	|
9+20	1.4040	2.48	|Q V |	|	|	|
9+25	1.4212	2.50	|Q V |	|	|	|
9+30	1.4385	2.51	|Q V |	|	|	|
9+35	1.4560	2.53	|Q V |	|	|	|
9+40	1.4735	2.55	|Q V |	|	|	|
9+45	1.4913	2.57	|Q V |	|	|	|
9+50	1.5091	2.59	|Q V |	|	|	|
9+55	1.5271	2.61	|Q V |	|	|	|
10+ 0	1.5453	2.63	|Q V |	|	|	|
10+ 5	1.5635	2.66	|Q V |	|	|	|
10+10	1.5820	2.68	|Q V |	|	|	|

```
10+15       1.6006      2.70  |Q      V |          |          |          |
10+20       1.6193      2.72  |Q      V |          |          |          |
10+25       1.6382      2.75  |Q      V |          |          |          |
10+30       1.6573      2.77  |Q      V |          |          |          |
10+35       1.6765      2.79  |Q      V |          |          |          |
10+40       1.6959      2.82  |Q      V |          |          |          |
10+45       1.7155      2.84  |Q      V |          |          |          |
10+50       1.7353      2.87  |Q      V |          |          |          |
10+55       1.7552      2.90  |Q      V |          |          |          |
11+ 0       1.7753      2.92  |Q      V |          |          |          |
11+ 5       1.7957      2.95  |Q       V|          |          |          |
11+10       1.8162      2.98  |Q       V|          |          |          |
11+15       1.8369      3.01  |Q       V|          |          |          |
11+20       1.8579      3.04  |Q       V|          |          |          |
11+25       1.8790      3.07  |Q       V|          |          |          |
11+30       1.9004      3.10  |Q       V|          |          |          |
11+35       1.9220      3.14  |Q       V|          |          |          |
11+40       1.9438      3.17  |Q       V|          |          |          |
11+45       1.9659      3.21  |Q       V|          |          |          |
11+50       1.9882      3.24  |Q       V|          |          |          |
11+55       2.0108      3.28  |Q        V          |          |          |
12+ 0       2.0336      3.32  |Q        V          |          |          |
12+ 5       2.0567      3.35  |Q        V          |          |          |
12+10       2.0799      3.37  |Q        V          |          |          |
12+15       2.1032      3.37  |Q        V          |          |          |
12+20       2.1265      3.39  |Q        V          |          |          |
12+25       2.1501      3.42  |Q        V          |          |          |
12+30       2.1740      3.46  |Q        V          |          |          |
12+35       2.1981      3.50  | Q       |V          |          |          |
12+40       2.2225      3.55  | Q       |V          |          |          |
12+45       2.2473      3.59  | Q       |V          |          |          |
12+50       2.2723      3.64  | Q       |V          |          |          |
12+55       2.2978      3.70  | Q       |V          |          |          |
13+ 0       2.3236      3.75  | Q       |V          |          |          |
13+ 5       2.3499      3.81  | Q       |V          |          |          |
13+10       2.3765      3.87  | Q       |V          |          |          |
13+15       2.4036      3.93  | Q       | V         |          |          |
13+20       2.4312      4.00  | Q       | V         |          |          |
13+25       2.4592      4.07  | Q       | V         |          |          |
13+30       2.4877      4.14  | Q       | V         |          |          |
13+35       2.5168      4.22  | Q       | V         |          |          |
13+40       2.5464      4.30  | Q       | V         |          |          |
13+45       2.5767      4.39  | Q       | V         |          |          |
13+50       2.6075      4.48  | Q       |  V        |          |          |
13+55       2.6390      4.57  | Q       |  V        |          |          |
14+ 0       2.6712      4.67  | Q       |  V        |          |          |
14+ 5       2.7041      4.77  | Q       |  V        |          |          |
14+10       2.7372      4.81  | Q       |  V        |          |          |
14+15       2.7701      4.78  | Q       |  V        |          |          |
14+20       2.8032      4.81  | Q       |   V       |          |          |
```



18+35	6.9596	3.33	Q			V	
18+40	6.9820	3.26	Q			V	
18+45	7.0040	3.19	Q			V	
18+50	7.0255	3.12	Q			V	
18+55	7.0466	3.06	Q			V	
19+ 0	7.0672	3.00	Q			V	
19+ 5	7.0875	2.94	Q			V	
19+10	7.1073	2.89	Q			V	
19+15	7.1269	2.83	Q			V	
19+20	7.1460	2.78	Q			V	
19+25	7.1649	2.74	Q			V	
19+30	7.1834	2.69	Q			V	
19+35	7.2017	2.65	Q			V	
19+40	7.2196	2.61	Q			V	
19+45	7.2373	2.57	Q			V	
19+50	7.2547	2.53	Q			V	
19+55	7.2718	2.49	Q			V	
20+ 0	7.2887	2.45	Q			V	
20+ 5	7.3054	2.42	Q			V	
20+10	7.3218	2.39	Q			V	
20+15	7.3380	2.35	Q			V	
20+20	7.3540	2.32	Q			V	
20+25	7.3698	2.29	Q			V	
20+30	7.3854	2.26	Q			V	
20+35	7.4008	2.24	Q			V	
20+40	7.4160	2.21	Q			V	
20+45	7.4311	2.18	Q			V	
20+50	7.4459	2.16	Q			V	
20+55	7.4606	2.13	Q			V	
21+ 0	7.4752	2.11	Q			V	
21+ 5	7.4895	2.09	Q			V	
21+10	7.5037	2.06	Q			V	
21+15	7.5178	2.04	Q			V	
21+20	7.5317	2.02	Q			V	
21+25	7.5455	2.00	Q			V	
21+30	7.5591	1.98	Q			V	
21+35	7.5726	1.96	Q			V	
21+40	7.5860	1.94	Q			V	
21+45	7.5992	1.92	Q			V	
21+50	7.6123	1.90	Q			V	
21+55	7.6253	1.89	Q			V	
22+ 0	7.6382	1.87	Q			V	
22+ 5	7.6509	1.85	Q			V	
22+10	7.6636	1.84	Q			V	
22+15	7.6761	1.82	Q			V	
22+20	7.6885	1.80	Q			V	
22+25	7.7009	1.79	Q			V	
22+30	7.7131	1.77	Q			V	
22+35	7.7252	1.76	Q			V	
22+40	7.7372	1.74	Q			V	

```
   22+45       7.7491      1.73  Q         |          |          |        V |
   22+50       7.7609      1.72  Q         |          |          |         V|
   22+55       7.7727      1.70  Q         |          |          |         V|
   23+ 0       7.7843      1.69  Q         |          |          |         V|
   23+ 5       7.7959      1.68  Q         |          |          |         V|
   23+10       7.8073      1.66  Q         |          |          |         V|
   23+15       7.8187      1.65  Q         |          |          |         V|
   23+20       7.8300      1.64  Q         |          |          |         V|
   23+25       7.8412      1.63  Q         |          |          |         V|
   23+30       7.8523      1.62  Q         |          |          |         V|
   23+35       7.8634      1.60  Q         |          |          |         V|
   23+40       7.8743      1.59  Q         |          |          |         V|
   23+45       7.8852      1.58  Q         |          |          |         V|
   23+50       7.8961      1.57  Q         |          |          |         V|
   23+55       7.9068      1.56  Q         |          |          |         V|
   24+ 0       7.9175      1.55  Q         |          |          |         V|
-------------------------------------------------------------------------
```

10 year onsite
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 10/19/22

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

Program License Serial Number 4009

Cordova Complex Site
Unit Hydrogragh Method
Existing Condition
10-year, 24-hours Storm

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		
86.14	1	0.61
Rainfall data for year 10		
86.14	6	1.23
Rainfall data for year 10		
86.14	24	2.14

++

******** 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	86.14	1.000	0.578	1.000	0.578

Area-averaged adjusted loss rate Fm (In/Hr) = 0.578

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
86.14	1.000	67.0	67.0	4.93	0.103

Area-averaged catchment yield fraction, Y = 0.103
Area-averaged low loss fraction, Yb = 0.897
User entry of time of concentration = 0.500 (hours)
++
Watershed area = 86.14(Ac.)
Catchment Lag time = 0.400 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 41.6667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.578(In/Hr)
Average low loss rate fraction (Yb) = 0.897 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.289(In)
Computed peak 30-minute rainfall = 0.495(In)
Specified peak 1-hour rainfall = 0.609(In)
Computed peak 3-hour rainfall = 0.937(In)
Specified peak 6-hour rainfall = 1.230(In)
Specified peak 24-hour rainfall = 2.140(In)

Rainfall depth area reduction factors:
Using a total area of 86.14(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.288(In)
30-minute factor = 0.996 Adjusted rainfall = 0.493(In)
1-hour factor = 0.996 Adjusted rainfall = 0.607(In)
3-hour factor = 0.999 Adjusted rainfall = 0.937(In)
6-hour factor = 1.000 Adjusted rainfall = 1.230(In)
24-hour factor = 1.000 Adjusted rainfall = 2.140(In)

U n i t H y d r o g r a p h
++
Interval 'S' Graph Unit Hydrograph

Number	Mean values ((CFS))	
	(K = 520.88 (CFS))	
1	4.633	24.134
2	23.847	100.078
3	51.410	143.571
4	68.028	86.558
5	76.108	42.090
6	81.350	27.303
7	85.280	20.470
8	88.240	15.418
9	90.630	12.449
10	92.477	9.619
11	93.898	7.405
12	95.175	6.650
13	96.258	5.643
14	97.122	4.497
15	97.845	3.768
16	98.428	3.038
17	98.875	2.327
18	99.292	2.170
19	99.708	2.170
20	100.000	1.519

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3543	0.0665
2	0.4362	0.0361
3	0.4927	0.0262
4	0.5371	0.0211
5	0.5743	0.0179
6	0.6065	0.0156
7	0.6447	0.0186
8	0.6796	0.0171
9	0.7121	0.0159
10	0.7424	0.0149
11	0.7709	0.0141
12	0.7979	0.0133
13	0.8235	0.0127
14	0.8480	0.0121
15	0.8715	0.0116
16	0.8940	0.0112
17	0.9157	0.0107
18	0.9367	0.0104
19	0.9568	0.0100
20	0.9762	0.0097
21	0.9951	0.0094
22	1.0135	0.0091
23	1.0313	0.0089

24	1.0487	0.0086
25	1.0656	0.0084
26	1.0822	0.0082
27	1.0983	0.0080
28	1.1141	0.0079
29	1.1296	0.0077
30	1.1447	0.0075
31	1.1595	0.0074
32	1.1741	0.0072
33	1.1884	0.0071
34	1.2024	0.0070
35	1.2161	0.0069
36	1.2297	0.0067
37	1.2432	0.0067
38	1.2565	0.0066
39	1.2696	0.0065
40	1.2825	0.0064
41	1.2953	0.0063
42	1.3078	0.0062
43	1.3201	0.0062
44	1.3323	0.0061
45	1.3444	0.0060
46	1.3562	0.0059
47	1.3679	0.0058
48	1.3795	0.0058
49	1.3909	0.0057
50	1.4022	0.0056
51	1.4133	0.0056
52	1.4243	0.0055
53	1.4352	0.0054
54	1.4459	0.0054
55	1.4566	0.0053
56	1.4671	0.0052
57	1.4775	0.0052
58	1.4878	0.0051
59	1.4980	0.0051
60	1.5081	0.0050
61	1.5181	0.0050
62	1.5280	0.0049
63	1.5378	0.0049
64	1.5475	0.0048
65	1.5571	0.0048
66	1.5667	0.0048
67	1.5761	0.0047
68	1.5855	0.0047
69	1.5947	0.0046
70	1.6039	0.0046
71	1.6131	0.0045
72	1.6221	0.0045
73	1.6311	0.0045

74	1.6400	0.0044
75	1.6488	0.0044
76	1.6575	0.0044
77	1.6662	0.0043
78	1.6748	0.0043
79	1.6834	0.0043
80	1.6919	0.0042
81	1.7003	0.0042
82	1.7086	0.0042
83	1.7169	0.0041
84	1.7252	0.0041
85	1.7333	0.0041
86	1.7415	0.0041
87	1.7495	0.0040
88	1.7575	0.0040
89	1.7655	0.0040
90	1.7734	0.0039
91	1.7812	0.0039
92	1.7890	0.0039
93	1.7968	0.0039
94	1.8045	0.0038
95	1.8121	0.0038
96	1.8197	0.0038
97	1.8273	0.0038
98	1.8348	0.0037
99	1.8422	0.0037
100	1.8496	0.0037
101	1.8570	0.0037
102	1.8643	0.0037
103	1.8716	0.0036
104	1.8789	0.0036
105	1.8861	0.0036
106	1.8932	0.0036
107	1.9003	0.0036
108	1.9074	0.0035
109	1.9144	0.0035
110	1.9214	0.0035
111	1.9284	0.0035
112	1.9353	0.0035
113	1.9422	0.0034
114	1.9491	0.0034
115	1.9559	0.0034
116	1.9627	0.0034
117	1.9694	0.0034
118	1.9761	0.0034
119	1.9828	0.0033
120	1.9894	0.0033
121	1.9960	0.0033
122	2.0026	0.0033
123	2.0091	0.0033

124	2.0157	0.0033
125	2.0221	0.0032
126	2.0286	0.0032
127	2.0350	0.0032
128	2.0414	0.0032
129	2.0478	0.0032
130	2.0541	0.0032
131	2.0604	0.0031
132	2.0667	0.0031
133	2.0729	0.0031
134	2.0791	0.0031
135	2.0853	0.0031
136	2.0915	0.0031
137	2.0976	0.0031
138	2.1037	0.0030
139	2.1098	0.0030
140	2.1158	0.0030
141	2.1218	0.0030
142	2.1278	0.0030
143	2.1338	0.0030
144	2.1398	0.0030

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0060	0.0053	0.0006
2	0.0060	0.0054	0.0006
3	0.0060	0.0054	0.0006
4	0.0061	0.0054	0.0006
5	0.0061	0.0055	0.0006
6	0.0061	0.0055	0.0006
7	0.0062	0.0056	0.0006
8	0.0062	0.0056	0.0006
9	0.0063	0.0056	0.0006
10	0.0063	0.0057	0.0006
11	0.0064	0.0057	0.0007
12	0.0064	0.0057	0.0007
13	0.0064	0.0058	0.0007
14	0.0065	0.0058	0.0007
15	0.0065	0.0059	0.0007
16	0.0066	0.0059	0.0007
17	0.0066	0.0060	0.0007
18	0.0067	0.0060	0.0007
19	0.0067	0.0061	0.0007
20	0.0068	0.0061	0.0007
21	0.0068	0.0061	0.0007
22	0.0069	0.0062	0.0007
23	0.0070	0.0062	0.0007
24	0.0070	0.0063	0.0007

25	0.0071	0.0064	0.0007
26	0.0071	0.0064	0.0007
27	0.0072	0.0065	0.0007
28	0.0073	0.0065	0.0007
29	0.0073	0.0066	0.0008
30	0.0074	0.0066	0.0008
31	0.0075	0.0067	0.0008
32	0.0075	0.0068	0.0008
33	0.0076	0.0068	0.0008
34	0.0077	0.0069	0.0008
35	0.0077	0.0070	0.0008
36	0.0078	0.0070	0.0008
37	0.0079	0.0071	0.0008
38	0.0080	0.0072	0.0008
39	0.0081	0.0072	0.0008
40	0.0081	0.0073	0.0008
41	0.0082	0.0074	0.0008
42	0.0083	0.0075	0.0009
43	0.0084	0.0076	0.0009
44	0.0085	0.0076	0.0009
45	0.0086	0.0077	0.0009
46	0.0087	0.0078	0.0009
47	0.0088	0.0079	0.0009
48	0.0089	0.0080	0.0009
49	0.0090	0.0081	0.0009
50	0.0092	0.0082	0.0009
51	0.0093	0.0083	0.0010
52	0.0094	0.0084	0.0010
53	0.0095	0.0086	0.0010
54	0.0097	0.0087	0.0010
55	0.0098	0.0088	0.0010
56	0.0099	0.0089	0.0010
57	0.0101	0.0091	0.0010
58	0.0103	0.0092	0.0011
59	0.0104	0.0093	0.0011
60	0.0106	0.0095	0.0011
61	0.0108	0.0097	0.0011
62	0.0109	0.0098	0.0011
63	0.0111	0.0100	0.0011
64	0.0113	0.0102	0.0012
65	0.0116	0.0104	0.0012
66	0.0118	0.0106	0.0012
67	0.0120	0.0108	0.0012
68	0.0123	0.0110	0.0013
69	0.0125	0.0112	0.0013
70	0.0128	0.0115	0.0013
71	0.0131	0.0118	0.0013
72	0.0134	0.0121	0.0014
73	0.0135	0.0121	0.0014
74	0.0139	0.0125	0.0014

75	0.0143	0.0128	0.0015
76	0.0147	0.0132	0.0015
77	0.0151	0.0136	0.0016
78	0.0156	0.0140	0.0016
79	0.0162	0.0145	0.0017
80	0.0167	0.0150	0.0017
81	0.0174	0.0156	0.0018
82	0.0181	0.0162	0.0019
83	0.0189	0.0169	0.0019
84	0.0198	0.0177	0.0020
85	0.0209	0.0188	0.0021
86	0.0221	0.0198	0.0023
87	0.0235	0.0211	0.0024
88	0.0251	0.0225	0.0026
89	0.0270	0.0242	0.0028
90	0.0294	0.0264	0.0030
91	0.0324	0.0291	0.0033
92	0.0365	0.0327	0.0037
93	0.0323	0.0290	0.0033
94	0.0404	0.0363	0.0041
95	0.0564	0.0506	0.0058
96	0.1124	0.0964	0.0160
97	0.3239	0.0964	0.2275
98	0.0412	0.0370	0.0042
99	0.0366	0.0329	0.0038
100	0.0294	0.0264	0.0030
101	0.0251	0.0225	0.0026
102	0.0221	0.0199	0.0023
103	0.0198	0.0178	0.0020
104	0.0181	0.0162	0.0019
105	0.0167	0.0150	0.0017
106	0.0156	0.0140	0.0016
107	0.0147	0.0132	0.0015
108	0.0139	0.0125	0.0014
109	0.0134	0.0121	0.0014
110	0.0128	0.0115	0.0013
111	0.0123	0.0110	0.0013
112	0.0118	0.0106	0.0012
113	0.0113	0.0102	0.0012
114	0.0109	0.0098	0.0011
115	0.0106	0.0095	0.0011
116	0.0103	0.0092	0.0011
117	0.0099	0.0089	0.0010
118	0.0097	0.0087	0.0010
119	0.0094	0.0084	0.0010
120	0.0092	0.0082	0.0009
121	0.0089	0.0080	0.0009
122	0.0087	0.0078	0.0009
123	0.0085	0.0076	0.0009
124	0.0083	0.0075	0.0009

125	0.0081	0.0073	0.0008
126	0.0080	0.0072	0.0008
127	0.0078	0.0070	0.0008
128	0.0077	0.0069	0.0008
129	0.0075	0.0068	0.0008
130	0.0074	0.0066	0.0008
131	0.0073	0.0065	0.0007
132	0.0071	0.0064	0.0007
133	0.0070	0.0063	0.0007
134	0.0069	0.0062	0.0007
135	0.0068	0.0061	0.0007
136	0.0067	0.0060	0.0007
137	0.0066	0.0059	0.0007
138	0.0065	0.0058	0.0007
139	0.0064	0.0057	0.0007
140	0.0063	0.0057	0.0006
141	0.0062	0.0056	0.0006
142	0.0061	0.0055	0.0006
143	0.0061	0.0054	0.0006
144	0.0060	0.0054	0.0006

Total soil rain loss = 1.72(In)
Total effective rainfall = 0.42(In)
Peak flow rate in flood hydrograph = 35.20(CFS)

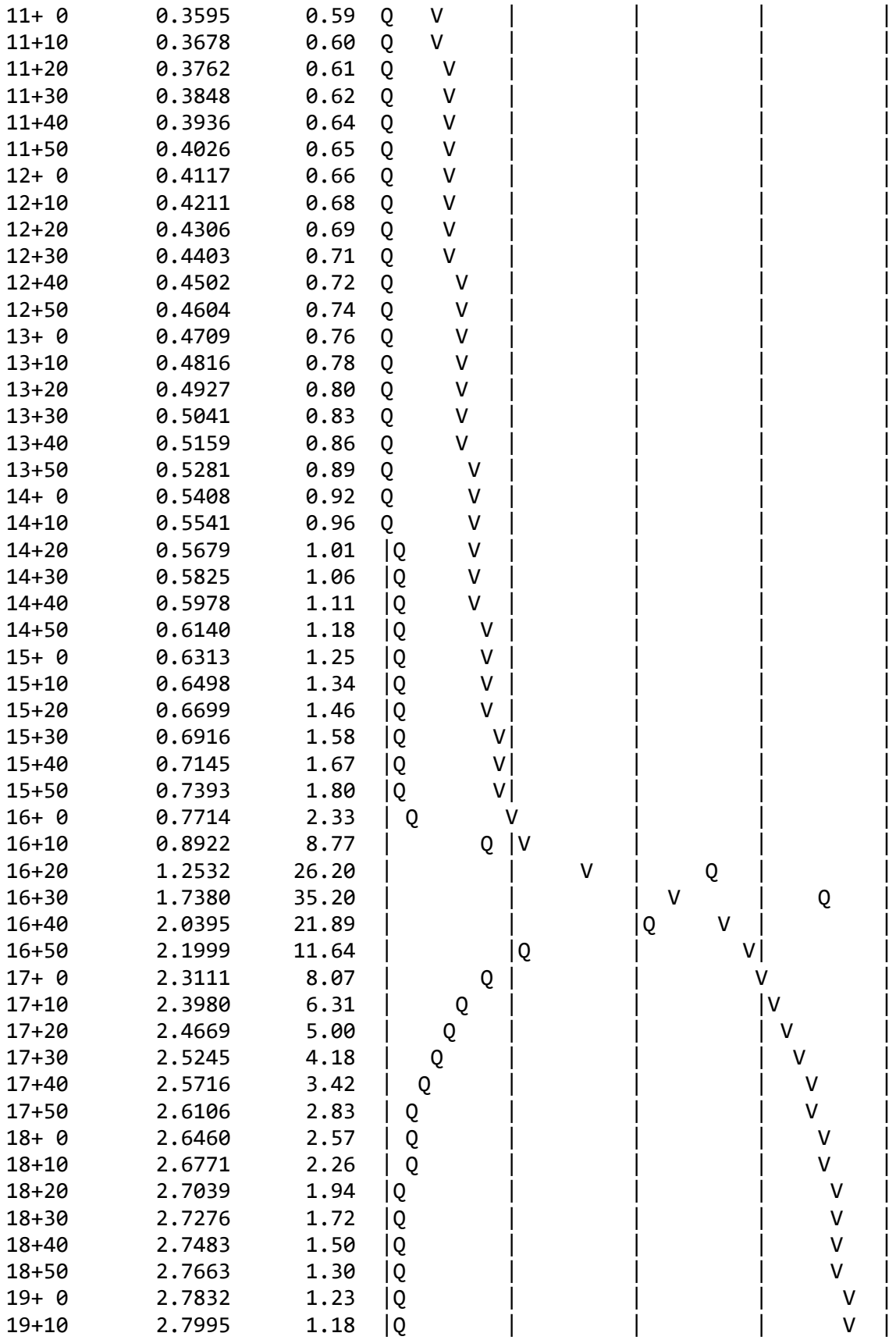
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	10.0	20.0	30.0	40.0
0+10	0.0002	0.01	Q	|	|	|	|
0+20	0.0012	0.08	Q	|	|	|	|
0+30	0.0035	0.16	Q	|	|	|	|
0+40	0.0065	0.22	Q	|	|	|	|
0+50	0.0099	0.24	Q	|	|	|	|
1+ 0	0.0135	0.26	Q	|	|	|	|
1+10	0.0173	0.28	Q	|	|	|	|
1+20	0.0213	0.29	Q	|	|	|	|
1+30	0.0254	0.30	Q	|	|	|	|
1+40	0.0296	0.31	Q	|	|	|	|
1+50	0.0339	0.31	Q	|	|	|	|
2+ 0	0.0383	0.32	Q	|	|	|	|
2+10	0.0428	0.32	Q	|	|	|	|
2+20	0.0473	0.33	Q	|	|	|	|
2+30	0.0519	0.33	Q	|	|	|	|

2+40	0.0566	0.34	Q	|	|	|	|
2+50	0.0613	0.34	Q	|	|	|	|
3+ 0	0.0660	0.35	Q	|	|	|	|
3+10	0.0709	0.35	Q	|	|	|	|
3+20	0.0757	0.35	QV	|	|	|	|
3+30	0.0806	0.36	QV	|	|	|	|
3+40	0.0856	0.36	QV	|	|	|	|
3+50	0.0905	0.36	QV	|	|	|	|
4+ 0	0.0956	0.36	QV	|	|	|	|
4+10	0.1006	0.37	QV	|	|	|	|
4+20	0.1057	0.37	QV	|	|	|	|
4+30	0.1109	0.37	QV	|	|	|	|
4+40	0.1160	0.38	QV	|	|	|	|
4+50	0.1213	0.38	QV	|	|	|	|
5+ 0	0.1265	0.38	QV	|	|	|	|
5+10	0.1319	0.39	QV	|	|	|	|
5+20	0.1372	0.39	QV	|	|	|	|
5+30	0.1426	0.39	QV	|	|	|	|
5+40	0.1481	0.40	QV	|	|	|	|
5+50	0.1536	0.40	Q V	|	|	|	|
6+ 0	0.1592	0.40	Q V	|	|	|	|
6+10	0.1648	0.41	Q V	|	|	|	|
6+20	0.1705	0.41	Q V	|	|	|	|
6+30	0.1762	0.42	Q V	|	|	|	|
6+40	0.1820	0.42	Q V	|	|	|	|
6+50	0.1878	0.42	Q V	|	|	|	|
7+ 0	0.1937	0.43	Q V	|	|	|	|
7+10	0.1997	0.43	Q V	|	|	|	|
7+20	0.2057	0.44	Q V	|	|	|	|
7+30	0.2118	0.44	Q V	|	|	|	|
7+40	0.2180	0.45	Q V	|	|	|	|
7+50	0.2242	0.45	Q V	|	|	|	|
8+ 0	0.2305	0.46	Q V	|	|	|	|
8+10	0.2369	0.46	Q V	|	|	|	|
8+20	0.2433	0.47	Q V	|	|	|	|
8+30	0.2498	0.47	Q V	|	|	|	|
8+40	0.2565	0.48	Q V	|	|	|	|
8+50	0.2632	0.49	Q V	|	|	|	|
9+ 0	0.2699	0.49	Q V	|	|	|	|
9+10	0.2768	0.50	Q V	|	|	|	|
9+20	0.2838	0.51	Q V	|	|	|	|
9+30	0.2908	0.51	Q V	|	|	|	|
9+40	0.2980	0.52	Q V	|	|	|	|
9+50	0.3053	0.53	Q V	|	|	|	|
10+ 0	0.3127	0.54	Q V	|	|	|	|
10+10	0.3202	0.54	Q V	|	|	|	|
10+20	0.3278	0.55	Q V	|	|	|	|
10+30	0.3355	0.56	Q V	|	|	|	|
10+40	0.3434	0.57	Q V	|	|	|	|
10+50	0.3514	0.58	Q V	|	|	|	|


11+ 0 0.3595 0.59
11+10 0.3678 0.60
11+20 0.3762 0.61
11+30 0.3848 0.62
11+40 0.3936 0.64
11+50 0.4026 0.65
12+ 0 0.4117 0.66
12+10 0.4211 0.68
12+20 0.4306 0.69
12+30 0.4403 0.71
12+40 0.4502 0.72
12+50 0.4604 0.74
13+ 0 0.4709 0.76
13+10 0.4816 0.78
13+20 0.4927 0.80
13+30 0.5041 0.83
13+40 0.5159 0.86
13+50 0.5281 0.89
14+ 0 0.5408 0.92
14+10 0.5541 0.96
14+20 0.5679 1.01
14+30 0.5825 1.06
14+40 0.5978 1.11
14+50 0.6140 1.18
15+ 0 0.6313 1.25
15+10 0.6498 1.34
15+20 0.6699 1.46
15+30 0.6916 1.58
15+40 0.7145 1.67
15+50 0.7393 1.80
16+ 0 0.7714 2.33
16+10 0.8922 8.77
16+20 1.2532 26.20
16+30 1.7380 35.20
16+40 2.0395 21.89
16+50 2.1999 11.64
17+ 0 2.3111 8.07
17+10 2.3980 6.31
17+20 2.4669 5.00
17+30 2.5245 4.18
17+40 2.5716 3.42
17+50 2.6106 2.83
18+ 0 2.6460 2.57
18+10 2.6771 2.26
18+20 2.7039 1.94
18+30 2.7276 1.72
18+40 2.7483 1.50
18+50 2.7663 1.30
19+ 0 2.7832 1.23
19+10 2.7995 1.18

```
  19+20       2.8132      0.99  Q         |         |         |      V  |
  19+30       2.8217      0.62  Q         |         |         |      V  |
  19+40       2.8300      0.60  Q         |         |         |      V  |
  19+50       2.8379      0.57  Q         |         |         |      V  |
  20+ 0       2.8455      0.55  Q         |         |         |      V  |
  20+10       2.8529      0.54  Q         |         |         |       V |
  20+20       2.8600      0.52  Q         |         |         |       V |
  20+30       2.8670      0.50  Q         |         |         |       V |
  20+40       2.8738      0.49  Q         |         |         |       V |
  20+50       2.8803      0.48  Q         |         |         |       V |
  21+ 0       2.8868      0.47  Q         |         |         |       V |
  21+10       2.8931      0.46  Q         |         |         |       V |
  21+20       2.8992      0.45  Q         |         |         |       V |
  21+30       2.9052      0.44  Q         |         |         |       V |
  21+40       2.9111      0.43  Q         |         |         |       V |
  21+50       2.9168      0.42  Q         |         |         |       V |
  22+ 0       2.9225      0.41  Q         |         |         |       V |
  22+10       2.9280      0.40  Q         |         |         |        V|
  22+20       2.9334      0.39  Q         |         |         |        V|
  22+30       2.9388      0.39  Q         |         |         |        V|
  22+40       2.9440      0.38  Q         |         |         |        V|
  22+50       2.9492      0.37  Q         |         |         |        V|
  23+ 0       2.9542      0.37  Q         |         |         |        V|
  23+10       2.9592      0.36  Q         |         |         |        V|
  23+20       2.9641      0.36  Q         |         |         |        V|
  23+30       2.9690      0.35  Q         |         |         |        V|
  23+40       2.9737      0.35  Q         |         |         |        V|
  23+50       2.9784      0.34  Q         |         |         |        V|
  24+ 0       2.9831      0.34  Q         |         |         |        V|
  24+10       2.9874      0.32  Q         |         |         |        V|
  24+20       2.9909      0.25  Q         |         |         |        V|
  24+30       2.9932      0.16  Q         |         |         |        V|
  24+40       2.9946      0.11  Q         |         |         |        V|
  24+50       2.9957      0.08  Q         |         |         |        V|
  25+ 0       2.9966      0.06  Q         |         |         |        V|
  25+10       2.9973      0.05  Q         |         |         |        V|
  25+20       2.9978      0.04  Q         |         |         |        V|
  25+30       2.9983      0.03  Q         |         |         |        V|
  25+40       2.9986      0.03  Q         |         |         |        V|
  25+50       2.9989      0.02  Q         |         |         |        V|
  26+ 0       2.9991      0.02  Q         |         |         |        V|
  26+10       2.9993      0.01  Q         |         |         |        V|
  26+20       2.9994      0.01  Q         |         |         |        V|
  26+30       2.9995      0.01  Q         |         |         |        V|
  26+40       2.9996      0.01  Q         |         |         |        V|
  26+50       2.9996      0.00  Q         |         |         |        V|
  27+ 0       2.9997      0.00  Q         |         |         |        V|
  27+10       2.9997      0.00  Q         |         |         |         V
-------------------------------------------------------------------------
```

100 year onsite
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 10/24/22

++

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

Program License Serial Number 4009

Cordova Complex Site
Unit Hydrogragh Method
Existing Condition
100-year, 24-hours Storm

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		
86.14	1	1.08
Rainfall data for year 100		
86.14	6	2.03
Rainfall data for year 100		
86.14	24	3.46

++

******** 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)
67.0	84.6	86.14	1.000	0.290	1.000	0.290

Area-averaged adjusted loss rate Fm (In/Hr) = 0.290

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
86.14	1.000	67.0	84.6	1.82	0.563

Area-averaged catchment yield fraction, Y = 0.563
Area-averaged low loss fraction, Yb = 0.437
User entry of time of concentration = 0.500 (hours)
++
Watershed area = 86.14(Ac.)
Catchment Lag time = 0.400 hours
Unit interval = 10.000 minutes
Unit interval percentage of lag time = 41.6667
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.290(In/Hr)
Average low loss rate fraction (Yb) = 0.437 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.512(In)
Computed peak 30-minute rainfall = 0.877(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.590(In)
Specified peak 6-hour rainfall = 2.030(In)
Specified peak 24-hour rainfall = 3.460(In)

Rainfall depth area reduction factors:
Using a total area of 86.14(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.510(In)
30-minute factor = 0.996 Adjusted rainfall = 0.874(In)
1-hour factor = 0.996 Adjusted rainfall = 1.076(In)
3-hour factor = 0.999 Adjusted rainfall = 1.589(In)
6-hour factor = 1.000 Adjusted rainfall = 2.029(In)
24-hour factor = 1.000 Adjusted rainfall = 3.460(In)

U n i t H y d r o g r a p h
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Interval 'S' Graph Unit Hydrograph

Number	Mean values ((CFS))	
	(K = 520.88 (CFS))	
1	4.633	24.134
2	23.847	100.078
3	51.410	143.571
4	68.028	86.558
5	76.108	42.090
6	81.350	27.303
7	85.280	20.470
8	88.240	15.418
9	90.630	12.449
10	92.477	9.619
11	93.898	7.405
12	95.175	6.650
13	96.258	5.643
14	97.122	4.497
15	97.845	3.768
16	98.428	3.038
17	98.875	2.327
18	99.292	2.170
19	99.708	2.170
20	100.000	1.519

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.6284	0.1180
2	0.7736	0.0640
3	0.8737	0.0465
4	0.9524	0.0374
5	1.0184	0.0317
6	1.0756	0.0277
7	1.1362	0.0295
8	1.1914	0.0270
9	1.2424	0.0250
10	1.2898	0.0233
11	1.3342	0.0219
12	1.3761	0.0207
13	1.4158	0.0196
14	1.4536	0.0187
15	1.4897	0.0178
16	1.5243	0.0171
17	1.5575	0.0164
18	1.5895	0.0158
19	1.6200	0.0152
20	1.6496	0.0147
21	1.6782	0.0142
22	1.7060	0.0138
23	1.7329	0.0134

24	1.7591	0.0130
25	1.7846	0.0127
26	1.8095	0.0123
27	1.8337	0.0120
28	1.8574	0.0118
29	1.8805	0.0115
30	1.9031	0.0112
31	1.9252	0.0110
32	1.9469	0.0108
33	1.9681	0.0106
34	1.9890	0.0104
35	2.0094	0.0102
36	2.0295	0.0100
37	2.0510	0.0107
38	2.0721	0.0105
39	2.0929	0.0104
40	2.1134	0.0102
41	2.1336	0.0100
42	2.1535	0.0099
43	2.1730	0.0098
44	2.1924	0.0096
45	2.2114	0.0095
46	2.2302	0.0094
47	2.2487	0.0092
48	2.2670	0.0091
49	2.2851	0.0090
50	2.3029	0.0089
51	2.3205	0.0088
52	2.3379	0.0087
53	2.3551	0.0086
54	2.3721	0.0085
55	2.3889	0.0084
56	2.4055	0.0083
57	2.4220	0.0082
58	2.4382	0.0081
59	2.4543	0.0080
60	2.4702	0.0079
61	2.4860	0.0079
62	2.5016	0.0078
63	2.5170	0.0077
64	2.5323	0.0076
65	2.5475	0.0076
66	2.5625	0.0075
67	2.5774	0.0074
68	2.5921	0.0074
69	2.6067	0.0073
70	2.6212	0.0072
71	2.6355	0.0072
72	2.6497	0.0071
73	2.6638	0.0070

74	2.6778	0.0070
75	2.6917	0.0069
76	2.7054	0.0069
77	2.7191	0.0068
78	2.7326	0.0068
79	2.7460	0.0067
80	2.7594	0.0066
81	2.7726	0.0066
82	2.7857	0.0065
83	2.7987	0.0065
84	2.8117	0.0065
85	2.8245	0.0064
86	2.8372	0.0064
87	2.8499	0.0063
88	2.8624	0.0063
89	2.8749	0.0062
90	2.8873	0.0062
91	2.8996	0.0061
92	2.9118	0.0061
93	2.9240	0.0061
94	2.9360	0.0060
95	2.9480	0.0060
96	2.9599	0.0059
97	2.9717	0.0059
98	2.9835	0.0059
99	2.9951	0.0058
100	3.0068	0.0058
101	3.0183	0.0058
102	3.0297	0.0057
103	3.0411	0.0057
104	3.0525	0.0057
105	3.0637	0.0056
106	3.0749	0.0056
107	3.0861	0.0056
108	3.0971	0.0055
109	3.1081	0.0055
110	3.1191	0.0055
111	3.1299	0.0054
112	3.1408	0.0054
113	3.1515	0.0054
114	3.1622	0.0053
115	3.1729	0.0053
116	3.1835	0.0053
117	3.1940	0.0053
118	3.2045	0.0052
119	3.2149	0.0052
120	3.2252	0.0052
121	3.2356	0.0052
122	3.2458	0.0051
123	3.2560	0.0051

124	3.2662	0.0051
125	3.2763	0.0050
126	3.2864	0.0050
127	3.2964	0.0050
128	3.3063	0.0050
129	3.3163	0.0050
130	3.3261	0.0049
131	3.3359	0.0049
132	3.3457	0.0049
133	3.3555	0.0049
134	3.3651	0.0048
135	3.3748	0.0048
136	3.3844	0.0048
137	3.3939	0.0048
138	3.4034	0.0047
139	3.4129	0.0047
140	3.4223	0.0047
141	3.4317	0.0047
142	3.4411	0.0047
143	3.4504	0.0046
144	3.4596	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0093	0.0040	0.0052
2	0.0093	0.0041	0.0053
3	0.0094	0.0041	0.0053
4	0.0094	0.0041	0.0053
5	0.0095	0.0042	0.0054
6	0.0096	0.0042	0.0054
7	0.0096	0.0042	0.0054
8	0.0097	0.0042	0.0055
9	0.0098	0.0043	0.0055
10	0.0098	0.0043	0.0055
11	0.0099	0.0043	0.0056
12	0.0100	0.0044	0.0056
13	0.0101	0.0044	0.0057
14	0.0101	0.0044	0.0057
15	0.0102	0.0045	0.0058
16	0.0103	0.0045	0.0058
17	0.0104	0.0045	0.0058
18	0.0104	0.0046	0.0059
19	0.0105	0.0046	0.0059
20	0.0106	0.0046	0.0060
21	0.0107	0.0047	0.0060
22	0.0108	0.0047	0.0061
23	0.0109	0.0047	0.0061
24	0.0110	0.0048	0.0062

25	0.0111	0.0048	0.0062
26	0.0112	0.0049	0.0063
27	0.0113	0.0049	0.0063
28	0.0114	0.0050	0.0064
29	0.0115	0.0050	0.0065
30	0.0116	0.0051	0.0065
31	0.0117	0.0051	0.0066
32	0.0118	0.0051	0.0066
33	0.0119	0.0052	0.0067
34	0.0120	0.0052	0.0068
35	0.0121	0.0053	0.0068
36	0.0123	0.0054	0.0069
37	0.0124	0.0054	0.0070
38	0.0125	0.0055	0.0071
39	0.0126	0.0055	0.0071
40	0.0128	0.0056	0.0072
41	0.0129	0.0056	0.0073
42	0.0131	0.0057	0.0074
43	0.0132	0.0058	0.0074
44	0.0134	0.0058	0.0075
45	0.0135	0.0059	0.0076
46	0.0137	0.0060	0.0077
47	0.0139	0.0061	0.0078
48	0.0140	0.0061	0.0079
49	0.0142	0.0062	0.0080
50	0.0144	0.0063	0.0081
51	0.0146	0.0064	0.0082
52	0.0148	0.0065	0.0083
53	0.0150	0.0066	0.0085
54	0.0152	0.0066	0.0086
55	0.0154	0.0067	0.0087
56	0.0157	0.0068	0.0088
57	0.0159	0.0070	0.0090
58	0.0162	0.0071	0.0091
59	0.0164	0.0072	0.0093
60	0.0167	0.0073	0.0094
61	0.0170	0.0074	0.0096
62	0.0173	0.0076	0.0097
63	0.0176	0.0077	0.0099
64	0.0179	0.0078	0.0101
65	0.0183	0.0080	0.0103
66	0.0187	0.0081	0.0105
67	0.0190	0.0083	0.0107
68	0.0194	0.0085	0.0110
69	0.0199	0.0087	0.0112
70	0.0203	0.0089	0.0115
71	0.0208	0.0091	0.0117
72	0.0213	0.0093	0.0120
73	0.0201	0.0088	0.0113
74	0.0206	0.0090	0.0116

75	0.0212	0.0093	0.0120
76	0.0219	0.0096	0.0123
77	0.0226	0.0099	0.0127
78	0.0234	0.0102	0.0132
79	0.0242	0.0106	0.0137
80	0.0252	0.0110	0.0142
81	0.0262	0.0114	0.0148
82	0.0273	0.0119	0.0154
83	0.0286	0.0125	0.0161
84	0.0301	0.0131	0.0169
85	0.0320	0.0140	0.0180
86	0.0339	0.0148	0.0191
87	0.0361	0.0158	0.0203
88	0.0387	0.0169	0.0218
89	0.0419	0.0183	0.0236
90	0.0459	0.0200	0.0258
91	0.0509	0.0222	0.0287
92	0.0577	0.0252	0.0325
93	0.0573	0.0250	0.0323
94	0.0717	0.0313	0.0404
95	0.1001	0.0437	0.0564
96	0.1993	0.0483	0.1509
97	0.5744	0.0483	0.5260
98	0.0730	0.0319	0.0412
99	0.0581	0.0253	0.0327
100	0.0460	0.0201	0.0259
101	0.0388	0.0169	0.0219
102	0.0339	0.0148	0.0191
103	0.0301	0.0131	0.0170
104	0.0274	0.0119	0.0154
105	0.0252	0.0110	0.0142
106	0.0234	0.0102	0.0132
107	0.0219	0.0096	0.0123
108	0.0206	0.0090	0.0116
109	0.0213	0.0093	0.0120
110	0.0203	0.0089	0.0115
111	0.0194	0.0085	0.0110
112	0.0187	0.0081	0.0105
113	0.0179	0.0078	0.0101
114	0.0173	0.0076	0.0097
115	0.0167	0.0073	0.0094
116	0.0162	0.0071	0.0091
117	0.0157	0.0068	0.0088
118	0.0152	0.0066	0.0086
119	0.0148	0.0065	0.0083
120	0.0144	0.0063	0.0081
121	0.0140	0.0061	0.0079
122	0.0137	0.0060	0.0077
123	0.0134	0.0058	0.0075
124	0.0131	0.0057	0.0074

125	0.0128	0.0056	0.0072
126	0.0125	0.0055	0.0071
127	0.0123	0.0054	0.0069
128	0.0120	0.0052	0.0068
129	0.0118	0.0051	0.0066
130	0.0116	0.0051	0.0065
131	0.0114	0.0050	0.0064
132	0.0112	0.0049	0.0063
133	0.0110	0.0048	0.0062
134	0.0108	0.0047	0.0061
135	0.0106	0.0046	0.0060
136	0.0104	0.0046	0.0059
137	0.0103	0.0045	0.0058
138	0.0101	0.0044	0.0057
139	0.0100	0.0044	0.0056
140	0.0098	0.0043	0.0055
141	0.0097	0.0042	0.0055
142	0.0096	0.0042	0.0054
143	0.0094	0.0041	0.0053
144	0.0093	0.0041	0.0053

Total soil rain loss = 1.27(In)
Total effective rainfall = 2.19(In)
Peak flow rate in flood hydrograph = 99.50(CFS)

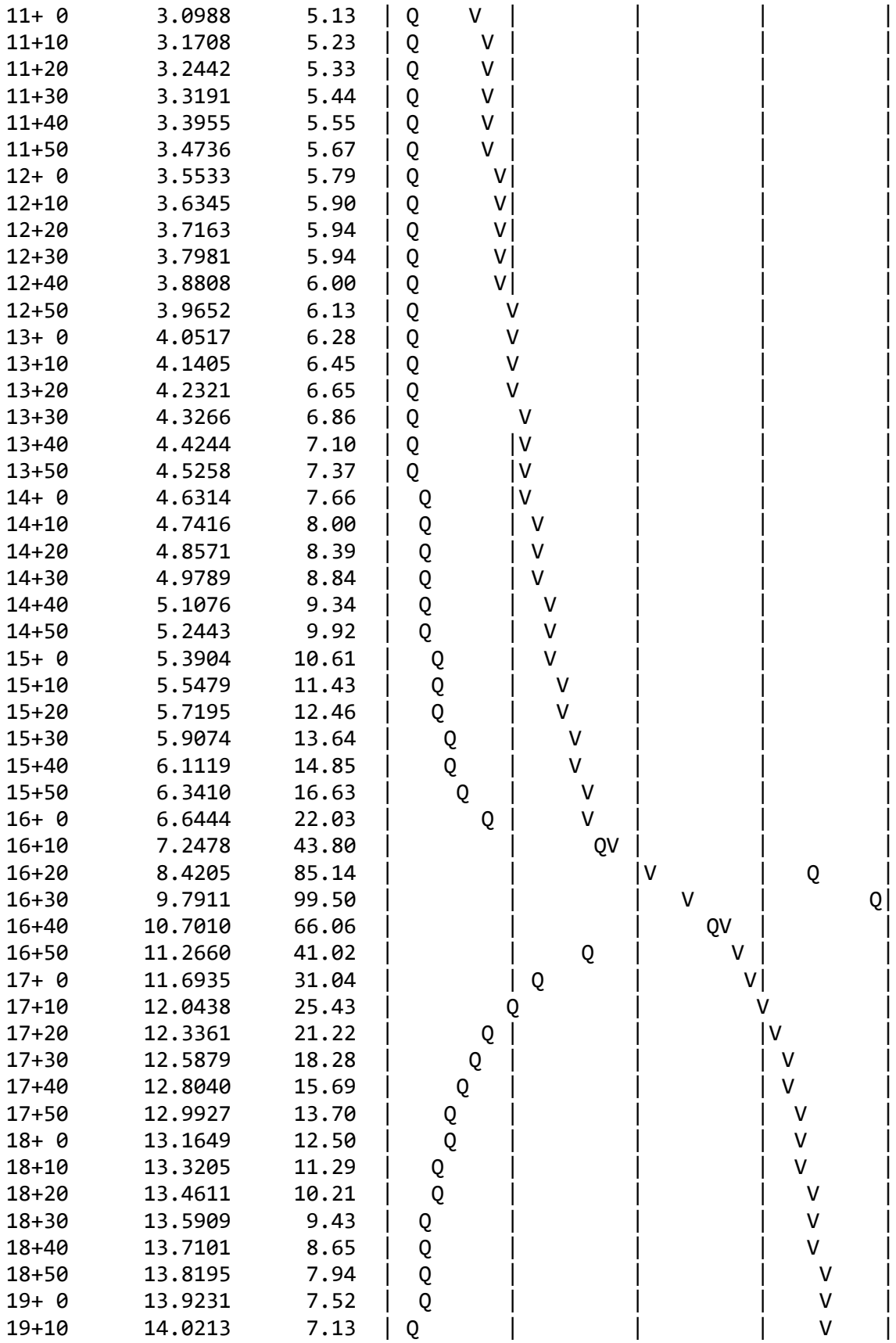
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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 10 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	25.0	50.0	75.0	100.0
0+10	0.0017	0.13	Q	|	|	|	|
0+20	0.0107	0.65	Q	|	|	|	|
0+30	0.0300	1.40	Q	|	|	|	|
0+40	0.0557	1.86	Q	|	|	|	|
0+50	0.0845	2.10	Q	|	|	|	|
1+ 0	0.1156	2.25	Q	|	|	|	|
1+10	0.1483	2.37	Q	|	|	|	|
1+20	0.1823	2.47	Q	|	|	|	|
1+30	0.2174	2.55	VQ	|	|	|	|
1+40	0.2535	2.62	VQ	|	|	|	|
1+50	0.2904	2.68	VQ	|	|	|	|
2+ 0	0.3280	2.73	VQ	|	|	|	|
2+10	0.3663	2.78	VQ	|	|	|	|
2+20	0.4052	2.82	Q	|	|	|	|
2+30	0.4446	2.86	|Q	|	|	|	|

2+40	0.4845	2.90	Q				
2+50	0.5250	2.93	Q				
3+ 0	0.5658	2.97	Q				
3+10	0.6071	3.00	Q				
3+20	0.6489	3.03	Q				
3+30	0.6910	3.05	Q				
3+40	0.7334	3.08	Q				
3+50	0.7761	3.10	Q				
4+ 0	0.8192	3.13	QV				
4+10	0.8626	3.15	QV				
4+20	0.9064	3.18	QV				
4+30	0.9506	3.21	QV				
4+40	0.9952	3.23	QV				
4+50	1.0401	3.26	QV				
5+ 0	1.0854	3.29	QV				
5+10	1.1311	3.32	QV				
5+20	1.1773	3.35	QV				
5+30	1.2238	3.38	Q V				
5+40	1.2708	3.41	Q V				
5+50	1.3183	3.44	Q V				
6+ 0	1.3662	3.48	Q V				
6+10	1.4145	3.51	Q V				
6+20	1.4634	3.55	Q V				
6+30	1.5127	3.58	Q V				
6+40	1.5625	3.62	Q V				
6+50	1.6129	3.66	Q V				
7+ 0	1.6638	3.69	Q V				
7+10	1.7152	3.73	Q V				
7+20	1.7672	3.77	Q V				
7+30	1.8198	3.82	Q V				
7+40	1.8729	3.86	Q V				
7+50	1.9267	3.90	Q V				
8+ 0	1.9811	3.95	Q V				
8+10	2.0362	4.00	Q V				
8+20	2.0919	4.05	Q V				
8+30	2.1484	4.10	Q V				
8+40	2.2056	4.15	Q V				
8+50	2.2635	4.20	Q V				
9+ 0	2.3222	4.26	Q V				
9+10	2.3816	4.32	Q V				
9+20	2.4420	4.38	Q V				
9+30	2.5031	4.44	Q V				
9+40	2.5652	4.51	Q V				
9+50	2.6282	4.57	Q V				
10+ 0	2.6922	4.64	Q V				
10+10	2.7572	4.72	Q V				
10+20	2.8232	4.79	Q V				
10+30	2.8903	4.87	Q V				
10+40	2.9586	4.96	Q V				
10+50	3.0280	5.04	Q V				



```
  19+20      14.1091      6.38  | Q       |         |         |    V    |
  19+30      14.1833      5.39  | Q       |         |         |     V   |
  19+40      14.2544      5.16  | Q       |         |         |     V   |
  19+50      14.3227      4.96  |Q        |         |         |     V   |
  20+ 0      14.3886      4.79  |Q        |         |         |     V   |
  20+10      14.4524      4.63  |Q        |         |         |     V   |
  20+20      14.5142      4.49  |Q        |         |         |     V   |
  20+30      14.5743      4.36  |Q        |         |         |      V  |
  20+40      14.6327      4.24  |Q        |         |         |      V  |
  20+50      14.6896      4.13  |Q        |         |         |      V  |
  21+ 0      14.7451      4.03  |Q        |         |         |      V  |
  21+10      14.7993      3.93  |Q        |         |         |      V  |
  21+20      14.8522      3.84  |Q        |         |         |      V  |
  21+30      14.9040      3.76  |Q        |         |         |      V  |
  21+40      14.9546      3.68  |Q        |         |         |       V |
  21+50      15.0042      3.60  |Q        |         |         |       V |
  22+ 0      15.0528      3.53  |Q        |         |         |       V |
  22+10      15.1004      3.46  |Q        |         |         |       V |
  22+20      15.1472      3.39  |Q        |         |         |       V |
  22+30      15.1930      3.33  |Q        |         |         |       V |
  22+40      15.2381      3.27  |Q        |         |         |       V |
  22+50      15.2824      3.22  |Q        |         |         |       V |
  23+ 0      15.3260      3.16  |Q        |         |         |        V|
  23+10      15.3688      3.11  |Q        |         |         |        V|
  23+20      15.4110      3.06  |Q        |         |         |        V|
  23+30      15.4525      3.01  |Q        |         |         |        V|
  23+40      15.4934      2.97  |Q        |         |         |        V|
  23+50      15.5337      2.93  |Q        |         |         |        V|
  24+ 0      15.5735      2.88  |Q        |         |         |        V|
  24+10      15.6109      2.72  |Q        |         |         |        V|
  24+20      15.6407      2.16  Q         |         |         |        V|
  24+30      15.6598      1.39  Q         |         |         |        V|
  24+40      15.6725      0.92  Q         |         |         |        V|
  24+50      15.6820      0.69  Q         |         |         |        V|
  25+ 0      15.6894      0.54  Q         |         |         |        V|
  25+10      15.6952      0.42  Q         |         |         |        V|
  25+20      15.6999      0.34  Q         |         |         |        V|
  25+30      15.7036      0.27  Q         |         |         |        V|
  25+40      15.7065      0.22  Q         |         |         |        V|
  25+50      15.7089      0.17  Q         |         |         |        V|
  26+ 0      15.7108      0.14  Q         |         |         |        V|
  26+10      15.7123      0.11  Q         |         |         |        V|
  26+20      15.7134      0.08  Q         |         |         |        V|
  26+30      15.7142      0.06  Q         |         |         |        V|
  26+40      15.7148      0.04  Q         |         |         |        V|
  26+50      15.7152      0.03  Q         |         |         |        V|
  27+ 0      15.7155      0.02  Q         |         |         |        V|
  27+10      15.7156      0.01  Q         |         |         |         V
-------------------------------------------------------------------------
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10 year
Onsite Developed

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 10/19/22

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

Program License Serial Number 4009

Cordova Complex Site
Unit Hydrogragh Method
Post-Development Condition
10-Year, 24-Hours Storm

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		
86.14	1	0.61
Rainfall data for year 10		
86.14	6	1.23
Rainfall data for year 10		
86.14	24	2.14

++

******** 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	86.14	1.000	0.978	0.100	0.098

Area-averaged adjusted loss rate Fm (In/Hr) = 0.098

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
8.61	0.100	32.0	32.0	10.70	0.000
77.53	0.900	98.0	98.0	0.20	0.894

Area-averaged catchment yield fraction, Y = 0.805
Area-averaged low loss fraction, Yb = 0.195
User entry of time of concentration = 0.316 (hours)
++
Watershed area = 86.14(Ac.)
Catchment Lag time = 0.253 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 32.9641
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.098(In/Hr)
Average low loss rate fraction (Yb) = 0.195 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.289(In)
Computed peak 30-minute rainfall = 0.495(In)
Specified peak 1-hour rainfall = 0.609(In)
Computed peak 3-hour rainfall = 0.937(In)
Specified peak 6-hour rainfall = 1.230(In)
Specified peak 24-hour rainfall = 2.140(In)

Rainfall depth area reduction factors:
Using a total area of 86.14(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.288(In)
30-minute factor = 0.996 Adjusted rainfall = 0.493(In)
1-hour factor = 0.996 Adjusted rainfall = 0.607(In)
3-hour factor = 0.999 Adjusted rainfall = 0.937(In)
6-hour factor = 1.000 Adjusted rainfall = 1.230(In)
24-hour factor = 1.000 Adjusted rainfall = 2.140(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 1041.76 (CFS))	
1	3.299	34.364
2	15.919	131.478
3	37.360	223.362
4	57.527	210.083
5	68.790	117.338
6	75.198	66.757
7	79.700	46.897
8	83.189	36.346
9	86.043	29.734
10	88.288	23.381
11	90.229	20.224
12	91.780	16.158
13	93.082	13.566
14	94.136	10.984
15	95.139	10.448
16	96.037	9.351
17	96.759	7.525
18	97.384	6.503
19	97.935	5.744
20	98.394	4.781
21	98.758	3.789
22	99.087	3.434
23	99.417	3.434
24	99.747	3.434
25	100.000	2.640

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2878	0.2878
2	0.3543	0.0665
3	0.4002	0.0458
4	0.4362	0.0361
5	0.4664	0.0302
6	0.4927	0.0262
7	0.5160	0.0233
8	0.5371	0.0211
9	0.5564	0.0193
10	0.5743	0.0179
11	0.5909	0.0167
12	0.6065	0.0156
13	0.6261	0.0195
14	0.6447	0.0186
15	0.6625	0.0178
16	0.6796	0.0171
17	0.6961	0.0165

18	0.7121	0.0159
19	0.7274	0.0154
20	0.7424	0.0149
21	0.7568	0.0145
22	0.7709	0.0141
23	0.7845	0.0137
24	0.7979	0.0133
25	0.8109	0.0130
26	0.8235	0.0127
27	0.8359	0.0124
28	0.8480	0.0121
29	0.8599	0.0119
30	0.8715	0.0116
31	0.8829	0.0114
32	0.8940	0.0112
33	0.9050	0.0109
34	0.9157	0.0107
35	0.9263	0.0106
36	0.9367	0.0104
37	0.9468	0.0101
38	0.9568	0.0100
39	0.9666	0.0098
40	0.9762	0.0097
41	0.9857	0.0095
42	0.9951	0.0094
43	1.0043	0.0092
44	1.0135	0.0091
45	1.0224	0.0090
46	1.0313	0.0089
47	1.0400	0.0087
48	1.0487	0.0086
49	1.0572	0.0085
50	1.0656	0.0084
51	1.0739	0.0083
52	1.0822	0.0082
53	1.0903	0.0081
54	1.0983	0.0080
55	1.1063	0.0079
56	1.1141	0.0079
57	1.1219	0.0078
58	1.1296	0.0077
59	1.1372	0.0076
60	1.1447	0.0075
61	1.1522	0.0075
62	1.1595	0.0074
63	1.1669	0.0073
64	1.1741	0.0072
65	1.1813	0.0072
66	1.1884	0.0071
67	1.1954	0.0070

68	1.2024	0.0070
69	1.2093	0.0069
70	1.2161	0.0069
71	1.2229	0.0068
72	1.2297	0.0067
73	1.2365	0.0068
74	1.2432	0.0067
75	1.2499	0.0067
76	1.2565	0.0066
77	1.2631	0.0066
78	1.2696	0.0065
79	1.2761	0.0065
80	1.2825	0.0064
81	1.2889	0.0064
82	1.2953	0.0063
83	1.3016	0.0063
84	1.3078	0.0062
85	1.3140	0.0062
86	1.3201	0.0062
87	1.3263	0.0061
88	1.3323	0.0061
89	1.3384	0.0060
90	1.3444	0.0060
91	1.3503	0.0059
92	1.3562	0.0059
93	1.3621	0.0059
94	1.3679	0.0058
95	1.3737	0.0058
96	1.3795	0.0058
97	1.3852	0.0057
98	1.3909	0.0057
99	1.3965	0.0057
100	1.4022	0.0056
101	1.4077	0.0056
102	1.4133	0.0056
103	1.4188	0.0055
104	1.4243	0.0055
105	1.4298	0.0055
106	1.4352	0.0054
107	1.4406	0.0054
108	1.4459	0.0054
109	1.4513	0.0053
110	1.4566	0.0053
111	1.4619	0.0053
112	1.4671	0.0052
113	1.4723	0.0052
114	1.4775	0.0052
115	1.4827	0.0052
116	1.4878	0.0051
117	1.4929	0.0051

118	1.4980	0.0051
119	1.5031	0.0051
120	1.5081	0.0050
121	1.5131	0.0050
122	1.5181	0.0050
123	1.5231	0.0050
124	1.5280	0.0049
125	1.5329	0.0049
126	1.5378	0.0049
127	1.5427	0.0049
128	1.5475	0.0048
129	1.5523	0.0048
130	1.5571	0.0048
131	1.5619	0.0048
132	1.5667	0.0048
133	1.5714	0.0047
134	1.5761	0.0047
135	1.5808	0.0047
136	1.5855	0.0047
137	1.5901	0.0046
138	1.5947	0.0046
139	1.5994	0.0046
140	1.6039	0.0046
141	1.6085	0.0046
142	1.6131	0.0045
143	1.6176	0.0045
144	1.6221	0.0045
145	1.6266	0.0045
146	1.6311	0.0045
147	1.6355	0.0045
148	1.6400	0.0044
149	1.6444	0.0044
150	1.6488	0.0044
151	1.6532	0.0044
152	1.6575	0.0044
153	1.6619	0.0043
154	1.6662	0.0043
155	1.6705	0.0043
156	1.6748	0.0043
157	1.6791	0.0043
158	1.6834	0.0043
159	1.6876	0.0042
160	1.6919	0.0042
161	1.6961	0.0042
162	1.7003	0.0042
163	1.7045	0.0042
164	1.7086	0.0042
165	1.7128	0.0042
166	1.7169	0.0041
167	1.7210	0.0041

168	1.7252	0.0041
169	1.7293	0.0041
170	1.7333	0.0041
171	1.7374	0.0041
172	1.7415	0.0041
173	1.7455	0.0040
174	1.7495	0.0040
175	1.7535	0.0040
176	1.7575	0.0040
177	1.7615	0.0040
178	1.7655	0.0040
179	1.7694	0.0040
180	1.7734	0.0039
181	1.7773	0.0039
182	1.7812	0.0039
183	1.7851	0.0039
184	1.7890	0.0039
185	1.7929	0.0039
186	1.7968	0.0039
187	1.8006	0.0039
188	1.8045	0.0038
189	1.8083	0.0038
190	1.8121	0.0038
191	1.8159	0.0038
192	1.8197	0.0038
193	1.8235	0.0038
194	1.8273	0.0038
195	1.8310	0.0038
196	1.8348	0.0037
197	1.8385	0.0037
198	1.8422	0.0037
199	1.8459	0.0037
200	1.8496	0.0037
201	1.8533	0.0037
202	1.8570	0.0037
203	1.8607	0.0037
204	1.8643	0.0037
205	1.8680	0.0036
206	1.8716	0.0036
207	1.8752	0.0036
208	1.8789	0.0036
209	1.8825	0.0036
210	1.8861	0.0036
211	1.8896	0.0036
212	1.8932	0.0036
213	1.8968	0.0036
214	1.9003	0.0036
215	1.9039	0.0035
216	1.9074	0.0035
217	1.9109	0.0035

218	1.9144	0.0035
219	1.9179	0.0035
220	1.9214	0.0035
221	1.9249	0.0035
222	1.9284	0.0035
223	1.9319	0.0035
224	1.9353	0.0035
225	1.9388	0.0034
226	1.9422	0.0034
227	1.9456	0.0034
228	1.9491	0.0034
229	1.9525	0.0034
230	1.9559	0.0034
231	1.9593	0.0034
232	1.9627	0.0034
233	1.9660	0.0034
234	1.9694	0.0034
235	1.9728	0.0034
236	1.9761	0.0034
237	1.9794	0.0033
238	1.9828	0.0033
239	1.9861	0.0033
240	1.9894	0.0033
241	1.9927	0.0033
242	1.9960	0.0033
243	1.9993	0.0033
244	2.0026	0.0033
245	2.0059	0.0033
246	2.0091	0.0033
247	2.0124	0.0033
248	2.0157	0.0033
249	2.0189	0.0032
250	2.0221	0.0032
251	2.0254	0.0032
252	2.0286	0.0032
253	2.0318	0.0032
254	2.0350	0.0032
255	2.0382	0.0032
256	2.0414	0.0032
257	2.0446	0.0032
258	2.0478	0.0032
259	2.0509	0.0032
260	2.0541	0.0032
261	2.0572	0.0032
262	2.0604	0.0031
263	2.0635	0.0031
264	2.0667	0.0031
265	2.0698	0.0031
266	2.0729	0.0031
267	2.0760	0.0031

268	2.0791	0.0031
269	2.0822	0.0031
270	2.0853	0.0031
271	2.0884	0.0031
272	2.0915	0.0031
273	2.0945	0.0031
274	2.0976	0.0031
275	2.1006	0.0031
276	2.1037	0.0030
277	2.1067	0.0030
278	2.1098	0.0030
279	2.1128	0.0030
280	2.1158	0.0030
281	2.1188	0.0030
282	2.1218	0.0030
283	2.1248	0.0030
284	2.1278	0.0030
285	2.1308	0.0030
286	2.1338	0.0030
287	2.1368	0.0030
288	2.1398	0.0030

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0030	0.0006	0.0024
2	0.0030	0.0006	0.0024
3	0.0030	0.0006	0.0024
4	0.0030	0.0006	0.0024
5	0.0030	0.0006	0.0024
6	0.0030	0.0006	0.0024
7	0.0030	0.0006	0.0024
8	0.0030	0.0006	0.0024
9	0.0030	0.0006	0.0025
10	0.0031	0.0006	0.0025
11	0.0031	0.0006	0.0025
12	0.0031	0.0006	0.0025
13	0.0031	0.0006	0.0025
14	0.0031	0.0006	0.0025
15	0.0031	0.0006	0.0025
16	0.0031	0.0006	0.0025
17	0.0031	0.0006	0.0025
18	0.0031	0.0006	0.0025
19	0.0032	0.0006	0.0025
20	0.0032	0.0006	0.0025
21	0.0032	0.0006	0.0026
22	0.0032	0.0006	0.0026
23	0.0032	0.0006	0.0026
24	0.0032	0.0006	0.0026

25	0.0032	0.0006	0.0026
26	0.0032	0.0006	0.0026
27	0.0032	0.0006	0.0026
28	0.0033	0.0006	0.0026
29	0.0033	0.0006	0.0026
30	0.0033	0.0006	0.0026
31	0.0033	0.0006	0.0026
32	0.0033	0.0006	0.0027
33	0.0033	0.0006	0.0027
34	0.0033	0.0006	0.0027
35	0.0033	0.0007	0.0027
36	0.0034	0.0007	0.0027
37	0.0034	0.0007	0.0027
38	0.0034	0.0007	0.0027
39	0.0034	0.0007	0.0027
40	0.0034	0.0007	0.0027
41	0.0034	0.0007	0.0028
42	0.0034	0.0007	0.0028
43	0.0034	0.0007	0.0028
44	0.0035	0.0007	0.0028
45	0.0035	0.0007	0.0028
46	0.0035	0.0007	0.0028
47	0.0035	0.0007	0.0028
48	0.0035	0.0007	0.0028
49	0.0035	0.0007	0.0028
50	0.0035	0.0007	0.0029
51	0.0036	0.0007	0.0029
52	0.0036	0.0007	0.0029
53	0.0036	0.0007	0.0029
54	0.0036	0.0007	0.0029
55	0.0036	0.0007	0.0029
56	0.0036	0.0007	0.0029
57	0.0037	0.0007	0.0029
58	0.0037	0.0007	0.0030
59	0.0037	0.0007	0.0030
60	0.0037	0.0007	0.0030
61	0.0037	0.0007	0.0030
62	0.0037	0.0007	0.0030
63	0.0038	0.0007	0.0030
64	0.0038	0.0007	0.0030
65	0.0038	0.0007	0.0031
66	0.0038	0.0007	0.0031
67	0.0038	0.0007	0.0031
68	0.0038	0.0008	0.0031
69	0.0039	0.0008	0.0031
70	0.0039	0.0008	0.0031
71	0.0039	0.0008	0.0031
72	0.0039	0.0008	0.0032
73	0.0039	0.0008	0.0032
74	0.0040	0.0008	0.0032

75	0.0040	0.0008	0.0032
76	0.0040	0.0008	0.0032
77	0.0040	0.0008	0.0032
78	0.0040	0.0008	0.0032
79	0.0041	0.0008	0.0033
80	0.0041	0.0008	0.0033
81	0.0041	0.0008	0.0033
82	0.0041	0.0008	0.0033
83	0.0042	0.0008	0.0033
84	0.0042	0.0008	0.0034
85	0.0042	0.0008	0.0034
86	0.0042	0.0008	0.0034
87	0.0042	0.0008	0.0034
88	0.0043	0.0008	0.0034
89	0.0043	0.0008	0.0035
90	0.0043	0.0008	0.0035
91	0.0043	0.0008	0.0035
92	0.0044	0.0009	0.0035
93	0.0044	0.0009	0.0035
94	0.0044	0.0009	0.0036
95	0.0045	0.0009	0.0036
96	0.0045	0.0009	0.0036
97	0.0045	0.0009	0.0036
98	0.0045	0.0009	0.0036
99	0.0046	0.0009	0.0037
100	0.0046	0.0009	0.0037
101	0.0046	0.0009	0.0037
102	0.0046	0.0009	0.0037
103	0.0047	0.0009	0.0038
104	0.0047	0.0009	0.0038
105	0.0048	0.0009	0.0038
106	0.0048	0.0009	0.0038
107	0.0048	0.0009	0.0039
108	0.0048	0.0009	0.0039
109	0.0049	0.0010	0.0039
110	0.0049	0.0010	0.0040
111	0.0050	0.0010	0.0040
112	0.0050	0.0010	0.0040
113	0.0050	0.0010	0.0041
114	0.0051	0.0010	0.0041
115	0.0051	0.0010	0.0041
116	0.0051	0.0010	0.0041
117	0.0052	0.0010	0.0042
118	0.0052	0.0010	0.0042
119	0.0053	0.0010	0.0042
120	0.0053	0.0010	0.0043
121	0.0054	0.0010	0.0043
122	0.0054	0.0011	0.0043
123	0.0055	0.0011	0.0044
124	0.0055	0.0011	0.0044

125	0.0056	0.0011	0.0045
126	0.0056	0.0011	0.0045
127	0.0057	0.0011	0.0045
128	0.0057	0.0011	0.0046
129	0.0058	0.0011	0.0046
130	0.0058	0.0011	0.0047
131	0.0059	0.0011	0.0047
132	0.0059	0.0012	0.0048
133	0.0060	0.0012	0.0048
134	0.0060	0.0012	0.0049
135	0.0061	0.0012	0.0049
136	0.0062	0.0012	0.0050
137	0.0062	0.0012	0.0050
138	0.0063	0.0012	0.0051
139	0.0064	0.0012	0.0051
140	0.0064	0.0013	0.0052
141	0.0065	0.0013	0.0053
142	0.0066	0.0013	0.0053
143	0.0067	0.0013	0.0054
144	0.0067	0.0013	0.0054
145	0.0067	0.0013	0.0054
146	0.0068	0.0013	0.0055
147	0.0069	0.0014	0.0056
148	0.0070	0.0014	0.0056
149	0.0071	0.0014	0.0057
150	0.0072	0.0014	0.0058
151	0.0073	0.0014	0.0059
152	0.0074	0.0014	0.0059
153	0.0075	0.0015	0.0061
154	0.0076	0.0015	0.0061
155	0.0078	0.0015	0.0063
156	0.0079	0.0015	0.0063
157	0.0080	0.0016	0.0065
158	0.0081	0.0016	0.0065
159	0.0083	0.0016	0.0067
160	0.0084	0.0016	0.0068
161	0.0086	0.0017	0.0069
162	0.0087	0.0017	0.0070
163	0.0090	0.0018	0.0072
164	0.0091	0.0018	0.0073
165	0.0094	0.0018	0.0075
166	0.0095	0.0019	0.0077
167	0.0098	0.0019	0.0079
168	0.0100	0.0019	0.0080
169	0.0104	0.0020	0.0084
170	0.0106	0.0021	0.0085
171	0.0109	0.0021	0.0088
172	0.0112	0.0022	0.0090
173	0.0116	0.0023	0.0093
174	0.0119	0.0023	0.0095

175	0.0124	0.0024	0.0100
176	0.0127	0.0025	0.0102
177	0.0133	0.0026	0.0107
178	0.0137	0.0027	0.0110
179	0.0145	0.0028	0.0116
180	0.0149	0.0029	0.0120
181	0.0159	0.0031	0.0128
182	0.0165	0.0032	0.0133
183	0.0178	0.0035	0.0144
184	0.0186	0.0036	0.0150
185	0.0156	0.0031	0.0126
186	0.0167	0.0033	0.0134
187	0.0193	0.0038	0.0155
188	0.0211	0.0041	0.0170
189	0.0262	0.0051	0.0211
190	0.0302	0.0059	0.0243
191	0.0458	0.0081	0.0377
192	0.0665	0.0081	0.0584
193	0.2878	0.0081	0.2797
194	0.0361	0.0070	0.0290
195	0.0233	0.0046	0.0188
196	0.0179	0.0035	0.0144
197	0.0195	0.0038	0.0157
198	0.0171	0.0033	0.0138
199	0.0154	0.0030	0.0124
200	0.0141	0.0027	0.0113
201	0.0130	0.0025	0.0104
202	0.0121	0.0024	0.0097
203	0.0114	0.0022	0.0092
204	0.0107	0.0021	0.0086
205	0.0101	0.0020	0.0082
206	0.0097	0.0019	0.0078
207	0.0092	0.0018	0.0074
208	0.0089	0.0017	0.0071
209	0.0085	0.0017	0.0069
210	0.0082	0.0016	0.0066
211	0.0079	0.0016	0.0064
212	0.0077	0.0015	0.0062
213	0.0075	0.0015	0.0060
214	0.0072	0.0014	0.0058
215	0.0070	0.0014	0.0057
216	0.0069	0.0013	0.0055
217	0.0068	0.0013	0.0055
218	0.0066	0.0013	0.0053
219	0.0065	0.0013	0.0052
220	0.0063	0.0012	0.0051
221	0.0062	0.0012	0.0050
222	0.0061	0.0012	0.0049
223	0.0059	0.0012	0.0048
224	0.0058	0.0011	0.0047

225	0.0057	0.0011	0.0046
226	0.0056	0.0011	0.0045
227	0.0055	0.0011	0.0044
228	0.0054	0.0011	0.0044
229	0.0053	0.0010	0.0043
230	0.0052	0.0010	0.0042
231	0.0052	0.0010	0.0042
232	0.0051	0.0010	0.0041
233	0.0050	0.0010	0.0040
234	0.0049	0.0010	0.0040
235	0.0049	0.0010	0.0039
236	0.0048	0.0009	0.0039
237	0.0047	0.0009	0.0038
238	0.0047	0.0009	0.0038
239	0.0046	0.0009	0.0037
240	0.0045	0.0009	0.0037
241	0.0045	0.0009	0.0036
242	0.0044	0.0009	0.0036
243	0.0044	0.0009	0.0035
244	0.0043	0.0008	0.0035
245	0.0043	0.0008	0.0034
246	0.0042	0.0008	0.0034
247	0.0042	0.0008	0.0034
248	0.0041	0.0008	0.0033
249	0.0041	0.0008	0.0033
250	0.0041	0.0008	0.0033
251	0.0040	0.0008	0.0032
252	0.0040	0.0008	0.0032
253	0.0039	0.0008	0.0032
254	0.0039	0.0008	0.0031
255	0.0039	0.0008	0.0031
256	0.0038	0.0007	0.0031
257	0.0038	0.0007	0.0030
258	0.0037	0.0007	0.0030
259	0.0037	0.0007	0.0030
260	0.0037	0.0007	0.0030
261	0.0036	0.0007	0.0029
262	0.0036	0.0007	0.0029
263	0.0036	0.0007	0.0029
264	0.0036	0.0007	0.0029
265	0.0035	0.0007	0.0028
266	0.0035	0.0007	0.0028
267	0.0035	0.0007	0.0028
268	0.0034	0.0007	0.0028
269	0.0034	0.0007	0.0027
270	0.0034	0.0007	0.0027
271	0.0034	0.0007	0.0027
272	0.0033	0.0007	0.0027
273	0.0033	0.0006	0.0027
274	0.0033	0.0006	0.0026

275	0.0033	0.0006	0.0026
276	0.0032	0.0006	0.0026
277	0.0032	0.0006	0.0026
278	0.0032	0.0006	0.0026
279	0.0032	0.0006	0.0025
280	0.0031	0.0006	0.0025
281	0.0031	0.0006	0.0025
282	0.0031	0.0006	0.0025
283	0.0031	0.0006	0.0025
284	0.0031	0.0006	0.0025
285	0.0030	0.0006	0.0024
286	0.0030	0.0006	0.0024
287	0.0030	0.0006	0.0024
288	0.0030	0.0006	0.0024

Total soil rain loss = 0.36(In)
Total effective rainfall = 1.78(In)
Peak flow rate in flood hydrograph = 89.13(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

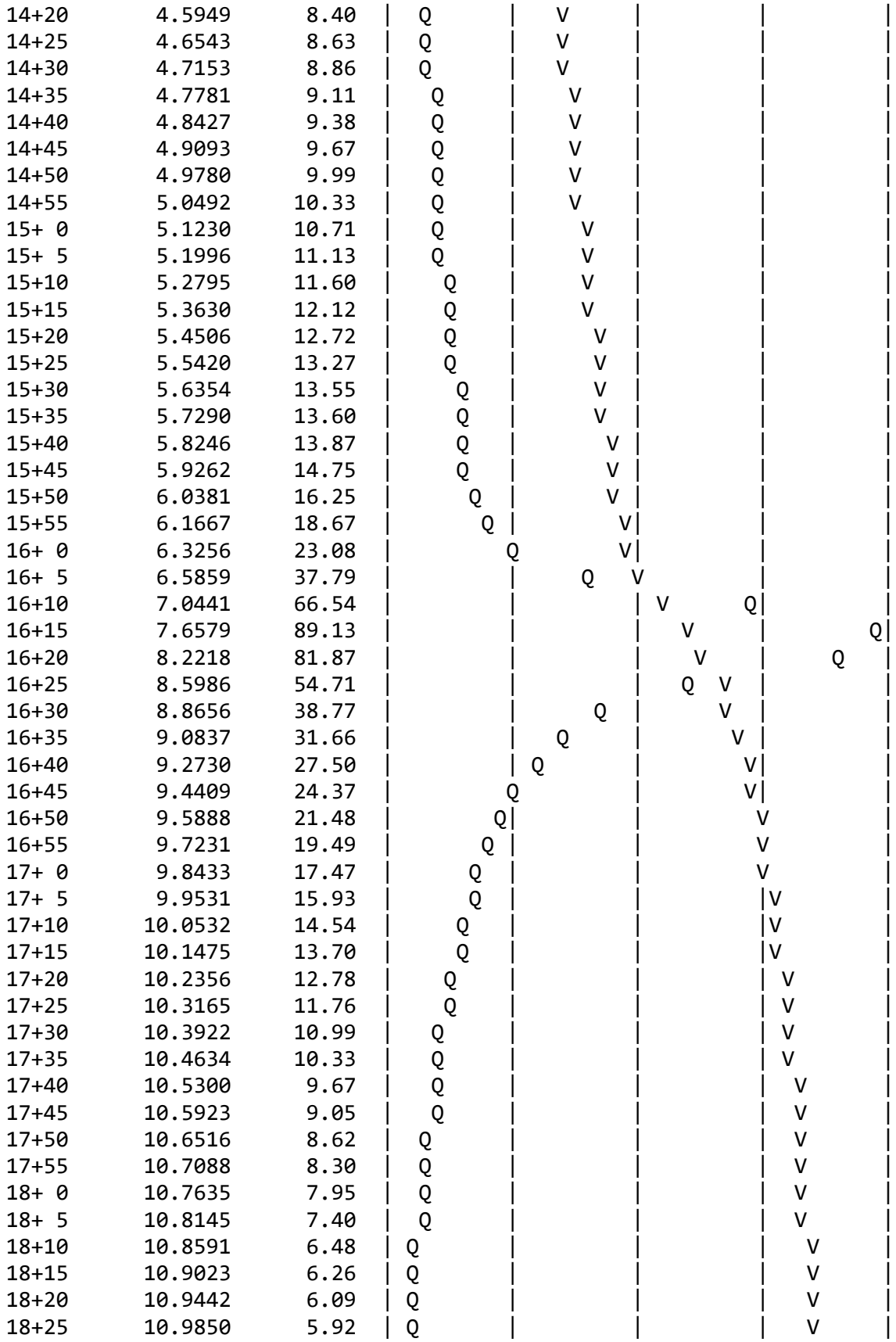
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0
0+ 5	0.0006	0.08	Q	|	|	|	|
0+10	0.0033	0.40	Q	|	|	|	|
0+15	0.0097	0.93	Q	|	|	|	|
0+20	0.0196	1.44	Q	|	|	|	|
0+25	0.0315	1.72	Q	|	|	|	|
0+30	0.0445	1.89	Q	|	|	|	|
0+35	0.0583	2.00	Q	|	|	|	|
0+40	0.0727	2.10	Q	|	|	|	|
0+45	0.0877	2.18	Q	|	|	|	|
0+50	0.1031	2.24	Q	|	|	|	|
0+55	0.1189	2.29	VQ	|	|	|	|
1+ 0	0.1350	2.34	VQ	|	|	|	|
1+ 5	0.1514	2.38	VQ	|	|	|	|
1+10	0.1681	2.41	VQ	|	|	|	|
1+15	0.1849	2.45	VQ	|	|	|	|
1+20	0.2020	2.48	VQ	|	|	|	|
1+25	0.2192	2.50	VQ	|	|	|	|
1+30	0.2367	2.53	VQ	|	|	|	|
1+35	0.2542	2.55	VQ	|	|	|	|
1+40	0.2719	2.57	VQ	|	|	|	|
1+45	0.2898	2.59	VQ	|	|	|	|

```
1+50       0.3077      2.61  VQ        |         |         |         |
1+55       0.3258      2.62  |Q        |         |         |         |
2+ 0       0.3439      2.64  |Q        |         |         |         |
2+ 5       0.3622      2.66  |Q        |         |         |         |
2+10       0.3806      2.66  |Q        |         |         |         |
2+15       0.3990      2.67  |Q        |         |         |         |
2+20       0.4175      2.68  |Q        |         |         |         |
2+25       0.4360      2.69  |Q        |         |         |         |
2+30       0.4546      2.70  |Q        |         |         |         |
2+35       0.4733      2.71  |Q        |         |         |         |
2+40       0.4921      2.72  |Q        |         |         |         |
2+45       0.5109      2.73  |Q        |         |         |         |
2+50       0.5298      2.74  |Q        |         |         |         |
2+55       0.5487      2.75  |Q        |         |         |         |
3+ 0       0.5678      2.76  |Q        |         |         |         |
3+ 5       0.5869      2.77  |Q        |         |         |         |
3+10       0.6060      2.78  |Q        |         |         |         |
3+15       0.6253      2.79  |Q        |         |         |         |
3+20       0.6446      2.80  |QV       |         |         |         |
3+25       0.6640      2.82  |QV       |         |         |         |
3+30       0.6835      2.83  |QV       |         |         |         |
3+35       0.7030      2.84  |QV       |         |         |         |
3+40       0.7226      2.85  |QV       |         |         |         |
3+45       0.7423      2.86  |QV       |         |         |         |
3+50       0.7621      2.87  |QV       |         |         |         |
3+55       0.7819      2.88  |QV       |         |         |         |
4+ 0       0.8019      2.89  |QV       |         |         |         |
4+ 5       0.8219      2.91  |QV       |         |         |         |
4+10       0.8420      2.92  |QV       |         |         |         |
4+15       0.8622      2.93  |QV       |         |         |         |
4+20       0.8824      2.94  |QV       |         |         |         |
4+25       0.9028      2.95  |QV       |         |         |         |
4+30       0.9232      2.97  |QV       |         |         |         |
4+35       0.9437      2.98  |QV       |         |         |         |
4+40       0.9643      2.99  |Q V      |         |         |         |
4+45       0.9850      3.00  |Q V      |         |         |         |
4+50       1.0058      3.02  |Q V      |         |         |         |
4+55       1.0266      3.03  |Q V      |         |         |         |
5+ 0       1.0476      3.04  |Q V      |         |         |         |
5+ 5       1.0687      3.06  |Q V      |         |         |         |
5+10       1.0898      3.07  |Q V      |         |         |         |
5+15       1.1110      3.08  |Q V      |         |         |         |
5+20       1.1324      3.10  |Q V      |         |         |         |
5+25       1.1538      3.11  |Q V      |         |         |         |
5+30       1.1754      3.13  |Q V      |         |         |         |
5+35       1.1970      3.14  |Q V      |         |         |         |
5+40       1.2187      3.16  |Q V      |         |         |         |
5+45       1.2405      3.17  |Q V      |         |         |         |
5+50       1.2625      3.19  |Q V      |         |         |         |
5+55       1.2845      3.20  |Q  V     |         |         |         |
```

6+ 0	1.3067	3.22	|Q V	|	|	|	|
6+ 5	1.3289	3.23	|Q V	|	|	|	|
6+10	1.3513	3.25	|Q V	|	|	|	|
6+15	1.3738	3.26	|Q V	|	|	|	|
6+20	1.3963	3.28	|Q V	|	|	|	|
6+25	1.4190	3.30	|Q V	|	|	|	|
6+30	1.4418	3.31	|Q V	|	|	|	|
6+35	1.4648	3.33	|Q V	|	|	|	|
6+40	1.4878	3.35	|Q V	|	|	|	|
6+45	1.5110	3.36	|Q V	|	|	|	|
6+50	1.5342	3.38	|Q V	|	|	|	|
6+55	1.5576	3.40	|Q V	|	|	|	|
7+ 0	1.5812	3.42	|Q V	|	|	|	|
7+ 5	1.6048	3.43	|Q V	|	|	|	|
7+10	1.6286	3.45	|Q V	|	|	|	|
7+15	1.6525	3.47	|Q V	|	|	|	|
7+20	1.6766	3.49	|Q V	|	|	|	|
7+25	1.7007	3.51	|Q V	|	|	|	|
7+30	1.7250	3.53	|Q V	|	|	|	|
7+35	1.7495	3.55	|Q V	|	|	|	|
7+40	1.7741	3.57	|Q V	|	|	|	|
7+45	1.7988	3.59	|Q V	|	|	|	|
7+50	1.8237	3.61	|Q V	|	|	|	|
7+55	1.8487	3.63	|Q V	|	|	|	|
8+ 0	1.8739	3.65	|Q V	|	|	|	|
8+ 5	1.8992	3.68	|Q V	|	|	|	|
8+10	1.9246	3.70	|Q V	|	|	|	|
8+15	1.9503	3.72	|Q V	|	|	|	|
8+20	1.9760	3.74	|Q V	|	|	|	|
8+25	2.0020	3.77	|Q V	|	|	|	|
8+30	2.0281	3.79	|Q V	|	|	|	|
8+35	2.0544	3.81	|Q V	|	|	|	|
8+40	2.0808	3.84	|Q V	|	|	|	|
8+45	2.1074	3.86	|Q V	|	|	|	|
8+50	2.1342	3.89	|Q V	|	|	|	|
8+55	2.1612	3.92	|Q V	|	|	|	|
9+ 0	2.1883	3.94	|Q V	|	|	|	|
9+ 5	2.2157	3.97	|Q V	|	|	|	|
9+10	2.2432	4.00	|Q V	|	|	|	|
9+15	2.2709	4.02	|Q V	|	|	|	|
9+20	2.2988	4.05	|Q V	|	|	|	|
9+25	2.3269	4.08	|Q V	|	|	|	|
9+30	2.3552	4.11	|Q V	|	|	|	|
9+35	2.3837	4.14	|Q V	|	|	|	|
9+40	2.4124	4.17	|Q V	|	|	|	|
9+45	2.4414	4.20	|Q V	|	|	|	|
9+50	2.4705	4.23	|Q V	|	|	|	|
9+55	2.4999	4.27	|Q V	|	|	|	|
10+ 0	2.5295	4.30	|Q V	|	|	|	|
10+ 5	2.5594	4.33	|Q V	|	|	|	|

10+10	2.5895	4.37	Q V				
10+15	2.6198	4.40	Q V				
10+20	2.6504	4.44	Q V				
10+25	2.6812	4.48	Q V				
10+30	2.7123	4.51	Q V				
10+35	2.7436	4.55	Q V				
10+40	2.7753	4.59	Q V				
10+45	2.8072	4.63	Q V				
10+50	2.8394	4.67	Q V				
10+55	2.8718	4.72	Q V				
11+ 0	2.9046	4.76	Q V				
11+ 5	2.9377	4.80	Q V				
11+10	2.9711	4.85	Q V				
11+15	3.0048	4.90	Q V				
11+20	3.0389	4.94	Q V				
11+25	3.0733	4.99	Q V				
11+30	3.1080	5.04	Q V				
11+35	3.1431	5.10	Q V				
11+40	3.1786	5.15	Q V				
11+45	3.2145	5.21	Q V				
11+50	3.2507	5.26	Q V				
11+55	3.2873	5.32	Q V				
12+ 0	3.3244	5.38	Q V				
12+ 5	3.3619	5.44	Q V				
12+10	3.3997	5.49	Q V				
12+15	3.4378	5.54	Q V				
12+20	3.4762	5.58	Q V				
12+25	3.5151	5.64	Q V				
12+30	3.5544	5.71	Q V				
12+35	3.5942	5.78	Q V				
12+40	3.6345	5.85	Q V				
12+45	3.6754	5.93	Q V				
12+50	3.7168	6.01	Q V				
12+55	3.7588	6.10	Q V				
13+ 0	3.8014	6.19	Q V				
13+ 5	3.8446	6.28	Q V				
13+10	3.8885	6.37	Q V				
13+15	3.9331	6.48	Q V				
13+20	3.9784	6.58	Q V				
13+25	4.0245	6.69	Q V				
13+30	4.0714	6.81	Q V				
13+35	4.1191	6.93	Q V				
13+40	4.1677	7.06	Q V				
13+45	4.2172	7.19	Q V				
13+50	4.2677	7.33	Q V				
13+55	4.3192	7.48	Q V				
14+ 0	4.3718	7.64	Q V				
14+ 5	4.4256	7.80	Q V				
14+10	4.4806	7.99	Q V				
14+15	4.5370	8.19	Q V				



```
18+30      11.0246      5.76  | Q       |         |         |   V     |
18+35      11.0633      5.61  | Q       |         |         |   V     |
18+40      11.1010      5.47  | Q       |         |         |   V     |
18+45      11.1378      5.34  | Q       |         |         |   V     |
18+50      11.1737      5.22  | Q       |         |         |    V    |
18+55      11.2089      5.11  | Q       |         |         |    V    |
19+ 0      11.2434      5.00  | Q       |         |         |    V    |
19+ 5      11.2772      4.90  | Q       |         |         |    V    |
19+10      11.3103      4.81  | Q       |         |         |    V    |
19+15      11.3428      4.72  | Q       |         |         |    V    |
19+20      11.3748      4.64  | Q       |         |         |    V    |
19+25      11.4061      4.55  | Q       |         |         |    V    |
19+30      11.4370      4.48  |Q        |         |         |    V    |
19+35      11.4673      4.40  |Q        |         |         |     V   |
19+40      11.4971      4.33  |Q        |         |         |     V   |
19+45      11.5265      4.27  |Q        |         |         |     V   |
19+50      11.5554      4.20  |Q        |         |         |     V   |
19+55      11.5839      4.14  |Q        |         |         |     V   |
20+ 0      11.6120      4.08  |Q        |         |         |     V   |
20+ 5      11.6397      4.02  |Q        |         |         |     V   |
20+10      11.6670      3.97  |Q        |         |         |     V   |
20+15      11.6940      3.91  |Q        |         |         |     V   |
20+20      11.7205      3.86  |Q        |         |         |     V   |
20+25      11.7468      3.81  |Q        |         |         |     V   |
20+30      11.7727      3.76  |Q        |         |         |     V   |
20+35      11.7983      3.72  |Q        |         |         |      V  |
20+40      11.8236      3.67  |Q        |         |         |      V  |
20+45      11.8485      3.63  |Q        |         |         |      V  |
20+50      11.8732      3.59  |Q        |         |         |      V  |
20+55      11.8976      3.54  |Q        |         |         |      V  |
21+ 0      11.9218      3.50  |Q        |         |         |      V  |
21+ 5      11.9457      3.47  |Q        |         |         |      V  |
21+10      11.9693      3.43  |Q        |         |         |      V  |
21+15      11.9926      3.39  |Q        |         |         |      V  |
21+20      12.0158      3.36  |Q        |         |         |      V  |
21+25      12.0386      3.32  |Q        |         |         |      V  |
21+30      12.0613      3.29  |Q        |         |         |      V  |
21+35      12.0837      3.26  |Q        |         |         |      V  |
21+40      12.1059      3.23  |Q        |         |         |       V |
21+45      12.1279      3.19  |Q        |         |         |       V |
21+50      12.1497      3.16  |Q        |         |         |       V |
21+55      12.1713      3.14  |Q        |         |         |       V |
22+ 0      12.1927      3.11  |Q        |         |         |       V |
22+ 5      12.2139      3.08  |Q        |         |         |       V |
22+10      12.2349      3.05  |Q        |         |         |       V |
22+15      12.2558      3.02  |Q        |         |         |       V |
22+20      12.2764      3.00  |Q        |         |         |       V |
22+25      12.2969      2.97  |Q        |         |         |       V |
22+30      12.3172      2.95  |Q        |         |         |       V |
22+35      12.3374      2.92  |Q        |         |         |       V |
```

```
  22+40      12.3573      2.90  |Q        |         |         |        V |
  22+45      12.3771      2.88  |Q        |         |         |        V |
  22+50      12.3968      2.85  |Q        |         |         |        V |
  22+55      12.4163      2.83  |Q        |         |         |        V |
  23+ 0      12.4357      2.81  |Q        |         |         |         V|
  23+ 5      12.4549      2.79  |Q        |         |         |         V|
  23+10      12.4739      2.77  |Q        |         |         |         V|
  23+15      12.4929      2.75  |Q        |         |         |         V|
  23+20      12.5117      2.73  |Q        |         |         |         V|
  23+25      12.5303      2.71  |Q        |         |         |         V|
  23+30      12.5488      2.69  |Q        |         |         |         V|
  23+35      12.5672      2.67  |Q        |         |         |         V|
  23+40      12.5855      2.65  |Q        |         |         |         V|
  23+45      12.6036      2.63  |Q        |         |         |         V|
  23+50      12.6216      2.61  |Q        |         |         |         V|
  23+55      12.6395      2.60  |Q        |         |         |         V|
  24+ 0      12.6573      2.58  |Q        |         |         |         V|
  24+ 5      12.6743      2.48  |Q        |         |         |         V|
  24+10      12.6891      2.15  Q         |         |         |         V|
  24+15      12.7002      1.60  Q         |         |         |         V|
  24+20      12.7077      1.09  Q         |         |         |         V|
  24+25      12.7133      0.80  Q         |         |         |         V|
  24+30      12.7177      0.64  Q         |         |         |         V|
  24+35      12.7213      0.52  Q         |         |         |         V|
  24+40      12.7243      0.43  Q         |         |         |         V|
  24+45      12.7267      0.36  Q         |         |         |         V|
  24+50      12.7288      0.30  Q         |         |         |         V|
  24+55      12.7306      0.25  Q         |         |         |         V|
  25+ 0      12.7320      0.21  Q         |         |         |         V|
  25+ 5      12.7332      0.18  Q         |         |         |         V|
  25+10      12.7343      0.15  Q         |         |         |         V|
  25+15      12.7351      0.12  Q         |         |         |         V|
  25+20      12.7358      0.10  Q         |         |         |         V|
  25+25      12.7364      0.08  Q         |         |         |         V|
  25+30      12.7368      0.07  Q         |         |         |         V|
  25+35      12.7372      0.05  Q         |         |         |         V|
  25+40      12.7375      0.04  Q         |         |         |         V|
  25+45      12.7377      0.03  Q         |         |         |         V|
  25+50      12.7379      0.02  Q         |         |         |         V|
  25+55      12.7380      0.01  Q         |         |         |         V|
  26+ 0      12.7380      0.01  Q         |         |         |          V
-------------------------------------------------------------------------
```

100 year
Onsite Developed

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

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004, Version 7.0

Study date 10/24/22

++

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

Program License Serial Number 4009

Cordova Complex Site
Unit Hydrogragh Method
Post-Development Condition
100-year, 24-hours Storm

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		
86.14	1	1.08
Rainfall data for year 100		
86.14	6	2.03
Rainfall data for year 100		
86.14	24	3.46

++

******** 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	86.14	1.000	0.785	0.100	0.079

Area-averaged adjusted loss rate Fm (In/Hr) = 0.079

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
8.61	0.100	32.0	52.0	9.23	0.069
77.53	0.900	98.0	98.0	0.20	0.933

Area-averaged catchment yield fraction, Y = 0.846
Area-averaged low loss fraction, Yb = 0.154
User entry of time of concentration = 0.316 (hours)
++
Watershed area = 86.14(Ac.)
Catchment Lag time = 0.253 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 32.9641
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.079(In/Hr)
Average low loss rate fraction (Yb) = 0.154 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.512(In)
Computed peak 30-minute rainfall = 0.877(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.590(In)
Specified peak 6-hour rainfall = 2.030(In)
Specified peak 24-hour rainfall = 3.460(In)

Rainfall depth area reduction factors:
Using a total area of 86.14(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.510(In)
30-minute factor = 0.996 Adjusted rainfall = 0.874(In)
1-hour factor = 0.996 Adjusted rainfall = 1.076(In)
3-hour factor = 0.999 Adjusted rainfall = 1.589(In)
6-hour factor = 1.000 Adjusted rainfall = 2.029(In)
24-hour factor = 1.000 Adjusted rainfall = 3.460(In)

U n i t H y d r o g r a p h
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Interval Number	'S' Graph Mean values	Unit Hydrograph ((CFS))
	(K = 1041.76 (CFS))	
1	3.299	34.364
2	15.919	131.478
3	37.360	223.362
4	57.527	210.083
5	68.790	117.338
6	75.198	66.757
7	79.700	46.897
8	83.189	36.346
9	86.043	29.734
10	88.288	23.381
11	90.229	20.224
12	91.780	16.158
13	93.082	13.566
14	94.136	10.984
15	95.139	10.448
16	96.037	9.351
17	96.759	7.525
18	97.384	6.503
19	97.935	5.744
20	98.394	4.781
21	98.758	3.789
22	99.087	3.434
23	99.417	3.434
24	99.747	3.434
25	100.000	2.640

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.5104	0.5104
2	0.6284	0.1180
3	0.7097	0.0813
4	0.7736	0.0640
5	0.8272	0.0536
6	0.8737	0.0465
7	0.9150	0.0414
8	0.9524	0.0374
9	0.9867	0.0343
10	1.0184	0.0317
11	1.0479	0.0295
12	1.0756	0.0277
13	1.1067	0.0310
14	1.1362	0.0295
15	1.1644	0.0282
16	1.1914	0.0270
17	1.2174	0.0260

18	1.2424	0.0250
19	1.2665	0.0241
20	1.2898	0.0233
21	1.3123	0.0226
22	1.3342	0.0219
23	1.3555	0.0212
24	1.3761	0.0207
25	1.3962	0.0201
26	1.4158	0.0196
27	1.4350	0.0191
28	1.4536	0.0187
29	1.4719	0.0182
30	1.4897	0.0178
31	1.5072	0.0175
32	1.5243	0.0171
33	1.5411	0.0168
34	1.5575	0.0164
35	1.5736	0.0161
36	1.5895	0.0158
37	1.6049	0.0154
38	1.6200	0.0152
39	1.6349	0.0149
40	1.6496	0.0147
41	1.6640	0.0144
42	1.6782	0.0142
43	1.6922	0.0140
44	1.7060	0.0138
45	1.7195	0.0136
46	1.7329	0.0134
47	1.7461	0.0132
48	1.7591	0.0130
49	1.7720	0.0128
50	1.7846	0.0127
51	1.7971	0.0125
52	1.8095	0.0123
53	1.8217	0.0122
54	1.8337	0.0120
55	1.8456	0.0119
56	1.8574	0.0118
57	1.8690	0.0116
58	1.8805	0.0115
59	1.8919	0.0114
60	1.9031	0.0112
61	1.9142	0.0111
62	1.9252	0.0110
63	1.9361	0.0109
64	1.9469	0.0108
65	1.9576	0.0107
66	1.9681	0.0106
67	1.9786	0.0105

68	1.9890	0.0104
69	1.9992	0.0103
70	2.0094	0.0102
71	2.0195	0.0101
72	2.0295	0.0100
73	2.0403	0.0108
74	2.0510	0.0107
75	2.0616	0.0106
76	2.0721	0.0105
77	2.0826	0.0104
78	2.0929	0.0104
79	2.1032	0.0103
80	2.1134	0.0102
81	2.1235	0.0101
82	2.1336	0.0100
83	2.1436	0.0100
84	2.1535	0.0099
85	2.1633	0.0098
86	2.1730	0.0098
87	2.1827	0.0097
88	2.1924	0.0096
89	2.2019	0.0096
90	2.2114	0.0095
91	2.2208	0.0094
92	2.2302	0.0094
93	2.2395	0.0093
94	2.2487	0.0092
95	2.2579	0.0092
96	2.2670	0.0091
97	2.2761	0.0091
98	2.2851	0.0090
99	2.2940	0.0089
100	2.3029	0.0089
101	2.3117	0.0088
102	2.3205	0.0088
103	2.3292	0.0087
104	2.3379	0.0087
105	2.3465	0.0086
106	2.3551	0.0086
107	2.3636	0.0085
108	2.3721	0.0085
109	2.3805	0.0084
110	2.3889	0.0084
111	2.3972	0.0083
112	2.4055	0.0083
113	2.4138	0.0082
114	2.4220	0.0082
115	2.4301	0.0082
116	2.4382	0.0081
117	2.4463	0.0081

118	2.4543	0.0080
119	2.4623	0.0080
120	2.4702	0.0079
121	2.4781	0.0079
122	2.4860	0.0079
123	2.4938	0.0078
124	2.5016	0.0078
125	2.5093	0.0077
126	2.5170	0.0077
127	2.5247	0.0077
128	2.5323	0.0076
129	2.5399	0.0076
130	2.5475	0.0076
131	2.5550	0.0075
132	2.5625	0.0075
133	2.5700	0.0075
134	2.5774	0.0074
135	2.5848	0.0074
136	2.5921	0.0074
137	2.5994	0.0073
138	2.6067	0.0073
139	2.6140	0.0073
140	2.6212	0.0072
141	2.6284	0.0072
142	2.6355	0.0072
143	2.6427	0.0071
144	2.6497	0.0071
145	2.6568	0.0071
146	2.6638	0.0070
147	2.6709	0.0070
148	2.6778	0.0070
149	2.6848	0.0069
150	2.6917	0.0069
151	2.6986	0.0069
152	2.7054	0.0069
153	2.7123	0.0068
154	2.7191	0.0068
155	2.7259	0.0068
156	2.7326	0.0068
157	2.7393	0.0067
158	2.7460	0.0067
159	2.7527	0.0067
160	2.7594	0.0066
161	2.7660	0.0066
162	2.7726	0.0066
163	2.7792	0.0066
164	2.7857	0.0065
165	2.7922	0.0065
166	2.7987	0.0065
167	2.8052	0.0065

168	2.8117	0.0065
169	2.8181	0.0064
170	2.8245	0.0064
171	2.8309	0.0064
172	2.8372	0.0064
173	2.8436	0.0063
174	2.8499	0.0063
175	2.8562	0.0063
176	2.8624	0.0063
177	2.8687	0.0062
178	2.8749	0.0062
179	2.8811	0.0062
180	2.8873	0.0062
181	2.8935	0.0062
182	2.8996	0.0061
183	2.9057	0.0061
184	2.9118	0.0061
185	2.9179	0.0061
186	2.9240	0.0061
187	2.9300	0.0060
188	2.9360	0.0060
189	2.9420	0.0060
190	2.9480	0.0060
191	2.9540	0.0060
192	2.9599	0.0059
193	2.9658	0.0059
194	2.9717	0.0059
195	2.9776	0.0059
196	2.9835	0.0059
197	2.9893	0.0058
198	2.9951	0.0058
199	3.0010	0.0058
200	3.0068	0.0058
201	3.0125	0.0058
202	3.0183	0.0058
203	3.0240	0.0057
204	3.0297	0.0057
205	3.0355	0.0057
206	3.0411	0.0057
207	3.0468	0.0057
208	3.0525	0.0057
209	3.0581	0.0056
210	3.0637	0.0056
211	3.0693	0.0056
212	3.0749	0.0056
213	3.0805	0.0056
214	3.0861	0.0056
215	3.0916	0.0055
216	3.0971	0.0055
217	3.1026	0.0055

218	3.1081	0.0055
219	3.1136	0.0055
220	3.1191	0.0055
221	3.1245	0.0054
222	3.1299	0.0054
223	3.1354	0.0054
224	3.1408	0.0054
225	3.1461	0.0054
226	3.1515	0.0054
227	3.1569	0.0054
228	3.1622	0.0053
229	3.1676	0.0053
230	3.1729	0.0053
231	3.1782	0.0053
232	3.1835	0.0053
233	3.1887	0.0053
234	3.1940	0.0053
235	3.1992	0.0052
236	3.2045	0.0052
237	3.2097	0.0052
238	3.2149	0.0052
239	3.2201	0.0052
240	3.2252	0.0052
241	3.2304	0.0052
242	3.2356	0.0052
243	3.2407	0.0051
244	3.2458	0.0051
245	3.2509	0.0051
246	3.2560	0.0051
247	3.2611	0.0051
248	3.2662	0.0051
249	3.2713	0.0051
250	3.2763	0.0050
251	3.2813	0.0050
252	3.2864	0.0050
253	3.2914	0.0050
254	3.2964	0.0050
255	3.3014	0.0050
256	3.3063	0.0050
257	3.3113	0.0050
258	3.3163	0.0050
259	3.3212	0.0049
260	3.3261	0.0049
261	3.3310	0.0049
262	3.3359	0.0049
263	3.3408	0.0049
264	3.3457	0.0049
265	3.3506	0.0049
266	3.3555	0.0049
267	3.3603	0.0048

268	3.3651	0.0048
269	3.3700	0.0048
270	3.3748	0.0048
271	3.3796	0.0048
272	3.3844	0.0048
273	3.3892	0.0048
274	3.3939	0.0048
275	3.3987	0.0048
276	3.4034	0.0047
277	3.4082	0.0047
278	3.4129	0.0047
279	3.4176	0.0047
280	3.4223	0.0047
281	3.4270	0.0047
282	3.4317	0.0047
283	3.4364	0.0047
284	3.4411	0.0047
285	3.4457	0.0047
286	3.4504	0.0046
287	3.4550	0.0046
288	3.4596	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0007	0.0039
2	0.0046	0.0007	0.0039
3	0.0047	0.0007	0.0039
4	0.0047	0.0007	0.0039
5	0.0047	0.0007	0.0040
6	0.0047	0.0007	0.0040
7	0.0047	0.0007	0.0040
8	0.0047	0.0007	0.0040
9	0.0047	0.0007	0.0040
10	0.0048	0.0007	0.0040
11	0.0048	0.0007	0.0040
12	0.0048	0.0007	0.0041
13	0.0048	0.0007	0.0041
14	0.0048	0.0007	0.0041
15	0.0048	0.0007	0.0041
16	0.0049	0.0007	0.0041
17	0.0049	0.0008	0.0041
18	0.0049	0.0008	0.0041
19	0.0049	0.0008	0.0042
20	0.0049	0.0008	0.0042
21	0.0050	0.0008	0.0042
22	0.0050	0.0008	0.0042
23	0.0050	0.0008	0.0042
24	0.0050	0.0008	0.0042

25	0.0050	0.0008	0.0043
26	0.0050	0.0008	0.0043
27	0.0051	0.0008	0.0043
28	0.0051	0.0008	0.0043
29	0.0051	0.0008	0.0043
30	0.0051	0.0008	0.0043
31	0.0051	0.0008	0.0043
32	0.0052	0.0008	0.0044
33	0.0052	0.0008	0.0044
34	0.0052	0.0008	0.0044
35	0.0052	0.0008	0.0044
36	0.0052	0.0008	0.0044
37	0.0053	0.0008	0.0045
38	0.0053	0.0008	0.0045
39	0.0053	0.0008	0.0045
40	0.0053	0.0008	0.0045
41	0.0053	0.0008	0.0045
42	0.0054	0.0008	0.0045
43	0.0054	0.0008	0.0046
44	0.0054	0.0008	0.0046
45	0.0054	0.0008	0.0046
46	0.0054	0.0008	0.0046
47	0.0055	0.0008	0.0046
48	0.0055	0.0008	0.0046
49	0.0055	0.0008	0.0047
50	0.0055	0.0009	0.0047
51	0.0056	0.0009	0.0047
52	0.0056	0.0009	0.0047
53	0.0056	0.0009	0.0048
54	0.0056	0.0009	0.0048
55	0.0057	0.0009	0.0048
56	0.0057	0.0009	0.0048
57	0.0057	0.0009	0.0048
58	0.0057	0.0009	0.0049
59	0.0058	0.0009	0.0049
60	0.0058	0.0009	0.0049
61	0.0058	0.0009	0.0049
62	0.0058	0.0009	0.0049
63	0.0059	0.0009	0.0050
64	0.0059	0.0009	0.0050
65	0.0059	0.0009	0.0050
66	0.0060	0.0009	0.0050
67	0.0060	0.0009	0.0051
68	0.0060	0.0009	0.0051
69	0.0061	0.0009	0.0051
70	0.0061	0.0009	0.0051
71	0.0061	0.0009	0.0052
72	0.0061	0.0009	0.0052
73	0.0062	0.0010	0.0052
74	0.0062	0.0010	0.0052

75	0.0062	0.0010	0.0053
76	0.0063	0.0010	0.0053
77	0.0063	0.0010	0.0053
78	0.0063	0.0010	0.0054
79	0.0064	0.0010	0.0054
80	0.0064	0.0010	0.0054
81	0.0065	0.0010	0.0055
82	0.0065	0.0010	0.0055
83	0.0065	0.0010	0.0055
84	0.0065	0.0010	0.0055
85	0.0066	0.0010	0.0056
86	0.0066	0.0010	0.0056
87	0.0067	0.0010	0.0056
88	0.0067	0.0010	0.0057
89	0.0068	0.0010	0.0057
90	0.0068	0.0010	0.0057
91	0.0068	0.0011	0.0058
92	0.0069	0.0011	0.0058
93	0.0069	0.0011	0.0059
94	0.0069	0.0011	0.0059
95	0.0070	0.0011	0.0059
96	0.0070	0.0011	0.0060
97	0.0071	0.0011	0.0060
98	0.0071	0.0011	0.0060
99	0.0072	0.0011	0.0061
100	0.0072	0.0011	0.0061
101	0.0073	0.0011	0.0062
102	0.0073	0.0011	0.0062
103	0.0074	0.0011	0.0062
104	0.0074	0.0011	0.0063
105	0.0075	0.0012	0.0063
106	0.0075	0.0012	0.0064
107	0.0076	0.0012	0.0064
108	0.0076	0.0012	0.0065
109	0.0077	0.0012	0.0065
110	0.0077	0.0012	0.0066
111	0.0078	0.0012	0.0066
112	0.0079	0.0012	0.0067
113	0.0079	0.0012	0.0067
114	0.0080	0.0012	0.0068
115	0.0081	0.0012	0.0068
116	0.0081	0.0012	0.0069
117	0.0082	0.0013	0.0069
118	0.0082	0.0013	0.0070
119	0.0083	0.0013	0.0071
120	0.0084	0.0013	0.0071
121	0.0085	0.0013	0.0072
122	0.0085	0.0013	0.0072
123	0.0086	0.0013	0.0073
124	0.0087	0.0013	0.0073

125	0.0088	0.0014	0.0074
126	0.0088	0.0014	0.0075
127	0.0089	0.0014	0.0076
128	0.0090	0.0014	0.0076
129	0.0091	0.0014	0.0077
130	0.0092	0.0014	0.0078
131	0.0093	0.0014	0.0079
132	0.0094	0.0014	0.0079
133	0.0095	0.0015	0.0080
134	0.0096	0.0015	0.0081
135	0.0097	0.0015	0.0082
136	0.0098	0.0015	0.0083
137	0.0099	0.0015	0.0084
138	0.0100	0.0015	0.0084
139	0.0101	0.0016	0.0086
140	0.0102	0.0016	0.0086
141	0.0104	0.0016	0.0088
142	0.0104	0.0016	0.0088
143	0.0106	0.0016	0.0090
144	0.0107	0.0016	0.0091
145	0.0100	0.0015	0.0084
146	0.0101	0.0015	0.0085
147	0.0103	0.0016	0.0087
148	0.0104	0.0016	0.0088
149	0.0106	0.0016	0.0089
150	0.0107	0.0016	0.0090
151	0.0109	0.0017	0.0092
152	0.0110	0.0017	0.0093
153	0.0112	0.0017	0.0095
154	0.0114	0.0017	0.0096
155	0.0116	0.0018	0.0098
156	0.0118	0.0018	0.0100
157	0.0120	0.0019	0.0102
158	0.0122	0.0019	0.0103
159	0.0125	0.0019	0.0106
160	0.0127	0.0019	0.0107
161	0.0130	0.0020	0.0110
162	0.0132	0.0020	0.0112
163	0.0136	0.0021	0.0115
164	0.0138	0.0021	0.0117
165	0.0142	0.0022	0.0120
166	0.0144	0.0022	0.0122
167	0.0149	0.0023	0.0126
168	0.0152	0.0023	0.0128
169	0.0158	0.0024	0.0134
170	0.0161	0.0025	0.0136
171	0.0168	0.0026	0.0142
172	0.0171	0.0026	0.0145
173	0.0178	0.0027	0.0151
174	0.0182	0.0028	0.0154

175	0.0191	0.0029	0.0162
176	0.0196	0.0030	0.0166
177	0.0207	0.0032	0.0175
178	0.0212	0.0033	0.0180
179	0.0226	0.0035	0.0191
180	0.0233	0.0036	0.0197
181	0.0250	0.0038	0.0211
182	0.0260	0.0040	0.0220
183	0.0282	0.0043	0.0239
184	0.0295	0.0045	0.0250
185	0.0277	0.0043	0.0235
186	0.0295	0.0045	0.0250
187	0.0343	0.0053	0.0290
188	0.0374	0.0058	0.0316
189	0.0465	0.0065	0.0400
190	0.0536	0.0065	0.0470
191	0.0813	0.0065	0.0747
192	0.1180	0.0065	0.1114
193	0.5104	0.0065	0.5039
194	0.0640	0.0065	0.0574
195	0.0414	0.0064	0.0350
196	0.0317	0.0049	0.0268
197	0.0310	0.0048	0.0263
198	0.0270	0.0042	0.0229
199	0.0241	0.0037	0.0204
200	0.0219	0.0034	0.0185
201	0.0201	0.0031	0.0170
202	0.0187	0.0029	0.0158
203	0.0175	0.0027	0.0148
204	0.0164	0.0025	0.0139
205	0.0154	0.0024	0.0131
206	0.0147	0.0023	0.0124
207	0.0140	0.0021	0.0118
208	0.0134	0.0021	0.0113
209	0.0128	0.0020	0.0109
210	0.0123	0.0019	0.0104
211	0.0119	0.0018	0.0101
212	0.0115	0.0018	0.0097
213	0.0111	0.0017	0.0094
214	0.0108	0.0017	0.0091
215	0.0105	0.0016	0.0089
216	0.0102	0.0016	0.0086
217	0.0108	0.0017	0.0091
218	0.0105	0.0016	0.0089
219	0.0103	0.0016	0.0087
220	0.0100	0.0015	0.0085
221	0.0098	0.0015	0.0083
222	0.0096	0.0015	0.0081
223	0.0094	0.0014	0.0080
224	0.0092	0.0014	0.0078

225	0.0091	0.0014	0.0077
226	0.0089	0.0014	0.0075
227	0.0087	0.0013	0.0074
228	0.0086	0.0013	0.0073
229	0.0084	0.0013	0.0071
230	0.0083	0.0013	0.0070
231	0.0082	0.0013	0.0069
232	0.0080	0.0012	0.0068
233	0.0079	0.0012	0.0067
234	0.0078	0.0012	0.0066
235	0.0077	0.0012	0.0065
236	0.0076	0.0012	0.0064
237	0.0075	0.0011	0.0063
238	0.0074	0.0011	0.0062
239	0.0073	0.0011	0.0061
240	0.0072	0.0011	0.0061
241	0.0071	0.0011	0.0060
242	0.0070	0.0011	0.0059
243	0.0069	0.0011	0.0058
244	0.0068	0.0010	0.0058
245	0.0067	0.0010	0.0057
246	0.0066	0.0010	0.0056
247	0.0066	0.0010	0.0056
248	0.0065	0.0010	0.0055
249	0.0064	0.0010	0.0054
250	0.0064	0.0010	0.0054
251	0.0063	0.0010	0.0053
252	0.0062	0.0010	0.0053
253	0.0062	0.0009	0.0052
254	0.0061	0.0009	0.0052
255	0.0060	0.0009	0.0051
256	0.0060	0.0009	0.0051
257	0.0059	0.0009	0.0050
258	0.0059	0.0009	0.0050
259	0.0058	0.0009	0.0049
260	0.0058	0.0009	0.0049
261	0.0057	0.0009	0.0048
262	0.0057	0.0009	0.0048
263	0.0056	0.0009	0.0047
264	0.0056	0.0009	0.0047
265	0.0055	0.0008	0.0047
266	0.0055	0.0008	0.0046
267	0.0054	0.0008	0.0046
268	0.0054	0.0008	0.0045
269	0.0053	0.0008	0.0045
270	0.0053	0.0008	0.0045
271	0.0052	0.0008	0.0044
272	0.0052	0.0008	0.0044
273	0.0052	0.0008	0.0044
274	0.0051	0.0008	0.0043

275	0.0051	0.0008	0.0043
276	0.0050	0.0008	0.0043
277	0.0050	0.0008	0.0042
278	0.0050	0.0008	0.0042
279	0.0049	0.0008	0.0042
280	0.0049	0.0008	0.0042
281	0.0049	0.0007	0.0041
282	0.0048	0.0007	0.0041
283	0.0048	0.0007	0.0041
284	0.0048	0.0007	0.0040
285	0.0047	0.0007	0.0040
286	0.0047	0.0007	0.0040
287	0.0047	0.0007	0.0040
288	0.0046	0.0007	0.0039

Total soil rain loss = 0.44(In)
Total effective rainfall = 3.02(In)
Peak flow rate in flood hydrograph = 163.63(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

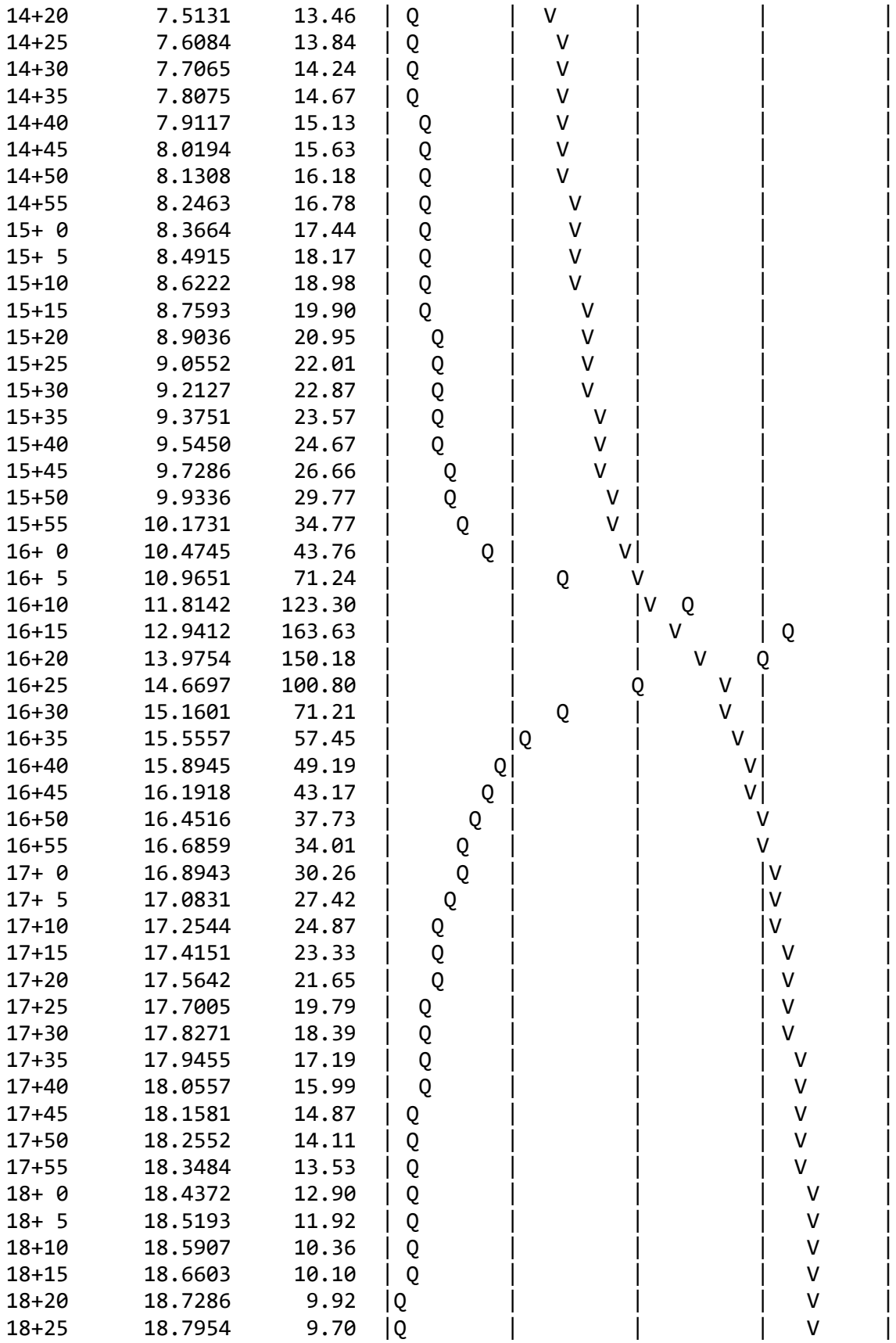
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0009	0.13	Q	|	|	|	|
0+10	0.0054	0.65	Q	|	|	|	|
0+15	0.0159	1.53	Q	|	|	|	|
0+20	0.0321	2.35	Q	|	|	|	|
0+25	0.0515	2.82	Q	|	|	|	|
0+30	0.0728	3.09	Q	|	|	|	|
0+35	0.0954	3.28	Q	|	|	|	|
0+40	0.1191	3.44	Q	|	|	|	|
0+45	0.1436	3.56	Q	|	|	|	|
0+50	0.1689	3.67	Q	|	|	|	|
0+55	0.1948	3.76	Q	|	|	|	|
1+ 0	0.2212	3.83	Q	|	|	|	|
1+ 5	0.2481	3.90	Q	|	|	|	|
1+10	0.2753	3.96	Q	|	|	|	|
1+15	0.3029	4.01	Q	|	|	|	|
1+20	0.3309	4.06	Q	|	|	|	|
1+25	0.3592	4.10	Q	|	|	|	|
1+30	0.3877	4.14	Q	|	|	|	|
1+35	0.4165	4.18	Q	|	|	|	|
1+40	0.4455	4.21	Q	|	|	|	|
1+45	0.4747	4.24	Q	|	|	|	|

1+50	0.5042	4.27	Q	|	|	|	|
1+55	0.5338	4.30	Q	|	|	|	|
2+ 0	0.5636	4.33	QV	|	|	|	|
2+ 5	0.5936	4.35	QV	|	|	|	|
2+10	0.6237	4.37	QV	|	|	|	|
2+15	0.6539	4.39	QV	|	|	|	|
2+20	0.6842	4.40	QV	|	|	|	|
2+25	0.7147	4.42	QV	|	|	|	|
2+30	0.7452	4.43	QV	|	|	|	|
2+35	0.7758	4.45	QV	|	|	|	|
2+40	0.8066	4.47	QV	|	|	|	|
2+45	0.8375	4.48	QV	|	|	|	|
2+50	0.8685	4.50	QV	|	|	|	|
2+55	0.8996	4.52	QV	|	|	|	|
3+ 0	0.9309	4.54	QV	|	|	|	|
3+ 5	0.9622	4.55	QV	|	|	|	|
3+10	0.9937	4.57	QV	|	|	|	|
3+15	1.0253	4.59	QV	|	|	|	|
3+20	1.0570	4.61	QV	|	|	|	|
3+25	1.0889	4.62	Q V	|	|	|	|
3+30	1.1208	4.64	Q V	|	|	|	|
3+35	1.1529	4.66	Q V	|	|	|	|
3+40	1.1852	4.68	Q V	|	|	|	|
3+45	1.2175	4.70	Q V	|	|	|	|
3+50	1.2500	4.72	Q V	|	|	|	|
3+55	1.2826	4.74	Q V	|	|	|	|
4+ 0	1.3154	4.76	Q V	|	|	|	|
4+ 5	1.3483	4.78	Q V	|	|	|	|
4+10	1.3813	4.80	Q V	|	|	|	|
4+15	1.4145	4.82	Q V	|	|	|	|
4+20	1.4478	4.84	Q V	|	|	|	|
4+25	1.4812	4.86	Q V	|	|	|	|
4+30	1.5148	4.88	Q V	|	|	|	|
4+35	1.5486	4.90	Q V	|	|	|	|
4+40	1.5825	4.92	Q V	|	|	|	|
4+45	1.6165	4.94	Q V	|	|	|	|
4+50	1.6507	4.96	Q V	|	|	|	|
4+55	1.6850	4.99	Q V	|	|	|	|
5+ 0	1.7195	5.01	|Q V	|	|	|	|
5+ 5	1.7542	5.03	|Q V	|	|	|	|
5+10	1.7890	5.05	|Q V	|	|	|	|
5+15	1.8239	5.08	|Q V	|	|	|	|
5+20	1.8591	5.10	|Q V	|	|	|	|
5+25	1.8944	5.12	|Q V	|	|	|	|
5+30	1.9298	5.15	|Q V	|	|	|	|
5+35	1.9654	5.17	|Q V	|	|	|	|
5+40	2.0012	5.20	|Q V	|	|	|	|
5+45	2.0372	5.22	|Q V	|	|	|	|
5+50	2.0733	5.25	|Q V	|	|	|	|
5+55	2.1096	5.27	|Q V	|	|	|	|

6+ 0	2.1461	5.30	|Q V	|	|	|	|
6+ 5	2.1828	5.32	|Q V	|	|	|	|
6+10	2.2196	5.35	|Q V	|	|	|	|
6+15	2.2567	5.38	|Q V	|	|	|	|
6+20	2.2939	5.41	|Q V	|	|	|	|
6+25	2.3313	5.43	|Q V	|	|	|	|
6+30	2.3689	5.46	|Q V	|	|	|	|
6+35	2.4067	5.49	|Q V	|	|	|	|
6+40	2.4447	5.52	|Q V	|	|	|	|
6+45	2.4830	5.55	|Q V	|	|	|	|
6+50	2.5214	5.58	|Q V	|	|	|	|
6+55	2.5600	5.61	|Q V	|	|	|	|
7+ 0	2.5988	5.64	|Q V	|	|	|	|
7+ 5	2.6378	5.67	|Q V	|	|	|	|
7+10	2.6771	5.70	|Q V	|	|	|	|
7+15	2.7166	5.73	|Q V	|	|	|	|
7+20	2.7563	5.76	|Q V	|	|	|	|
7+25	2.7962	5.80	|Q V	|	|	|	|
7+30	2.8363	5.83	|Q V	|	|	|	|
7+35	2.8767	5.86	|Q V	|	|	|	|
7+40	2.9173	5.90	|Q V	|	|	|	|
7+45	2.9582	5.93	|Q V	|	|	|	|
7+50	2.9993	5.97	|Q V	|	|	|	|
7+55	3.0406	6.00	|Q V	|	|	|	|
8+ 0	3.0822	6.04	|Q V	|	|	|	|
8+ 5	3.1241	6.08	|Q V	|	|	|	|
8+10	3.1662	6.11	|Q V	|	|	|	|
8+15	3.2086	6.15	|Q V	|	|	|	|
8+20	3.2512	6.19	|Q V	|	|	|	|
8+25	3.2941	6.23	|Q V	|	|	|	|
8+30	3.3373	6.27	|Q V	|	|	|	|
8+35	3.3808	6.31	|Q V	|	|	|	|
8+40	3.4245	6.35	|Q V	|	|	|	|
8+45	3.4686	6.40	|Q V	|	|	|	|
8+50	3.5129	6.44	|Q V	|	|	|	|
8+55	3.5576	6.48	|Q V	|	|	|	|
9+ 0	3.6025	6.53	|Q V	|	|	|	|
9+ 5	3.6478	6.57	|Q V	|	|	|	|
9+10	3.6934	6.62	|Q V	|	|	|	|
9+15	3.7393	6.67	|Q V	|	|	|	|
9+20	3.7856	6.72	|Q V	|	|	|	|
9+25	3.8322	6.76	|Q V	|	|	|	|
9+30	3.8791	6.81	|Q V	|	|	|	|
9+35	3.9264	6.87	|Q V	|	|	|	|
9+40	3.9740	6.92	|Q V	|	|	|	|
9+45	4.0220	6.97	|Q V	|	|	|	|
9+50	4.0704	7.02	|Q V	|	|	|	|
9+55	4.1191	7.08	|Q V	|	|	|	|
10+ 0	4.1683	7.14	|Q V	|	|	|	|
10+ 5	4.2178	7.19	|Q V	|	|	|	|

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10+10       4.2678      7.25  |Q     V  |          |          |          |
10+15       4.3181      7.31  |Q     V  |          |          |          |
10+20       4.3689      7.37  |Q      V |          |          |          |
10+25       4.4201      7.44  |Q      V |          |          |          |
10+30       4.4718      7.50  |Q      V |          |          |          |
10+35       4.5239      7.57  |Q      V |          |          |          |
10+40       4.5765      7.63  |Q      V |          |          |          |
10+45       4.6295      7.70  |Q      V |          |          |          |
10+50       4.6831      7.77  |Q      V |          |          |          |
10+55       4.7371      7.85  |Q      V |          |          |          |
11+ 0       4.7916      7.92  |Q      V |          |          |          |
11+ 5       4.8467      8.00  |Q      V |          |          |          |
11+10       4.9023      8.07  |Q       V|          |          |          |
11+15       4.9584      8.15  |Q       V|          |          |          |
11+20       5.0152      8.23  |Q       V|          |          |          |
11+25       5.0725      8.32  |Q       V|          |          |          |
11+30       5.1303      8.41  |Q       V|          |          |          |
11+35       5.1888      8.49  |Q       V|          |          |          |
11+40       5.2480      8.59  |Q       V|          |          |          |
11+45       5.3078      8.68  |Q       V|          |          |          |
11+50       5.3682      8.78  |Q       V|          |          |          |
11+55       5.4293      8.88  |Q        V          |          |          |
12+ 0       5.4912      8.98  |Q        V          |          |          |
12+ 5       5.5536      9.06  |Q        V          |          |          |
12+10       5.6160      9.07  |Q        V          |          |          |
12+15       5.6781      9.01  |Q        V          |          |          |
12+20       5.7398      8.96  |Q        V          |          |          |
12+25       5.8017      8.99  |Q        V          |          |          |
12+30       5.8641      9.06  |Q        V          |          |          |
12+35       5.9271      9.15  |Q        V          |          |          |
12+40       5.9908      9.25  |Q        |V         |          |          |
12+45       6.0553      9.36  |Q        |V         |          |          |
12+50       6.1206      9.48  |Q        |V         |          |          |
12+55       6.1868      9.61  |Q        |V         |          |          |
13+ 0       6.2540      9.75  |Q        |V         |          |          |
13+ 5       6.3222      9.90  |Q        |V         |          |          |
13+10       6.3914     10.06  | Q       |V         |          |          |
13+15       6.4618     10.22  | Q       |V         |          |          |
13+20       6.5333     10.39  | Q       | V        |          |          |
13+25       6.6061     10.57  | Q       | V        |          |          |
13+30       6.6803     10.76  | Q       | V        |          |          |
13+35       6.7558     10.96  | Q       | V        |          |          |
13+40       6.8327     11.17  | Q       | V        |          |          |
13+45       6.9112     11.40  | Q       | V        |          |          |
13+50       6.9913     11.63  | Q       | V        |          |          |
13+55       7.0732     11.88  | Q       |  V       |          |          |
14+ 0       7.1569     12.15  | Q       |  V       |          |          |
14+ 5       7.2425     12.43  | Q       |  V       |          |          |
14+10       7.3303     12.75  | Q       |  V       |          |          |
14+15       7.4205     13.09  | Q       |  V       |          |          |
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18+30      18.8605      9.46  |Q        |         |         |   V     |
18+35      18.9242      9.24  |Q        |         |         |   V     |
18+40      18.9863      9.02  |Q        |         |         |    V    |
18+45      19.0471      8.82  |Q        |         |         |    V    |
18+50      19.1065      8.63  |Q        |         |         |    V    |
18+55      19.1648      8.45  |Q        |         |         |    V    |
19+ 0      19.2218      8.28  |Q        |         |         |    V    |
19+ 5      19.2778      8.12  |Q        |         |         |    V    |
19+10      19.3326      7.97  |Q        |         |         |    V    |
19+15      19.3865      7.82  |Q        |         |         |    V    |
19+20      19.4394      7.68  |Q        |         |         |    V    |
19+25      19.4914      7.55  |Q        |         |         |    V    |
19+30      19.5425      7.42  |Q        |         |         |     V   |
19+35      19.5928      7.30  |Q        |         |         |     V   |
19+40      19.6422      7.18  |Q        |         |         |     V   |
19+45      19.6909      7.07  |Q        |         |         |     V   |
19+50      19.7389      6.96  |Q        |         |         |     V   |
19+55      19.7861      6.86  |Q        |         |         |     V   |
20+ 0      19.8326      6.76  |Q        |         |         |     V   |
20+ 5      19.8785      6.66  |Q        |         |         |     V   |
20+10      19.9238      6.57  |Q        |         |         |     V   |
20+15      19.9684      6.48  |Q        |         |         |     V   |
20+20      20.0124      6.39  |Q        |         |         |     V   |
20+25      20.0558      6.31  |Q        |         |         |     V   |
20+30      20.0987      6.22  |Q        |         |         |      V  |
20+35      20.1410      6.14  |Q        |         |         |      V  |
20+40      20.1828      6.07  |Q        |         |         |      V  |
20+45      20.2241      5.99  |Q        |         |         |      V  |
20+50      20.2649      5.92  |Q        |         |         |      V  |
20+55      20.3052      5.85  |Q        |         |         |      V  |
21+ 0      20.3450      5.79  |Q        |         |         |      V  |
21+ 5      20.3844      5.72  |Q        |         |         |      V  |
21+10      20.4234      5.66  |Q        |         |         |      V  |
21+15      20.4620      5.60  |Q        |         |         |      V  |
21+20      20.5001      5.54  |Q        |         |         |      V  |
21+25      20.5378      5.48  |Q        |         |         |      V  |
21+30      20.5752      5.42  |Q        |         |         |      V  |
21+35      20.6122      5.37  |Q        |         |         |       V |
21+40      20.6488      5.32  |Q        |         |         |       V |
21+45      20.6850      5.26  |Q        |         |         |       V |
21+50      20.7209      5.21  |Q        |         |         |       V |
21+55      20.7565      5.16  |Q        |         |         |       V |
22+ 0      20.7917      5.11  |Q        |         |         |       V |
22+ 5      20.8266      5.07  |Q        |         |         |       V |
22+10      20.8612      5.02  |Q        |         |         |       V |
22+15      20.8955      4.98  Q        |         |         |       V |
22+20      20.9294      4.93  Q        |         |         |       V |
22+25      20.9631      4.89  Q        |         |         |       V |
22+30      20.9965      4.85  Q        |         |         |       V |
22+35      21.0296      4.81  Q        |         |         |       V |
```

22+40	21.0625	4.77	Q	|	|	|	V |
22+45	21.0950	4.73	Q	|	|	|	V |
22+50	21.1273	4.69	Q	|	|	|	V |
22+55	21.1594	4.65	Q	|	|	|	V|
23+ 0	21.1911	4.62	Q	|	|	|	V|
23+ 5	21.2227	4.58	Q	|	|	|	V|
23+10	21.2540	4.54	Q	|	|	|	V|
23+15	21.2851	4.51	Q	|	|	|	V|
23+20	21.3159	4.48	Q	|	|	|	V|
23+25	21.3465	4.44	Q	|	|	|	V|
23+30	21.3769	4.41	Q	|	|	|	V|
23+35	21.4070	4.38	Q	|	|	|	V|
23+40	21.4369	4.35	Q	|	|	|	V|
23+45	21.4667	4.32	Q	|	|	|	V|
23+50	21.4962	4.29	Q	|	|	|	V|
23+55	21.5255	4.26	Q	|	|	|	V|
24+ 0	21.5546	4.23	Q	|	|	|	V|
24+ 5	21.5826	4.06	Q	|	|	|	V|
24+10	21.6069	3.52	Q	|	|	|	V|
24+15	21.6250	2.63	Q	|	|	|	V|
24+20	21.6373	1.79	Q	|	|	|	V|
24+25	21.6464	1.32	Q	|	|	|	V|
24+30	21.6536	1.05	Q	|	|	|	V|
24+35	21.6595	0.86	Q	|	|	|	V|
24+40	21.6644	0.71	Q	|	|	|	V|
24+45	21.6685	0.59	Q	|	|	|	V|
24+50	21.6719	0.49	Q	|	|	|	V|
24+55	21.6747	0.41	Q	|	|	|	V|
25+ 0	21.6771	0.35	Q	|	|	|	V|
25+ 5	21.6791	0.29	Q	|	|	|	V|
25+10	21.6808	0.25	Q	|	|	|	V|
25+15	21.6822	0.20	Q	|	|	|	V|
25+20	21.6834	0.17	Q	|	|	|	V|
25+25	21.6843	0.14	Q	|	|	|	V|
25+30	21.6851	0.11	Q	|	|	|	V|
25+35	21.6856	0.09	Q	|	|	|	V|
25+40	21.6861	0.07	Q	|	|	|	V|
25+45	21.6865	0.05	Q	|	|	|	V|
25+50	21.6867	0.04	Q	|	|	|	V|
25+55	21.6869	0.02	Q	|	|	|	V|
26+ 0	21.6869	0.01	Q	|	|	|	V|

APPENDIX 'E'

Basin Routing

Detention Basin Table
Basin Routing—10- and 100-year storm events

Cordova Site Basin Table:

Elevation (ft.)	Basin Area (sf)	Depth (ft.)	Basin Volume (cft)	Basin Volume (ac-ft)	Basin Infiltration Flow* (cfs)	Weir Over Flow (cfs)	Total Outlet Flow (cfs)
3055	180,939	-	-	-	4.77	0.00	4.77
3056	191,260	1.00	186,100	4.27	4.77	0.00	4.77
3057	201,605	2.00	392,865	9.02	4.77	0.00	4.77
3058	211,976	3.00	599,656	13.77	4.77	0.00	4.77
3059	222,371	4.00	816,829	18.75	4.77	0.00	4.77
3060	232,790	5.50	1,158,200	26.59	4.77	0.00	4.77
3061	243,235	6.00	1,277,206	29.32	4.77	99.00	103.77

Note:

* Infiltration flow based on the infiltration test the Infiltration rate =2.5in/hr with safty factor SF=2.19, design infiltration rate=2.5/2.19=1.14 in/hr.
Basin infiltration flow=(1/12x1.14)/3600 xbasin Bottom Area = 4.77 cfs

FLOOD HYDROGRAPH ROUTING PROGRAM
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Study date: 10/25/22

Cordova Site Basin Routing
10-year, 24-hours storm

Program License Serial Number 4009

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

From study/file name: CordovaUHpr10.rte
**********HYDROGRAPH DATA**********
Number of intervals = 312
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 89.125 (CFS)
Total volume = 12.738 (Ac.Ft)

Status of hydrographs being held in storage

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

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Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 312
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
1.000	4.270	4.770	4.254	4.286
2.000	9.020	4.771	9.004	9.036
3.000	13.770	4.772	13.754	13.786
4.000	18.750	4.773	18.734	18.766
5.500	26.590	4.774	26.574	26.606
6.000	29.320	103.770	28.963	29.677

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 22.3 44.56 66.84 89.13	Depth (Ft.)
0.083	0.08	0.00	0.000	O | | | |	0.00
0.167	0.40	0.00	0.002	O | | | |	0.00
0.250	0.93	0.01	0.006	O | | | |	0.00
0.333	1.44	0.02	0.015	O | | | |	0.00
0.417	1.72	0.03	0.025	O | | | |	0.01
0.500	1.89	0.04	0.037	O | | | |	0.01
0.583	2.00	0.06	0.051	O | | | |	0.01
0.667	2.10	0.07	0.064	O | | | |	0.02
0.750	2.18	0.09	0.078	O | | | |	0.02
0.833	2.24	0.10	0.093	O | | | |	0.02
0.917	2.29	0.12	0.108	O | | | |	0.03
1.000	2.34	0.14	0.123	O | | | |	0.03
1.083	2.38	0.15	0.138	O | | | |	0.03
1.167	2.41	0.17	0.153	O | | | |	0.04
1.250	2.45	0.19	0.169	O | | | |	0.04
1.333	2.48	0.21	0.185	O | | | |	0.04
1.417	2.50	0.22	0.200	O | | | |	0.05
1.500	2.53	0.24	0.216	O | | | |	0.05
1.583	2.55	0.26	0.232	O | | | |	0.05
1.667	2.57	0.28	0.248	O | | | |	0.06
1.750	2.59	0.29	0.263	O | | | |	0.06
1.833	2.61	0.31	0.279	O | | | |	0.07
1.917	2.62	0.33	0.295	O | | | |	0.07
2.000	2.64	0.35	0.311	O | | | |	0.07
2.083	2.66	0.36	0.327	O | | | |	0.08
2.167	2.66	0.38	0.342	O | | | |	0.08
2.250	2.67	0.40	0.358	O | | | |	0.08
2.333	2.68	0.42	0.374	O | | | |	0.09

2.417	2.69	0.43	0.389	O				0.09
2.500	2.70	0.45	0.405	O				0.09
2.583	2.71	0.47	0.420	O				0.10
2.667	2.72	0.49	0.436	O				0.10
2.750	2.73	0.50	0.451	O				0.11
2.833	2.74	0.52	0.466	O				0.11
2.917	2.75	0.54	0.482	O				0.11
3.000	2.76	0.55	0.497	O				0.12
3.083	2.77	0.57	0.512	O				0.12
3.167	2.78	0.59	0.527	O				0.12
3.250	2.79	0.61	0.542	OI				0.13
3.333	2.80	0.62	0.557	OI				0.13
3.417	2.82	0.64	0.572	OI				0.13
3.500	2.83	0.66	0.587	OI				0.14
3.583	2.84	0.67	0.602	OI				0.14
3.667	2.85	0.69	0.617	OI				0.14
3.750	2.86	0.71	0.632	OI				0.15
3.833	2.87	0.72	0.647	OI				0.15
3.917	2.88	0.74	0.662	OI				0.15
4.000	2.89	0.76	0.676	OI				0.16
4.083	2.91	0.77	0.691	OI				0.16
4.167	2.92	0.79	0.706	OI				0.17
4.250	2.93	0.80	0.720	OI				0.17
4.333	2.94	0.82	0.735	OI				0.17
4.417	2.95	0.84	0.750	OI				0.18
4.500	2.97	0.85	0.764	OI				0.18
4.583	2.98	0.87	0.779	OI				0.18
4.667	2.99	0.89	0.793	OI				0.19
4.750	3.00	0.90	0.808	OI				0.19
4.833	3.02	0.92	0.822	OI				0.19
4.917	3.03	0.93	0.837	OI				0.20
5.000	3.04	0.95	0.851	OI				0.20
5.083	3.06	0.97	0.865	OI				0.20
5.167	3.07	0.98	0.880	OI				0.21
5.250	3.08	1.00	0.894	OI				0.21
5.333	3.10	1.01	0.908	OI				0.21
5.417	3.11	1.03	0.923	OI				0.22
5.500	3.13	1.05	0.937	OI				0.22
5.583	3.14	1.06	0.951	OI				0.22
5.667	3.16	1.08	0.966	OI				0.23
5.750	3.17	1.09	0.980	OI				0.23
5.833	3.19	1.11	0.994	OI				0.23
5.917	3.20	1.13	1.009	OI				0.24
6.000	3.22	1.14	1.023	OI				0.24
6.083	3.23	1.16	1.037	OI				0.24
6.167	3.25	1.17	1.051	OI				0.25
6.250	3.26	1.19	1.066	OI				0.25
6.333	3.28	1.21	1.080	OI				0.25
6.417	3.30	1.22	1.094	OI				0.26
6.500	3.31	1.24	1.109	OI				0.26

6.583	3.33	1.25	1.123	OI				0.26
6.667	3.35	1.27	1.137	OI				0.27
6.750	3.36	1.29	1.151	OI				0.27
6.833	3.38	1.30	1.166	OI				0.27
6.917	3.40	1.32	1.180	OI				0.28
7.000	3.42	1.33	1.194	OI				0.28
7.083	3.43	1.35	1.209	OI				0.28
7.167	3.45	1.37	1.223	OI				0.29
7.250	3.47	1.38	1.237	OI				0.29
7.333	3.49	1.40	1.252	OI				0.29
7.417	3.51	1.41	1.266	OI				0.30
7.500	3.53	1.43	1.281	OI				0.30
7.583	3.55	1.45	1.295	OI				0.30
7.667	3.57	1.46	1.310	OI				0.31
7.750	3.59	1.48	1.324	OI				0.31
7.833	3.61	1.50	1.339	OI				0.31
7.917	3.63	1.51	1.353	OI				0.32
8.000	3.65	1.53	1.368	OI				0.32
8.083	3.68	1.54	1.383	OI				0.32
8.167	3.70	1.56	1.397	OI				0.33
8.250	3.72	1.58	1.412	OI				0.33
8.333	3.74	1.59	1.427	OI				0.33
8.417	3.77	1.61	1.442	OI				0.34
8.500	3.79	1.63	1.457	OI				0.34
8.583	3.81	1.64	1.471	OI				0.34
8.667	3.84	1.66	1.486	OI				0.35
8.750	3.86	1.68	1.502	OI				0.35
8.833	3.89	1.69	1.517	OI				0.36
8.917	3.92	1.71	1.532	OI				0.36
9.000	3.94	1.73	1.547	OI				0.36
9.083	3.97	1.75	1.562	OI				0.37
9.167	4.00	1.76	1.578	OI				0.37
9.250	4.02	1.78	1.593	OI				0.37
9.333	4.05	1.80	1.609	OI				0.38
9.417	4.08	1.81	1.624	OI				0.38
9.500	4.11	1.83	1.640	OI				0.38
9.583	4.14	1.85	1.655	OI				0.39
9.667	4.17	1.87	1.671	OI				0.39
9.750	4.20	1.88	1.687	OI				0.40
9.833	4.23	1.90	1.703	OI				0.40
9.917	4.27	1.92	1.719	OI				0.40
10.000	4.30	1.94	1.736	OI				0.41
10.083	4.33	1.96	1.752	OI				0.41
10.167	4.37	1.98	1.768	OI				0.41
10.250	4.40	1.99	1.785	OI				0.42
10.333	4.44	2.01	1.801	OI				0.42
10.417	4.48	2.03	1.818	OI				0.43
10.500	4.51	2.05	1.835	OI				0.43
10.583	4.55	2.07	1.852	OI				0.43
10.667	4.59	2.09	1.869	OI				0.44

10.750	4.63	2.11	1.887	OI	|	|	|	0.44
10.833	4.67	2.13	1.904	OI	|	|	|	0.45
10.917	4.72	2.15	1.922	OI	|	|	|	0.45
11.000	4.76	2.17	1.940	OI	|	|	|	0.45
11.083	4.80	2.19	1.957	OI	|	|	|	0.46
11.167	4.85	2.21	1.976	OI	|	|	|	0.46
11.250	4.90	2.23	1.994	OI	|	|	|	0.47
11.333	4.94	2.25	2.012	OI	|	|	|	0.47
11.417	4.99	2.27	2.031	OI	|	|	|	0.48
11.500	5.04	2.29	2.050	OI	|	|	|	0.48
11.583	5.10	2.31	2.069	OI	|	|	|	0.48
11.667	5.15	2.33	2.088	OI	|	|	|	0.49
11.750	5.21	2.35	2.108	OI	|	|	|	0.49
11.833	5.26	2.38	2.128	OI	|	|	|	0.50
11.917	5.32	2.40	2.148	OI	|	|	|	0.50
12.000	5.38	2.42	2.168	OI	|	|	|	0.51
12.083	5.44	2.44	2.188	OI	|	|	|	0.51
12.167	5.49	2.47	2.209	OI	|	|	|	0.52
12.250	5.54	2.49	2.230	OI	|	|	|	0.52
12.333	5.58	2.51	2.251	O I	|	|	|	0.53
12.417	5.64	2.54	2.272	O I	|	|	|	0.53
12.500	5.71	2.56	2.294	O I	|	|	|	0.54
12.583	5.78	2.59	2.316	O I	|	|	|	0.54
12.667	5.85	2.61	2.338	O I	|	|	|	0.55
12.750	5.93	2.64	2.360	O I	|	|	|	0.55
12.833	6.01	2.66	2.383	O I	|	|	|	0.56
12.917	6.10	2.69	2.406	O I	|	|	|	0.56
13.000	6.19	2.71	2.430	O I	|	|	|	0.57
13.083	6.28	2.74	2.454	O I	|	|	|	0.57
13.167	6.37	2.77	2.479	O I	|	|	|	0.58
13.250	6.48	2.80	2.504	|OI	|	|	|	0.59
13.333	6.58	2.83	2.529	|OI	|	|	|	0.59
13.417	6.69	2.85	2.556	|OI	|	|	|	0.60
13.500	6.81	2.88	2.582	|OI	|	|	|	0.60
13.583	6.93	2.92	2.610	|OI	|	|	|	0.61
13.667	7.06	2.95	2.638	|OI	|	|	|	0.62
13.750	7.19	2.98	2.666	|OI	|	|	|	0.62
13.833	7.33	3.01	2.696	|OI	|	|	|	0.63
13.917	7.48	3.04	2.726	|OI	|	|	|	0.64
14.000	7.64	3.08	2.757	|OI	|	|	|	0.65
14.083	7.80	3.12	2.789	|OI	|	|	|	0.65
14.167	7.99	3.15	2.821	|OI	|	|	|	0.66
14.250	8.19	3.19	2.855	|OI	|	|	|	0.67
14.333	8.40	3.23	2.890	|O I	|	|	|	0.68
14.417	8.63	3.27	2.927	|O I	|	|	|	0.69
14.500	8.86	3.31	2.964	|O I	|	|	|	0.69
14.583	9.11	3.35	3.003	|O I	|	|	|	0.70
14.667	9.38	3.40	3.044	|O I	|	|	|	0.71
14.750	9.67	3.45	3.086	|O I	|	|	|	0.72
14.833	9.99	3.50	3.129	|O I	|	|	|	0.73

14.917	10.33	3.55	3.175	O I				0.74
15.000	10.71	3.60	3.223	O I				0.75
15.083	11.13	3.66	3.273	O I				0.77
15.167	11.60	3.72	3.326	O I				0.78
15.250	12.12	3.78	3.382	O I				0.79
15.333	12.72	3.84	3.441	O I				0.81
15.417	13.27	3.91	3.504	O I				0.82
15.500	13.55	3.99	3.569	O I				0.84
15.583	13.60	4.06	3.635	O I				0.85
15.667	13.87	4.13	3.701	O I				0.87
15.750	14.75	4.21	3.771	O I				0.88
15.833	16.25	4.30	3.849	O I				0.90
15.917	18.67	4.40	3.939	O I				0.92
16.000	23.08	4.53	4.052	O I				0.95
16.083	37.79	4.72	4.230	O	I			0.99
16.167	66.54	4.77	4.556	O		I		1.06
16.250	89.13	4.77	5.059	O			I	1.17
16.333	81.87	4.77	5.615	O			I	1.28
16.417	54.71	4.77	6.053	O		I		1.38
16.500	38.77	4.77	6.342	O	I			1.44
16.583	31.66	4.77	6.552	O	I			1.48
16.667	27.50	4.77	6.722	O I				1.52
16.750	24.37	4.77	6.868	O I				1.55
16.833	21.48	4.77	6.993	O I				1.57
16.917	19.49	4.77	7.101	O I				1.60
17.000	17.47	4.77	7.196	O I				1.62
17.083	15.93	4.77	7.278	O I				1.63
17.167	14.54	4.77	7.350	O I				1.65
17.250	13.70	4.77	7.414	O I				1.66
17.333	12.78	4.77	7.473	O I				1.67
17.417	11.76	4.77	7.524	O I				1.69
17.500	10.99	4.77	7.570	O I				1.69
17.583	10.33	4.77	7.610	O I				1.70
17.667	9.67	4.77	7.646	O I				1.71
17.750	9.05	4.77	7.678	O I				1.72
17.833	8.62	4.77	7.706	O I				1.72
17.917	8.30	4.77	7.731	OI				1.73
18.000	7.95	4.77	7.755	OI				1.73
18.083	7.40	4.77	7.775	OI				1.74
18.167	6.48	4.77	7.789	OI				1.74
18.250	6.26	4.77	7.801	OI				1.74
18.333	6.09	4.77	7.810	OI				1.75
18.417	5.92	4.77	7.819	OI				1.75
18.500	5.76	4.77	7.826	OI				1.75
18.583	5.61	4.77	7.832	OI				1.75
18.667	5.47	4.77	7.838	O				1.75
18.750	5.34	4.77	7.842	O				1.75
18.833	5.22	4.77	7.846	O				1.75
18.917	5.11	4.77	7.848	O				1.75
19.000	5.00	4.77	7.850	O				1.75

19.083	4.90	4.77	7.852	O				1.75
19.167	4.81	4.77	7.852	O				1.75
19.250	4.72	4.77	7.852	O				1.75
19.333	4.64	4.77	7.851	O				1.75
19.417	4.55	4.77	7.850	O				1.75
19.500	4.48	4.77	7.849	O				1.75
19.583	4.40	4.77	7.846	O				1.75
19.667	4.33	4.77	7.843	O				1.75
19.750	4.27	4.77	7.840	O				1.75
19.833	4.20	4.77	7.837	O				1.75
19.917	4.14	4.77	7.832	O				1.75
20.000	4.08	4.77	7.828	O				1.75
20.083	4.02	4.77	7.823	O				1.75
20.167	3.97	4.77	7.817	O				1.75
20.250	3.91	4.77	7.812	O				1.75
20.333	3.86	4.77	7.806	O				1.74
20.417	3.81	4.77	7.799	O				1.74
20.500	3.76	4.77	7.792	O				1.74
20.583	3.72	4.77	7.785	O				1.74
20.667	3.67	4.77	7.778	O				1.74
20.750	3.63	4.77	7.770	O				1.74
20.833	3.59	4.77	7.762	O				1.74
20.917	3.54	4.77	7.754	O				1.73
21.000	3.50	4.77	7.745	O				1.73
21.083	3.47	4.77	7.736	O				1.73
21.167	3.43	4.77	7.727	O				1.73
21.250	3.39	4.77	7.718	O				1.73
21.333	3.36	4.77	7.708	O				1.72
21.417	3.32	4.77	7.698	O				1.72
21.500	3.29	4.77	7.688	O				1.72
21.583	3.26	4.77	7.678	O				1.72
21.667	3.23	4.77	7.668	O				1.72
21.750	3.19	4.77	7.657	O				1.71
21.833	3.16	4.77	7.646	O				1.71
21.917	3.14	4.77	7.635	O				1.71
22.000	3.11	4.77	7.623	O				1.71
22.083	3.08	4.77	7.612	O				1.70
22.167	3.05	4.77	7.600	O				1.70
22.250	3.02	4.77	7.588	O				1.70
22.333	3.00	4.77	7.576	O				1.70
22.417	2.97	4.77	7.564	O				1.69
22.500	2.95	4.77	7.551	O				1.69
22.583	2.92	4.77	7.539	O				1.69
22.667	2.90	4.77	7.526	O				1.69
22.750	2.88	4.77	7.513	O				1.68
22.833	2.85	4.77	7.500	O				1.68
22.917	2.83	4.77	7.486	O				1.68
23.000	2.81	4.77	7.473	O				1.67
23.083	2.79	4.77	7.459	O				1.67
23.167	2.77	4.77	7.446	IO				1.67

23.250	2.75	4.77	7.432	IO				1.67
23.333	2.73	4.77	7.418	IO				1.66
23.417	2.71	4.77	7.404	IO				1.66
23.500	2.69	4.77	7.389	IO				1.66
23.583	2.67	4.77	7.375	IO				1.65
23.667	2.65	4.77	7.361	IO				1.65
23.750	2.63	4.77	7.346	IO				1.65
23.833	2.61	4.77	7.331	IO				1.64
23.917	2.60	4.77	7.316	IO				1.64
24.000	2.58	4.77	7.301	IO				1.64
24.083	2.48	4.77	7.286	IO				1.63
24.167	2.15	4.77	7.269	IO				1.63
24.250	1.60	4.77	7.249	IO				1.63
24.333	1.09	4.77	7.225	IO				1.62
24.417	0.80	4.77	7.199	IO				1.62
24.500	0.64	4.77	7.171	IO				1.61
24.583	0.52	4.77	7.142	IO				1.60
24.667	0.43	4.77	7.113	IO				1.60
24.750	0.36	4.77	7.083	IO				1.59
24.833	0.30	4.77	7.052	IO				1.59
24.917	0.25	4.77	7.021	IO				1.58
25.000	0.21	4.77	6.990	IO				1.57
25.083	0.18	4.77	6.958	IO				1.57
25.167	0.15	4.77	6.927	IO				1.56
25.250	0.12	4.77	6.895	IO				1.55
25.333	0.10	4.77	6.863	IO				1.55
25.417	0.08	4.77	6.830	IO				1.54
25.500	0.07	4.77	6.798	IO				1.53
25.583	0.05	4.77	6.766	IO				1.53
25.667	0.04	4.77	6.733	IO				1.52
25.750	0.03	4.77	6.700	IO				1.51
25.833	0.02	4.77	6.668	IO				1.50
25.917	0.01	4.77	6.635	IO				1.50
26.000	0.01	4.77	6.602	IO				1.49
26.083	0.00	4.77	6.569	IO				1.48
26.167	0.00	4.77	6.537	IO				1.48
26.250	0.00	4.77	6.504	IO				1.47
26.333	0.00	4.77	6.471	IO				1.46
26.417	0.00	4.77	6.438	IO				1.46
26.500	0.00	4.77	6.405	IO				1.45
26.583	0.00	4.77	6.372	IO				1.44
26.667	0.00	4.77	6.339	IO				1.44
26.750	0.00	4.77	6.307	IO				1.43
26.833	0.00	4.77	6.274	IO				1.42
26.917	0.00	4.77	6.241	IO				1.41
27.000	0.00	4.77	6.208	IO				1.41
27.083	0.00	4.77	6.175	IO				1.40
27.167	0.00	4.77	6.142	IO				1.39
27.250	0.00	4.77	6.109	IO				1.39
27.333	0.00	4.77	6.077	IO				1.38

27.417	0.00	4.77	6.044	IO				1.37
27.500	0.00	4.77	6.011	IO				1.37
27.583	0.00	4.77	5.978	IO				1.36
27.667	0.00	4.77	5.945	IO				1.35
27.750	0.00	4.77	5.912	IO				1.35
27.833	0.00	4.77	5.879	IO				1.34
27.917	0.00	4.77	5.847	IO				1.33
28.000	0.00	4.77	5.814	IO				1.32
28.083	0.00	4.77	5.781	IO				1.32
28.167	0.00	4.77	5.748	IO				1.31
28.250	0.00	4.77	5.715	IO				1.30
28.333	0.00	4.77	5.682	IO				1.30
28.417	0.00	4.77	5.649	IO				1.29
28.500	0.00	4.77	5.617	IO				1.28
28.583	0.00	4.77	5.584	IO				1.28
28.667	0.00	4.77	5.551	IO				1.27
28.750	0.00	4.77	5.518	IO				1.26
28.833	0.00	4.77	5.485	IO				1.26
28.917	0.00	4.77	5.452	IO				1.25
29.000	0.00	4.77	5.419	IO				1.24
29.083	0.00	4.77	5.387	IO				1.24
29.167	0.00	4.77	5.354	IO				1.23
29.250	0.00	4.77	5.321	IO				1.22
29.333	0.00	4.77	5.288	IO				1.21
29.417	0.00	4.77	5.255	IO				1.21
29.500	0.00	4.77	5.222	IO				1.20
29.583	0.00	4.77	5.190	IO				1.19
29.667	0.00	4.77	5.157	IO				1.19
29.750	0.00	4.77	5.124	IO				1.18
29.833	0.00	4.77	5.091	IO				1.17
29.917	0.00	4.77	5.058	IO				1.17
30.000	0.00	4.77	5.025	IO				1.16
30.083	0.00	4.77	4.992	IO				1.15
30.167	0.00	4.77	4.960	IO				1.15
30.250	0.00	4.77	4.927	IO				1.14
30.333	0.00	4.77	4.894	IO				1.13
30.417	0.00	4.77	4.861	IO				1.12
30.500	0.00	4.77	4.828	IO				1.12
30.583	0.00	4.77	4.795	IO				1.11
30.667	0.00	4.77	4.762	IO				1.10
30.750	0.00	4.77	4.730	IO				1.10
30.833	0.00	4.77	4.697	IO				1.09
30.917	0.00	4.77	4.664	IO				1.08
31.000	0.00	4.77	4.631	IO				1.08
31.083	0.00	4.77	4.598	IO				1.07
31.167	0.00	4.77	4.565	IO				1.06
31.250	0.00	4.77	4.532	IO				1.06
31.333	0.00	4.77	4.500	IO				1.05
31.417	0.00	4.77	4.467	IO				1.04
31.500	0.00	4.77	4.434	IO				1.03

31.583	0.00	4.77	4.401	IO				1.03
31.667	0.00	4.77	4.368	IO				1.02
31.750	0.00	4.77	4.335	IO				1.01
31.833	0.00	4.77	4.303	IO				1.01
31.917	0.00	4.77	4.270	IO				1.00
32.000	0.00	4.73	4.237	IO				0.99
32.083	0.00	4.70	4.204	IO				0.98
32.167	0.00	4.66	4.172	IO				0.98
32.250	0.00	4.63	4.140	IO				0.97
32.333	0.00	4.59	4.109	IO				0.96
32.417	0.00	4.55	4.077	IO				0.95
32.500	0.00	4.52	4.046	IO				0.95
32.583	0.00	4.48	4.015	IO				0.94
32.667	0.00	4.45	3.984	IO				0.93
32.750	0.00	4.42	3.953	IO				0.93
32.833	0.00	4.38	3.923	IO				0.92
32.917	0.00	4.35	3.893	IO				0.91
33.000	0.00	4.32	3.863	IO				0.90
33.083	0.00	4.28	3.834	IO				0.90
33.167	0.00	4.25	3.804	IO				0.89
33.250	0.00	4.22	3.775	IO				0.88
33.333	0.00	4.18	3.746	IO				0.88
33.417	0.00	4.15	3.718	IO				0.87
33.500	0.00	4.12	3.689	IO				0.86
33.583	0.00	4.09	3.661	IO				0.86
33.667	0.00	4.06	3.633	IO				0.85
33.750	0.00	4.03	3.605	IO				0.84
33.833	0.00	4.00	3.577	IO				0.84
33.917	0.00	3.97	3.550	IO				0.83
34.000	0.00	3.94	3.523	IO				0.82
34.083	0.00	3.90	3.496	IO				0.82
34.167	0.00	3.87	3.469	IO				0.81
34.250	0.00	3.85	3.442	IO				0.81
34.333	0.00	3.82	3.416	IO				0.80
34.417	0.00	3.79	3.390	IO				0.79
34.500	0.00	3.76	3.364	IO				0.79
34.583	0.00	3.73	3.338	IO				0.78
34.667	0.00	3.70	3.312	IO				0.78
34.750	0.00	3.67	3.287	IO				0.77
34.833	0.00	3.64	3.262	IO				0.76
34.917	0.00	3.62	3.237	IO				0.76
35.000	0.00	3.59	3.212	IO				0.75
35.083	0.00	3.56	3.187	IO				0.75
35.167	0.00	3.53	3.163	IO				0.74
35.250	0.00	3.51	3.139	IO				0.74
35.333	0.00	3.48	3.115	IO				0.73
35.417	0.00	3.45	3.091	IO				0.72
35.500	0.00	3.43	3.067	IO				0.72
35.583	0.00	3.40	3.044	IO				0.71
35.667	0.00	3.37	3.020	IO				0.71

35.750	0.00	3.35	2.997	IO				0.70
35.833	0.00	3.32	2.974	IO				0.70
35.917	0.00	3.30	2.951	IO				0.69
36.000	0.00	3.27	2.929	IO				0.69
36.083	0.00	3.25	2.906	IO				0.68
36.167	0.00	3.22	2.884	IO				0.68
36.250	0.00	3.20	2.862	IO				0.67
36.333	0.00	3.17	2.840	IO				0.67
36.417	0.00	3.15	2.818	IO				0.66
36.500	0.00	3.12	2.797	IO				0.65
36.583	0.00	3.10	2.775	IO				0.65
36.667	0.00	3.08	2.754	IO				0.64
36.750	0.00	3.05	2.733	IO				0.64
36.833	0.00	3.03	2.712	IO				0.64
36.917	0.00	3.01	2.691	IO				0.63
37.000	0.00	2.98	2.670	IO				0.63
37.083	0.00	2.96	2.650	IO				0.62
37.167	0.00	2.94	2.630	IO				0.62
37.250	0.00	2.92	2.609	IO				0.61
37.333	0.00	2.89	2.589	IO				0.61
37.417	0.00	2.87	2.570	IO				0.60
37.500	0.00	2.85	2.550	IO				0.60
37.583	0.00	2.83	2.530	IO				0.59
37.667	0.00	2.81	2.511	IO				0.59
37.750	0.00	2.78	2.492	O				0.58
37.833	0.00	2.76	2.473	O				0.58
37.917	0.00	2.74	2.454	O				0.57
38.000	0.00	2.72	2.435	O				0.57
38.083	0.00	2.70	2.416	O				0.57
38.167	0.00	2.68	2.398	O				0.56
38.250	0.00	2.66	2.379	O				0.56
38.333	0.00	2.64	2.361	O				0.55
38.417	0.00	2.62	2.343	O				0.55
38.500	0.00	2.60	2.325	O				0.54
38.583	0.00	2.58	2.307	O				0.54
38.667	0.00	2.56	2.290	O				0.54
38.750	0.00	2.54	2.272	O				0.53
38.833	0.00	2.52	2.255	O				0.53
38.917	0.00	2.50	2.237	O				0.52
39.000	0.00	2.48	2.220	O				0.52
39.083	0.00	2.46	2.203	O				0.52
39.167	0.00	2.44	2.186	O				0.51
39.250	0.00	2.42	2.170	O				0.51
39.333	0.00	2.40	2.153	O				0.50
39.417	0.00	2.39	2.136	O				0.50
39.500	0.00	2.37	2.120	O				0.50
39.583	0.00	2.35	2.104	O				0.49
39.667	0.00	2.33	2.088	O				0.49
39.750	0.00	2.31	2.072	O				0.49
39.833	0.00	2.30	2.056	O				0.48

39.917	0.00	2.28	2.040	O				0.48
40.000	0.00	2.26	2.024	O				0.47
40.083	0.00	2.24	2.009	O				0.47
40.167	0.00	2.23	1.993	O				0.47
40.250	0.00	2.21	1.978	O				0.46
40.333	0.00	2.19	1.963	O				0.46
40.417	0.00	2.18	1.948	O				0.46
40.500	0.00	2.16	1.933	O				0.45
40.583	0.00	2.14	1.918	O				0.45
40.667	0.00	2.13	1.904	O				0.45
40.750	0.00	2.11	1.889	O				0.44
40.833	0.00	2.09	1.874	O				0.44
40.917	0.00	2.08	1.860	O				0.44
41.000	0.00	2.06	1.846	O				0.43
41.083	0.00	2.05	1.832	O				0.43
41.167	0.00	2.03	1.818	O				0.43
41.250	0.00	2.01	1.804	O				0.42
41.333	0.00	2.00	1.790	O				0.42
41.417	0.00	1.98	1.776	O				0.42
41.500	0.00	1.97	1.763	O				0.41
41.583	0.00	1.95	1.749	O				0.41
41.667	0.00	1.94	1.736	O				0.41
41.750	0.00	1.92	1.722	O				0.40
41.833	0.00	1.91	1.709	O				0.40
41.917	0.00	1.89	1.696	O				0.40
42.000	0.00	1.88	1.683	O				0.39
42.083	0.00	1.87	1.670	O				0.39
42.167	0.00	1.85	1.657	O				0.39
42.250	0.00	1.84	1.645	O				0.39
42.333	0.00	1.82	1.632	O				0.38
42.417	0.00	1.81	1.620	O				0.38
42.500	0.00	1.80	1.607	O				0.38
42.583	0.00	1.78	1.595	O				0.37
42.667	0.00	1.77	1.583	O				0.37
42.750	0.00	1.75	1.570	O				0.37
42.833	0.00	1.74	1.558	O				0.36
42.917	0.00	1.73	1.546	O				0.36
43.000	0.00	1.71	1.535	O				0.36
43.083	0.00	1.70	1.523	O				0.36
43.167	0.00	1.69	1.511	O				0.35
43.250	0.00	1.68	1.500	O				0.35
43.333	0.00	1.66	1.488	O				0.35
43.417	0.00	1.65	1.477	O				0.35
43.500	0.00	1.64	1.465	O				0.34
43.583	0.00	1.62	1.454	O				0.34
43.667	0.00	1.61	1.443	O				0.34
43.750	0.00	1.60	1.432	O				0.34
43.833	0.00	1.59	1.421	O				0.33
43.917	0.00	1.58	1.410	O				0.33
44.000	0.00	1.56	1.399	O				0.33

44.083	0.00	1.55	1.389	O				0.33
44.167	0.00	1.54	1.378	O				0.32
44.250	0.00	1.53	1.367	O				0.32
44.333	0.00	1.52	1.357	O				0.32
44.417	0.00	1.50	1.346	O				0.32
44.500	0.00	1.49	1.336	O				0.31
44.583	0.00	1.48	1.326	O				0.31
44.667	0.00	1.47	1.316	O				0.31
44.750	0.00	1.46	1.306	O				0.31
44.833	0.00	1.45	1.296	O				0.30
44.917	0.00	1.44	1.286	O				0.30
45.000	0.00	1.43	1.276	O				0.30
45.083	0.00	1.41	1.266	O				0.30
45.167	0.00	1.40	1.256	O				0.29
45.250	0.00	1.39	1.247	O				0.29
45.333	0.00	1.38	1.237	O				0.29
45.417	0.00	1.37	1.228	O				0.29
45.500	0.00	1.36	1.218	O				0.29
45.583	0.00	1.35	1.209	O				0.28
45.667	0.00	1.34	1.200	O				0.28
45.750	0.00	1.33	1.191	O				0.28
45.833	0.00	1.32	1.181	O				0.28
45.917	0.00	1.31	1.172	O				0.27
46.000	0.00	1.30	1.163	O				0.27
46.083	0.00	1.29	1.154	O				0.27
46.167	0.00	1.28	1.146	O				0.27
46.250	0.00	1.27	1.137	O				0.27
46.333	0.00	1.26	1.128	O				0.26
46.417	0.00	1.25	1.119	O				0.26
46.500	0.00	1.24	1.111	O				0.26
46.583	0.00	1.23	1.102	O				0.26
46.667	0.00	1.22	1.094	O				0.26
46.750	0.00	1.21	1.086	O				0.25
46.833	0.00	1.20	1.077	O				0.25
46.917	0.00	1.19	1.069	O				0.25
47.000	0.00	1.18	1.061	O				0.25
47.083	0.00	1.18	1.053	O				0.25
47.167	0.00	1.17	1.045	O				0.24
47.250	0.00	1.16	1.037	O				0.24
47.333	0.00	1.15	1.029	O				0.24
47.417	0.00	1.14	1.021	O				0.24
47.500	0.00	1.13	1.013	O				0.24
47.583	0.00	1.12	1.005	O				0.24
47.667	0.00	1.11	0.997	O				0.23
47.750	0.00	1.11	0.990	O				0.23
47.833	0.00	1.10	0.982	O				0.23
47.917	0.00	1.09	0.975	O				0.23
48.000	0.00	1.08	0.967	O				0.23
48.083	0.00	1.07	0.960	O				0.22
48.167	0.00	1.06	0.952	O				0.22

48.250	0.00	1.06	0.945	O	|	|	|	0.22
48.333	0.00	1.05	0.938	O	|	|	|	0.22
48.417	0.00	1.04	0.931	O	|	|	|	0.22
48.500	0.00	1.03	0.924	O	|	|	|	0.22
48.583	0.00	1.02	0.917	O	|	|	|	0.21
48.667	0.00	1.02	0.909	O	|	|	|	0.21
48.750	0.00	1.01	0.903	O	|	|	|	0.21
48.833	0.00	1.00	0.896	O	|	|	|	0.21
48.917	0.00	0.99	0.889	O	|	|	|	0.21
49.000	0.00	0.99	0.882	O	|	|	|	0.21
49.083	0.00	0.98	0.875	O	|	|	|	0.20
49.167	0.00	0.97	0.868	O	|	|	|	0.20
49.250	0.00	0.96	0.862	O	|	|	|	0.20
49.333	0.00	0.96	0.855	O	|	|	|	0.20
49.417	0.00	0.95	0.849	O	|	|	|	0.20
49.500	0.00	0.94	0.842	O	|	|	|	0.20
49.583	0.00	0.93	0.836	O	|	|	|	0.20
49.667	0.00	0.93	0.829	O	|	|	|	0.19
49.750	0.00	0.92	0.823	O	|	|	|	0.19
49.833	0.00	0.91	0.817	O	|	|	|	0.19
49.917	0.00	0.91	0.810	O	|	|	|	0.19
50.000	0.00	0.90	0.804	O	|	|	|	0.19
50.083	0.00	0.89	0.798	O	|	|	|	0.19
50.167	0.00	0.88	0.792	O	|	|	|	0.19
50.250	0.00	0.88	0.786	O	|	|	|	0.18
50.333	0.00	0.87	0.780	O	|	|	|	0.18
50.417	0.00	0.86	0.774	O	|	|	|	0.18
50.500	0.00	0.86	0.768	O	|	|	|	0.18
50.583	0.00	0.85	0.762	O	|	|	|	0.18
50.667	0.00	0.84	0.756	O	|	|	|	0.18
50.750	0.00	0.84	0.750	O	|	|	|	0.18
50.833	0.00	0.83	0.745	O	|	|	|	0.17
50.917	0.00	0.83	0.739	O	|	|	|	0.17
51.000	0.00	0.82	0.733	O	|	|	|	0.17
51.083	0.00	0.81	0.728	O	|	|	|	0.17
51.167	0.00	0.81	0.722	O	|	|	|	0.17
51.250	0.00	0.80	0.717	O	|	|	|	0.17
51.333	0.00	0.79	0.711	O	|	|	|	0.17
51.417	0.00	0.79	0.706	O	|	|	|	0.17
51.500	0.00	0.78	0.700	O	|	|	|	0.16
51.583	0.00	0.78	0.695	O	|	|	|	0.16
51.667	0.00	0.77	0.689	O	|	|	|	0.16
51.750	0.00	0.76	0.684	O	|	|	|	0.16
51.833	0.00	0.76	0.679	O	|	|	|	0.16
51.917	0.00	0.75	0.674	O	|	|	|	0.16
52.000	0.00	0.75	0.669	O	|	|	|	0.16
52.083	0.00	0.74	0.663	O	|	|	|	0.16
52.167	0.00	0.74	0.658	O	|	|	|	0.15
52.250	0.00	0.73	0.653	O	|	|	|	0.15
52.333	0.00	0.72	0.648	O	|	|	|	0.15

52.417	0.00	0.72	0.643	O				0.15
52.500	0.00	0.71	0.638	O				0.15
52.583	0.00	0.71	0.634	O				0.15
52.667	0.00	0.70	0.629	O				0.15
52.750	0.00	0.70	0.624	O				0.15
52.833	0.00	0.69	0.619	O				0.14
52.917	0.00	0.69	0.614	O				0.14
53.000	0.00	0.68	0.610	O				0.14
53.083	0.00	0.68	0.605	O				0.14
53.167	0.00	0.67	0.600	O				0.14
53.250	0.00	0.67	0.596	O				0.14
53.333	0.00	0.66	0.591	O				0.14
53.417	0.00	0.66	0.587	O				0.14
53.500	0.00	0.65	0.582	O				0.14
53.583	0.00	0.65	0.578	O				0.14
53.667	0.00	0.64	0.573	O				0.13
53.750	0.00	0.64	0.569	O				0.13
53.833	0.00	0.63	0.564	O				0.13
53.917	0.00	0.63	0.560	O				0.13
54.000	0.00	0.62	0.556	O				0.13
54.083	0.00	0.62	0.552	O				0.13
54.167	0.00	0.61	0.547	O				0.13
54.250	0.00	0.61	0.543	O				0.13
54.333	0.00	0.60	0.539	O				0.13
54.417	0.00	0.60	0.535	O				0.13
54.500	0.00	0.59	0.531	O				0.12
54.583	0.00	0.59	0.527	O				0.12
54.667	0.00	0.58	0.523	O				0.12
54.750	0.00	0.58	0.519	O				0.12
54.833	0.00	0.57	0.515	O				0.12
54.917	0.00	0.57	0.511	O				0.12
55.000	0.00	0.57	0.507	O				0.12
55.083	0.00	0.56	0.503	O				0.12
55.167	0.00	0.56	0.499	O				0.12
55.250	0.00	0.55	0.495	O				0.12
55.333	0.00	0.55	0.491	O				0.12
55.417	0.00	0.54	0.488	O				0.11
55.500	0.00	0.54	0.484	O				0.11
55.583	0.00	0.54	0.480	O				0.11
55.667	0.00	0.53	0.477	O				0.11
55.750	0.00	0.53	0.473	O				0.11
55.833	0.00	0.52	0.469	O				0.11
55.917	0.00	0.52	0.466	O				0.11
56.000	0.00	0.52	0.462	O				0.11
56.083	0.00	0.51	0.459	O				0.11
56.167	0.00	0.51	0.455	O				0.11
56.250	0.00	0.50	0.452	O				0.11
56.333	0.00	0.50	0.448	O				0.10
56.417	0.00	0.50	0.445	O				0.10
56.500	0.00	0.49	0.441	O				0.10

56.583	0.00	0.49	0.438	O				0.10
56.667	0.00	0.49	0.435	O				0.10
56.750	0.00	0.48	0.431	O				0.10
56.833	0.00	0.48	0.428	O				0.10
56.917	0.00	0.47	0.425	O				0.10
57.000	0.00	0.47	0.421	O				0.10
57.083	0.00	0.47	0.418	O				0.10
57.167	0.00	0.46	0.415	O				0.10
57.250	0.00	0.46	0.412	O				0.10
57.333	0.00	0.46	0.409	O				0.10
57.417	0.00	0.45	0.405	O				0.09
57.500	0.00	0.45	0.402	O				0.09
57.583	0.00	0.45	0.399	O				0.09
57.667	0.00	0.44	0.396	O				0.09
57.750	0.00	0.44	0.393	O				0.09
57.833	0.00	0.44	0.390	O				0.09
57.917	0.00	0.43	0.387	O				0.09
58.000	0.00	0.43	0.384	O				0.09
58.083	0.00	0.43	0.381	O				0.09
58.167	0.00	0.42	0.378	O				0.09
58.250	0.00	0.42	0.375	O				0.09
58.333	0.00	0.42	0.373	O				0.09
58.417	0.00	0.41	0.370	O				0.09
58.500	0.00	0.41	0.367	O				0.09
58.583	0.00	0.41	0.364	O				0.09
58.667	0.00	0.40	0.361	O				0.08
58.750	0.00	0.40	0.359	O				0.08
58.833	0.00	0.40	0.356	O				0.08
58.917	0.00	0.39	0.353	O				0.08
59.000	0.00	0.39	0.350	O				0.08
59.083	0.00	0.39	0.348	O				0.08
59.167	0.00	0.39	0.345	O				0.08
59.250	0.00	0.38	0.342	O				0.08
59.333	0.00	0.38	0.340	O				0.08
59.417	0.00	0.38	0.337	O				0.08
59.500	0.00	0.37	0.335	O				0.08
59.583	0.00	0.37	0.332	O				0.08
59.667	0.00	0.37	0.329	O				0.08
59.750	0.00	0.37	0.327	O				0.08
59.833	0.00	0.36	0.324	O				0.08
59.917	0.00	0.36	0.322	O				0.08
60.000	0.00	0.36	0.319	O				0.07
60.083	0.00	0.35	0.317	O				0.07
60.167	0.00	0.35	0.315	O				0.07
60.250	0.00	0.35	0.312	O				0.07
60.333	0.00	0.35	0.310	O				0.07
60.417	0.00	0.34	0.307	O				0.07
60.500	0.00	0.34	0.305	O				0.07
60.583	0.00	0.34	0.303	O				0.07
60.667	0.00	0.34	0.300	O				0.07

60.750	0.00	0.33	0.298	O	|	|	|	0.07
60.833	0.00	0.33	0.296	O	|	|	|	0.07
60.917	0.00	0.33	0.294	O	|	|	|	0.07
61.000	0.00	0.33	0.291	O	|	|	|	0.07
61.083	0.00	0.32	0.289	O	|	|	|	0.07
61.167	0.00	0.32	0.287	O	|	|	|	0.07
61.250	0.00	0.32	0.285	O	|	|	|	0.07
61.333	0.00	0.32	0.282	O	|	|	|	0.07
61.417	0.00	0.31	0.280	O	|	|	|	0.07
61.500	0.00	0.31	0.278	O	|	|	|	0.07
61.583	0.00	0.31	0.276	O	|	|	|	0.06
61.667	0.00	0.31	0.274	O	|	|	|	0.06
61.750	0.00	0.30	0.272	O	|	|	|	0.06
61.833	0.00	0.30	0.270	O	|	|	|	0.06
61.917	0.00	0.30	0.268	O	|	|	|	0.06
62.000	0.00	0.30	0.266	O	|	|	|	0.06
62.083	0.00	0.29	0.264	O	|	|	|	0.06
62.167	0.00	0.29	0.262	O	|	|	|	0.06
62.250	0.00	0.29	0.260	O	|	|	|	0.06
62.333	0.00	0.29	0.258	O	|	|	|	0.06
62.417	0.00	0.29	0.256	O	|	|	|	0.06
62.500	0.00	0.28	0.254	O	|	|	|	0.06
62.583	0.00	0.28	0.252	O	|	|	|	0.06
62.667	0.00	0.28	0.250	O	|	|	|	0.06
62.750	0.00	0.28	0.248	O	|	|	|	0.06
62.833	0.00	0.27	0.246	O	|	|	|	0.06
62.917	0.00	0.27	0.244	O	|	|	|	0.06
63.000	0.00	0.27	0.242	O	|	|	|	0.06
63.083	0.00	0.27	0.240	O	|	|	|	0.06
63.167	0.00	0.27	0.238	O	|	|	|	0.06
63.250	0.00	0.26	0.237	O	|	|	|	0.06
63.333	0.00	0.26	0.235	O	|	|	|	0.05
63.417	0.00	0.26	0.233	O	|	|	|	0.05
63.500	0.00	0.26	0.231	O	|	|	|	0.05
63.583	0.00	0.26	0.229	O	|	|	|	0.05
63.667	0.00	0.25	0.228	O	|	|	|	0.05
63.750	0.00	0.25	0.226	O	|	|	|	0.05
63.833	0.00	0.25	0.224	O	|	|	|	0.05
63.917	0.00	0.25	0.223	O	|	|	|	0.05
64.000	0.00	0.25	0.221	O	|	|	|	0.05
64.083	0.00	0.24	0.219	O	|	|	|	0.05
64.167	0.00	0.24	0.217	O	|	|	|	0.05
64.250	0.00	0.24	0.216	O	|	|	|	0.05
64.333	0.00	0.24	0.214	O	|	|	|	0.05
64.417	0.00	0.24	0.212	O	|	|	|	0.05
64.500	0.00	0.24	0.211	O	|	|	|	0.05
64.583	0.00	0.23	0.209	O	|	|	|	0.05
64.667	0.00	0.23	0.208	O	|	|	|	0.05
64.750	0.00	0.23	0.206	O	|	|	|	0.05
64.833	0.00	0.23	0.204	O	|	|	|	0.05

64.917	0.00	0.23	0.203	O	|	|	|	0.05
65.000	0.00	0.22	0.201	O	|	|	|	0.05
65.083	0.00	0.22	0.200	O	|	|	|	0.05
65.167	0.00	0.22	0.198	O	|	|	|	0.05
65.250	0.00	0.22	0.197	O	|	|	|	0.05
65.333	0.00	0.22	0.195	O	|	|	|	0.05
65.417	0.00	0.22	0.194	O	|	|	|	0.05
65.500	0.00	0.21	0.192	O	|	|	|	0.05
65.583	0.00	0.21	0.191	O	|	|	|	0.04
65.667	0.00	0.21	0.189	O	|	|	|	0.04
65.750	0.00	0.21	0.188	O	|	|	|	0.04
65.833	0.00	0.21	0.186	O	|	|	|	0.04
65.917	0.00	0.21	0.185	O	|	|	|	0.04
66.000	0.00	0.21	0.184	O	|	|	|	0.04
66.083	0.00	0.20	0.182	O	|	|	|	0.04
66.167	0.00	0.20	0.181	O	|	|	|	0.04
66.250	0.00	0.20	0.179	O	|	|	|	0.04
66.333	0.00	0.20	0.178	O	|	|	|	0.04
66.417	0.00	0.20	0.177	O	|	|	|	0.04
66.500	0.00	0.20	0.175	O	|	|	|	0.04
66.583	0.00	0.19	0.174	O	|	|	|	0.04
66.667	0.00	0.19	0.173	O	|	|	|	0.04
66.750	0.00	0.19	0.171	O	|	|	|	0.04
66.833	0.00	0.19	0.170	O	|	|	|	0.04
66.917	0.00	0.19	0.169	O	|	|	|	0.04
67.000	0.00	0.19	0.167	O	|	|	|	0.04
67.083	0.00	0.19	0.166	O	|	|	|	0.04
67.167	0.00	0.18	0.165	O	|	|	|	0.04
67.250	0.00	0.18	0.164	O	|	|	|	0.04
67.333	0.00	0.18	0.162	O	|	|	|	0.04
67.417	0.00	0.18	0.161	O	|	|	|	0.04
67.500	0.00	0.18	0.160	O	|	|	|	0.04
67.583	0.00	0.18	0.159	O	|	|	|	0.04
67.667	0.00	0.18	0.157	O	|	|	|	0.04
67.750	0.00	0.17	0.156	O	|	|	|	0.04
67.833	0.00	0.17	0.155	O	|	|	|	0.04
67.917	0.00	0.17	0.154	O	|	|	|	0.04
68.000	0.00	0.17	0.153	O	|	|	|	0.04
68.083	0.00	0.17	0.151	O	|	|	|	0.04
68.167	0.00	0.17	0.150	O	|	|	|	0.04
68.250	0.00	0.17	0.149	O	|	|	|	0.03
68.333	0.00	0.17	0.148	O	|	|	|	0.03
68.417	0.00	0.16	0.147	O	|	|	|	0.03
68.500	0.00	0.16	0.146	O	|	|	|	0.03
68.583	0.00	0.16	0.145	O	|	|	|	0.03
68.667	0.00	0.16	0.144	O	|	|	|	0.03
68.750	0.00	0.16	0.142	O	|	|	|	0.03
68.833	0.00	0.16	0.141	O	|	|	|	0.03
68.917	0.00	0.16	0.140	O	|	|	|	0.03
69.000	0.00	0.16	0.139	O	|	|	|	0.03

69.083	0.00	0.15	0.138	O				0.03
69.167	0.00	0.15	0.137	O				0.03
69.250	0.00	0.15	0.136	O				0.03
69.333	0.00	0.15	0.135	O				0.03
69.417	0.00	0.15	0.134	O				0.03
69.500	0.00	0.15	0.133	O				0.03
69.583	0.00	0.15	0.132	O				0.03
69.667	0.00	0.15	0.131	O				0.03
69.750	0.00	0.15	0.130	O				0.03
69.833	0.00	0.14	0.129	O				0.03
69.917	0.00	0.14	0.128	O				0.03
70.000	0.00	0.14	0.127	O				0.03
70.083	0.00	0.14	0.126	O				0.03
70.167	0.00	0.14	0.125	O				0.03
70.250	0.00	0.14	0.124	O				0.03
70.333	0.00	0.14	0.123	O				0.03
70.417	0.00	0.14	0.122	O				0.03
70.500	0.00	0.14	0.121	O				0.03
70.583	0.00	0.13	0.120	O				0.03
70.667	0.00	0.13	0.119	O				0.03
70.750	0.00	0.13	0.118	O				0.03
70.833	0.00	0.13	0.117	O				0.03
70.917	0.00	0.13	0.117	O				0.03
71.000	0.00	0.13	0.116	O				0.03
71.083	0.00	0.13	0.115	O				0.03
71.167	0.00	0.13	0.114	O				0.03
71.250	0.00	0.13	0.113	O				0.03
71.333	0.00	0.13	0.112	O				0.03
71.417	0.00	0.12	0.111	O				0.03
71.500	0.00	0.12	0.110	O				0.03
71.583	0.00	0.12	0.110	O				0.03
71.667	0.00	0.12	0.109	O				0.03
71.750	0.00	0.12	0.108	O				0.03
71.833	0.00	0.12	0.107	O				0.03
71.917	0.00	0.12	0.106	O				0.02
72.000	0.00	0.12	0.105	O				0.02
72.083	0.00	0.12	0.105	O				0.02
72.167	0.00	0.12	0.104	O				0.02
72.250	0.00	0.12	0.103	O				0.02
72.333	0.00	0.11	0.102	O				0.02
72.417	0.00	0.11	0.102	O				0.02
72.500	0.00	0.11	0.101	O				0.02
72.583	0.00	0.11	0.100	O				0.02
72.667	0.00	0.11	0.099	O				0.02
72.750	0.00	0.11	0.098	O				0.02
72.833	0.00	0.11	0.098	O				0.02
72.917	0.00	0.11	0.097	O				0.02
73.000	0.00	0.11	0.096	O				0.02
73.083	0.00	0.11	0.095	O				0.02
73.167	0.00	0.11	0.095	O				0.02

73.250	0.00	0.11	0.094	O	|	|	|	|	0.02
73.333	0.00	0.10	0.093	O	|	|	|	|	0.02
73.417	0.00	0.10	0.093	O	|	|	|	|	0.02
73.500	0.00	0.10	0.092	O	|	|	|	|	0.02
73.583	0.00	0.10	0.091	O	|	|	|	|	0.02
73.667	0.00	0.10	0.090	O	|	|	|	|	0.02
73.750	0.00	0.10	0.090	O	|	|	|	|	0.02
73.833	0.00	0.10	0.089	O	|	|	|	|	0.02

Remaining water in basin = 0.09 (Ac.Ft)

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

Number of intervals = 886
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 4.771 (CFS)
Total volume = 12.649 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (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: 10/25/22

Cordova Site Basin Routing
100-year, 24-hours storm

Program License Serial Number 4009

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

From study/file name: CordovaUHpr100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 312
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 163.627 (CFS)
Total volume = 21.687 (Ac.Ft)

Status of hydrographs being held in storage

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

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Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 312
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
1.000	4.270	4.770	4.254	4.286
2.000	9.020	4.771	9.004	9.036
3.000	13.770	4.772	13.754	13.786
4.000	18.750	4.773	18.734	18.766
5.500	26.590	4.774	26.574	26.606
6.000	29.320	103.770	28.963	29.677

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 40.9 81.81 122.72 163.63	Depth (Ft.)
0.083	0.13	0.00	0.000	O | | | |	0.00
0.167	0.65	0.00	0.003	O | | | |	0.00
0.250	1.53	0.01	0.011	O | | | |	0.00
0.333	2.35	0.03	0.024	O | | | |	0.01
0.417	2.82	0.05	0.041	O | | | |	0.01
0.500	3.09	0.07	0.061	O | | | |	0.01
0.583	3.28	0.09	0.083	O | | | |	0.02
0.667	3.44	0.12	0.105	O | | | |	0.02
0.750	3.56	0.14	0.128	O | | | |	0.03
0.833	3.67	0.17	0.152	O | | | |	0.04
0.917	3.76	0.20	0.176	O | | | |	0.04
1.000	3.83	0.22	0.201	O | | | |	0.05
1.083	3.90	0.25	0.226	O | | | |	0.05
1.167	3.96	0.28	0.251	O | | | |	0.06
1.250	4.01	0.31	0.277	O | | | |	0.06
1.333	4.06	0.34	0.302	O | | | |	0.07
1.417	4.10	0.37	0.328	O | | | |	0.08
1.500	4.14	0.40	0.354	O | | | |	0.08
1.583	4.18	0.42	0.380	O | | | |	0.09
1.667	4.21	0.45	0.406	O | | | |	0.09
1.750	4.24	0.48	0.431	O | | | |	0.10
1.833	4.27	0.51	0.457	O | | | |	0.11
1.917	4.30	0.54	0.483	O | | | |	0.11
2.000	4.33	0.57	0.509	O | | | |	0.12
2.083	4.35	0.60	0.535	O | | | |	0.13
2.167	4.37	0.63	0.561	O | | | |	0.13
2.250	4.39	0.66	0.587	O | | | |	0.14
2.333	4.40	0.68	0.612	O | | | |	0.14

2.417	4.42	0.71	0.638	O				0.15
2.500	4.43	0.74	0.663	O				0.16
2.583	4.45	0.77	0.689	O				0.16
2.667	4.47	0.80	0.714	O				0.17
2.750	4.48	0.83	0.739	O				0.17
2.833	4.50	0.85	0.764	O				0.18
2.917	4.52	0.88	0.790	O				0.18
3.000	4.54	0.91	0.815	O				0.19
3.083	4.55	0.94	0.839	O				0.20
3.167	4.57	0.97	0.864	O				0.20
3.250	4.59	0.99	0.889	O				0.21
3.333	4.61	1.02	0.914	O				0.21
3.417	4.62	1.05	0.938	O				0.22
3.500	4.64	1.08	0.963	O				0.23
3.583	4.66	1.10	0.988	O				0.23
3.667	4.68	1.13	1.012	O				0.24
3.750	4.70	1.16	1.037	O				0.24
3.833	4.72	1.19	1.061	O				0.25
3.917	4.74	1.21	1.085	O				0.25
4.000	4.76	1.24	1.109	O				0.26
4.083	4.78	1.27	1.134	O				0.27
4.167	4.80	1.29	1.158	O				0.27
4.250	4.82	1.32	1.182	O				0.28
4.333	4.84	1.35	1.206	O				0.28
4.417	4.86	1.37	1.230	O				0.29
4.500	4.88	1.40	1.254	O				0.29
4.583	4.90	1.43	1.278	O				0.30
4.667	4.92	1.45	1.302	O				0.30
4.750	4.94	1.48	1.326	O				0.31
4.833	4.96	1.51	1.349	O				0.32
4.917	4.99	1.53	1.373	O				0.32
5.000	5.01	1.56	1.397	O				0.33
5.083	5.03	1.59	1.421	O				0.33
5.167	5.05	1.61	1.444	O				0.34
5.250	5.08	1.64	1.468	O				0.34
5.333	5.10	1.67	1.492	O				0.35
5.417	5.12	1.69	1.515	OI				0.35
5.500	5.15	1.72	1.539	OI				0.36
5.583	5.17	1.75	1.563	OI				0.37
5.667	5.20	1.77	1.586	OI				0.37
5.750	5.22	1.80	1.610	OI				0.38
5.833	5.25	1.82	1.633	OI				0.38
5.917	5.27	1.85	1.657	OI				0.39
6.000	5.30	1.88	1.680	OI				0.39
6.083	5.32	1.90	1.704	OI				0.40
6.167	5.35	1.93	1.728	OI				0.40
6.250	5.38	1.96	1.751	OI				0.41
6.333	5.41	1.98	1.775	OI				0.42
6.417	5.43	2.01	1.798	OI				0.42
6.500	5.46	2.04	1.822	OI				0.43

6.583	5.49	2.06	1.845	OI				0.43
6.667	5.52	2.09	1.869	OI				0.44
6.750	5.55	2.11	1.893	OI				0.44
6.833	5.58	2.14	1.916	OI				0.45
6.917	5.61	2.17	1.940	OI				0.45
7.000	5.64	2.19	1.964	OI				0.46
7.083	5.67	2.22	1.988	OI				0.47
7.167	5.70	2.25	2.011	OI				0.47
7.250	5.73	2.27	2.035	OI				0.48
7.333	5.76	2.30	2.059	OI				0.48
7.417	5.80	2.33	2.083	OI				0.49
7.500	5.83	2.35	2.107	OI				0.49
7.583	5.86	2.38	2.131	OI				0.50
7.667	5.90	2.41	2.155	OI				0.50
7.750	5.93	2.43	2.179	OI				0.51
7.833	5.97	2.46	2.203	OI				0.52
7.917	6.00	2.49	2.227	OI				0.52
8.000	6.04	2.51	2.251	OI				0.53
8.083	6.08	2.54	2.276	OI				0.53
8.167	6.11	2.57	2.300	OI				0.54
8.250	6.15	2.60	2.324	OI				0.54
8.333	6.19	2.62	2.349	OI				0.55
8.417	6.23	2.65	2.374	OI				0.56
8.500	6.27	2.68	2.398	OI				0.56
8.583	6.31	2.71	2.423	OI				0.57
8.667	6.35	2.73	2.448	OI				0.57
8.750	6.40	2.76	2.473	OI				0.58
8.833	6.44	2.79	2.498	OI				0.59
8.917	6.48	2.82	2.523	OI				0.59
9.000	6.53	2.85	2.548	OI				0.60
9.083	6.57	2.88	2.574	OI				0.60
9.167	6.62	2.90	2.599	OI				0.61
9.250	6.67	2.93	2.625	OI				0.61
9.333	6.72	2.96	2.651	OI				0.62
9.417	6.76	2.99	2.677	OI				0.63
9.500	6.81	3.02	2.703	OI				0.63
9.583	6.87	3.05	2.729	OI				0.64
9.667	6.92	3.08	2.755	OI				0.65
9.750	6.97	3.11	2.782	OI				0.65
9.833	7.02	3.14	2.809	OI				0.66
9.917	7.08	3.17	2.835	OI				0.66
10.000	7.14	3.20	2.863	OI				0.67
10.083	7.19	3.23	2.890	OI				0.68
10.167	7.25	3.26	2.917	OI				0.68
10.250	7.31	3.29	2.945	OI				0.69
10.333	7.37	3.32	2.973	OI				0.70
10.417	7.44	3.35	3.001	OI				0.70
10.500	7.50	3.38	3.029	OI				0.71
10.583	7.57	3.42	3.057	OI				0.72
10.667	7.63	3.45	3.086	OI				0.72

10.750	7.70	3.48	3.115	OI				0.73
10.833	7.77	3.51	3.144	OI				0.74
10.917	7.85	3.55	3.174	OI				0.74
11.000	7.92	3.58	3.203	OI				0.75
11.083	8.00	3.61	3.233	OI				0.76
11.167	8.07	3.65	3.264	OI				0.76
11.250	8.15	3.68	3.294	OI				0.77
11.333	8.23	3.71	3.325	OI				0.78
11.417	8.32	3.75	3.357	OI				0.79
11.500	8.41	3.79	3.388	OI				0.79
11.583	8.49	3.82	3.420	OI				0.80
11.667	8.59	3.86	3.453	OI				0.81
11.750	8.68	3.89	3.485	OI				0.82
11.833	8.78	3.93	3.519	OI				0.82
11.917	8.88	3.97	3.552	OI				0.83
12.000	8.98	4.01	3.586	OI				0.84
12.083	9.06	4.04	3.621	OI				0.85
12.167	9.07	4.08	3.655	OI				0.86
12.250	9.01	4.12	3.689	OI				0.86
12.333	8.96	4.16	3.722	OI				0.87
12.417	8.99	4.20	3.755	OI				0.88
12.500	9.06	4.23	3.789	OI				0.89
12.583	9.15	4.27	3.822	OI				0.90
12.667	9.25	4.31	3.856	OI				0.90
12.750	9.36	4.35	3.890	OI				0.91
12.833	9.48	4.38	3.925	OI				0.92
12.917	9.61	4.42	3.960	OI				0.93
13.000	9.75	4.46	3.997	OI				0.94
13.083	9.90	4.51	4.033	OI				0.94
13.167	10.06	4.55	4.071	OI				0.95
13.250	10.22	4.59	4.109	OI				0.96
13.333	10.39	4.63	4.148	O I				0.97
13.417	10.57	4.68	4.189	O I				0.98
13.500	10.76	4.72	4.230	O I				0.99
13.583	10.96	4.77	4.272	O I				1.00
13.667	11.17	4.77	4.315	O I				1.01
13.750	11.40	4.77	4.360	O I				1.02
13.833	11.63	4.77	4.406	O I				1.03
13.917	11.88	4.77	4.455	O I				1.04
14.000	12.15	4.77	4.504	O I				1.05
14.083	12.43	4.77	4.556	O I				1.06
14.167	12.75	4.77	4.610	O I				1.07
14.250	13.09	4.77	4.666	O I				1.08
14.333	13.46	4.77	4.725	O I				1.10
14.417	13.84	4.77	4.786	O I				1.11
14.500	14.24	4.77	4.850	O I				1.12
14.583	14.67	4.77	4.916	O I				1.14
14.667	15.13	4.77	4.986	O I				1.15
14.750	15.63	4.77	5.059	O I				1.17
14.833	16.18	4.77	5.136	O I				1.18

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14.917   16.78    4.77      5.217  O  I    |        |        |        |     1.20
15.000   17.44    4.77      5.302  O  I    |        |        |        |     1.22
15.083   18.17    4.77      5.391  O  I    |        |        |        |     1.24
15.167   18.98    4.77      5.486  O  I    |        |        |        |     1.26
15.250   19.90    4.77      5.587  O  I    |        |        |        |     1.28
15.333   20.95    4.77      5.695  O   I   |        |        |        |     1.30
15.417   22.01    4.77      5.810  O   I   |        |        |        |     1.32
15.500   22.87    4.77      5.932  O   I   |        |        |        |     1.35
15.583   23.57    4.77      6.059  O   I   |        |        |        |     1.38
15.667   24.67    4.77      6.192  O   I   |        |        |        |     1.40
15.750   26.66    4.77      6.336  O    I  |        |        |        |     1.44
15.833   29.77    4.77      6.498  O    I  |        |        |        |     1.47
15.917   34.77    4.77      6.687  O     I |        |        |        |     1.51
16.000   43.76    4.77      6.925  O       I        |        |        |     1.56
16.083   71.24    4.77      7.288  O        |    I   |        |        |     1.64
16.167  123.30    4.77      7.925  O        |        |       I        |     1.77
16.250  163.63    4.77      8.880  O        |        |        |       I     1.97
16.333  150.18    4.77      9.928  O        |        |        |    I   |     2.19
16.417  100.80    4.77     10.759  O        |        |  I     |        |     2.37
16.500   71.21    4.77     11.319  O        |    I   |        |        |     2.48
16.583   57.45    4.77     11.729  O        |  I     |        |        |     2.57
16.667   49.19    4.77     12.063  O       |I       |        |        |     2.64
16.750   43.17    4.77     12.348  O       I        |        |        |     2.70
16.833   37.73    4.77     12.594  O      I|        |        |        |     2.75
16.917   34.01    4.77     12.808  O     I |        |        |        |     2.80
17.000   30.26    4.77     12.997  O    I  |        |        |        |     2.84
17.083   27.42    4.77     13.163  O    I  |        |        |        |     2.87
17.167   24.87    4.77     13.310  O   I   |        |        |        |     2.90
17.250   23.33    4.77     13.443  O   I   |        |        |        |     2.93
17.333   21.65    4.77     13.565  O   I   |        |        |        |     2.96
17.417   19.79    4.77     13.675  O  I    |        |        |        |     2.98
17.500   18.39    4.77     13.773  O  I    |        |        |        |     3.00
17.583   17.19    4.77     13.863  O  I    |        |        |        |     3.02
17.667   15.99    4.77     13.944  O  I    |        |        |        |     3.04
17.750   14.87    4.77     14.018  O I     |        |        |        |     3.05
17.833   14.11    4.77     14.085  O I     |        |        |        |     3.06
17.917   13.53    4.77     14.147  O I     |        |        |        |     3.08
18.000   12.90    4.77     14.205  O I     |        |        |        |     3.09
18.083   11.92    4.77     14.258  O I     |        |        |        |     3.10
18.167   10.36    4.77     14.302  O I     |        |        |        |     3.11
18.250   10.10    4.77     14.339  OI      |        |        |        |     3.11
18.333    9.92    4.77     14.375  OI      |        |        |        |     3.12
18.417    9.70    4.77     14.410  OI      |        |        |        |     3.13
18.500    9.46    4.77     14.443  OI      |        |        |        |     3.14
18.583    9.24    4.77     14.475  OI      |        |        |        |     3.14
18.667    9.02    4.77     14.505  OI      |        |        |        |     3.15
18.750    8.82    4.77     14.533  OI      |        |        |        |     3.15
18.833    8.63    4.77     14.560  OI      |        |        |        |     3.16
18.917    8.45    4.77     14.586  OI      |        |        |        |     3.16
19.000    8.28    4.77     14.611  OI      |        |        |        |     3.17
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19.083	8.12	4.77	14.635	OI				3.17
19.167	7.97	4.77	14.657	OI				3.18
19.250	7.82	4.77	14.679	OI				3.18
19.333	7.68	4.77	14.699	OI				3.19
19.417	7.55	4.77	14.719	OI				3.19
19.500	7.42	4.77	14.738	OI				3.19
19.583	7.30	4.77	14.755	OI				3.20
19.667	7.18	4.77	14.772	OI				3.20
19.750	7.07	4.77	14.789	OI				3.20
19.833	6.96	4.77	14.804	OI				3.21
19.917	6.86	4.77	14.819	OI				3.21
20.000	6.76	4.77	14.833	OI				3.21
20.083	6.66	4.77	14.846	OI				3.22
20.167	6.57	4.77	14.859	OI				3.22
20.250	6.48	4.77	14.871	OI				3.22
20.333	6.39	4.77	14.882	OI				3.22
20.417	6.31	4.77	14.893	OI				3.23
20.500	6.22	4.77	14.904	OI				3.23
20.583	6.14	4.77	14.913	OI				3.23
20.667	6.07	4.77	14.922	OI				3.23
20.750	5.99	4.77	14.931	OI				3.23
20.833	5.92	4.77	14.939	OI				3.23
20.917	5.85	4.77	14.947	OI				3.24
21.000	5.79	4.77	14.954	OI				3.24
21.083	5.72	4.77	14.961	OI				3.24
21.167	5.66	4.77	14.967	OI				3.24
21.250	5.60	4.77	14.973	OI				3.24
21.333	5.54	4.77	14.979	OI				3.24
21.417	5.48	4.77	14.984	OI				3.24
21.500	5.42	4.77	14.988	OI				3.24
21.583	5.37	4.77	14.993	OI				3.25
21.667	5.32	4.77	14.997	OI				3.25
21.750	5.26	4.77	15.000	OI				3.25
21.833	5.21	4.77	15.003	OI				3.25
21.917	5.16	4.77	15.006	OI				3.25
22.000	5.11	4.77	15.009	OI				3.25
22.083	5.07	4.77	15.011	O				3.25
22.167	5.02	4.77	15.013	O				3.25
22.250	4.98	4.77	15.014	O				3.25
22.333	4.93	4.77	15.016	O				3.25
22.417	4.89	4.77	15.017	O				3.25
22.500	4.85	4.77	15.017	O				3.25
22.583	4.81	4.77	15.018	O				3.25
22.667	4.77	4.77	15.018	O				3.25
22.750	4.73	4.77	15.018	O				3.25
22.833	4.69	4.77	15.017	O				3.25
22.917	4.65	4.77	15.016	O				3.25
23.000	4.62	4.77	15.016	O				3.25
23.083	4.58	4.77	15.014	O				3.25
23.167	4.54	4.77	15.013	O				3.25

23.250	4.51	4.77	15.011	O				3.25
23.333	4.48	4.77	15.009	O				3.25
23.417	4.44	4.77	15.007	O				3.25
23.500	4.41	4.77	15.005	O				3.25
23.583	4.38	4.77	15.002	O				3.25
23.667	4.35	4.77	14.999	O				3.25
23.750	4.32	4.77	14.996	O				3.25
23.833	4.29	4.77	14.993	O				3.25
23.917	4.26	4.77	14.990	O				3.24
24.000	4.23	4.77	14.986	O				3.24
24.083	4.06	4.77	14.982	O				3.24
24.167	3.52	4.77	14.975	O				3.24
24.250	2.63	4.77	14.963	O				3.24
24.333	1.79	4.77	14.946	O				3.24
24.417	1.32	4.77	14.923	O				3.23
24.500	1.05	4.77	14.899	O				3.23
24.583	0.86	4.77	14.872	O				3.22
24.667	0.71	4.77	14.845	O				3.22
24.750	0.59	4.77	14.817	O				3.21
24.833	0.49	4.77	14.787	O				3.20
24.917	0.41	4.77	14.758	O				3.20
25.000	0.35	4.77	14.727	O				3.19
25.083	0.29	4.77	14.697	O				3.19
25.167	0.25	4.77	14.666	O				3.18
25.250	0.20	4.77	14.634	O				3.17
25.333	0.17	4.77	14.603	O				3.17
25.417	0.14	4.77	14.571	O				3.16
25.500	0.11	4.77	14.539	O				3.15
25.583	0.09	4.77	14.507	O				3.15
25.667	0.07	4.77	14.474	O				3.14
25.750	0.05	4.77	14.442	O				3.13
25.833	0.04	4.77	14.409	O				3.13
25.917	0.02	4.77	14.377	O				3.12
26.000	0.01	4.77	14.344	O				3.12
26.083	0.00	4.77	14.311	O				3.11
26.167	0.00	4.77	14.278	O				3.10
26.250	0.00	4.77	14.245	O				3.10
26.333	0.00	4.77	14.213	O				3.09
26.417	0.00	4.77	14.180	O				3.08
26.500	0.00	4.77	14.147	O				3.08
26.583	0.00	4.77	14.114	O				3.07
26.667	0.00	4.77	14.081	O				3.06
26.750	0.00	4.77	14.048	O				3.06
26.833	0.00	4.77	14.015	O				3.05
26.917	0.00	4.77	13.983	O				3.04
27.000	0.00	4.77	13.950	O				3.04
27.083	0.00	4.77	13.917	O				3.03
27.167	0.00	4.77	13.884	O				3.02
27.250	0.00	4.77	13.851	O				3.02
27.333	0.00	4.77	13.818	O				3.01

27.417	0.00	4.77	13.785	O				3.00
27.500	0.00	4.77	13.752	O				3.00
27.583	0.00	4.77	13.720	O				2.99
27.667	0.00	4.77	13.687	O				2.98
27.750	0.00	4.77	13.654	O				2.98
27.833	0.00	4.77	13.621	O				2.97
27.917	0.00	4.77	13.588	O				2.96
28.000	0.00	4.77	13.555	O				2.95
28.083	0.00	4.77	13.522	O				2.95
28.167	0.00	4.77	13.490	O				2.94
28.250	0.00	4.77	13.457	O				2.93
28.333	0.00	4.77	13.424	O				2.93
28.417	0.00	4.77	13.391	O				2.92
28.500	0.00	4.77	13.358	O				2.91
28.583	0.00	4.77	13.325	O				2.91
28.667	0.00	4.77	13.292	O				2.90
28.750	0.00	4.77	13.259	O				2.89
28.833	0.00	4.77	13.227	O				2.89
28.917	0.00	4.77	13.194	O				2.88
29.000	0.00	4.77	13.161	O				2.87
29.083	0.00	4.77	13.128	O				2.86
29.167	0.00	4.77	13.095	O				2.86
29.250	0.00	4.77	13.062	O				2.85
29.333	0.00	4.77	13.029	O				2.84
29.417	0.00	4.77	12.997	O				2.84
29.500	0.00	4.77	12.964	O				2.83
29.583	0.00	4.77	12.931	O				2.82
29.667	0.00	4.77	12.898	O				2.82
29.750	0.00	4.77	12.865	O				2.81
29.833	0.00	4.77	12.832	O				2.80
29.917	0.00	4.77	12.799	O				2.80
30.000	0.00	4.77	12.767	O				2.79
30.083	0.00	4.77	12.734	O				2.78
30.167	0.00	4.77	12.701	O				2.77
30.250	0.00	4.77	12.668	O				2.77
30.333	0.00	4.77	12.635	O				2.76
30.417	0.00	4.77	12.602	O				2.75
30.500	0.00	4.77	12.569	O				2.75
30.583	0.00	4.77	12.536	O				2.74
30.667	0.00	4.77	12.504	O				2.73
30.750	0.00	4.77	12.471	O				2.73
30.833	0.00	4.77	12.438	O				2.72
30.917	0.00	4.77	12.405	O				2.71
31.000	0.00	4.77	12.372	O				2.71
31.083	0.00	4.77	12.339	O				2.70
31.167	0.00	4.77	12.306	O				2.69
31.250	0.00	4.77	12.274	O				2.68
31.333	0.00	4.77	12.241	O				2.68
31.417	0.00	4.77	12.208	O				2.67
31.500	0.00	4.77	12.175	O				2.66

31.583	0.00	4.77	12.142	O				2.66
31.667	0.00	4.77	12.109	O				2.65
31.750	0.00	4.77	12.076	O				2.64
31.833	0.00	4.77	12.044	O				2.64
31.917	0.00	4.77	12.011	O				2.63
32.000	0.00	4.77	11.978	O				2.62
32.083	0.00	4.77	11.945	O				2.62
32.167	0.00	4.77	11.912	O				2.61
32.250	0.00	4.77	11.879	O				2.60
32.333	0.00	4.77	11.846	O				2.60
32.417	0.00	4.77	11.814	O				2.59
32.500	0.00	4.77	11.781	O				2.58
32.583	0.00	4.77	11.748	O				2.57
32.667	0.00	4.77	11.715	O				2.57
32.750	0.00	4.77	11.682	O				2.56
32.833	0.00	4.77	11.649	O				2.55
32.917	0.00	4.77	11.616	O				2.55
33.000	0.00	4.77	11.583	O				2.54
33.083	0.00	4.77	11.551	O				2.53
33.167	0.00	4.77	11.518	O				2.53
33.250	0.00	4.77	11.485	O				2.52
33.333	0.00	4.77	11.452	O				2.51
33.417	0.00	4.77	11.419	O				2.51
33.500	0.00	4.77	11.386	O				2.50
33.583	0.00	4.77	11.353	O				2.49
33.667	0.00	4.77	11.321	O				2.48
33.750	0.00	4.77	11.288	O				2.48
33.833	0.00	4.77	11.255	O				2.47
33.917	0.00	4.77	11.222	O				2.46
34.000	0.00	4.77	11.189	O				2.46
34.083	0.00	4.77	11.156	O				2.45
34.167	0.00	4.77	11.123	O				2.44
34.250	0.00	4.77	11.091	O				2.44
34.333	0.00	4.77	11.058	O				2.43
34.417	0.00	4.77	11.025	O				2.42
34.500	0.00	4.77	10.992	O				2.42
34.583	0.00	4.77	10.959	O				2.41
34.667	0.00	4.77	10.926	O				2.40
34.750	0.00	4.77	10.893	O				2.39
34.833	0.00	4.77	10.861	O				2.39
34.917	0.00	4.77	10.828	O				2.38
35.000	0.00	4.77	10.795	O				2.37
35.083	0.00	4.77	10.762	O				2.37
35.167	0.00	4.77	10.729	O				2.36
35.250	0.00	4.77	10.696	O				2.35
35.333	0.00	4.77	10.663	O				2.35
35.417	0.00	4.77	10.630	O				2.34
35.500	0.00	4.77	10.598	O				2.33
35.583	0.00	4.77	10.565	O				2.33
35.667	0.00	4.77	10.532	O				2.32

35.750	0.00	4.77	10.499	O				2.31
35.833	0.00	4.77	10.466	O				2.30
35.917	0.00	4.77	10.433	O				2.30
36.000	0.00	4.77	10.400	O				2.29
36.083	0.00	4.77	10.368	O				2.28
36.167	0.00	4.77	10.335	O				2.28
36.250	0.00	4.77	10.302	O				2.27
36.333	0.00	4.77	10.269	O				2.26
36.417	0.00	4.77	10.236	O				2.26
36.500	0.00	4.77	10.203	O				2.25
36.583	0.00	4.77	10.170	O				2.24
36.667	0.00	4.77	10.138	O				2.24
36.750	0.00	4.77	10.105	O				2.23
36.833	0.00	4.77	10.072	O				2.22
36.917	0.00	4.77	10.039	O				2.21
37.000	0.00	4.77	10.006	O				2.21
37.083	0.00	4.77	9.973	O				2.20
37.167	0.00	4.77	9.940	O				2.19
37.250	0.00	4.77	9.908	O				2.19
37.333	0.00	4.77	9.875	O				2.18
37.417	0.00	4.77	9.842	O				2.17
37.500	0.00	4.77	9.809	O				2.17
37.583	0.00	4.77	9.776	O				2.16
37.667	0.00	4.77	9.743	O				2.15
37.750	0.00	4.77	9.710	O				2.15
37.833	0.00	4.77	9.678	O				2.14
37.917	0.00	4.77	9.645	O				2.13
38.000	0.00	4.77	9.612	O				2.12
38.083	0.00	4.77	9.579	O				2.12
38.167	0.00	4.77	9.546	O				2.11
38.250	0.00	4.77	9.513	O				2.10
38.333	0.00	4.77	9.480	O				2.10
38.417	0.00	4.77	9.448	O				2.09
38.500	0.00	4.77	9.415	O				2.08
38.583	0.00	4.77	9.382	O				2.08
38.667	0.00	4.77	9.349	O				2.07
38.750	0.00	4.77	9.316	O				2.06
38.833	0.00	4.77	9.283	O				2.06
38.917	0.00	4.77	9.250	O				2.05
39.000	0.00	4.77	9.218	O				2.04
39.083	0.00	4.77	9.185	O				2.03
39.167	0.00	4.77	9.152	O				2.03
39.250	0.00	4.77	9.119	O				2.02
39.333	0.00	4.77	9.086	O				2.01
39.417	0.00	4.77	9.053	O				2.01
39.500	0.00	4.77	9.020	O				2.00
39.583	0.00	4.77	8.988	O				1.99
39.667	0.00	4.77	8.955	O				1.99
39.750	0.00	4.77	8.922	O				1.98
39.833	0.00	4.77	8.889	O				1.97

39.917	0.00	4.77	8.856	O				1.97
40.000	0.00	4.77	8.823	O				1.96
40.083	0.00	4.77	8.790	O				1.95
40.167	0.00	4.77	8.758	O				1.94
40.250	0.00	4.77	8.725	O				1.94
40.333	0.00	4.77	8.692	O				1.93
40.417	0.00	4.77	8.659	O				1.92
40.500	0.00	4.77	8.626	O				1.92
40.583	0.00	4.77	8.593	O				1.91
40.667	0.00	4.77	8.560	O				1.90
40.750	0.00	4.77	8.528	O				1.90
40.833	0.00	4.77	8.495	O				1.89
40.917	0.00	4.77	8.462	O				1.88
41.000	0.00	4.77	8.429	O				1.88
41.083	0.00	4.77	8.396	O				1.87
41.167	0.00	4.77	8.363	O				1.86
41.250	0.00	4.77	8.330	O				1.85
41.333	0.00	4.77	8.298	O				1.85
41.417	0.00	4.77	8.265	O				1.84
41.500	0.00	4.77	8.232	O				1.83
41.583	0.00	4.77	8.199	O				1.83
41.667	0.00	4.77	8.166	O				1.82
41.750	0.00	4.77	8.133	O				1.81
41.833	0.00	4.77	8.100	O				1.81
41.917	0.00	4.77	8.068	O				1.80
42.000	0.00	4.77	8.035	O				1.79
42.083	0.00	4.77	8.002	O				1.79
42.167	0.00	4.77	7.969	O				1.78
42.250	0.00	4.77	7.936	O				1.77
42.333	0.00	4.77	7.903	O				1.76
42.417	0.00	4.77	7.870	O				1.76
42.500	0.00	4.77	7.838	O				1.75
42.583	0.00	4.77	7.805	O				1.74
42.667	0.00	4.77	7.772	O				1.74
42.750	0.00	4.77	7.739	O				1.73
42.833	0.00	4.77	7.706	O				1.72
42.917	0.00	4.77	7.673	O				1.72
43.000	0.00	4.77	7.640	O				1.71
43.083	0.00	4.77	7.608	O				1.70
43.167	0.00	4.77	7.575	O				1.70
43.250	0.00	4.77	7.542	O				1.69
43.333	0.00	4.77	7.509	O				1.68
43.417	0.00	4.77	7.476	O				1.67
43.500	0.00	4.77	7.443	O				1.67
43.583	0.00	4.77	7.410	O				1.66
43.667	0.00	4.77	7.378	O				1.65
43.750	0.00	4.77	7.345	O				1.65
43.833	0.00	4.77	7.312	O				1.64
43.917	0.00	4.77	7.279	O				1.63
44.000	0.00	4.77	7.246	O				1.63

44.083	0.00	4.77	7.213	O				1.62
44.167	0.00	4.77	7.180	O				1.61
44.250	0.00	4.77	7.148	O				1.61
44.333	0.00	4.77	7.115	O				1.60
44.417	0.00	4.77	7.082	O				1.59
44.500	0.00	4.77	7.049	O				1.59
44.583	0.00	4.77	7.016	O				1.58
44.667	0.00	4.77	6.983	O				1.57
44.750	0.00	4.77	6.950	O				1.56
44.833	0.00	4.77	6.918	O				1.56
44.917	0.00	4.77	6.885	O				1.55
45.000	0.00	4.77	6.852	O				1.54
45.083	0.00	4.77	6.819	O				1.54
45.167	0.00	4.77	6.786	O				1.53
45.250	0.00	4.77	6.753	O				1.52
45.333	0.00	4.77	6.720	O				1.52
45.417	0.00	4.77	6.688	O				1.51
45.500	0.00	4.77	6.655	O				1.50
45.583	0.00	4.77	6.622	O				1.50
45.667	0.00	4.77	6.589	O				1.49
45.750	0.00	4.77	6.556	O				1.48
45.833	0.00	4.77	6.523	O				1.47
45.917	0.00	4.77	6.490	O				1.47
46.000	0.00	4.77	6.458	O				1.46
46.083	0.00	4.77	6.425	O				1.45
46.167	0.00	4.77	6.392	O				1.45
46.250	0.00	4.77	6.359	O				1.44
46.333	0.00	4.77	6.326	O				1.43
46.417	0.00	4.77	6.293	O				1.43
46.500	0.00	4.77	6.260	O				1.42
46.583	0.00	4.77	6.228	O				1.41
46.667	0.00	4.77	6.195	O				1.41
46.750	0.00	4.77	6.162	O				1.40
46.833	0.00	4.77	6.129	O				1.39
46.917	0.00	4.77	6.096	O				1.38
47.000	0.00	4.77	6.063	O				1.38
47.083	0.00	4.77	6.031	O				1.37
47.167	0.00	4.77	5.998	O				1.36
47.250	0.00	4.77	5.965	O				1.36
47.333	0.00	4.77	5.932	O				1.35
47.417	0.00	4.77	5.899	O				1.34
47.500	0.00	4.77	5.866	O				1.34
47.583	0.00	4.77	5.833	O				1.33
47.667	0.00	4.77	5.801	O				1.32
47.750	0.00	4.77	5.768	O				1.32
47.833	0.00	4.77	5.735	O				1.31
47.917	0.00	4.77	5.702	O				1.30
48.000	0.00	4.77	5.669	O				1.29
48.083	0.00	4.77	5.636	O				1.29
48.167	0.00	4.77	5.603	O				1.28

48.250	0.00	4.77	5.571	O				1.27
48.333	0.00	4.77	5.538	O				1.27
48.417	0.00	4.77	5.505	O				1.26
48.500	0.00	4.77	5.472	O				1.25
48.583	0.00	4.77	5.439	O				1.25
48.667	0.00	4.77	5.406	O				1.24
48.750	0.00	4.77	5.373	O				1.23
48.833	0.00	4.77	5.341	O				1.23
48.917	0.00	4.77	5.308	O				1.22
49.000	0.00	4.77	5.275	O				1.21
49.083	0.00	4.77	5.242	O				1.20
49.167	0.00	4.77	5.209	O				1.20
49.250	0.00	4.77	5.176	O				1.19
49.333	0.00	4.77	5.143	O				1.18
49.417	0.00	4.77	5.111	O				1.18
49.500	0.00	4.77	5.078	O				1.17
49.583	0.00	4.77	5.045	O				1.16
49.667	0.00	4.77	5.012	O				1.16
49.750	0.00	4.77	4.979	O				1.15
49.833	0.00	4.77	4.946	O				1.14
49.917	0.00	4.77	4.914	O				1.14
50.000	0.00	4.77	4.881	O				1.13
50.083	0.00	4.77	4.848	O				1.12
50.167	0.00	4.77	4.815	O				1.11
50.250	0.00	4.77	4.782	O				1.11
50.333	0.00	4.77	4.749	O				1.10
50.417	0.00	4.77	4.716	O				1.09
50.500	0.00	4.77	4.684	O				1.09
50.583	0.00	4.77	4.651	O				1.08
50.667	0.00	4.77	4.618	O				1.07
50.750	0.00	4.77	4.585	O				1.07
50.833	0.00	4.77	4.552	O				1.06
50.917	0.00	4.77	4.519	O				1.05
51.000	0.00	4.77	4.486	O				1.05
51.083	0.00	4.77	4.454	O				1.04
51.167	0.00	4.77	4.421	O				1.03
51.250	0.00	4.77	4.388	O				1.02
51.333	0.00	4.77	4.355	O				1.02
51.417	0.00	4.77	4.322	O				1.01
51.500	0.00	4.77	4.289	O				1.00
51.583	0.00	4.75	4.257	O				1.00
51.667	0.00	4.72	4.224	O				0.99
51.750	0.00	4.68	4.192	O				0.98
51.833	0.00	4.65	4.159	O				0.97
51.917	0.00	4.61	4.128	O				0.97
52.000	0.00	4.58	4.096	O				0.96
52.083	0.00	4.54	4.064	O				0.95
52.167	0.00	4.51	4.033	O				0.94
52.250	0.00	4.47	4.002	O				0.94
52.333	0.00	4.44	3.972	O				0.93

52.417	0.00	4.40	3.941	O				0.92
52.500	0.00	4.37	3.911	O				0.92
52.583	0.00	4.34	3.881	O				0.91
52.667	0.00	4.30	3.851	O				0.90
52.750	0.00	4.27	3.822	O				0.90
52.833	0.00	4.24	3.793	O				0.89
52.917	0.00	4.20	3.764	O				0.88
53.000	0.00	4.17	3.735	O				0.87
53.083	0.00	4.14	3.706	O				0.87
53.167	0.00	4.11	3.678	O				0.86
53.250	0.00	4.08	3.649	O				0.85
53.333	0.00	4.05	3.621	O				0.85
53.417	0.00	4.01	3.594	O				0.84
53.500	0.00	3.98	3.566	O				0.84
53.583	0.00	3.95	3.539	O				0.83
53.667	0.00	3.92	3.512	O				0.82
53.750	0.00	3.89	3.485	O				0.82
53.833	0.00	3.86	3.458	O				0.81
53.917	0.00	3.83	3.432	O				0.80
54.000	0.00	3.80	3.405	O				0.80
54.083	0.00	3.77	3.379	O				0.79
54.167	0.00	3.75	3.353	O				0.79
54.250	0.00	3.72	3.328	O				0.78
54.333	0.00	3.69	3.302	O				0.77
54.417	0.00	3.66	3.277	O				0.77
54.500	0.00	3.63	3.252	O				0.76
54.583	0.00	3.60	3.227	O				0.76
54.667	0.00	3.58	3.202	O				0.75
54.750	0.00	3.55	3.178	O				0.74
54.833	0.00	3.52	3.153	O				0.74
54.917	0.00	3.50	3.129	O				0.73
55.000	0.00	3.47	3.105	O				0.73
55.083	0.00	3.44	3.081	O				0.72
55.167	0.00	3.42	3.058	O				0.72
55.250	0.00	3.39	3.034	O				0.71
55.333	0.00	3.36	3.011	O				0.71
55.417	0.00	3.34	2.988	O				0.70
55.500	0.00	3.31	2.965	O				0.69
55.583	0.00	3.29	2.942	O				0.69
55.667	0.00	3.26	2.920	O				0.68
55.750	0.00	3.24	2.897	O				0.68
55.833	0.00	3.21	2.875	O				0.67
55.917	0.00	3.19	2.853	O				0.67
56.000	0.00	3.16	2.831	O				0.66
56.083	0.00	3.14	2.809	O				0.66
56.167	0.00	3.11	2.788	O				0.65
56.250	0.00	3.09	2.767	O				0.65
56.333	0.00	3.07	2.745	O				0.64
56.417	0.00	3.04	2.724	O				0.64
56.500	0.00	3.02	2.703	O				0.63

56.583	0.00	3.00	2.683	O				0.63
56.667	0.00	2.97	2.662	O				0.62
56.750	0.00	2.95	2.642	O				0.62
56.833	0.00	2.93	2.622	O				0.61
56.917	0.00	2.91	2.601	O				0.61
57.000	0.00	2.88	2.582	O				0.60
57.083	0.00	2.86	2.562	O				0.60
57.167	0.00	2.84	2.542	O				0.60
57.250	0.00	2.82	2.523	O				0.59
57.333	0.00	2.80	2.503	O				0.59
57.417	0.00	2.77	2.484	O				0.58
57.500	0.00	2.75	2.465	O				0.58
57.583	0.00	2.73	2.446	O				0.57
57.667	0.00	2.71	2.427	O				0.57
57.750	0.00	2.69	2.409	O				0.56
57.833	0.00	2.67	2.390	O				0.56
57.917	0.00	2.65	2.372	O				0.56
58.000	0.00	2.63	2.354	O				0.55
58.083	0.00	2.61	2.336	O				0.55
58.167	0.00	2.59	2.318	O				0.54
58.250	0.00	2.57	2.300	O				0.54
58.333	0.00	2.55	2.283	O				0.53
58.417	0.00	2.53	2.265	O				0.53
58.500	0.00	2.51	2.248	O				0.53
58.583	0.00	2.49	2.230	O				0.52
58.667	0.00	2.47	2.213	O				0.52
58.750	0.00	2.45	2.196	O				0.51
58.833	0.00	2.43	2.180	O				0.51
58.917	0.00	2.42	2.163	O				0.51
59.000	0.00	2.40	2.146	O				0.50
59.083	0.00	2.38	2.130	O				0.50
59.167	0.00	2.36	2.113	O				0.49
59.250	0.00	2.34	2.097	O				0.49
59.333	0.00	2.32	2.081	O				0.49
59.417	0.00	2.31	2.065	O				0.48
59.500	0.00	2.29	2.049	O				0.48
59.583	0.00	2.27	2.034	O				0.48
59.667	0.00	2.25	2.018	O				0.47
59.750	0.00	2.24	2.003	O				0.47
59.833	0.00	2.22	1.987	O				0.47
59.917	0.00	2.20	1.972	O				0.46
60.000	0.00	2.19	1.957	O				0.46
60.083	0.00	2.17	1.942	O				0.45
60.167	0.00	2.15	1.927	O				0.45
60.250	0.00	2.14	1.912	O				0.45
60.333	0.00	2.12	1.898	O				0.44
60.417	0.00	2.10	1.883	O				0.44
60.500	0.00	2.09	1.869	O				0.44
60.583	0.00	2.07	1.854	O				0.43
60.667	0.00	2.06	1.840	O				0.43

60.750	0.00	2.04	1.826	O				0.43
60.833	0.00	2.02	1.812	O				0.42
60.917	0.00	2.01	1.798	O				0.42
61.000	0.00	1.99	1.784	O				0.42
61.083	0.00	1.98	1.771	O				0.41
61.167	0.00	1.96	1.757	O				0.41
61.250	0.00	1.95	1.744	O				0.41
61.333	0.00	1.93	1.730	O				0.41
61.417	0.00	1.92	1.717	O				0.40
61.500	0.00	1.90	1.704	O				0.40
61.583	0.00	1.89	1.691	O				0.40
61.667	0.00	1.87	1.678	O				0.39
61.750	0.00	1.86	1.665	O				0.39
61.833	0.00	1.85	1.652	O				0.39
61.917	0.00	1.83	1.640	O				0.38
62.000	0.00	1.82	1.627	O				0.38
62.083	0.00	1.80	1.615	O				0.38
62.167	0.00	1.79	1.602	O				0.38
62.250	0.00	1.78	1.590	O				0.37
62.333	0.00	1.76	1.578	O				0.37
62.417	0.00	1.75	1.566	O				0.37
62.500	0.00	1.74	1.554	O				0.36
62.583	0.00	1.72	1.542	O				0.36
62.667	0.00	1.71	1.530	O				0.36
62.750	0.00	1.70	1.518	O				0.36
62.833	0.00	1.68	1.507	O				0.35
62.917	0.00	1.67	1.495	O				0.35
63.000	0.00	1.66	1.484	O				0.35
63.083	0.00	1.64	1.472	O				0.34
63.167	0.00	1.63	1.461	O				0.34
63.250	0.00	1.62	1.450	O				0.34
63.333	0.00	1.61	1.439	O				0.34
63.417	0.00	1.59	1.428	O				0.33
63.500	0.00	1.58	1.417	O				0.33
63.583	0.00	1.57	1.406	O				0.33
63.667	0.00	1.56	1.395	O				0.33
63.750	0.00	1.55	1.384	O				0.32
63.833	0.00	1.53	1.374	O				0.32
63.917	0.00	1.52	1.363	O				0.32
64.000	0.00	1.51	1.353	O				0.32
64.083	0.00	1.50	1.342	O				0.31
64.167	0.00	1.49	1.332	O				0.31
64.250	0.00	1.48	1.322	O				0.31
64.333	0.00	1.47	1.312	O				0.31
64.417	0.00	1.45	1.302	O				0.30
64.500	0.00	1.44	1.292	O				0.30
64.583	0.00	1.43	1.282	O				0.30
64.667	0.00	1.42	1.272	O				0.30
64.750	0.00	1.41	1.262	O				0.30
64.833	0.00	1.40	1.253	O				0.29

64.917	0.00	1.39	1.243	O				0.29
65.000	0.00	1.38	1.233	O				0.29
65.083	0.00	1.37	1.224	O				0.29
65.167	0.00	1.36	1.215	O				0.28
65.250	0.00	1.35	1.205	O				0.28
65.333	0.00	1.34	1.196	O				0.28
65.417	0.00	1.33	1.187	O				0.28
65.500	0.00	1.32	1.178	O				0.28
65.583	0.00	1.31	1.169	O				0.27
65.667	0.00	1.30	1.160	O				0.27
65.750	0.00	1.29	1.151	O				0.27
65.833	0.00	1.28	1.142	O				0.27
65.917	0.00	1.27	1.133	O				0.27
66.000	0.00	1.26	1.125	O				0.26
66.083	0.00	1.25	1.116	O				0.26
66.167	0.00	1.24	1.107	O				0.26
66.250	0.00	1.23	1.099	O				0.26
66.333	0.00	1.22	1.091	O				0.26
66.417	0.00	1.21	1.082	O				0.25
66.500	0.00	1.20	1.074	O				0.25
66.583	0.00	1.19	1.066	O				0.25
66.667	0.00	1.18	1.058	O				0.25
66.750	0.00	1.17	1.049	O				0.25
66.833	0.00	1.16	1.041	O				0.24
66.917	0.00	1.15	1.033	O				0.24
67.000	0.00	1.15	1.025	O				0.24
67.083	0.00	1.14	1.018	O				0.24
67.167	0.00	1.13	1.010	O				0.24
67.250	0.00	1.12	1.002	O				0.23
67.333	0.00	1.11	0.994	O				0.23
67.417	0.00	1.10	0.987	O				0.23
67.500	0.00	1.09	0.979	O				0.23
67.583	0.00	1.09	0.972	O				0.23
67.667	0.00	1.08	0.964	O				0.23
67.750	0.00	1.07	0.957	O				0.22
67.833	0.00	1.06	0.950	O				0.22
67.917	0.00	1.05	0.942	O				0.22
68.000	0.00	1.04	0.935	O				0.22
68.083	0.00	1.04	0.928	O				0.22
68.167	0.00	1.03	0.921	O				0.22
68.250	0.00	1.02	0.914	O				0.21
68.333	0.00	1.01	0.907	O				0.21
68.417	0.00	1.01	0.900	O				0.21
68.500	0.00	1.00	0.893	O				0.21
68.583	0.00	0.99	0.886	O				0.21
68.667	0.00	0.98	0.879	O				0.21
68.750	0.00	0.97	0.872	O				0.20
68.833	0.00	0.97	0.866	O				0.20
68.917	0.00	0.96	0.859	O				0.20
69.000	0.00	0.95	0.853	O				0.20

69.083	0.00	0.95	0.846	O				0.20
69.167	0.00	0.94	0.840	O				0.20
69.250	0.00	0.93	0.833	O				0.20
69.333	0.00	0.92	0.827	O				0.19
69.417	0.00	0.92	0.820	O				0.19
69.500	0.00	0.91	0.814	O				0.19
69.583	0.00	0.90	0.808	O				0.19
69.667	0.00	0.90	0.802	O				0.19
69.750	0.00	0.89	0.796	O				0.19
69.833	0.00	0.88	0.789	O				0.18
69.917	0.00	0.88	0.783	O				0.18
70.000	0.00	0.87	0.777	O				0.18
70.083	0.00	0.86	0.771	O				0.18
70.167	0.00	0.86	0.766	O				0.18
70.250	0.00	0.85	0.760	O				0.18
70.333	0.00	0.84	0.754	O				0.18
70.417	0.00	0.84	0.748	O				0.18
70.500	0.00	0.83	0.742	O				0.17
70.583	0.00	0.82	0.737	O				0.17
70.667	0.00	0.82	0.731	O				0.17
70.750	0.00	0.81	0.725	O				0.17
70.833	0.00	0.80	0.720	O				0.17
70.917	0.00	0.80	0.714	O				0.17
71.000	0.00	0.79	0.709	O				0.17
71.083	0.00	0.79	0.703	O				0.16
71.167	0.00	0.78	0.698	O				0.16
71.250	0.00	0.77	0.693	O				0.16
71.333	0.00	0.77	0.687	O				0.16
71.417	0.00	0.76	0.682	O				0.16
71.500	0.00	0.76	0.677	O				0.16
71.583	0.00	0.75	0.672	O				0.16
71.667	0.00	0.74	0.667	O				0.16
71.750	0.00	0.74	0.661	O				0.15
71.833	0.00	0.73	0.656	O				0.15
71.917	0.00	0.73	0.651	O				0.15
72.000	0.00	0.72	0.646	O				0.15
72.083	0.00	0.72	0.641	O				0.15
72.167	0.00	0.71	0.636	O				0.15
72.250	0.00	0.71	0.632	O				0.15
72.333	0.00	0.70	0.627	O				0.15
72.417	0.00	0.69	0.622	O				0.15
72.500	0.00	0.69	0.617	O				0.14
72.583	0.00	0.68	0.612	O				0.14
72.667	0.00	0.68	0.608	O				0.14
72.750	0.00	0.67	0.603	O				0.14
72.833	0.00	0.67	0.598	O				0.14
72.917	0.00	0.66	0.594	O				0.14
73.000	0.00	0.66	0.589	O				0.14
73.083	0.00	0.65	0.585	O				0.14
73.167	0.00	0.65	0.580	O				0.14

73.250	0.00	0.64	0.576	O	|	|	|	0.13
73.333	0.00	0.64	0.571	O	|	|	|	0.13
73.417	0.00	0.63	0.567	O	|	|	|	0.13
73.500	0.00	0.63	0.563	O	|	|	|	0.13
73.583	0.00	0.62	0.558	O	|	|	|	0.13
73.667	0.00	0.62	0.554	O	|	|	|	0.13
73.750	0.00	0.61	0.550	O	|	|	|	0.13
73.833	0.00	0.61	0.546	O	|	|	|	0.13
73.917	0.00	0.60	0.541	O	|	|	|	0.13
74.000	0.00	0.60	0.537	O	|	|	|	0.13
74.083	0.00	0.60	0.533	O	|	|	|	0.12
74.167	0.00	0.59	0.529	O	|	|	|	0.12
74.250	0.00	0.59	0.525	O	|	|	|	0.12
74.333	0.00	0.58	0.521	O	|	|	|	0.12
74.417	0.00	0.58	0.517	O	|	|	|	0.12
74.500	0.00	0.57	0.513	O	|	|	|	0.12
74.583	0.00	0.57	0.509	O	|	|	|	0.12
74.667	0.00	0.56	0.505	O	|	|	|	0.12
74.750	0.00	0.56	0.501	O	|	|	|	0.12
74.833	0.00	0.56	0.498	O	|	|	|	0.12
74.917	0.00	0.55	0.494	O	|	|	|	0.12
75.000	0.00	0.55	0.490	O	|	|	|	0.11
75.083	0.00	0.54	0.486	O	|	|	|	0.11
75.167	0.00	0.54	0.482	O	|	|	|	0.11
75.250	0.00	0.53	0.479	O	|	|	|	0.11
75.333	0.00	0.53	0.475	O	|	|	|	0.11
75.417	0.00	0.53	0.471	O	|	|	|	0.11
75.500	0.00	0.52	0.468	O	|	|	|	0.11
75.583	0.00	0.52	0.464	O	|	|	|	0.11
75.667	0.00	0.51	0.461	O	|	|	|	0.11
75.750	0.00	0.51	0.457	O	|	|	|	0.11
75.833	0.00	0.51	0.454	O	|	|	|	0.11
75.917	0.00	0.50	0.450	O	|	|	|	0.11
76.000	0.00	0.50	0.447	O	|	|	|	0.10
76.083	0.00	0.50	0.443	O	|	|	|	0.10
76.167	0.00	0.49	0.440	O	|	|	|	0.10
76.250	0.00	0.49	0.437	O	|	|	|	0.10
76.333	0.00	0.48	0.433	O	|	|	|	0.10
76.417	0.00	0.48	0.430	O	|	|	|	0.10
76.500	0.00	0.48	0.427	O	|	|	|	0.10
76.583	0.00	0.47	0.423	O	|	|	|	0.10
76.667	0.00	0.47	0.420	O	|	|	|	0.10
76.750	0.00	0.47	0.417	O	|	|	|	0.10
76.833	0.00	0.46	0.414	O	|	|	|	0.10
76.917	0.00	0.46	0.410	O	|	|	|	0.10
77.000	0.00	0.46	0.407	O	|	|	|	0.10
77.083	0.00	0.45	0.404	O	|	|	|	0.09
77.167	0.00	0.45	0.401	O	|	|	|	0.09
77.250	0.00	0.44	0.398	O	|	|	|	0.09
77.333	0.00	0.44	0.395	O	|	|	|	0.09

77.417	0.00	0.44	0.392	O				0.09
77.500	0.00	0.43	0.389	O				0.09
77.583	0.00	0.43	0.386	O				0.09
77.667	0.00	0.43	0.383	O				0.09
77.750	0.00	0.42	0.380	O				0.09
77.833	0.00	0.42	0.377	O				0.09
77.917	0.00	0.42	0.374	O				0.09
78.000	0.00	0.41	0.371	O				0.09
78.083	0.00	0.41	0.369	O				0.09
78.167	0.00	0.41	0.366	O				0.09
78.250	0.00	0.41	0.363	O				0.09
78.333	0.00	0.40	0.360	O				0.08
78.417	0.00	0.40	0.357	O				0.08
78.500	0.00	0.40	0.355	O				0.08
78.583	0.00	0.39	0.352	O				0.08
78.667	0.00	0.39	0.349	O				0.08
78.750	0.00	0.39	0.347	O				0.08
78.833	0.00	0.38	0.344	O				0.08
78.917	0.00	0.38	0.341	O				0.08
79.000	0.00	0.38	0.339	O				0.08
79.083	0.00	0.38	0.336	O				0.08
79.167	0.00	0.37	0.334	O				0.08
79.250	0.00	0.37	0.331	O				0.08
79.333	0.00	0.37	0.328	O				0.08
79.417	0.00	0.36	0.326	O				0.08
79.500	0.00	0.36	0.323	O				0.08
79.583	0.00	0.36	0.321	O				0.08
79.667	0.00	0.36	0.318	O				0.07
79.750	0.00	0.35	0.316	O				0.07
79.833	0.00	0.35	0.314	O				0.07
79.917	0.00	0.35	0.311	O				0.07
80.000	0.00	0.34	0.309	O				0.07
80.083	0.00	0.34	0.306	O				0.07
80.167	0.00	0.34	0.304	O				0.07
80.250	0.00	0.34	0.302	O				0.07
80.333	0.00	0.33	0.299	O				0.07
80.417	0.00	0.33	0.297	O				0.07
80.500	0.00	0.33	0.295	O				0.07
80.583	0.00	0.33	0.293	O				0.07
80.667	0.00	0.32	0.290	O				0.07
80.750	0.00	0.32	0.288	O				0.07
80.833	0.00	0.32	0.286	O				0.07
80.917	0.00	0.32	0.284	O				0.07
81.000	0.00	0.31	0.282	O				0.07
81.083	0.00	0.31	0.279	O				0.07
81.167	0.00	0.31	0.277	O				0.06
81.250	0.00	0.31	0.275	O				0.06
81.333	0.00	0.31	0.273	O				0.06
81.417	0.00	0.30	0.271	O				0.06
81.500	0.00	0.30	0.269	O				0.06

81.583	0.00	0.30	0.267	O	|	|	|	0.06
81.667	0.00	0.30	0.265	O	|	|	|	0.06
81.750	0.00	0.29	0.263	O	|	|	|	0.06
81.833	0.00	0.29	0.261	O	|	|	|	0.06
81.917	0.00	0.29	0.259	O	|	|	|	0.06
82.000	0.00	0.29	0.257	O	|	|	|	0.06
82.083	0.00	0.28	0.255	O	|	|	|	0.06
82.167	0.00	0.28	0.253	O	|	|	|	0.06
82.250	0.00	0.28	0.251	O	|	|	|	0.06
82.333	0.00	0.28	0.249	O	|	|	|	0.06
82.417	0.00	0.28	0.247	O	|	|	|	0.06
82.500	0.00	0.27	0.245	O	|	|	|	0.06
82.583	0.00	0.27	0.243	O	|	|	|	0.06
82.667	0.00	0.27	0.241	O	|	|	|	0.06
82.750	0.00	0.27	0.240	O	|	|	|	0.06
82.833	0.00	0.27	0.238	O	|	|	|	0.06
82.917	0.00	0.26	0.236	O	|	|	|	0.06
83.000	0.00	0.26	0.234	O	|	|	|	0.05
83.083	0.00	0.26	0.232	O	|	|	|	0.05
83.167	0.00	0.26	0.231	O	|	|	|	0.05
83.250	0.00	0.26	0.229	O	|	|	|	0.05
83.333	0.00	0.25	0.227	O	|	|	|	0.05
83.417	0.00	0.25	0.225	O	|	|	|	0.05
83.500	0.00	0.25	0.224	O	|	|	|	0.05
83.583	0.00	0.25	0.222	O	|	|	|	0.05
83.667	0.00	0.25	0.220	O	|	|	|	0.05
83.750	0.00	0.24	0.218	O	|	|	|	0.05
83.833	0.00	0.24	0.217	O	|	|	|	0.05
83.917	0.00	0.24	0.215	O	|	|	|	0.05
84.000	0.00	0.24	0.213	O	|	|	|	0.05
84.083	0.00	0.24	0.212	O	|	|	|	0.05
84.167	0.00	0.23	0.210	O	|	|	|	0.05
84.250	0.00	0.23	0.209	O	|	|	|	0.05
84.333	0.00	0.23	0.207	O	|	|	|	0.05
84.417	0.00	0.23	0.205	O	|	|	|	0.05
84.500	0.00	0.23	0.204	O	|	|	|	0.05
84.583	0.00	0.23	0.202	O	|	|	|	0.05
84.667	0.00	0.22	0.201	O	|	|	|	0.05
84.750	0.00	0.22	0.199	O	|	|	|	0.05
84.833	0.00	0.22	0.198	O	|	|	|	0.05
84.917	0.00	0.22	0.196	O	|	|	|	0.05
85.000	0.00	0.22	0.195	O	|	|	|	0.05
85.083	0.00	0.22	0.193	O	|	|	|	0.05
85.167	0.00	0.21	0.192	O	|	|	|	0.04
85.250	0.00	0.21	0.190	O	|	|	|	0.04
85.333	0.00	0.21	0.189	O	|	|	|	0.04
85.417	0.00	0.21	0.187	O	|	|	|	0.04
85.500	0.00	0.21	0.186	O	|	|	|	0.04
85.583	0.00	0.21	0.184	O	|	|	|	0.04
85.667	0.00	0.20	0.183	O	|	|	|	0.04

85.750	0.00	0.20	0.182	O	|	|	|	0.04
85.833	0.00	0.20	0.180	O	|	|	|	0.04
85.917	0.00	0.20	0.179	O	|	|	|	0.04
86.000	0.00	0.20	0.177	O	|	|	|	0.04
86.083	0.00	0.20	0.176	O	|	|	|	0.04
86.167	0.00	0.20	0.175	O	|	|	|	0.04
86.250	0.00	0.19	0.173	O	|	|	|	0.04
86.333	0.00	0.19	0.172	O	|	|	|	0.04
86.417	0.00	0.19	0.171	O	|	|	|	0.04
86.500	0.00	0.19	0.169	O	|	|	|	0.04
86.583	0.00	0.19	0.168	O	|	|	|	0.04
86.667	0.00	0.19	0.167	O	|	|	|	0.04
86.750	0.00	0.18	0.166	O	|	|	|	0.04
86.833	0.00	0.18	0.164	O	|	|	|	0.04
86.917	0.00	0.18	0.163	O	|	|	|	0.04
87.000	0.00	0.18	0.162	O	|	|	|	0.04
87.083	0.00	0.18	0.161	O	|	|	|	0.04
87.167	0.00	0.18	0.159	O	|	|	|	0.04
87.250	0.00	0.18	0.158	O	|	|	|	0.04
87.333	0.00	0.18	0.157	O	|	|	|	0.04
87.417	0.00	0.17	0.156	O	|	|	|	0.04
87.500	0.00	0.17	0.155	O	|	|	|	0.04
87.583	0.00	0.17	0.153	O	|	|	|	0.04
87.667	0.00	0.17	0.152	O	|	|	|	0.04
87.750	0.00	0.17	0.151	O	|	|	|	0.04
87.833	0.00	0.17	0.150	O	|	|	|	0.04
87.917	0.00	0.17	0.149	O	|	|	|	0.03
88.000	0.00	0.16	0.148	O	|	|	|	0.03
88.083	0.00	0.16	0.146	O	|	|	|	0.03
88.167	0.00	0.16	0.145	O	|	|	|	0.03
88.250	0.00	0.16	0.144	O	|	|	|	0.03
88.333	0.00	0.16	0.143	O	|	|	|	0.03
88.417	0.00	0.16	0.142	O	|	|	|	0.03
88.500	0.00	0.16	0.141	O	|	|	|	0.03
88.583	0.00	0.16	0.140	O	|	|	|	0.03
88.667	0.00	0.15	0.139	O	|	|	|	0.03
88.750	0.00	0.15	0.138	O	|	|	|	0.03
88.833	0.00	0.15	0.137	O	|	|	|	0.03
88.917	0.00	0.15	0.136	O	|	|	|	0.03
89.000	0.00	0.15	0.135	O	|	|	|	0.03
89.083	0.00	0.15	0.134	O	|	|	|	0.03
89.167	0.00	0.15	0.132	O	|	|	|	0.03
89.250	0.00	0.15	0.131	O	|	|	|	0.03
89.333	0.00	0.15	0.130	O	|	|	|	0.03
89.417	0.00	0.14	0.129	O	|	|	|	0.03
89.500	0.00	0.14	0.128	O	|	|	|	0.03
89.583	0.00	0.14	0.127	O	|	|	|	0.03
89.667	0.00	0.14	0.127	O	|	|	|	0.03
89.750	0.00	0.14	0.126	O	|	|	|	0.03
89.833	0.00	0.14	0.125	O	|	|	|	0.03

89.917	0.00	0.14	0.124	O	|	|	|	0.03
90.000	0.00	0.14	0.123	O	|	|	|	0.03
90.083	0.00	0.14	0.122	O	|	|	|	0.03
90.167	0.00	0.13	0.121	O	|	|	|	0.03
90.250	0.00	0.13	0.120	O	|	|	|	0.03
90.333	0.00	0.13	0.119	O	|	|	|	0.03
90.417	0.00	0.13	0.118	O	|	|	|	0.03
90.500	0.00	0.13	0.117	O	|	|	|	0.03
90.583	0.00	0.13	0.116	O	|	|	|	0.03
90.667	0.00	0.13	0.115	O	|	|	|	0.03
90.750	0.00	0.13	0.114	O	|	|	|	0.03
90.833	0.00	0.13	0.114	O	|	|	|	0.03
90.917	0.00	0.13	0.113	O	|	|	|	0.03
91.000	0.00	0.12	0.112	O	|	|	|	0.03
91.083	0.00	0.12	0.111	O	|	|	|	0.03
91.167	0.00	0.12	0.110	O	|	|	|	0.03
91.250	0.00	0.12	0.109	O	|	|	|	0.03
91.333	0.00	0.12	0.108	O	|	|	|	0.03
91.417	0.00	0.12	0.108	O	|	|	|	0.03
91.500	0.00	0.12	0.107	O	|	|	|	0.03
91.583	0.00	0.12	0.106	O	|	|	|	0.02
91.667	0.00	0.12	0.105	O	|	|	|	0.02
91.750	0.00	0.12	0.104	O	|	|	|	0.02
91.833	0.00	0.12	0.104	O	|	|	|	0.02
91.917	0.00	0.11	0.103	O	|	|	|	0.02
92.000	0.00	0.11	0.102	O	|	|	|	0.02
92.083	0.00	0.11	0.101	O	|	|	|	0.02
92.167	0.00	0.11	0.100	O	|	|	|	0.02
92.250	0.00	0.11	0.100	O	|	|	|	0.02
92.333	0.00	0.11	0.099	O	|	|	|	0.02
92.417	0.00	0.11	0.098	O	|	|	|	0.02
92.500	0.00	0.11	0.097	O	|	|	|	0.02
92.583	0.00	0.11	0.097	O	|	|	|	0.02
92.667	0.00	0.11	0.096	O	|	|	|	0.02
92.750	0.00	0.11	0.095	O	|	|	|	0.02
92.833	0.00	0.11	0.094	O	|	|	|	0.02
92.917	0.00	0.10	0.094	O	|	|	|	0.02
93.000	0.00	0.10	0.093	O	|	|	|	0.02
93.083	0.00	0.10	0.092	O	|	|	|	0.02
93.167	0.00	0.10	0.092	O	|	|	|	0.02
93.250	0.00	0.10	0.091	O	|	|	|	0.02
93.333	0.00	0.10	0.090	O	|	|	|	0.02
93.417	0.00	0.10	0.089	O	|	|	|	0.02

Remaining water in basin = 0.09 (Ac.Ft)

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

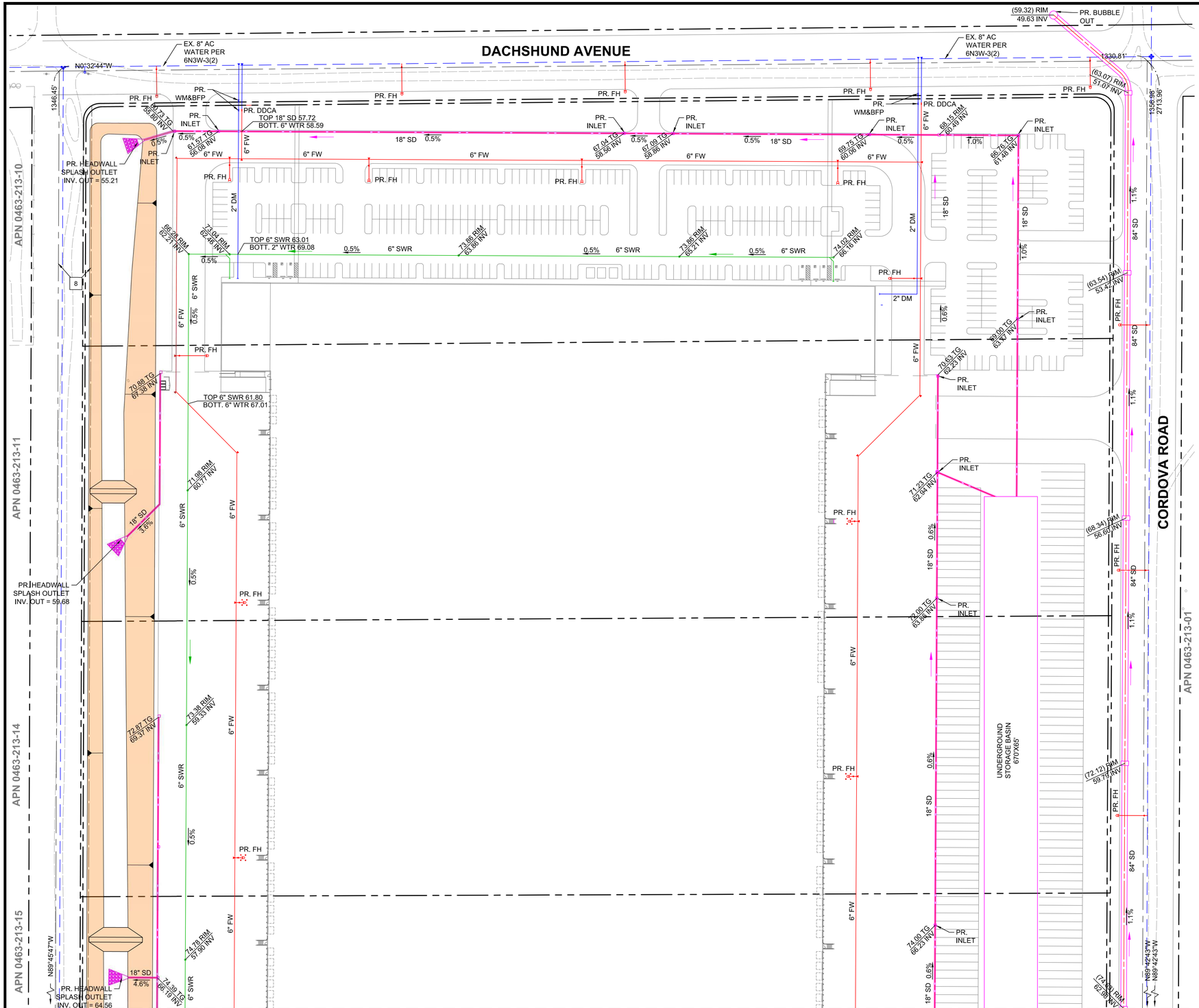
Number of intervals = 1121

```
                Time interval =    5.0 (Min.)
                Maximum/Peak flow rate =        4.772 (CFS)
                Total volume =      21.598 (Ac.Ft)
        Status of hydrographs being held in storage
                    Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (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'

Utility maps



ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
CB	CATCH BASIN
EG	EXISTING GROUND
EL.	ELEVATION
ELEC.	ELECTRIC
EX.	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOW LINE
FH	FIRE HYDRANT
FS	FINISH SURFACE
FUT.	FUTURE
GB	GRADE BREAK
GUY	GUY ANCHOR
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
P/L	PROPERTY LINE
PE	PAD ELEVATION
PP	POWER POLE
PS	PIPE SLOPE
PR.	PROPOSED
R/W	RIGHT OF WAY
ST.	STREET
SWR	SEWER
TG	TOP OF GRATE
TYP	TYPICAL
WTR	WATER

EASEMENTS

8 A 40' WIDE OFFER OF DEDICATION FOR PIPELINE, UTILITIES, ACCESS AND INCIDENTAL PURPOSES, RECORDED MAY 06, 1987 AS INSTRUMENT NO. 87-150726 OF OFFICIAL RECORDS.

UTILITY LEGEND

- PROPOSED FIRE WATER SERVICE/MAIN
- PROPOSED DOMESTIC WATER SERVICE/MAIN
- PROPOSED SEWER SERVICE/MAIN
- PROPOSED STORM DRAIN
- PROPOSED SEWER PIPE FLOW DIRECTION
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

LEGEND

- PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

NOT FOR CONSTRUCTION

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

DATE: 10/27/2022

ENGINEER
DAVID EVANS AND ASSOCIATES INC.
18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

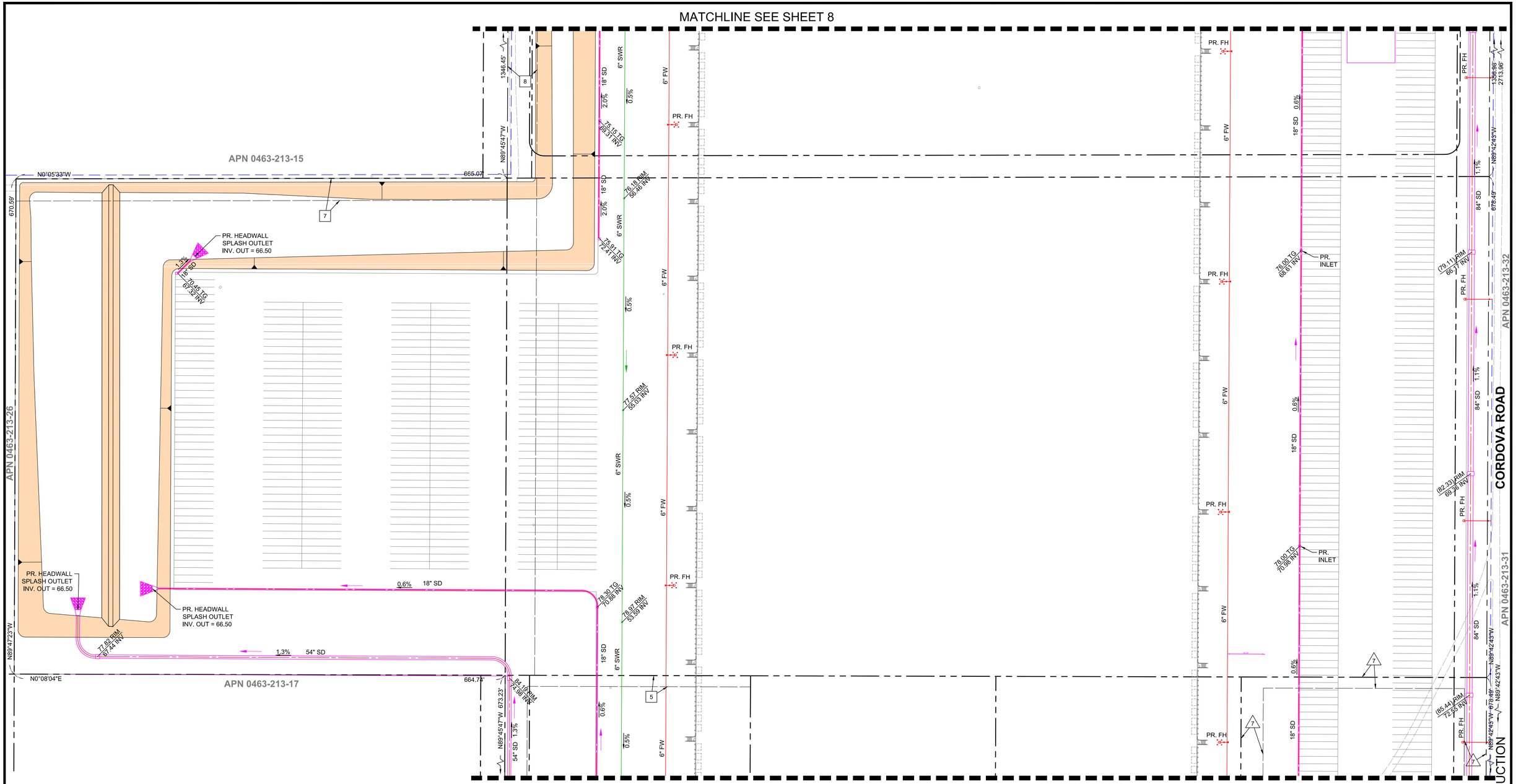
CORDOVA ROAD INDUSTRIAL COMPLEX
APN: 0436-213-05 - 09, 16, 33 - 36

SITE PLAN REVIEW
CONCEPTUAL WET UTILITY PLAN

FILE NO.

DRAWING NO.
SH. 8 OF 10

By: Jose Aguilar
File: P:\VVVL\00000001\04000CAD\SHEETSIEC\Conceptual Utility\001-Cordova-Conceptual Utility-VVVL00000001.dwg
By: JA
Plot Date: 11/2/2022 2:14 PM
Save Date: 11/2/2022 2:07 PM



MATCHLINE SEE SHEET 10

EASEMENTS

5 A VARIABLE WIDTH EASEMENT FOR INGRESS, EGRESS AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED JUNE 5, 1984 AS INSTRUMENT NO. 84-131161 OF OFFICIAL RECORDS.

7 A 30' WIDE OFFER OF DEDICATION FOR PIPELINE, UTILITIES, ACCESS AND INCIDENTAL PURPOSES, RECORDED MAY 06, 1987 AS INSTRUMENT NO. 87-150725 OF OFFICIAL RECORDS.

8 A 40' WIDE OFFER OF DEDICATION FOR PIPELINE, UTILITIES, ACCESS AND INCIDENTAL PURPOSES, RECORDED MAY 06, 1987 AS INSTRUMENT NO. 87-150726 OF OFFICIAL RECORDS.

△7 A VARIABLE WIDTH EASEMENT FOR INGRESS, EGRESS AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 24, 1972 AS BOOK 7866, PAGE 704 OF OFFICIAL RECORDS AND RECORDED FEBRUARY 24, 1972 AS BOOK 7866, PAGE 708 OF OFFICIAL RECORDS.

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
CB	CATCH BASIN
EG	EXISTING GROUND
EL.	ELEVATION
ELEC.	ELECTRIC
EX.	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOW LINE
FH	FIRE HYDRANT
FS	FINISH SURFACE
FUT.	FUTURE
GB	GRADE BREAK
GUY	GUY ANCHOR
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
P/L	PROPERTY LINE
PE	PAD ELEVATION
PP	POWER POLE
PS	PIPE SLOPE
PR.	PROPOSED
R/W	RIGHT OF WAY
ST.	STREET
SWR	SEWER
TG	TOP OF GRATE
TYP	TYPICAL
WTR	WATER

UTILITY LEGEND

- PROPOSED FIRE WATER SERVICE/MAIN
- PROPOSED DOMESTIC WATER SERVICE/MAIN
- PROPOSED SEWER SERVICE/MAIN
- PROPOSED STORM DRAIN
- PROPOSED SEWER PIPE FLOW DIRECTION
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

LEGEND

- TOP / TOE PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

DATE: 10/27/2022

NOT FOR CONSTRUCTION

ENGINEER

DAVID EVANS AND ASSOCIATES INC.
18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

CORDOVA ROAD INDUSTRIAL COMPLEX
APN: 0436-213-05 - 09, 16, 33 - 36

SITE PLAN REVIEW
CONCEPTUAL WET UTILITY PLAN

FILE NO.

DRAWING NO.
SH. 9 OF 10

Plot Date: 11/2/2022 2:14 PM
Save Date: 11/2/2022 2:08 PM
By: Jose Aguilar
By: Jds File: P:\VVVL\000000010400CAD\SHEETS\EC\Conceptual Utility\002-Cordova-Conceptual Utility-VVL000000001.dwg

MATCHLINE SEE SHEET 9

MATCHLINE SEE BOTTOM RIGHT

MATCHLINE SEE MIDDLE RIGHT

MATCHLINE SEE TOP RIGHT

MATCHLINE SEE MIDDLE LEFT

APN 0463-213-17

APN 0463-213-03

APN 0463-214-24

APN 0463-214-22

APN 0463-214-13

NAVAJO ROAD

CORDOVA ROAD

PR. SEWER EJECTOR WELL

TOP 6" SWR 52.05
BOTT. 6" WTR 76.47

TOP 6" SWR 81.56
BOTT. 6" WTR 82.07

TOP 6" SWR 81.51
BOTT. 6" WTR 82.27

TOP 6" SWR 80.25
BOTT. 54" SD 85.27

PR. 35' CATCH BASIN

PR. INLET

PR. FH

2" DW

6" FW

6" SWR

18" SD

54" SD

60" SD

72" SD

84" SD

8" SWR

1328.28'

EX. 12" SWR
PER DC NO
7033 C12

N89°45'47"W

N0°21'41"E

N89°42'43"W

CONTOUR INTERVALS = 2'

ABBREVIATIONS

BFP	BACK FLOW PREVENTER	GUY	GUY ANCHOR
C/L	CENTERLINE	HP	HIGH POINT
C&G	CURB AND GUTTER	INV	INVERT
CB	CATCH BASIN	LF	LINEAR FEET
EG	EXISTING GROUND	LP	LOW POINT
EL.	ELEVATION	P/L	PROPERTY LINE
ELEC.	ELECTRIC	PE	PAD ELEVATION
EX.	EXISTING	PP	POWER POLE
FF	FINISH FLOOR	PS	PIPE SLOPE
FG	FINISH GRADE	PR.	PROPOSED
FL	FLOW LINE	R/W	RIGHT OF WAY
FH	FIRE HYDRANT	ST.	STREET
FS	FINISH SURFACE	SWR	SEWER
FUT.	FUTURE	TG	TOP OF GRATE
GB	GRADE BREAK	TYP	TYPICAL
		WTR	WATER

EASEMENTS

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UTILITY LEGEND

- PROPOSED FIRE WATER SERVICE/MAIN
- PROPOSED DOMESTIC WATER SERVICE/MAIN
- PROPOSED SEWER SERVICE/MAIN
- PROPOSED STORM DRAIN
- PROPOSED SEWER PIPE FLOW DIRECTION
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

LEGEND

- PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

ENGINEER

DAVID EVANS AND ASSOCIATES INC.

18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

NOT FOR CONSTRUCTION

DATE: 10/27/2022

CORDOVA ROAD INDUSTRIAL COMPLEX
APN: 0436-213-05 - 09, 16, 33 - 36

SITE PLAN REVIEW

CONCEPTUAL WET UTILITY PLAN

FILE NO.

DRAWING NO.

SH. 10OF 10

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Save Date: 11/2/2022 2:10 PM
By: Jose Aguilar
By: Jfs
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QUARRY ROAD INDUSTRIAL COMPLEX

PRELIMINARY HYDROLOGY REPORT

APN 0463-214-06, 07, 08 & 09

Prepared for:

VVLIG Holdings, LLC
9040 Leslie Street, Suite 7
Richmond Hill, ON L4B 3M4
TX

Prepared by:

David Evans and Associates
18484 Outer Highway 18 North, Suite 225
Apple Valley, CA 92307
Tel: (760) 524-9100
Attn: Bret Thorpe

Prepared Under the Supervision of:

Bret Thorpe, P.E. R.C.E. 82754

October 31, 2022
Job No: VVLI0000001

TUSTIN
17782 East 17th Street
Suite 200
Tustin, CA 92780
714.665.4500
Fax: 714.665.4501

SANTA CLARITA
25152 Springfield Court
Suite350
Santa Clarita, CA 91355-1096
661.284.7400
Fax 661.284.7401

TEMECULA
41951 Remington Avenue
Suite 130
Temecula, CA 92590-2553
951.294.9300
Fax: 951.294-9301

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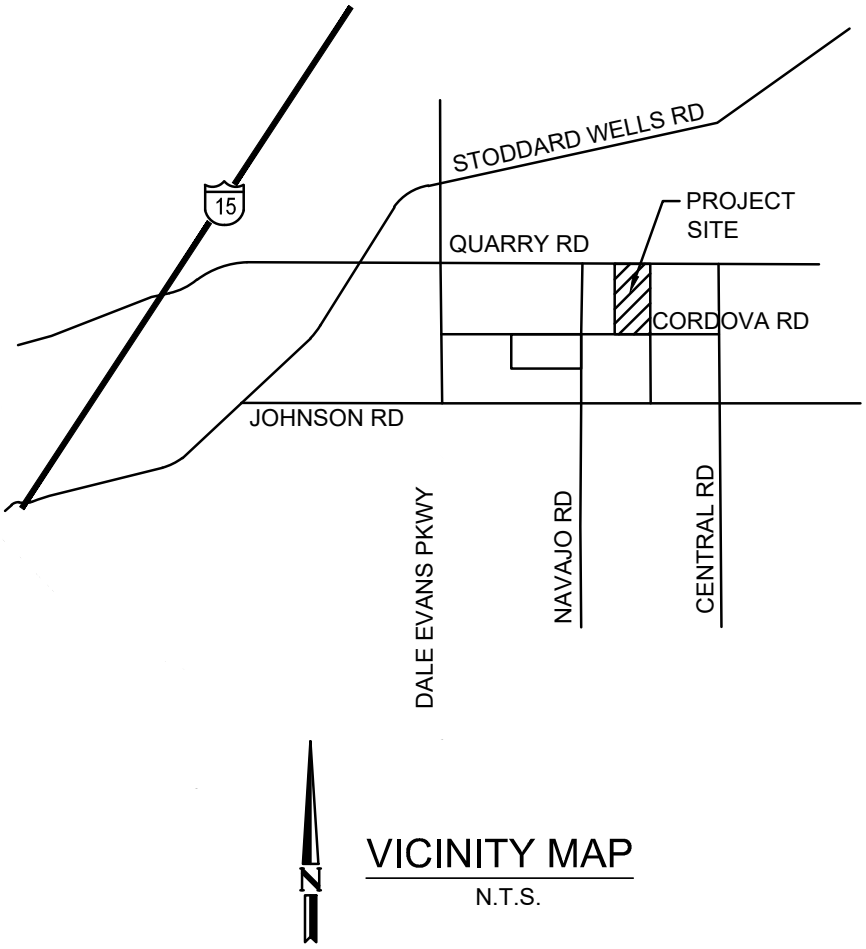
Section 1 - Introduction:

1.1. Location

The Project Owner is VVLIG Holdings, LLC, 9040 Leslie Street, Suite 7, Richmond Hill, ON L4B 3M4. Hydrology Study prepared by David Evans and Associates 18484 Outer Highway 18 North, Suite 225, Apple Valley, CA 92307 Phone No. (760) 524-9100.

The Project site is located within the Town of Apple Valley South of Quarry Road, West of Flint Road, and North of Cordova.
APN No. 0463-214-06, 07, 08, & 09
Latitude 34d 36m 42s, Longitude -117d 10m 56s.

Location map



1.2 Property Description:

1.2.1. Gross Land Acreage: 81 Acres, Net Land 80.1 Acres. A large warehouse type building is proposed as shown on the Developed Hydrology Exhibit in Appendix A

1.2.2. The proposed Project site is vacant and Quarry Road on the north is paved, no curb and gutter. The site slopes from east to west toward the unimproved Bell Mountain Wash at an approximate slope of 2.3% and consists of multiple flow paths, ridges, and sparse native desert plants.

1.2.3. The Project consists of a large warehouse building. The building covers approximately 32 acres with adjoining areas to include loading docks, parking lots, drive aisles, drainage improvements and landscaping. The site will be graded into one large pad area for the building and storm water from the paved/roof areas of the site will be picked up in catch basins and conveyed to a detention basin. Overflows will drain to storm drain or channels that will also intercept and convey the offsite flows around the building site to existing flow lines. The Project is a Regulated Project and will require a WQMP.

1.2.4 The offsite flows are proposed to be intercepted in streets or conveyed under the streets and picked up in storm drain or soft bottom channels to be diverted around the buildings and outlet into the respective natural drainage course.

1.2.5. The Project site lies northeast of the Mojave River and easterly of the Bell Mountain Wash, east of the I-15 Freeway. The Project site flows west to the Bell Mountain Wash and the Bell Mountain Wash flows southwest to the Mojave river, Upper Narrows to Lower Narrows, approximately 7.5 miles south of the Project site. The site lies within an "D" Zone, "areas in which flood hazards are undetermined, but possible." Flood Insurance Rate Map (FIRM) No. 06071C5835H, Map revised August 28, 2008. This panel is not printed.

1.2.6. The receiving Waters is the Mojave River, southwest of the Project site.

Section 2 - Hydrologic Analysis:

2.1. Conditions, Resources and Methods

2.1.1. The existing Project site is vacant. Quarry Road on the north is paved and will not be used or connected to as part of this project.

The area northeasterly of the Project site slopes up and is vacant except for mining operations and access to and from the mining sites. This area drains to the Project site for

consideration of the projects worst case scenario and for preliminary purposes. The offsite flows will be re-examined in the final Hydrology report.

The proposed development for the site consists of a large box warehouse building.

Soil classification is Hydrologic Soils Group (HSG) “A”, (1.2%), HSG “C”, (82.8%), HSG “D”, (16%). For this preliminary study, HSG C will be used. The soil classification boundary limit is based on the Web Soil Survey from the USDA Natural Resources Conservation Service included in Appendix ‘B’ of this report.

NOAA 14 was used for the 10 year and 100-year rainfall estimates. The ten year, 24-hour is 2.13 inches. The 100 year, 24-hour is 3.45 inches. See Section 2.2. Table of Results for runoff coefficients and/or loss rate parameters, and time of concentration.

2.1.2. As stated above, the NOAA Atlas 14 was used for the rainfall values and Soils was based on the Web Soil Survey from the USDA Natural Resources Conservation Service. USGS Topography Maps and the San Bernardino County Hydrology Manual were also used to determine watershed conditions.

2.2. Table of Results

Unit Hydrograph results

Condition	Area ID	10-yr Qp (cfs)	10-yr Volume (cf)	100-yr Qp (cfs)	100-yr Volume (cf)
Existing condition	A	66.5	230,023	157.7	835,738
Developed condition	A-C	87.6	519,645	160.9	920,222
Difference		**21.1**	**289,622**	**3.2**	**84,484**
Mitigated		**0.03**	**489,614**	**30.2**	**319,404**

Rational method results existing condition

Area ID	Q10 (cfs	Time of concentration (min) 10-yr	Q100 cfs	Time of concentration (min) 100-yr
A	14.0	23.22	31.9	22.28
B	20.1	28.674	48.0	27.47
C	11.7	25.05	27.4	23.89
D1, D2	9.2	20.42	20.3	15.18
D3	9.78	15.18	10.9	19.76

Rational method results developed condition

Area ID	Q10 (cfs	Time of concentration (min) 10-yr	Q100 cfs	Time of concentration (min) 100-yr	Comments
A	55.8	16.43	108.6	15.16	
B	0.83	30.93	3.5	29.04	This area will be landscaped, no impervious
C	26.2	23.56	50.7	22.18	

Summary

The largest volume difference of predevelopment vs post development volume is the Q10, 24 hour, of 289,622 cubic feet as can been seen in the Unit Hydrograph table above and that is the minimum retention required for this project The Town of Apple Valley requires not to exceed 90% of the pre-development volume, for the Q 100, 24 hour storm event, and 95% of the pre-developed volume in the Q10, 24-hour storm event, however, in this case, the Q10 post vs pre development volume is larger and will be the design volume mitigation used in this report.

The site will use one large detention basin to capture the DCV and mitigate Hydromodification caused by the development.. Basin routing, infiltration and storage

also mitigate Qpeak to below its existing Qpeak as well as the time of concentration. Reference is made to the sites WQMP report.

2.3. Drainage Maps

See Appendix B for the pre and post drainage maps.

Section 3 Proposed Drainage Design Concept:

3.1. Town of Apple Valley Drainage management guidelines.
The City's guidelines are to analyze the 10 year and 100 year storm events for 1 hour (rational method) and 24-hour durations (unit hydrograph). Then demonstrate the project will not exceed 90% of the pre-development runoff for the 100-year storm event and 95% of the 10-year storm event.. See section 2.2 Table of Results.

3.2. Stormwater Storage Provisions
The Project site proposes to use one large detention basin

Drainage Area	Required DCV* (CF)	Minimum detention/infiltration (CF)	Provided detention/infiltration system (CF)*
Entire site	198,389	289,622	290,011

*Values from the WQMP report.

The total volume of detention and infiltration provided is 290,011 CF for the drainage areas.

3.4 Drainage Structures

There will be onsite catch basins to collect the storm water and convey the storm flows to underground infiltration/and detention system. Overflows will be conveyed to the proposed storm drain or existing natural drainage course.

Offsite flows are to be capture in streets and inlet structures and conveyed around the proposed buildings and outlet to their natural flowline.

Section 4 - References:

Bonadiman Civil Design Software, Version 7.0 & 7.1 was used for the 10-year & 100-year Hydrological Analysis.

- 10-year AMC II Unit hydrograph Method (developed and undeveloped)
- 10-year AMC II Unit Hydrograph Method (developed and undeveloped)
- Soil Type A
- Mannings Values Used
- Existing Surface n=0.035
- Proposed Surface n=0.015
- Unit Hydrograph n=0.020
- Project is in the Town of Apple Valley, CA

Drainage boundaries were derived using field topography, USGS Map for Apple Valley as shown on the hydrology map, provided in Appendix A of this report. See Appendix C for San Bernardino County Hydrology Manual and Town of Apple Valley technical references.

APPENDIX 'A'

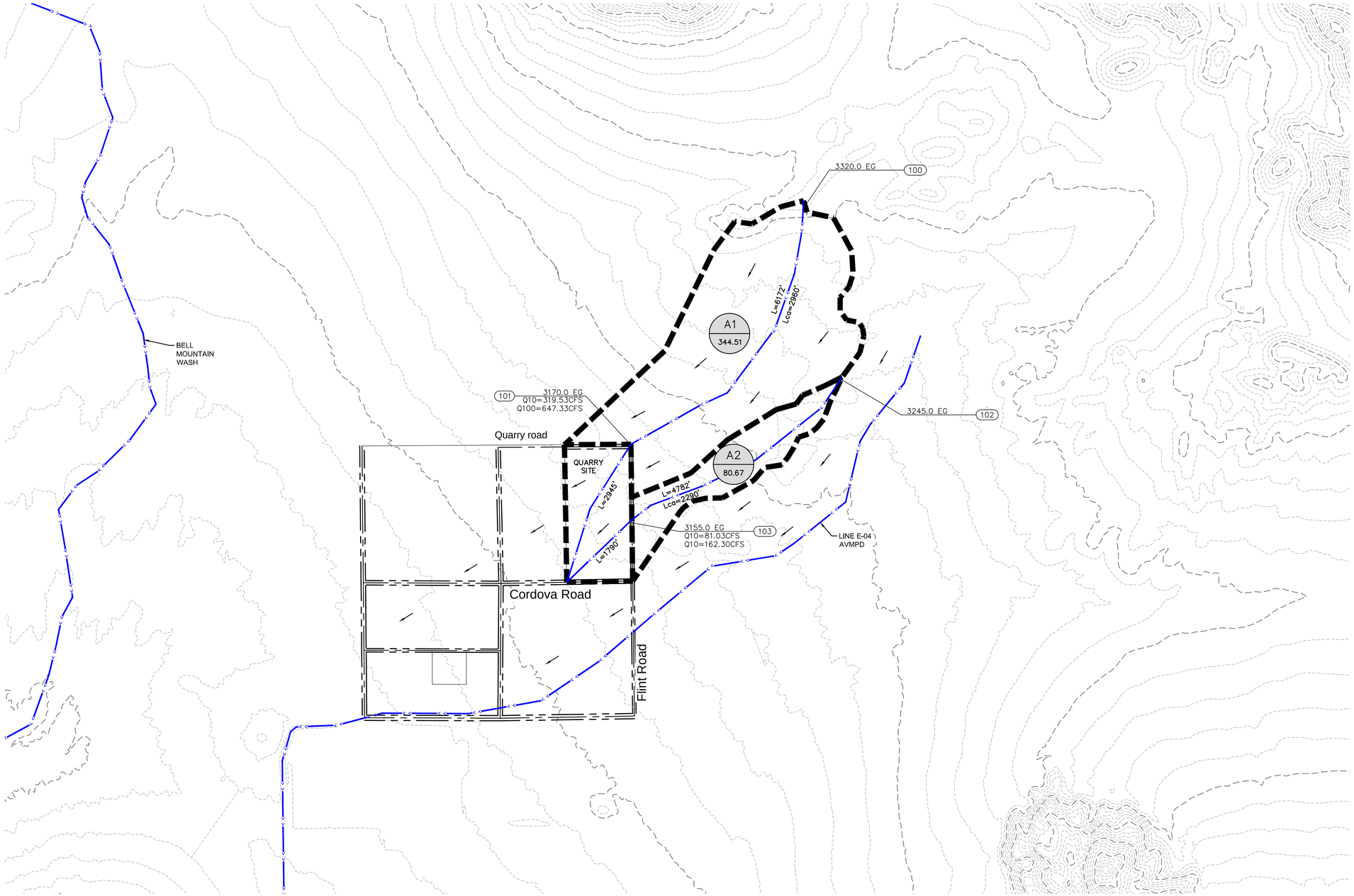
- Hydrology Maps

    -Offsite existing condtion hydrology map
    -Onsite existing condition hydrology map
    -Onsite developed hydrology map

QUARRY OFFSITE EXISTING CONDITION HYDROLOGY MAP

LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A / 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- DIRECTION OF FLOW
- FS ELEVATION / INV ELEVATION (NODE #) — CONCENTRATION/NODE ID
- (XXXX) — EXISTING CONTOUR



N

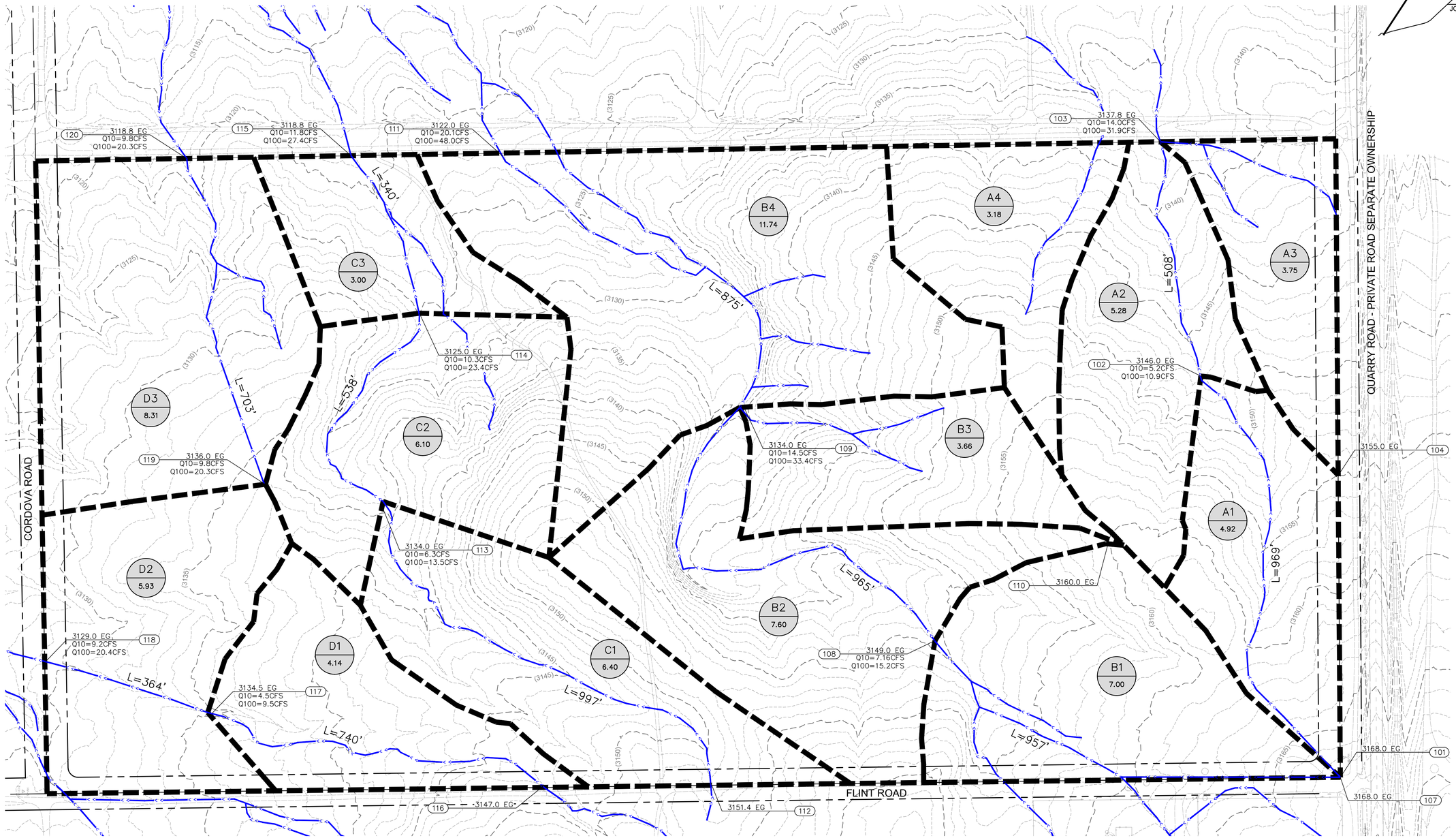
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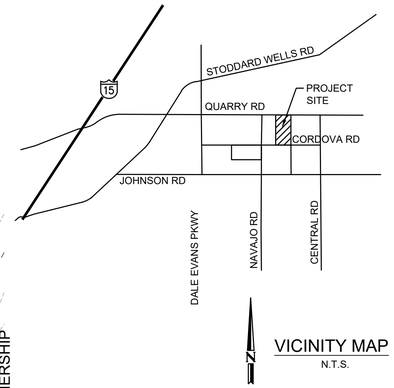
18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100

DAVID EVANS AND ASSOCIATES INC.

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Last Opened: Oct 04, 2022 - 12:58pm By: jfa

QUARRY SITE EXISTING CONDITION HYDROLOGY MAP





VICINITY MAP
N.T.S.

LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A / 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- FS ELEVATION / INV ELEVATION (NODE #) — CONCENTRATION/NODE ID
- (XXXX) — EXISTING CONTOUR

N

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scale 1"= 100' feet

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Apple Valley California 92307
Phone: 760.524.9100
DAVID EVANS AND ASSOCIATES INC.

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ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
CB	CATCH BASIN
EG	EXISTING GROUND
EL.	ELEVATION
ELEC.	ELECTRIC
EX.	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOW LINE
FH	FIRE HYDRANT
FS	FINISH SURFACE
FUT.	FUTURE
GB	GRADE BREAK
GUY	GUY ANCHOR
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
P/L	PROPERTY LINE
PE	PAD ELEVATION
PP	POWER POLE
PS	PIPE SLOPE
PR.	PROPOSED
R/W	RIGHT OF WAY
ST.	STREET
SWR	SEWER
TG	TOP OF GRATE
TYP	TYPICAL
WTR	WATER

QAURRY ROAD - PRIVATE ROAD SEPARATE OWNERSHIP

APN 0463-411-38

APN 0463-411-37

APN 0463-214-02

APN 0463-471-17

APN 0463-471-18

APN 0463-471-19

FLINT ROAD

OFFICE

OFFICE

PROPOSED BUILDING
1,456,240 SF

B1 1.27ac

B2 0.45ac

B3 0.89ac

A1 0.75ac

A2 2.05ac

A3 4.25ac

A4 5.66ac

A5 6.85ac

C1 6.62ac

202 45.5

200 67.5

10 51.1

20 46.26TG 40 INV

CB1 Q10=1.7 CFS Q100=3.1 CFS

203 37.8

Q10=0.83 CFS Q100=3.5 CFS

300 43.3

30 37.68 INV

Q10=5.3 CFS Q100=9.8 CFS

40 35.56 INV

Q10=12.1 CFS Q100=22.7 CFS

50 33.36 INV

CB10 Q10=20.0 CFS Q100=38.3 CFS

301 39.2

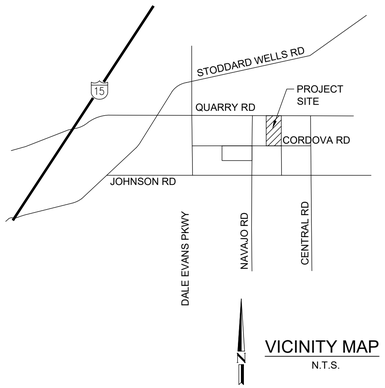
Q10=9.5 CFS Q100=17.3 CFS

CB2 CB3 CB4 CB5 CB6 CB7 CB8 CB9

L=217' L=997' L=363' L=997' L=997' L=437' L=400' L=412' L=404' L=975'

PR. 18" HDPE

MATCHLINE
SEE SHEET 2



VICINITY MAP
N.T.S.

LEGEND:

- HYDROLOGY BOUNDARY
- FLOWLINE
- A 7.96 — DRAINAGE AREA ID / TOTAL ACREAGE
- FS ELEVATION / NODE # — CONCENTRATION/NODE ID
- (XXXX) — EXISTING CONTOUR
- TOP / TOE — PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

NOT FOR CONSTRUCTION

ENGINEER

DAVID EVANS AND ASSOCIATES INC.

18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

DATE: 10/27/2022

QUARRY ROAD INDUSTRIAL COMPLEX
APN: 0436-214-06 - 09

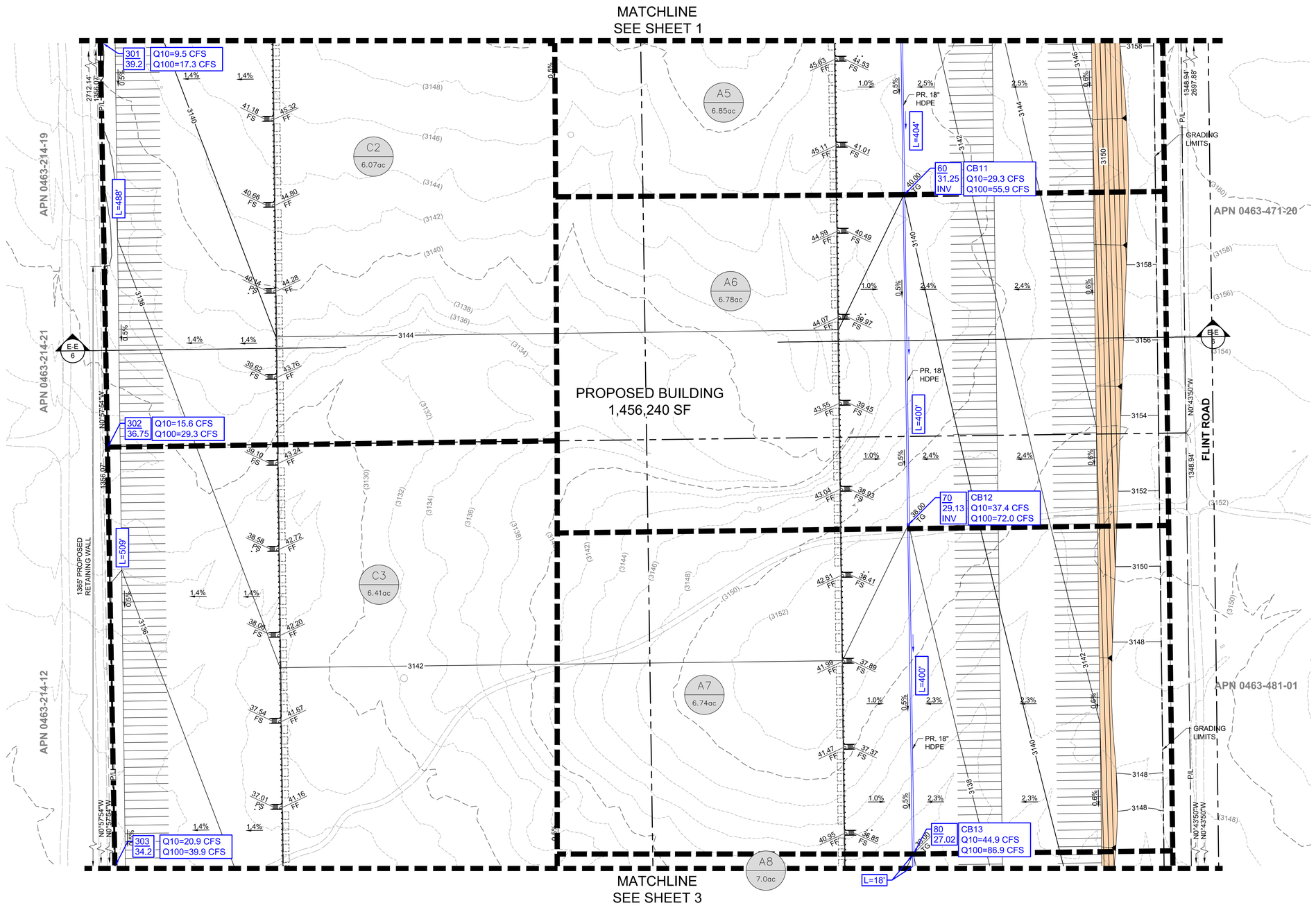
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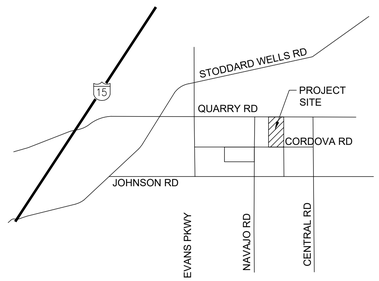
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VICINITY MAP
N.T.S.

ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
CB	CATCH BASIN
EG	EXISTING GROUND
EL.	ELEVATION
ELEC.	ELECTRIC
EX.	EXISTING
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FG	FINISH GRADE
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FS	FINISH SURFACE
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INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
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PS	PIPE SLOPE
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R/W	RIGHT OF WAY
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TYP	TYPICAL
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- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

NOT FOR CONSTRUCTION

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

ENGINEER

DAVID EVANS AND ASSOCIATES INC.

18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

DATE: 10/27/2022

QUARRY ROAD INDUSTRIAL COMPLEX
APN: 0436-214-06 - 09

DEVELOPED CONDITION
HYDROLOGY MAP

FILE NO.

DRAWING NO.
SH. 2 OF 3

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By: Jla
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MATCHLINE
SEE SHEET 2

Q10=20.9 CFS
Q100=39.9 CFS

C4
7.49ac

A8
7.0ac

A9
3.3ac

PROPOSED BUILDING
1,456,240 SF

OFFICE

L=600'

L=413'

L=196'

L=178'

L=70'

CB14
Q10=55.8 CFS
Q100=105.6 CFS

PR. 18" HDPE

PR. HEADWALL
SPLASH OUTLET
INV. OUT = 15.00

Q10=26.2 CFS
Q100=50.7 CFS

BASIN BOTTOM=100,350 SF
BASIN TOP=118,536 SF
BASIN DEPTH=3'
BASIN VOLUME=290,011 CF

PROPOSED BASIN
BOTOM = 3115.00

BASIN
AREA=5.77 acre

Q10=55.8 CFS
Q100=105.6 CFS

PR. HEADWALL
SPLASH OUTLET
INV. OUT = 15.00

GRADING LIMITS

1365' PROPOSED RETAINING WALL

APN 0463-214-13

APN 0463-481-03

APN 0463-481-05

APN 0463-213-11

FLINT ROAD

CORDOVA ROAD

N0°57'54"W
N0°42'54"W

N88°57'47"E

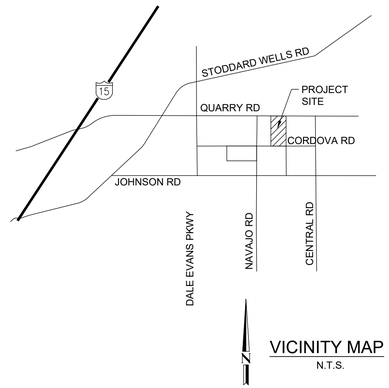
649.10'

N88°57'47"E 1298.20'

D-D 8

ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
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SWR	SEWER
TG	TOP OF GRATE
TYP	TYPICAL
WTR	WATER



VICINITY MAP
N.T.S.

LEGEND:

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- FLOWLINE
- DRAINAGE AREA ID (A / 7.96)
- TOTAL ACREAGE
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- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

NOT FOR CONSTRUCTION

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

ENGINEER

DAVID EVANS AND ASSOCIATES INC.

18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

DATE: 10/27/2022

QUARRY ROAD INDUSTRIAL COMPLEX
APN: 0436-214-06 - 09

DEVELOPED CONDITION
HYDROLOGY MAP

FILE NO.

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SH. 3 OF 9

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APPENDIX 'B'

Reference Documents

San Bernardino County Hydrology Manual Reference Material
- NOAA 14 Point Precipitation Estimates
- Hydrologic Soils Group Map
- Figure C-3Curve Numbers
- AMC Map

NOAA Atlas 14, Volume 6, Version 2
Location name: Apple Valley, California, USA*
Latitude: 34.6119°, Longitude: -117.1835°
Elevation: 3138.95 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point 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	**0.082** (0.068-0.101)	**0.116** (0.095-0.142)	**0.162** (0.133-0.200)	**0.202** (0.165-0.251)	**0.260** (0.205-0.334)	**0.308** (0.238-0.403)	**0.359** (0.270-0.481)	**0.414** (0.304-0.571)	**0.494** (0.348-0.709)	**0.560** (0.381-0.832)
10-min	**0.118** (0.097-0.145)	**0.166** (0.136-0.204)	**0.233** (0.191-0.286)	**0.290** (0.236-0.360)	**0.373** (0.294-0.479)	**0.441** (0.341-0.578)	**0.514** (0.388-0.690)	**0.594** (0.435-0.818)	**0.708** (0.499-1.02)	**0.803** (0.546-1.19)
15-min	**0.143** (0.117-0.175)	**0.201** (0.165-0.246)	**0.281** (0.231-0.346)	**0.351** (0.285-0.435)	**0.451** (0.356-0.579)	**0.534** (0.412-0.699)	**0.622** (0.469-0.834)	**0.718** (0.527-0.990)	**0.857** (0.603-1.23)	**0.971** (0.661-1.44)
30-min	**0.196** (0.161-0.240)	**0.275** (0.226-0.338)	**0.386** (0.317-0.475)	**0.481** (0.392-0.597)	**0.620** (0.488-0.794)	**0.733** (0.565-0.959)	**0.854** (0.643-1.15)	**0.986** (0.723-1.36)	**1.18** (0.827-1.69)	**1.33** (0.907-1.98)
60-min	**0.248** (0.204-0.304)	**0.348** (0.286-0.428)	**0.488** (0.401-0.601)	**0.609** (0.496-0.756)	**0.784** (0.618-1.00)	**0.927** (0.716-1.21)	**1.08** (0.814-1.45)	**1.25** (0.914-1.72)	**1.49** (1.05-2.13)	**1.69** (1.15-2.50)
2-hr	**0.350** (0.289-0.430)	**0.474** (0.390-0.582)	**0.645** (0.529-0.794)	**0.791** (0.644-0.982)	**1.00** (0.788-1.28)	**1.17** (0.903-1.53)	**1.35** (1.02-1.81)	**1.54** (1.13-2.13)	**1.82** (1.28-2.61)	**2.05** (1.39-3.04)
3-hr	**0.425** (0.350-0.522)	**0.568** (0.467-0.697)	**0.764** (0.627-0.940)	**0.931** (0.757-1.16)	**1.17** (0.920-1.50)	**1.36** (1.05-1.78)	**1.56** (1.18-2.09)	**1.78** (1.30-2.45)	**2.09** (1.47-2.99)	**2.34** (1.59-3.47)
6-hr	**0.578** (0.476-0.709)	**0.763** (0.628-0.937)	**1.02** (0.833-1.25)	**1.23** (1.00-1.53)	**1.53** (1.21-1.96)	**1.77** (1.37-2.32)	**2.02** (1.52-2.71)	**2.29** (1.68-3.15)	**2.66** (1.87-3.82)	**2.96** (2.02-4.40)
12-hr	**0.740** (0.610-0.908)	**0.983** (0.809-1.21)	**1.31** (1.08-1.61)	**1.58** (1.29-1.96)	**1.96** (1.55-2.52)	**2.26** (1.75-2.96)	**2.58** (1.94-3.45)	**2.90** (2.13-4.00)	**3.36** (2.36-4.82)	**3.72** (2.53-5.52)
24-hr	**0.972** (0.862-1.12)	**1.31** (1.16-1.51)	**1.76** (1.55-2.03)	**2.13** (1.86-2.48)	**2.64** (2.23-3.17)	**3.04** (2.52-3.73)	**3.45** (2.79-4.34)	**3.88** (3.06-5.02)	**4.47** (3.38-6.04)	**4.94** (3.61-6.90)
2-day	**1.15** (1.02-1.32)	**1.57** (1.39-1.81)	**2.13** (1.88-2.46)	**2.59** (2.27-3.02)	**3.23** (2.73-3.88)	**3.72** (3.09-4.57)	**4.22** (3.42-5.32)	**4.74** (3.74-6.15)	**5.46** (4.13-7.37)	**6.03** (4.40-8.42)
3-day	**1.25** (1.11-1.44)	**1.73** (1.53-1.99)	**2.36** (2.08-2.72)	**2.87** (2.52-3.35)	**3.58** (3.03-4.31)	**4.13** (3.43-5.07)	**4.69** (3.80-5.90)	**5.27** (4.15-6.83)	**6.07** (4.59-8.19)	**6.70** (4.89-9.36)
4-day	**1.32** (1.17-1.52)	**1.84** (1.63-2.11)	**2.51** (2.22-2.90)	**3.06** (2.69-3.57)	**3.82** (3.24-4.60)	**4.41** (3.66-5.41)	**5.00** (4.05-6.30)	**5.63** (4.43-7.29)	**6.48** (4.90-8.74)	**7.14** (5.22-9.98)
7-day	**1.44** (1.28-1.66)	**1.98** (1.76-2.29)	**2.71** (2.39-3.13)	**3.30** (2.89-3.84)	**4.11** (3.49-4.95)	**4.75** (3.94-5.83)	**5.40** (4.37-6.80)	**6.07** (4.78-7.86)	**7.00** (5.29-9.45)	**7.72** (5.64-10.8)
10-day	**1.53** (1.35-1.76)	**2.09** (1.85-2.41)	**2.84** (2.51-3.29)	**3.47** (3.04-4.04)	**4.33** (3.67-5.21)	**5.00** (4.15-6.14)	**5.69** (4.61-7.17)	**6.41** (5.05-8.30)	**7.40** (5.60-9.99)	**8.18** (5.98-11.4)
20-day	**1.75** (1.55-2.01)	**2.41** (2.13-2.77)	**3.29** (2.91-3.80)	**4.03** (3.53-4.69)	**5.06** (4.29-6.09)	**5.87** (4.87-7.21)	**6.71** (5.43-8.45)	**7.58** (5.98-9.82)	**8.80** (6.65-11.9)	**9.76** (7.13-13.6)
30-day	**1.98** (1.75-2.27)	**2.73** (2.42-3.14)	**3.75** (3.31-4.33)	**4.61** (4.04-5.37)	**5.82** (4.93-7.00)	**6.77** (5.62-8.32)	**7.77** (6.29-9.78)	**8.82** (6.95-11.4)	**10.3** (7.76-13.9)	**11.4** (8.35-16.0)
45-day	**2.32** (2.06-2.67)	**3.22** (2.85-3.70)	**4.44** (3.92-5.13)	**5.48** (4.80-6.39)	**6.96** (5.90-8.38)	**8.15** (6.77-10.0)	**9.39** (7.61-11.8)	**10.7** (8.44-13.9)	**12.5** (9.49-16.9)	**14.0** (10.2-19.6)
60-day	**2.55** (2.26-2.93)	**3.52** (3.12-4.05)	**4.86** (4.30-5.62)	**6.02** (5.27-7.01)	**7.67** (6.50-9.23)	**9.00** (7.47-11.1)	**10.4** (8.44-13.1)	**11.9** (9.39-15.4)	**14.1** (10.6-19.0)	**15.8** (11.5-22.0)

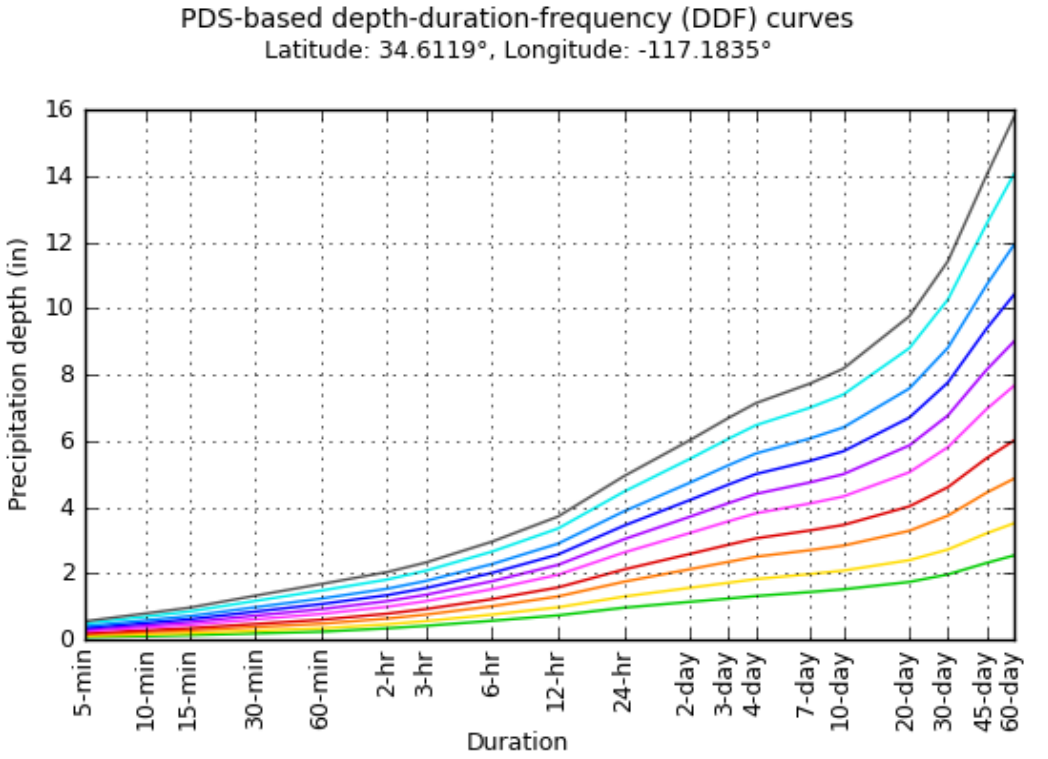
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

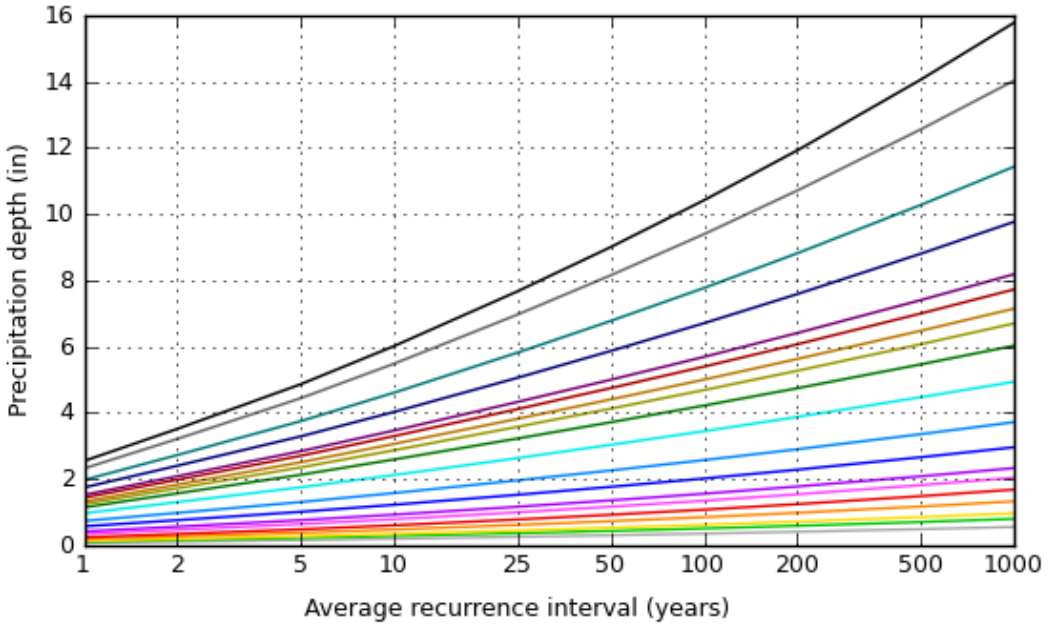
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical





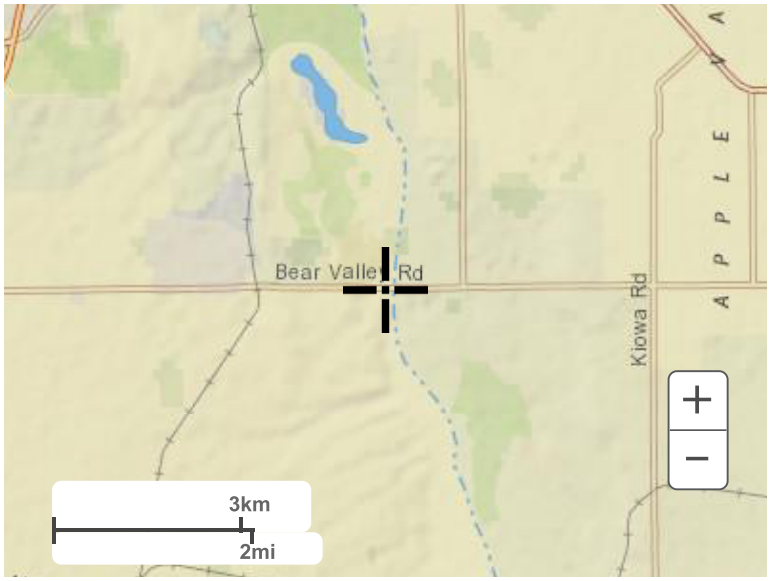
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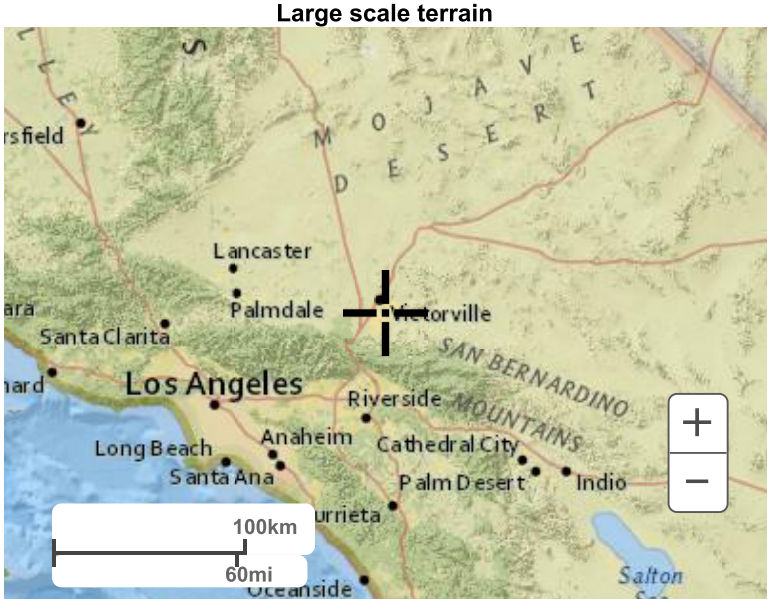
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Maps & aerials

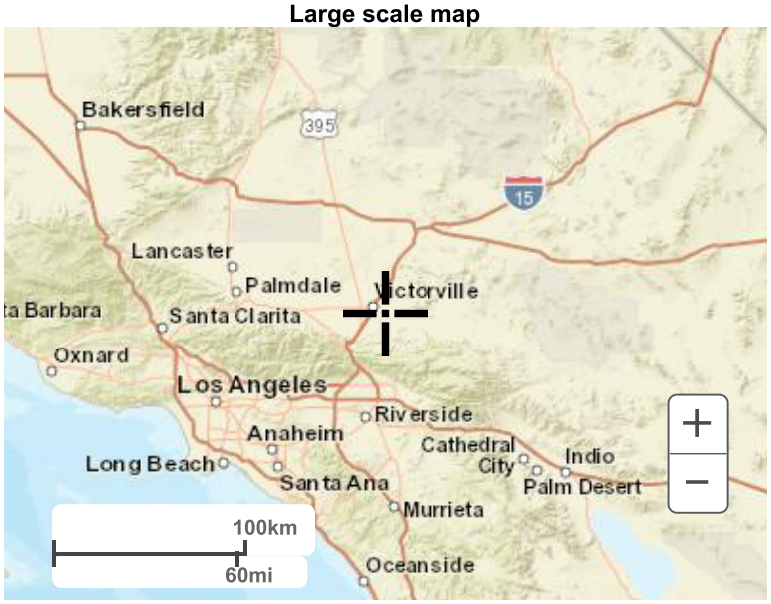
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

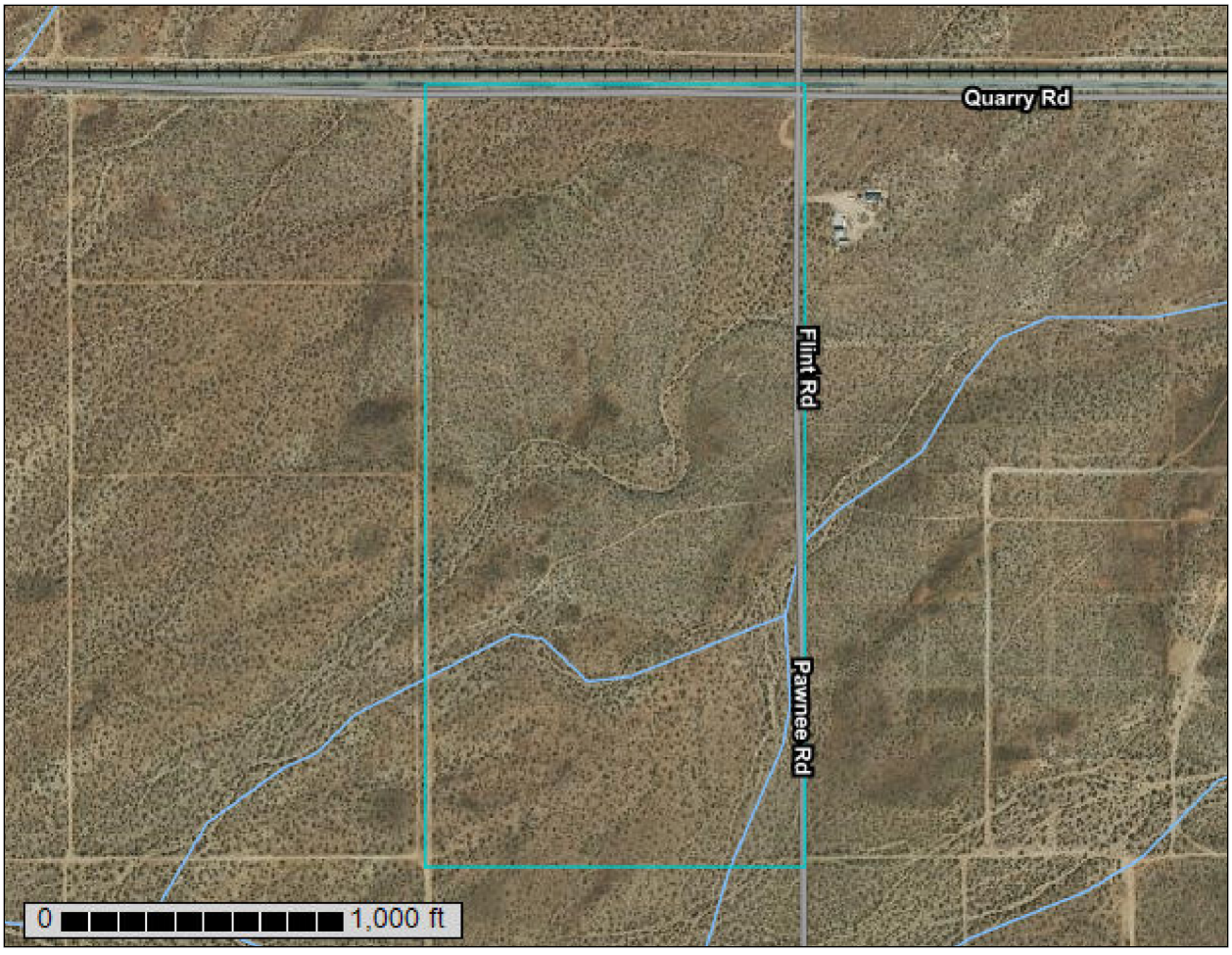
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Bernardino County, California, Mojave River Area



September 7, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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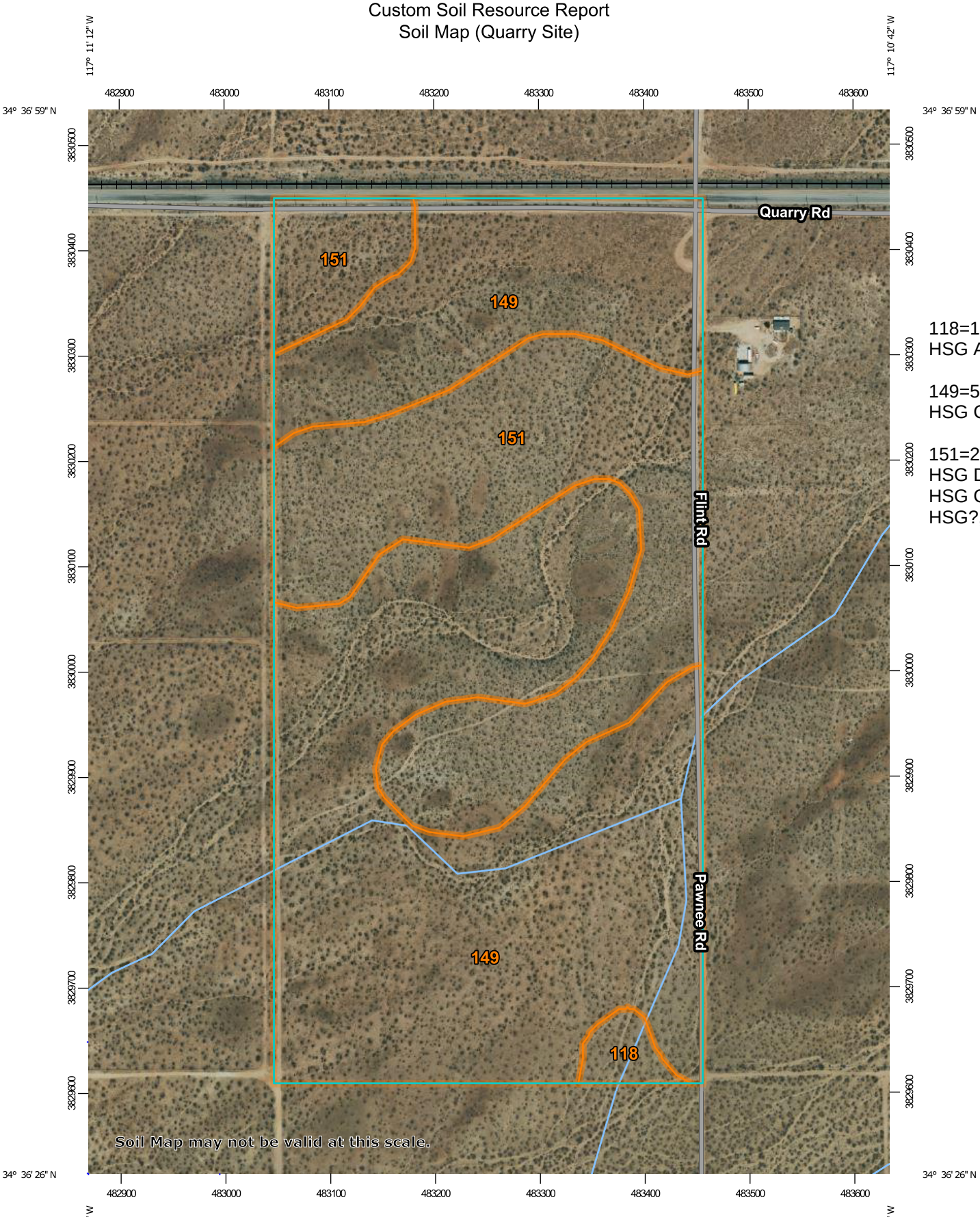
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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Quarry Site)



118=1.2%, HSG A

149=56.8%, HSG C

151=27.3%, HSG D, 60%
HSG C, 20%
HSG?, 20%

Map Scale: 1:4,930 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 13, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 27, 2021—May 24, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Quarry Site)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
118	CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES*	1.2	1.4%
149	MIRAGE-JOSHUA COMPLEX, 2 TO 5 PERCENT SLOPES*	56.8	66.6%
151	NEBONA-CUDDEBACK COMPLEX, 2 TO 9 PERCENT SLOPES*	27.3	32.1%
Totals for Area of Interest		**85.3**	**100.0%**

Map Unit Descriptions (Quarry Site)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Bernardino County, California, Mojave River Area

118—CAJON-ARIZO COMPLEX, 2 TO 15 PERCENT SLOPES*

Map Unit Setting

National map unit symbol: hkrq
Elevation: 2,800 to 3,300 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Cajon, gravelly surface, and similar soils: 55 percent
Arizo and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon, Gravelly Surface

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 6 inches: gravelly sand
H2 - 6 to 60 inches: gravelly sand

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R030XF028CA - COBBLY SANDY
Hydric soil rating: No

Description of Arizo

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 6 inches: gravelly loamy sand
H2 - 6 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: R030XF025CA - GRAVELLY COARSE LOAMY
Hydric soil rating: No

Minor Components

Helendale

Percent of map unit: 4 percent
Hydric soil rating: No

Bryman

Percent of map unit: 4 percent
Hydric soil rating: No

Joshua

Percent of map unit: 4 percent
Hydric soil rating: No

Cajon, clayey substratum

Percent of map unit: 3 percent

149—MIRAGE-JOSHUA COMPLEX, 2 TO 5 PERCENT SLOPES*

Map Unit Setting

National map unit symbol: hksq
Elevation: 2,600 to 3,400 feet

Mean annual precipitation: 3 to 5 inches
Mean annual air temperature: 63 to 66 degrees F
Frost-free period: 200 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Mirage and similar soils: 50 percent
Joshua and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mirage

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 5 inches: sandy loam
H2 - 5 to 21 inches: gravelly sandy clay loam
H3 - 21 to 39 inches: gravelly sandy loam
H4 - 39 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Strongly saline (16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R030XG024CA - DESERT PAVEMENT
Hydric soil rating: No

Description of Joshua

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 20 inches: gravelly sandy clay loam
H3 - 20 to 55 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R030XG024CA - DESERT PAVEMENT
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Hydric soil rating: No

Nebona

Percent of map unit: 5 percent
Hydric soil rating: No

Cuddeback

Percent of map unit: 5 percent
Hydric soil rating: No

151—NEBONA-CUDDEBACK COMPLEX, 2 TO 9 PERCENT SLOPES*

Map Unit Setting

National map unit symbol: hkss
Elevation: 1,800 to 3,400 feet
Mean annual precipitation: 3 to 5 inches
Mean annual air temperature: 63 to 66 degrees F
Frost-free period: 200 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Nebona and similar soils: 60 percent
Cuddeback and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nebona

Setting

Landform: Fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 2 inches: sandy loam
H2 - 2 to 8 inches: fine sandy loam
H3 - 8 to 12 inches: indurated
H4 - 12 to 65 inches: stratified gravelly sand to loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 6 to 14 inches to duripan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 0.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R030XF030CA - DESERT PAVEMENT
Hydric soil rating: No

Description of Cuddeback

Setting

Landform: Inset fans
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile

H1 - 0 to 3 inches: sandy loam
H2 - 3 to 6 inches: sandy loam
H3 - 6 to 17 inches: gravelly sandy clay loam
H4 - 17 to 34 inches: gravelly sandy loam

H5 - 34 to 38 inches: indurated

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R030XG024CA - DESERT PAVEMENT
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 19 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Playas
Hydric soil rating: Yes

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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)

Figure ADD-1
Antecedent Moisture Condition (AMC)

5-day Rainfall - NOAA Atlas 14
(50% of Total Rainfall Prior to Peak)*

*1/2 (11-day - 1-day) =
1/2 (([10-day] + (1/10 ([20-day] - [10-day]))) - [1-day])

5 0 5 10 15
Miles

N
W E
S

Growing Season
- AMC I
- AMC II
- AMC III

Site

STATE HWY 127
I-15
US HWY 395
I-40
STATE HWY 247
STATE HWY 62

Baxter Valley
Ridgecrest
Boron
Barstow
Adelanto
George AFB
George AFB
Victorville
Apple Valley
Mountain View Acres
Hesperia
Wrightwood
Crestline
Lake Arrowhead
Running Springs
Big Bear City
Big Bear Lake
Twentynine Palms
Yucca Valley
Joshua Tree
Morongo Valley
Claremont
Needles
Parker Dam
Big River

Appendix C

Rational Method Analysis

Onsite Predevelopment, 10 Year and 100 Year events
Onsite Developed, 10 Year and 100 Year events

10-year existing condition Rational Method

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/15/22

Quarry site
10-yr existing condition
Area A

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.601 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.800
Decimal fraction soil group D = 0.200
SCS curve number for soil(AMC 2) = 86.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.254(In/Hr)
Initial subarea data:
Initial area flow distance = 969.000(Ft.)
Top (of initial area) elevation = 3168.000(Ft.)
Bottom (of initial area) elevation = 3146.000(Ft.)
Difference in elevation = 22.000(Ft.)
Slope = 0.02270 s(%)= 2.27
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.517 min.
Rainfall intensity = 1.423(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.739

```
Subarea runoff =      5.174(CFS)
Total initial stream area =        4.920(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.254(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.324(Ft.), Average velocity =   1.483(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2             27.00              0.20
        3             36.00              0.00
        4             54.00              0.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      6.797(CFS)
  '     '        flow top width =     31.761(Ft.)
  '     '    velocity=    1.483(Ft/s)
  '     '        area =      4.582(Sq.Ft)
  '     '        Froude number =     0.688

Upstream point elevation =  3146.000(Ft.)
Downstream point elevation =  3137.800(Ft.)
Flow length =   508.000(Ft.)
Travel time  =    5.71 min.
Time of concentration =   23.22 min.
Depth of flow =   0.324(Ft.)
Average velocity =   1.483(Ft/s)
Total irregular channel flow =     6.797(CFS)
Irregular channel normal depth above invert elev. =   0.324(Ft.)
Average velocity of channel(s) =   1.483(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.168(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.700
Subarea runoff =      3.162(CFS) for    5.280(Ac.)
```

```
Total runoff =      8.336(CFS)
Effective area this stream =       10.20(Ac.)
Total Study Area (Main Stream No. 1) =       10.20(Ac.)
Area averaged Fm value =    0.260(In/Hr)
Depth of flow =   0.347(Ft.), Average velocity =   1.553(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Time of concentration =    23.22 min.
Rainfall intensity =      1.168(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.699
Subarea runoff =      3.047(CFS) for    3.750(Ac.)
Total runoff =     11.383(CFS)
Effective area this stream =       13.95(Ac.)
Total Study Area (Main Stream No. 1) =       13.95(Ac.)
Area averaged Fm value =    0.261(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Time of concentration =    23.22 min.
Rainfall intensity =      1.168(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.698
Subarea runoff =      2.584(CFS) for    3.180(Ac.)
Total runoff =     13.967(CFS)
Effective area this stream =       17.13(Ac.)
Total Study Area (Main Stream No. 1) =       17.13(Ac.)
Area averaged Fm value =    0.262(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     17.130(Ac.)
Runoff from this stream =     13.967(CFS)
Time of concentration =   23.22 min.
Rainfall intensity =     1.168(In/Hr)
Area averaged loss rate (Fm) =    0.2620(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     13.97    17.130     23.22    0.262      1.168
Qmax(1) =
           1.000 *    1.000 *    13.967) + =      13.967

Total of 1 streams to confluence:
Flow rates before confluence point:
      13.967
Maximum flow rates at confluence using above data:
       13.967
Area of streams before confluence:
       17.130
Effective area values after confluence:
       17.130
Results of confluence:
Total flow rate =     13.967(CFS)
Time of concentration =    23.225 min.
Effective stream area after confluence =     17.130(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.262(In/Hr)
Study area total (this main stream) =      17.13(Ac.)
End of computations, Total Study Area =           17.13 (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) = 1.000
Area averaged SCS curve number =  86.2
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/19/22

Quarry site
10-yr existing condition
Area B

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.601 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 107.000 to Point/Station 108.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 957.000(Ft.)
Top (of initial area) elevation = 3168.000(Ft.)
Bottom (of initial area) elevation = 3149.000(Ft.)
Difference in elevation = 19.000(Ft.)
Slope = 0.01985 s(%)= 1.99
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.904 min.
Rainfall intensity = 1.401(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.730

```
Subarea runoff =      7.158(CFS)
Total initial stream area =        7.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.265(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.745(Ft.), Average velocity =   2.712(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             34.00              1.00
        3             43.00              0.00
        4             50.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      9.403(CFS)
  '     '        flow top width =      9.311(Ft.)
  '     '    velocity=    2.712(Ft/s)
  '     '        area =      3.467(Sq.Ft)
  '     '        Froude number =     0.783

Upstream point elevation =  3149.000(Ft.)
Downstream point elevation =  3134.000(Ft.)
Flow length =   965.000(Ft.)
Travel time  =    5.93 min.
Time of concentration =   23.84 min.
Depth of flow =   0.745(Ft.)
Average velocity =   2.712(Ft/s)
Total irregular channel flow =     9.403(CFS)
Irregular channel normal depth above invert elev. =   0.745(Ft.)
Average velocity of channel(s) =   2.712(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.147(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.692
Subarea runoff =      4.429(CFS) for    7.600(Ac.)
```

```
Total runoff =     11.587(CFS)
Effective area this stream =       14.60(Ac.)
Total Study Area (Main Stream No. 1) =       14.60(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.806(Ft.), Average velocity =   2.857(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      109.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Time of concentration =    23.84 min.
Rainfall intensity =      1.147(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.692
Subarea runoff =      2.905(CFS) for    3.660(Ac.)
Total runoff =     14.492(CFS)
Effective area this stream =       18.26(Ac.)
Total Study Area (Main Stream No. 1) =       18.26(Ac.)
Area averaged Fm value =    0.265(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      111.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.958(Ft.), Average velocity =   3.014(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             34.00              1.00
        3             43.00              0.00
        4             50.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     17.304(CFS)
  '     '        flow top width =     11.981(Ft.)
  '     '    velocity=    3.014(Ft/s)
  '     '        area =      5.742(Sq.Ft)
  '     '        Froude number =     0.767
```

```
Upstream point elevation =  3134.000(Ft.)
Downstream point elevation =  3122.000(Ft.)
Flow length =   875.000(Ft.)
Travel time  =    4.84 min.
Time of concentration =   28.67 min.
Depth of flow =   0.958(Ft.)
Average velocity =   3.014(Ft/s)
Total irregular channel flow =    17.304(CFS)
Irregular channel normal depth above invert elev. =   0.958(Ft.)
Average velocity of channel(s) =   3.014(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.008(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.663
Subarea runoff =      5.559(CFS) for   11.740(Ac.)
Total runoff =     20.051(CFS)
Effective area this stream =       30.00(Ac.)
Total Study Area (Main Stream No. 1) =       30.00(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   1.024(Ft.), Average velocity =   3.059(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      111.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     30.000(Ac.)
Runoff from this stream =     20.051(CFS)
Time of concentration =   28.67 min.
Rainfall intensity =     1.008(In/Hr)
Area averaged loss rate (Fm) =    0.2651(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     20.05    30.000     28.67    0.265      1.008
Qmax(1) =
           1.000 *    1.000 *    20.051) + =      20.051
```

Total of 1 streams to confluence:
Flow rates before confluence point:
      20.051
Maximum flow rates at confluence using above data:
       20.051
Area of streams before confluence:
       30.000
Effective area values after confluence:
       30.000
Results of confluence:
Total flow rate =   20.051(CFS)
Time of concentration =   28.674 min.
Effective stream area after confluence =   30.000(Ac.)
Study area average Pervious fraction(Ap) = 1.000
Study area average soil loss rate(Fm) =   0.265(In/Hr)
Study area total (this main stream) =   30.00(Ac.)
End of computations, Total Study Area =   30.00 (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) = 1.000
Area averaged SCS curve number = 86.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/29/22

Quarry site
10-yr existing
Area C

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.601 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 112.000 to Point/Station 113.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 997.000(Ft.)
Top (of initial area) elevation = 3151.400(Ft.)
Bottom (of initial area) elevation = 3134.000(Ft.)
Difference in elevation = 17.400(Ft.)
Slope = 0.01745 s(%)= 1.75
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.675 min.
Rainfall intensity = 1.360(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.725

```
Subarea runoff =      6.309(CFS)
Total initial stream area =        6.400(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.265(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.511(Ft.), Average velocity =   2.208(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             16.00              1.00
        3             32.00              0.00
        4             45.00              1.00
        5             54.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      8.366(CFS)
  '     '        flow top width =     14.824(Ft.)
  '     '    velocity=    2.208(Ft/s)
  '     '        area =      3.789(Sq.Ft)
  '     '        Froude number =     0.770

Upstream point elevation =  3134.000(Ft.)
Downstream point elevation =  3125.000(Ft.)
Flow length =   538.000(Ft.)
Travel time  =    4.06 min.
Time of concentration =   22.74 min.
Depth of flow =   0.511(Ft.)
Average velocity =   2.208(Ft/s)
Total irregular channel flow =     8.365(CFS)
Irregular channel normal depth above invert elev. =   0.511(Ft.)
Average velocity of channel(s) =   2.208(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.185(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.699
```

```
Subarea runoff =      4.044(CFS) for    6.100(Ac.)
Total runoff =     10.354(CFS)
Effective area this stream =       12.50(Ac.)
Total Study Area (Main Stream No. 1) =       12.50(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.554(Ft.), Average velocity =   2.329(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.559(Ft.), Average velocity =   2.447(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             16.00              1.00
        3             32.00              0.00
        4             45.00              1.00
        5             54.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     11.089(CFS)
  '     '        flow top width =     16.212(Ft.)
  '     '    velocity=    2.447(Ft/s)
  '     '        area =      4.531(Sq.Ft)
  '     '        Froude number =     0.816

Upstream point elevation =  3125.000(Ft.)
Downstream point elevation =  3118.800(Ft.)
Flow length =   340.000(Ft.)
Travel time  =    2.32 min.
Time of concentration =   25.05 min.
Depth of flow =   0.559(Ft.)
Average velocity =   2.447(Ft/s)
Total irregular channel flow =    11.089(CFS)
Irregular channel normal depth above invert elev. =   0.559(Ft.)
Average velocity of channel(s) =   2.447(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.108(In/Hr) for a    10.0 year storm
```

```
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.685
Subarea runoff =      1.399(CFS) for    3.000(Ac.)
Total runoff =     11.753(CFS)
Effective area this stream =       15.50(Ac.)
Total Study Area (Main Stream No. 1) =       15.50(Ac.)
Area averaged Fm value =    0.265(In/Hr)
Depth of flow =   0.571(Ft.), Average velocity =   2.483(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     15.500(Ac.)
Runoff from this stream =     11.753(CFS)
Time of concentration =   25.05 min.
Rainfall intensity =     1.108(In/Hr)
Area averaged loss rate (Fm) =    0.2651(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     11.75    15.500     25.05    0.265      1.108
Qmax(1) =
           1.000 *    1.000 *    11.753) + =      11.753

Total of 1 streams to confluence:
Flow rates before confluence point:
      11.753
Maximum flow rates at confluence using above data:
       11.753
Area of streams before confluence:
       15.500
Effective area values after confluence:
       15.500
Results of confluence:
Total flow rate =     11.753(CFS)
Time of concentration =    25.052 min.
Effective stream area after confluence =     15.500(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.265(In/Hr)
Study area total (this main stream) =      15.50(Ac.)
End of computations, Total Study Area =           15.50 (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) = 1.000
Area averaged SCS curve number = 86.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/29/22

Quarry site
10-yr existing
Area D1 and D2

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.601 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 116.000 to Point/Station 117.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 740.000(Ft.)
Top (of initial area) elevation = 3147.000(Ft.)
Bottom (of initial area) elevation = 3134.500(Ft.)
Difference in elevation = 12.500(Ft.)
Slope = 0.01689 s(%)= 1.69
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 16.685 min.
Rainfall intensity = 1.472(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.738

```
Subarea runoff =      4.498(CFS)
Total initial stream area =        4.140(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.265(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      118.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.348(Ft.), Average velocity =   1.625(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.00
        2             53.00              0.00
        3             70.00              1.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      6.870(CFS)
  '     '        flow top width =     24.330(Ft.)
  '     '    velocity=    1.625(Ft/s)
  '     '        area =      4.228(Sq.Ft)
  '     '        Froude number =     0.687

Upstream point elevation =  3134.500(Ft.)
Downstream point elevation =  3129.000(Ft.)
Flow length =   364.000(Ft.)
Travel time  =    3.73 min.
Time of concentration =   20.42 min.
Depth of flow =   0.348(Ft.)
Average velocity =   1.625(Ft/s)
Total irregular channel flow =     6.870(CFS)
Irregular channel normal depth above invert elev. =   0.348(Ft.)
Average velocity of channel(s) =   1.625(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.265(In/Hr)
Rainfall intensity =      1.278(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.713
Subarea runoff =      4.683(CFS) for    5.930(Ac.)
Total runoff =      9.181(CFS)
```

Effective area this stream = 10.07(Ac.)
Total Study Area (Main Stream No. 1) = 10.07(Ac.)
Area averaged Fm value = 0.265(In/Hr)
Depth of flow = 0.388(Ft.), Average velocity = 1.747(Ft/s)
End of computations, Total Study Area = 10.07 (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) = 1.000
Area averaged SCS curve number = 86.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/29/22

Quarry Site
10-yr existing
Area D3

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.601 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 119.000 to Point/Station 120.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.265(In/Hr)
Initial subarea data:
Initial area flow distance = 703.000(Ft.)
Top (of initial area) elevation = 3136.000(Ft.)
Bottom (of initial area) elevation = 3118.800(Ft.)
Difference in elevation = 17.200(Ft.)
Slope = 0.02447 s(%)= 2.45
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.178 min.
Rainfall intensity = 1.573(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.748

```
Subarea runoff =      9.782(CFS)
Total initial stream area =        8.310(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.265(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      120.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      8.310(Ac.)
Runoff from this stream =      9.782(CFS)
Time of concentration =   15.18 min.
Rainfall intensity =     1.573(In/Hr)
Area averaged loss rate (Fm) =    0.2651(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      9.78     8.310     15.18    0.265      1.573
Qmax(1) =
           1.000 *    1.000 *     9.782) + =       9.782

Total of 1 streams to confluence:
Flow rates before confluence point:
       9.782
Maximum flow rates at confluence using above data:
        9.782
Area of streams before confluence:
        8.310
Effective area values after confluence:
        8.310
Results of confluence:
Total flow rate =      9.782(CFS)
Time of concentration =    15.178 min.
Effective stream area after confluence =      8.310(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.265(In/Hr)
Study area total (this main stream) =       8.31(Ac.)
End of computations, Total Study Area =            8.31 (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) = 1.000
```

Area averaged SCS curve number = 86.0

100-year existing condition Rational Method

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/15/22

Quarry Site
100-yr existing condition
Area A

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.800
Decimal fraction soil group D = 0.200
SCS curve number for soil(AMC 2) = 86.60
Adjusted SCS curve number for AMC 3 = 97.32
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.053(In/Hr)
Initial subarea data:
Initial area flow distance = 969.000(Ft.)
Top (of initial area) elevation = 3168.000(Ft.)
Bottom (of initial area) elevation = 3146.000(Ft.)
Difference in elevation = 22.000(Ft.)
Slope = 0.02270 s(%)= 2.27
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.517 min.
Rainfall intensity = 2.509(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.881
Subarea runoff =     10.877(CFS)
Total initial stream area =        4.920(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.053(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.424(Ft.), Average velocity =   1.778(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2             27.00              0.20
        3             36.00              0.00
        4             54.00              0.50
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     14.961(CFS)
  '     '        flow top width =     44.432(Ft.)
  '     '    velocity=    1.778(Ft/s)
  '     '        area =      8.413(Sq.Ft)
  '     '        Froude number =     0.720

Upstream point elevation =  3146.000(Ft.)
Downstream point elevation =  3137.800(Ft.)
Flow length =   508.000(Ft.)
Travel time  =    4.76 min.
Time of concentration =   22.28 min.
Depth of flow =   0.424(Ft.)
Average velocity =   1.778(Ft/s)
Total irregular channel flow =    14.961(CFS)
Irregular channel normal depth above invert elev. =   0.424(Ft.)
Average velocity of channel(s) =   1.778(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.800
Decimal fraction soil group D = 0.200
SCS curve number for soil(AMC 2)  = 86.60
Adjusted SCS curve number for AMC 3 = 97.32
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.053(In/Hr)
Rainfall intensity =      2.121(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
```

```
rational method)(Q=KCIA) is C = 0.877
Subarea runoff =      8.105(CFS) for    5.280(Ac.)
Total runoff =     18.982(CFS)
Effective area this stream =       10.20(Ac.)
Total Study Area (Main Stream No. 1) =       10.20(Ac.)
Area averaged Fm value =    0.053(In/Hr)
Depth of flow =   0.460(Ft.), Average velocity =   1.882(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    22.28 min.
Rainfall intensity =      2.121(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.877
Subarea runoff =      6.971(CFS) for    3.750(Ac.)
Total runoff =     25.952(CFS)
Effective area this stream =       13.95(Ac.)
Total Study Area (Main Stream No. 1) =       13.95(Ac.)
Area averaged Fm value =    0.054(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    22.28 min.
Rainfall intensity =      2.121(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.877
Subarea runoff =      5.911(CFS) for    3.180(Ac.)
Total runoff =     31.864(CFS)
```

```
Effective area this stream =       17.13(Ac.)
Total Study Area (Main Stream No. 1) =       17.13(Ac.)
Area averaged Fm value =    0.054(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     17.130(Ac.)
Runoff from this stream =     31.864(CFS)
Time of concentration =   22.28 min.
Rainfall intensity =     2.121(In/Hr)
Area averaged loss rate (Fm) =    0.0540(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     31.86    17.130     22.28    0.054      2.121
Qmax(1) =
           1.000 *    1.000 *    31.864) + =      31.864

Total of 1 streams to confluence:
Flow rates before confluence point:
      31.864
Maximum flow rates at confluence using above data:
       31.864
Area of streams before confluence:
       17.130
Effective area values after confluence:
       17.130
Results of confluence:
Total flow rate =     31.864(CFS)
Time of concentration =    22.278 min.
Effective stream area after confluence =     17.130(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.054(In/Hr)
Study area total (this main stream) =      17.13(Ac.)
End of computations, Total Study Area =           17.13 (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) = 1.000
Area averaged SCS curve number =  86.4
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/19/22

Quarry Site
100-yr existing condition
Area B

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 107.000 to Point/Station 108.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 957.000(Ft.)
Top (of initial area) elevation = 3168.000(Ft.)
Bottom (of initial area) elevation = 3149.000(Ft.)
Difference in elevation = 19.000(Ft.)
Slope = 0.01985 s(%)= 1.99
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.904 min.
Rainfall intensity = 2.471(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff =     15.221(CFS)
Total initial stream area =        7.000(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   1.012(Ft.), Average velocity =   3.276(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             34.00              1.00
        3             43.00              0.00
        4             50.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     20.984(CFS)
  '     '        flow top width =     12.957(Ft.)
  '     '    velocity=    3.276(Ft/s)
  '     '        area =      6.405(Sq.Ft)
  '     '        Froude number =     0.821

Upstream point elevation =  3149.000(Ft.)
Downstream point elevation =  3134.000(Ft.)
Flow length =   965.000(Ft.)
Travel time  =    4.91 min.
Time of concentration =   22.81 min.
Depth of flow =   1.012(Ft.)
Average velocity =   3.276(Ft/s)
Total irregular channel flow =    20.984(CFS)
Irregular channel normal depth above invert elev. =   1.012(Ft.)
Average velocity of channel(s) =   3.276(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      2.086(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
```

```
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =     11.459(CFS) for    7.600(Ac.)
Total runoff =     26.680(CFS)
Effective area this stream =       14.60(Ac.)
Total Study Area (Main Stream No. 1) =       14.60(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   1.141(Ft.), Average velocity =   3.180(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      109.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    22.81 min.
Rainfall intensity =      2.086(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =      6.688(CFS) for    3.660(Ac.)
Total runoff =     33.368(CFS)
Effective area this stream =       18.26(Ac.)
Total Study Area (Main Stream No. 1) =       18.26(Ac.)
Area averaged Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      111.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   1.353(Ft.), Average velocity =   3.133(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             34.00              1.00
        3             43.00              0.00
        4             50.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     40.691(CFS)
  '     '        flow top width =     25.724(Ft.)
```

```
  '     '    velocity=    3.133(Ft/s)
  '     '        area =     12.990(Sq.Ft)
  '     '        Froude number =     0.777

Upstream point elevation =  3134.000(Ft.)
Downstream point elevation =  3122.000(Ft.)
Flow length =   875.000(Ft.)
Travel time  =    4.66 min.
Time of concentration =   27.47 min.
Depth of flow =   1.353(Ft.)
Average velocity =   3.133(Ft/s)
Total irregular channel flow =    40.691(CFS)
Irregular channel normal depth above invert elev. =   1.353(Ft.)
Average velocity of channel(s) =   3.133(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      1.832(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =     14.589(CFS) for   11.740(Ac.)
Total runoff =     47.957(CFS)
Effective area this stream =       30.00(Ac.)
Total Study Area (Main Stream No. 1) =       30.00(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   1.424(Ft.), Average velocity =   3.217(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      111.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     30.000(Ac.)
Runoff from this stream =     47.957(CFS)
Time of concentration =   27.47 min.
Rainfall intensity =     1.832(In/Hr)
Area averaged loss rate (Fm) =    0.0554(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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

```
1     47.96    30.000     27.47    0.055      1.832
Qmax(1) =
           1.000 *    1.000 *    47.957) + =      47.957

Total of 1 streams to confluence:
Flow rates before confluence point:
      47.957
Maximum flow rates at confluence using above data:
       47.957
Area of streams before confluence:
       30.000
Effective area values after confluence:
       30.000
Results of confluence:
Total flow rate =     47.957(CFS)
Time of concentration =    27.469 min.
Effective stream area after confluence =     30.000(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.055(In/Hr)
Study area total (this main stream) =      30.00(Ac.)
End of computations, Total Study Area =           30.00 (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) = 1.000
Area averaged SCS curve number =  86.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/29/22

Quarry site
100-yr existing
Area C

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 112.000 to Point/Station 113.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 997.000(Ft.)
Top (of initial area) elevation = 3151.400(Ft.)
Bottom (of initial area) elevation = 3134.000(Ft.)
Difference in elevation = 17.400(Ft.)
Slope = 0.01745 s(%)= 1.75
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.675 min.
Rainfall intensity = 2.400(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.879
Subarea runoff =     13.502(CFS)
Total initial stream area =        6.400(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.689(Ft.), Average velocity =   2.693(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             16.00              1.00
        3             32.00              0.00
        4             45.00              1.00
        5             54.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     18.522(CFS)
  '     '        flow top width =     19.971(Ft.)
  '     '    velocity=    2.693(Ft/s)
  '     '        area =      6.877(Sq.Ft)
  '     '        Froude number =     0.809

Upstream point elevation =  3134.000(Ft.)
Downstream point elevation =  3125.000(Ft.)
Flow length =   538.000(Ft.)
Travel time  =    3.33 min.
Time of concentration =   22.00 min.
Depth of flow =   0.689(Ft.)
Average velocity =   2.693(Ft/s)
Total irregular channel flow =    18.522(CFS)
Irregular channel normal depth above invert elev. =   0.689(Ft.)
Average velocity of channel(s) =   2.693(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      2.139(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.877
Subarea runoff =      9.941(CFS) for    6.100(Ac.)
Total runoff =     23.443(CFS)
Effective area this stream =       12.50(Ac.)
Total Study Area (Main Stream No. 1) =       12.50(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   0.752(Ft.), Average velocity =   2.857(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.763(Ft.), Average velocity =   3.012(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              2.00
        2             16.00              1.00
        3             32.00              0.00
        4             45.00              1.00
        5             54.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     25.450(CFS)
  '     '        flow top width =     22.138(Ft.)
  '     '    velocity=    3.012(Ft/s)
  '     '        area =      8.450(Sq.Ft)
  '     '        Froude number =     0.859

Upstream point elevation =  3125.000(Ft.)
Downstream point elevation =  3118.800(Ft.)
Flow length =   340.000(Ft.)
Travel time  =    1.88 min.
Time of concentration =   23.89 min.
Depth of flow =   0.763(Ft.)
Average velocity =   3.012(Ft/s)
Total irregular channel flow =    25.450(CFS)
Irregular channel normal depth above invert elev. =   0.763(Ft.)
Average velocity of channel(s) =   3.012(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
```

```
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      2.020(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.875
Subarea runoff =      3.961(CFS) for    3.000(Ac.)
Total runoff =     27.404(CFS)
Effective area this stream =       15.50(Ac.)
Total Study Area (Main Stream No. 1) =       15.50(Ac.)
Area averaged Fm value =    0.055(In/Hr)
Depth of flow =   0.785(Ft.), Average velocity =   3.068(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     15.500(Ac.)
Runoff from this stream =     27.404(CFS)
Time of concentration =   23.89 min.
Rainfall intensity =     2.020(In/Hr)
Area averaged loss rate (Fm) =    0.0554(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     27.40    15.500     23.89    0.055      2.020
Qmax(1) =
           1.000 *    1.000 *    27.404) + =      27.404

Total of 1 streams to confluence:
Flow rates before confluence point:
      27.404
Maximum flow rates at confluence using above data:
       27.404
Area of streams before confluence:
       15.500
Effective area values after confluence:
       15.500
Results of confluence:
Total flow rate =     27.404(CFS)
Time of concentration =    23.886 min.
Effective stream area after confluence =     15.500(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.055(In/Hr)
Study area total (this main stream) =      15.50(Ac.)
```

End of computations, Total Study Area = 15.50 (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) = 1.000
Area averaged SCS curve number = 86.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/29/22

Quarry site
100-yr existing
Area D1 and D2

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 116.000 to Point/Station 117.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 740.000(Ft.)
Top (of initial area) elevation = 3147.000(Ft.)
Bottom (of initial area) elevation = 3134.500(Ft.)
Difference in elevation = 12.500(Ft.)
Slope = 0.01689 s(%)= 1.69
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 16.685 min.
Rainfall intensity = 2.597(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.881
Subarea runoff =      9.468(CFS)
Total initial stream area =        4.140(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      118.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.466(Ft.), Average velocity =   1.974(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              1.00
        2             53.00              0.00
        3             70.00              1.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     14.980(CFS)
  '     '        flow top width =     32.592(Ft.)
  '     '    velocity=    1.974(Ft/s)
  '     '        area =      7.588(Sq.Ft)
  '     '        Froude number =     0.721

Upstream point elevation =  3134.500(Ft.)
Downstream point elevation =  3129.000(Ft.)
Flow length =   364.000(Ft.)
Travel time  =    3.07 min.
Time of concentration =   19.76 min.
Depth of flow =   0.466(Ft.)
Average velocity =   1.974(Ft/s)
Total irregular channel flow =    14.980(CFS)
Irregular channel normal depth above invert elev. =   0.466(Ft.)
Average velocity of channel(s) =   1.974(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.055(In/Hr)
Rainfall intensity =      2.307(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.878
```

Subarea runoff = 10.936(CFS) for 5.930(Ac.)
Total runoff = 20.404(CFS)
Effective area this stream = 10.07(Ac.)
Total Study Area (Main Stream No. 1) = 10.07(Ac.)
Area averaged Fm value = 0.055(In/Hr)
Depth of flow = 0.523(Ft.), Average velocity = 2.133(Ft/s)
End of computations, Total Study Area = 10.07 (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) = 1.000
Area averaged SCS curve number = 86.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 09/29/22

Quarry Site
100-yr existing
Area D3

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.060 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 119.000 to Point/Station 120.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 86.00
Adjusted SCS curve number for AMC 3 = 97.20
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.055(In/Hr)
Initial subarea data:
Initial area flow distance = 703.000(Ft.)
Top (of initial area) elevation = 3136.000(Ft.)
Bottom (of initial area) elevation = 3118.800(Ft.)
Difference in elevation = 17.200(Ft.)
Slope = 0.02447 s(%)= 2.45
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.178 min.
Rainfall intensity = 2.774(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =     20.335(CFS)
Total initial stream area =        8.310(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.055(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      120.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      8.310(Ac.)
Runoff from this stream =     20.335(CFS)
Time of concentration =   15.18 min.
Rainfall intensity =     2.774(In/Hr)
Area averaged loss rate (Fm) =    0.0554(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1     20.33     8.310     15.18    0.055      2.774
Qmax(1) =
           1.000 *    1.000 *    20.335) + =      20.335

Total of 1 streams to confluence:
Flow rates before confluence point:
      20.335
Maximum flow rates at confluence using above data:
       20.335
Area of streams before confluence:
        8.310
Effective area values after confluence:
        8.310
Results of confluence:
Total flow rate =     20.335(CFS)
Time of concentration =    15.178 min.
Effective stream area after confluence =      8.310(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.055(In/Hr)
Study area total (this main stream) =       8.31(Ac.)
End of computations, Total Study Area =            8.31 (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) = 1.000
Area averaged SCS curve number = 86.0

10-year developed condition Rational Method

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/21/22

Quarry site
10-yr developed
Area A

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

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Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.080(In/Hr)
Initial subarea data:
Initial area flow distance = 363.000(Ft.)
Top (of initial area) elevation = 51.100(Ft.)
Bottom (of initial area) elevation = 46.260(Ft.)
Difference in elevation = 4.840(Ft.)
Slope = 0.01333 s(%)= 1.33
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.618 min.
Rainfall intensity = 2.582(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.872

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Subarea runoff =      1.689(CFS)
Total initial stream area =        0.750(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.080(In/Hr)


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Process from Point/Station       20.000 to Point/Station       30.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    40.000(Ft.)
Downstream point/station elevation =    37.680(Ft.)
Pipe length  =   437.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.689(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.689(CFS)
Normal flow depth in pipe =    7.05(In.)
Flow top width inside pipe =   11.81(In.)
Critical Depth =    6.63(In.)
Pipe flow velocity =      3.52(Ft/s)
Travel time through pipe =    2.07 min.
Time of concentration (TC) =     9.69 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       30.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =     9.69 min.
Rainfall intensity =      2.183(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.867
Subarea runoff =      3.609(CFS) for    2.050(Ac.)
Total runoff =      5.298(CFS)
Effective area this stream =        2.80(Ac.)
Total Study Area (Main Stream No. 1) =        2.80(Ac.)
Area averaged Fm value =    0.080(In/Hr)


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Process from Point/Station       30.000 to Point/Station       40.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
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Upstream point/station elevation =    37.680(Ft.)
Downstream point/station elevation =    35.560(Ft.)
Pipe length  =   400.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.298(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     5.298(CFS)
Normal flow depth in pipe =   11.02(In.)
Flow top width inside pipe =   17.54(In.)
Critical Depth =   10.65(In.)
Pipe flow velocity =      4.67(Ft/s)
Travel time through pipe =    1.43 min.
Time of concentration (TC) =    11.11 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****
_______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    11.11 min.
Rainfall intensity =      1.982(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.864
Subarea runoff =      6.771(CFS) for    4.250(Ac.)
Total runoff =     12.069(CFS)
Effective area this stream =        7.05(Ac.)
Total Study Area (Main Stream No. 1) =        7.05(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_______________________________________________________________________________
Upstream point/station elevation =    35.560(Ft.)
Downstream point/station elevation =    33.360(Ft.)
Pipe length  =   412.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.069(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    12.069(CFS)
Normal flow depth in pipe =   15.22(In.)
Flow top width inside pipe =   23.12(In.)
Critical Depth =   14.98(In.)
Pipe flow velocity =      5.74(Ft/s)
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Travel time through pipe =    1.20 min.
Time of concentration (TC) =    12.31 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    12.31 min.
Rainfall intensity =      1.846(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.861
Subarea runoff =      8.124(CFS) for    5.660(Ac.)
Total runoff =     20.193(CFS)
Effective area this stream =       12.71(Ac.)
Total Study Area (Main Stream No. 1) =       12.71(Ac.)
Area averaged Fm value =    0.080(In/Hr)


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Process from Point/Station       50.000 to Point/Station       60.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    33.360(Ft.)
Downstream point/station elevation =    31.250(Ft.)
Pipe length  =   404.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.193(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    20.193(CFS)
Normal flow depth in pipe =   20.06(In.)
Flow top width inside pipe =   23.60(In.)
Critical Depth =   18.88(In.)
Pipe flow velocity =      6.37(Ft/s)
Travel time through pipe =    1.06 min.
Time of concentration (TC) =    13.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       50.000 to Point/Station       60.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
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```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    13.37 min.
Rainfall intensity =      1.742(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.858
Subarea runoff =      9.063(CFS) for    6.850(Ac.)
Total runoff =     29.256(CFS)
Effective area this stream =       19.56(Ac.)
Total Study Area (Main Stream No. 1) =       19.56(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       60.000 to Point/Station       70.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    31.250(Ft.)
Downstream point/station elevation =    29.130(Ft.)
Pipe length  =   400.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    29.256(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    29.256(CFS)
Normal flow depth in pipe =   24.05(In.)
Flow top width inside pipe =   23.93(In.)
Critical Depth =   22.13(In.)
Pipe flow velocity =      6.93(Ft/s)
Travel time through pipe =    0.96 min.
Time of concentration (TC) =    14.33 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       60.000 to Point/Station       70.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    14.33 min.
Rainfall intensity =      1.660(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.856
Subarea runoff =      8.181(CFS) for    6.780(Ac.)
```

```
Total runoff =     37.436(CFS)
Effective area this stream =       26.34(Ac.)
Total Study Area (Main Stream No. 1) =       26.34(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       70.000 to Point/Station       80.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    29.130(Ft.)
Downstream point/station elevation =    27.020(Ft.)
Pipe length  =   400.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    37.436(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    37.436(CFS)
Normal flow depth in pipe =   26.34(In.)
Flow top width inside pipe =   26.48(In.)
Critical Depth =   24.44(In.)
Pipe flow velocity =      7.37(Ft/s)
Travel time through pipe =    0.90 min.
Time of concentration (TC) =    15.23 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       70.000 to Point/Station       80.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    15.23 min.
Rainfall intensity =      1.590(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.855
Subarea runoff =      7.507(CFS) for    6.740(Ac.)
Total runoff =     44.943(CFS)
Effective area this stream =       33.08(Ac.)
Total Study Area (Main Stream No. 1) =       33.08(Ac.)
Area averaged Fm value =    0.080(In/Hr)


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Process from Point/Station       80.000 to Point/Station       90.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
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Upstream point/station elevation =    27.020(Ft.)
Downstream point/station elevation =    24.860(Ft.)
Pipe length  =   413.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    44.943(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    44.943(CFS)
Normal flow depth in pipe =   27.52(In.)
Flow top width inside pipe =   30.56(In.)
Critical Depth =   26.21(In.)
Pipe flow velocity =      7.75(Ft/s)
Travel time through pipe =    0.89 min.
Time of concentration (TC) =    16.12 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       80.000 to Point/Station       90.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    16.12 min.
Rainfall intensity =      1.528(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.853
Subarea runoff =      7.280(CFS) for    7.000(Ac.)
Total runoff =     52.224(CFS)
Effective area this stream =       40.08(Ac.)
Total Study Area (Main Stream No. 1) =       40.08(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       90.000 to Point/Station      100.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    24.860(Ft.)
Downstream point/station elevation =    21.740(Ft.)
Pipe length  =   196.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    52.224(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    52.224(CFS)
Normal flow depth in pipe =   21.98(In.)
Flow top width inside pipe =   31.12(In.)
Critical Depth =   28.44(In.)
Pipe flow velocity =     12.43(Ft/s)
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Travel time through pipe =    0.26 min.
Time of concentration (TC) =    16.38 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       90.000 to Point/Station      100.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Time of concentration =    16.38 min.
Rainfall intensity =      1.511(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.852
Subarea runoff =      3.628(CFS) for    3.300(Ac.)
Total runoff =     55.852(CFS)
Effective area this stream =       43.38(Ac.)
Total Study Area (Main Stream No. 1) =       43.38(Ac.)
Area averaged Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    21.740(Ft.)
Downstream point/station elevation =    15.000(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    55.852(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    55.852(CFS)
Normal flow depth in pipe =   16.17(In.)
Flow top width inside pipe =   22.50(In.)
Critical depth could not be calculated.
Pipe flow velocity =     24.80(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    16.43 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     43.380(Ac.)
```

Runoff from this stream = 55.852(CFS)
Time of concentration = 16.43 min.
Rainfall intensity = 1.508(In/Hr)
Area averaged loss rate (Fm) = 0.0804(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream No.	Flow rate (CFS)	Area (Ac.)	TC (min)	Fm (In/Hr)	Rainfall Intensity (In/Hr)
1	55.85	43.380	16.43	0.080	1.508

Qmax(1) =
1.000 * 1.000 * 55.852) + = 55.852

Total of 1 streams to confluence:
Flow rates before confluence point:
55.852
Maximum flow rates at confluence using above data:
55.852
Area of streams before confluence:
43.380
Effective area values after confluence:
43.380
Results of confluence:
Total flow rate = 55.852(CFS)
Time of concentration = 16.430 min.
Effective stream area after confluence = 43.380(Ac.)
Study area average Pervious fraction(Ap) = 0.100
Study area average soil loss rate(Fm) = 0.080(In/Hr)
Study area total (this main stream) = 43.38(Ac.)
End of computations, Total Study Area = 43.38 (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) = 0.100
Area averaged SCS curve number = 50.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/21/22

Quarry site
10-yr developed
Area B

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

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Process from Point/Station 200.000 to Point/Station 201.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 64.50
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.615(In/Hr)
Initial subarea data:
Initial area flow distance = 972.000(Ft.)
Top (of initial area) elevation = 67.500(Ft.)
Bottom (of initial area) elevation = 47.000(Ft.)
Difference in elevation = 20.500(Ft.)
Slope = 0.02109 s(%)= 2.11
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 23.936 min.
Rainfall intensity = 1.159(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.422

```
Subarea runoff =      0.621(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.615(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.257(Ft.), Average velocity =   1.045(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              5.00              0.00
        3             10.00              0.50
Manning's 'N' friction factor =   0.030
------------------------------------------------------------------
Sub-Channel flow  =      0.691(CFS)
  '     '        flow top width =      5.142(Ft.)
  '     '    velocity=    1.045(Ft/s)
  '     '        area =      0.661(Sq.Ft)
  '     '        Froude number =     0.514

Upstream point elevation =    47.000(Ft.)
Downstream point elevation =    45.500(Ft.)
Flow length =   217.000(Ft.)
Travel time  =    3.46 min.
Time of concentration =   27.40 min.
Depth of flow =   0.257(Ft.)
Average velocity =   1.045(Ft/s)
Total irregular channel flow =     0.691(CFS)
Irregular channel normal depth above invert elev. =   0.257(Ft.)
Average velocity of channel(s) =   1.045(Ft/s)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 64.50
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.615(In/Hr)
Rainfall intensity =      1.054(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.375
Subarea runoff =      0.058(CFS) for    0.450(Ac.)
Total runoff =      0.679(CFS)
```

```
Effective area this stream =        1.72(Ac.)
Total Study Area (Main Stream No. 1) =        1.72(Ac.)
Area averaged Fm value =    0.615(In/Hr)
Depth of flow =   0.255(Ft.), Average velocity =   1.041(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.217(Ft.), Average velocity =   1.660(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              5.00              0.00
        3             10.00              0.50
Manning's 'N' friction factor =   0.030
------------------------------------------------------------------
Sub-Channel flow  =      0.780(CFS)
  '     '        flow top width =      4.336(Ft.)
  '     '    velocity=    1.660(Ft/s)
  '     '        area =      0.470(Sq.Ft)
  '     '        Froude number =     0.889

Upstream point elevation =    45.500(Ft.)
Downstream point elevation =    37.800(Ft.)
Flow length =   352.000(Ft.)
Travel time  =    3.53 min.
Time of concentration =   30.93 min.
Depth of flow =   0.217(Ft.)
Average velocity =   1.660(Ft/s)
Total irregular channel flow =     0.780(CFS)
Irregular channel normal depth above invert elev. =   0.217(Ft.)
Average velocity of channel(s) =   1.660(Ft/s)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 64.50
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.615(In/Hr)
Rainfall intensity =      0.968(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.328
Subarea runoff =      0.150(CFS) for    0.890(Ac.)
Total runoff =      0.829(CFS)
```

```
Effective area this stream =        2.61(Ac.)
Total Study Area (Main Stream No. 1) =        2.61(Ac.)
Area averaged Fm value =    0.615(In/Hr)
Depth of flow =   0.222(Ft.), Average velocity =   1.685(Ft/s)


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Process from Point/Station      202.000 to Point/Station      203.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.610(Ac.)
Runoff from this stream =      0.829(CFS)
Time of concentration =   30.93 min.
Rainfall intensity =     0.968(In/Hr)
Area averaged loss rate (Fm) =    0.6155(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      0.83     2.610     30.93    0.615      0.968
Qmax(1) =
           1.000 *    1.000 *     0.829) + =       0.829

Total of 1 streams to confluence:
Flow rates before confluence point:
       0.829
Maximum flow rates at confluence using above data:
        0.829
Area of streams before confluence:
        2.610
Effective area values after confluence:
        2.610
Results of confluence:
Total flow rate =      0.829(CFS)
Time of concentration =    30.930 min.
Effective stream area after confluence =      2.610(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.615(In/Hr)
Study area total (this main stream) =       2.61(Ac.)
End of computations, Total Study Area =            2.61 (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) = 1.000
```

Area averaged SCS curve number = 64.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/21/22

Quarry site
10-yr developed
Area C

Program License Serial Number 6385

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.609 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++

Process from Point/Station 300.000 to Point/Station 301.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.080(In/Hr)
Initial subarea data:
Initial area flow distance = 975.000(Ft.)
Top (of initial area) elevation = 43.300(Ft.)
Bottom (of initial area) elevation = 39.200(Ft.)
Difference in elevation = 4.100(Ft.)
Slope = 0.00421 s(%)= 0.42
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.247 min.
Rainfall intensity = 1.666(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.857

```
Subarea runoff =      9.448(CFS)
Total initial stream area =        6.620(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    39.200(Ft.)
End of street segment elevation =    36.750(Ft.)
Length of street segment  =   488.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  47.000(Ft.)
Distance from crown to crossfall grade break  =  46.990(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.014
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   0.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     12.580(CFS)
Depth of flow =   0.536(Ft.), Average velocity =   2.581(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  26.387(Ft.)
Flow velocity =   2.58(Ft/s)
Travel time =    3.15 min.     TC =   17.40  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Rainfall intensity =      1.449(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.850
Subarea runoff =      6.179(CFS) for    6.070(Ac.)
Total runoff =     15.628(CFS)
Effective area this stream =       12.69(Ac.)
Total Study Area (Main Stream No. 1) =       12.69(Ac.)
Area averaged Fm value =    0.080(In/Hr)
Street flow at end of street =     15.628(CFS)
Half street flow at end of street =     15.628(CFS)
```

```
Depth of flow =   0.567(Ft.), Average velocity =   2.726(Ft/s)
Flow width (from curb towards crown)=  28.616(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    36.750(Ft.)
End of street segment elevation =    34.200(Ft.)
Length of street segment  =   509.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  47.000(Ft.)
Distance from crown to crossfall grade break  =  46.990(Ft.)
Slope from gutter to grade break (v/hz) =   0.014
Slope from grade break to crown (v/hz)  =   0.014
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   0.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     18.309(CFS)
Depth of flow =   0.592(Ft.), Average velocity =   2.835(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  30.374(Ft.)
Flow velocity =   2.83(Ft/s)
Travel time =    2.99 min.     TC =   20.39  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Rainfall intensity =      1.296(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.844
Subarea runoff =      5.275(CFS) for    6.410(Ac.)
Total runoff =     20.903(CFS)
Effective area this stream =       19.10(Ac.)
Total Study Area (Main Stream No. 1) =       19.10(Ac.)
Area averaged Fm value =    0.080(In/Hr)
Street flow at end of street =     20.903(CFS)
Half street flow at end of street =     20.903(CFS)
Depth of flow =   0.614(Ft.), Average velocity =   2.931(Ft/s)
Flow width (from curb towards crown)=  31.918(Ft.)
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      305.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    34.200(Ft.)
End of street segment elevation =    30.640(Ft.)
Length of street segment  =   601.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  47.000(Ft.)
Distance from crown to crossfall grade break  =  46.990(Ft.)
Slope from gutter to grade break (v/hz) =   0.014
Slope from grade break to crown (v/hz)  =   0.014
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   0.000(Ft.)
Slope from curb to property line (v/hz) =   0.000
Gutter width =   0.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     23.581(CFS)
Depth of flow =   0.620(Ft.), Average velocity =   3.217(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  32.360(Ft.)
Flow velocity =   3.22(Ft/s)
Travel time =    3.11 min.     TC =   23.50  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Rainfall intensity =      1.174(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.838
Subarea runoff =      5.260(CFS) for    7.490(Ac.)
Total runoff =     26.163(CFS)
Effective area this stream =       26.59(Ac.)
Total Study Area (Main Stream No. 1) =       26.59(Ac.)
Area averaged Fm value =    0.080(In/Hr)
Street flow at end of street =     26.163(CFS)
Half street flow at end of street =     26.163(CFS)
Depth of flow =   0.638(Ft.), Average velocity =   3.302(Ft/s)
Flow width (from curb towards crown)=  33.642(Ft.)
```

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Process from Point/Station      304.000 to Point/Station      305.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    25.000(Ft.)
Downstream point/station elevation =    15.000(Ft.)
Pipe length  =    78.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    26.163(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    26.163(CFS)
Normal flow depth in pipe =   11.05(In.)
Flow top width inside pipe =   17.53(In.)
Critical depth could not be calculated.
Pipe flow velocity =     23.00(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    23.56 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     26.590(Ac.)
Runoff from this stream =     26.163(CFS)
Time of concentration =   23.56 min.
Rainfall intensity =     1.172(In/Hr)
Area averaged loss rate (Fm) =    0.0804(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     26.16    26.590     23.56    0.080      1.172
Qmax(1) =
           1.000 *    1.000 *    26.163) + =      26.163

Total of 1 streams to confluence:
Flow rates before confluence point:
      26.163
Maximum flow rates at confluence using above data:
       26.163
Area of streams before confluence:
       26.590
Effective area values after confluence:
       26.590
Results of confluence:
Total flow rate =     26.163(CFS)
```

Time of concentration =   23.561 min.
Effective stream area after confluence =   26.590(Ac.)
Study area average Pervious fraction(Ap) = 0.100
Study area average soil loss rate(Fm) =   0.080(In/Hr)
Study area total (this main stream) =   26.59(Ac.)
End of computations, Total Study Area =   26.59 (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) = 0.100
Area averaged SCS curve number = 50.5

100-year developed condition Rational Method

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/21/22

Quarry site
100-yr developed
Area A

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.052(In/Hr)
Initial subarea data:
Initial area flow distance = 363.000(Ft.)
Top (of initial area) elevation = 51.100(Ft.)
Bottom (of initial area) elevation = 46.260(Ft.)
Difference in elevation = 4.840(Ft.)
Slope = 0.01333 s(%)= 1.33
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.618 min.
Rainfall intensity = 4.580(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff =      3.056(CFS)
Total initial stream area =        0.750(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       30.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    40.000(Ft.)
Downstream point/station elevation =    37.680(Ft.)
Pipe length  =   437.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.056(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.056(CFS)
Normal flow depth in pipe =    8.80(In.)
Flow top width inside pipe =   14.77(In.)
Critical Depth =    8.44(In.)
Pipe flow velocity =      4.08(Ft/s)
Travel time through pipe =    1.78 min.
Time of concentration (TC) =     9.40 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       30.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =     9.40 min.
Rainfall intensity =      3.952(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.888
Subarea runoff =      6.772(CFS) for    2.050(Ac.)
Total runoff =      9.828(CFS)
Effective area this stream =        2.80(Ac.)
Total Study Area (Main Stream No. 1) =        2.80(Ac.)
Area averaged Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =    37.680(Ft.)
Downstream point/station elevation =    35.560(Ft.)
Pipe length  =   400.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.828(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     9.828(CFS)
Normal flow depth in pipe =   14.91(In.)
Flow top width inside pipe =   19.06(In.)
Critical Depth =   13.99(In.)
Pipe flow velocity =      5.39(Ft/s)
Travel time through pipe =    1.24 min.
Time of concentration (TC) =    10.64 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    10.64 min.
Rainfall intensity =      3.625(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.887
Subarea runoff =     12.837(CFS) for    4.250(Ac.)
Total runoff =     22.665(CFS)
Effective area this stream =        7.05(Ac.)
Total Study Area (Main Stream No. 1) =        7.05(Ac.)
Area averaged Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =    35.560(Ft.)
Downstream point/station elevation =    33.360(Ft.)
Pipe length  =   412.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.665(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    22.665(CFS)
Normal flow depth in pipe =   19.50(In.)
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Flow top width inside pipe =   28.62(In.)
Critical Depth =   19.43(In.)
Pipe flow velocity =      6.71(Ft/s)
Travel time through pipe =    1.02 min.
Time of concentration (TC) =    11.66 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       50.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    11.66 min.
Rainfall intensity =      3.399(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.886
Subarea runoff =     15.616(CFS) for    5.660(Ac.)
Total runoff =     38.281(CFS)
Effective area this stream =       12.71(Ac.)
Total Study Area (Main Stream No. 1) =       12.71(Ac.)
Area averaged Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       50.000 to Point/Station       60.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    33.360(Ft.)
Downstream point/station elevation =    31.250(Ft.)
Pipe length  =   404.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    38.281(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    38.281(CFS)
Normal flow depth in pipe =   24.23(In.)
Flow top width inside pipe =   33.77(In.)
Critical Depth =   24.16(In.)
Pipe flow velocity =      7.57(Ft/s)
Travel time through pipe =    0.89 min.
Time of concentration (TC) =    12.55 min.


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Process from Point/Station       50.000 to Point/Station       60.000
```

**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.052(In/Hr)
Time of concentration = 12.55 min.
Rainfall intensity = 3.229(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area,(total area with modified rational method)(Q=KCIA) is C = 0.885
Subarea runoff = 17.630(CFS) for 6.850(Ac.)
Total runoff = 55.911(CFS)
Effective area this stream = 19.56(Ac.)
Total Study Area (Main Stream No. 1) = 19.56(Ac.)
Area averaged Fm value = 0.052(In/Hr)

++
Process from Point/Station 60.000 to Point/Station 70.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 31.250(Ft.)
Downstream point/station elevation = 29.130(Ft.)
Pipe length = 400.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 55.911(CFS)
Nearest computed pipe diameter = 39.00(In.)
Calculated individual pipe flow = 55.911(CFS)
Normal flow depth in pipe = 29.77(In.)
Flow top width inside pipe = 33.16(In.)
Critical Depth = 28.67(In.)
Pipe flow velocity = 8.23(Ft/s)
Travel time through pipe = 0.81 min.
Time of concentration (TC) = 13.36 min.

++
Process from Point/Station 60.000 to Point/Station 70.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    13.36 min.
Rainfall intensity =      3.090(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.885
Subarea runoff =     16.103(CFS) for    6.780(Ac.)
Total runoff =     72.014(CFS)
Effective area this stream =       26.34(Ac.)
Total Study Area (Main Stream No. 1) =       26.34(Ac.)
Area averaged Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       70.000 to Point/Station       80.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    29.130(Ft.)
Downstream point/station elevation =    27.020(Ft.)
Pipe length  =   400.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    72.014(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    72.014(CFS)
Normal flow depth in pipe =   33.89(In.)
Flow top width inside pipe =   33.16(In.)
Critical Depth =   31.89(In.)
Pipe flow velocity =      8.66(Ft/s)
Travel time through pipe =    0.77 min.
Time of concentration (TC) =    14.13 min.


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Process from Point/Station       70.000 to Point/Station       80.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    14.13 min.
Rainfall intensity =      2.971(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.884
Subarea runoff =     14.889(CFS) for    6.740(Ac.)
Total runoff =     86.903(CFS)
Effective area this stream =       33.08(Ac.)
Total Study Area (Main Stream No. 1) =       33.08(Ac.)
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```
Area averaged Fm value =    0.052(In/Hr)


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Process from Point/Station       80.000 to Point/Station       90.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    27.020(Ft.)
Downstream point/station elevation =    24.860(Ft.)
Pipe length  =   413.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    86.903(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    86.903(CFS)
Normal flow depth in pipe =   36.66(In.)
Flow top width inside pipe =   34.98(In.)
Critical Depth =   34.42(In.)
Pipe flow velocity =      9.03(Ft/s)
Travel time through pipe =    0.76 min.
Time of concentration (TC) =    14.90 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       80.000 to Point/Station       90.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    14.90 min.
Rainfall intensity =      2.864(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.884
Subarea runoff =     14.518(CFS) for    7.000(Ac.)
Total runoff =    101.421(CFS)
Effective area this stream =       40.08(Ac.)
Total Study Area (Main Stream No. 1) =       40.08(Ac.)
Area averaged Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       90.000 to Point/Station      100.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    24.860(Ft.)
Downstream point/station elevation =    21.740(Ft.)
```

```
Pipe length  =   196.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   101.421(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =   101.421(CFS)
Normal flow depth in pipe =   31.08(In.)
Flow top width inside pipe =   31.38(In.)
Critical Depth =   36.35(In.)
Pipe flow velocity =     14.31(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =    15.12 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       90.000 to Point/Station      100.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Time of concentration =    15.12 min.
Rainfall intensity =      2.834(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.883
Subarea runoff =      7.166(CFS) for    3.300(Ac.)
Total runoff =    108.587(CFS)
Effective area this stream =       43.38(Ac.)
Total Study Area (Main Stream No. 1) =       43.38(Ac.)
Area averaged Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    21.740(Ft.)
Downstream point/station elevation =    15.000(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   108.587(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =   108.587(CFS)
Normal flow depth in pipe =   21.30(In.)
Flow top width inside pipe =   27.22(In.)
Critical depth could not be calculated.
Pipe flow velocity =     29.12(Ft/s)
Travel time through pipe =    0.04 min.
```

```
Time of concentration (TC) =    15.16 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     43.380(Ac.)
Runoff from this stream =    108.587(CFS)
Time of concentration =   15.16 min.
Rainfall intensity =     2.829(In/Hr)
Area averaged loss rate (Fm) =    0.0525(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1    108.59    43.380     15.16    0.052      2.829
Qmax(1) =
           1.000 *    1.000 *   108.587) + =     108.587

Total of 1 streams to confluence:
Flow rates before confluence point:
     108.587
Maximum flow rates at confluence using above data:
      108.587
Area of streams before confluence:
       43.380
Effective area values after confluence:
       43.380
Results of confluence:
Total flow rate =    108.587(CFS)
Time of concentration =    15.164 min.
Effective stream area after confluence =     43.380(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.052(In/Hr)
Study area total (this main stream) =      43.38(Ac.)
End of computations, Total Study Area =           43.38 (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) = 0.100
Area averaged SCS curve number =  50.5
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/21/22

Quarry site
100-yr developed
Area B

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 200.000 to Point/Station 201.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 64.50
Adjusted SCS curve number for AMC 3 = 82.60
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.325(In/Hr)
Initial subarea data:
Initial area flow distance = 972.000(Ft.)
Top (of initial area) elevation = 67.500(Ft.)
Bottom (of initial area) elevation = 47.000(Ft.)
Difference in elevation = 20.500(Ft.)
Slope = 0.02109 s(%)= 2.11
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 23.936 min.
Rainfall intensity = 2.055(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.758
Subarea runoff =      1.977(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.325(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.400(Ft.), Average velocity =   1.404(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              5.00              0.00
        3             10.00              0.50
Manning's 'N' friction factor =   0.030
------------------------------------------------------------------
Sub-Channel flow  =      2.245(CFS)
  '     '        flow top width =      7.999(Ft.)
  '     '    velocity=    1.404(Ft/s)
  '     '        area =      1.600(Sq.Ft)
  '     '        Froude number =     0.553

Upstream point elevation =    47.000(Ft.)
Downstream point elevation =    45.500(Ft.)
Flow length =   217.000(Ft.)
Travel time  =    2.58 min.
Time of concentration =   26.51 min.
Depth of flow =   0.400(Ft.)
Average velocity =   1.404(Ft/s)
Total irregular channel flow =     2.245(CFS)
Irregular channel normal depth above invert elev. =   0.400(Ft.)
Average velocity of channel(s) =   1.404(Ft/s)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 64.50
Adjusted SCS curve number for AMC 3 = 82.60
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.325(In/Hr)
Rainfall intensity =      1.913(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.747
```

```
Subarea runoff =      0.481(CFS) for    0.450(Ac.)
Total runoff =      2.458(CFS)
Effective area this stream =        1.72(Ac.)
Total Study Area (Main Stream No. 1) =        1.72(Ac.)
Area averaged Fm value =    0.325(In/Hr)
Depth of flow =   0.414(Ft.), Average velocity =   1.436(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.359(Ft.), Average velocity =   2.323(Ft/s)
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.50
        2              5.00              0.00
        3             10.00              0.50
Manning's 'N' friction factor =   0.030
------------------------------------------------------------------
Sub-Channel flow  =      2.991(CFS)
  '     '        flow top width =      7.176(Ft.)
  '     '    velocity=    2.323(Ft/s)
  '     '        area =      1.288(Sq.Ft)
  '     '        Froude number =     0.966

Upstream point elevation =    45.500(Ft.)
Downstream point elevation =    37.800(Ft.)
Flow length =   352.000(Ft.)
Travel time  =    2.53 min.
Time of concentration =   29.04 min.
Depth of flow =   0.359(Ft.)
Average velocity =   2.323(Ft/s)
Total irregular channel flow =     2.991(CFS)
Irregular channel normal depth above invert elev. =   0.359(Ft.)
Average velocity of channel(s) =   2.323(Ft/s)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 64.50
Adjusted SCS curve number for AMC 3 = 82.60
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.325(In/Hr)
Rainfall intensity =      1.795(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
```

```
rational method)(Q=KCIA) is C = 0.737
Subarea runoff =      0.995(CFS) for    0.890(Ac.)
Total runoff =      3.453(CFS)
Effective area this stream =        2.61(Ac.)
Total Study Area (Main Stream No. 1) =        2.61(Ac.)
Area averaged Fm value =    0.325(In/Hr)
Depth of flow =   0.379(Ft.), Average velocity =   2.408(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station      203.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.610(Ac.)
Runoff from this stream =      3.453(CFS)
Time of concentration =   29.04 min.
Rainfall intensity =     1.795(In/Hr)
Area averaged loss rate (Fm) =    0.3251(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Summary of stream data:

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


1      3.45     2.610     29.04    0.325      1.795
Qmax(1) =
           1.000 *    1.000 *     3.453) + =       3.453

Total of 1 streams to confluence:
Flow rates before confluence point:
       3.453
Maximum flow rates at confluence using above data:
        3.453
Area of streams before confluence:
        2.610
Effective area values after confluence:
        2.610
Results of confluence:
Total flow rate =      3.453(CFS)
Time of concentration =    29.038 min.
Effective stream area after confluence =      2.610(Ac.)
Study area average Pervious fraction(Ap) =  1.000
Study area average soil loss rate(Fm) =    0.325(In/Hr)
Study area total (this main stream) =       2.61(Ac.)
End of computations, Total Study Area =            2.61 (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) = 1.000
Area averaged SCS curve number = 64.5

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 10/21/22

Quarry site
100-yr developed
Area C

Program License Serial Number 6385

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.080 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

++

Process from Point/Station 300.000 to Point/Station 301.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.052(In/Hr)
Initial subarea data:
Initial area flow distance = 975.000(Ft.)
Top (of initial area) elevation = 43.300(Ft.)
Bottom (of initial area) elevation = 39.200(Ft.)
Difference in elevation = 4.100(Ft.)
Slope = 0.00421 s(%)= 0.42
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.247 min.
Rainfall intensity = 2.955(In/Hr) for a 100.0 year storm

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff =     17.292(CFS)
Total initial stream area =        6.620(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.052(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    39.200(Ft.)
End of street segment elevation =    36.750(Ft.)
Length of street segment  =   488.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  47.000(Ft.)
Distance from crown to crossfall grade break  =  46.990(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.014
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   0.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     23.324(CFS)
Depth of flow =   0.632(Ft.), Average velocity =   3.016(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  33.240(Ft.)
Flow velocity =   3.02(Ft/s)
Travel time =    2.70 min.     TC =   16.94  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Rainfall intensity =      2.617(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.882
Subarea runoff =     11.999(CFS) for    6.070(Ac.)
Total runoff =     29.291(CFS)
Effective area this stream =       12.69(Ac.)
Total Study Area (Main Stream No. 1) =       12.69(Ac.)
Area averaged Fm value =    0.052(In/Hr)
```

```
Street flow at end of street =     29.291(CFS)
Half street flow at end of street =     29.291(CFS)
Depth of flow =   0.673(Ft.), Average velocity =   3.194(Ft/s)
Warning: depth of flow exceeds top of curb
Flow width (from curb towards crown)=  36.195(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    36.750(Ft.)
End of street segment elevation =    34.200(Ft.)
Length of street segment  =   509.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  47.000(Ft.)
Distance from crown to crossfall grade break  =  46.990(Ft.)
Slope from gutter to grade break (v/hz) =   0.014
Slope from grade break to crown (v/hz)  =   0.014
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   0.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   0.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     34.623(CFS)
Depth of flow =   0.706(Ft.), Average velocity =   3.330(Ft/s)
Warning: depth of flow exceeds top of curb
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  38.540(Ft.)
Flow velocity =   3.33(Ft/s)
Travel time =    2.55 min.     TC =   19.49  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Rainfall intensity =      2.373(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.880
Subarea runoff =     10.594(CFS) for    6.410(Ac.)
Total runoff =     39.884(CFS)
Effective area this stream =       19.10(Ac.)
Total Study Area (Main Stream No. 1) =       19.10(Ac.)
```

```
Area averaged Fm value =    0.052(In/Hr)
Street flow at end of street =     39.884(CFS)
Half street flow at end of street =     39.884(CFS)
Depth of flow =   0.735(Ft.), Average velocity =   3.452(Ft/s)
Warning: depth of flow exceeds top of curb
Flow width (from curb towards crown)=  40.629(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      305.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =    34.200(Ft.)
End of street segment elevation =    30.640(Ft.)
Length of street segment  =   601.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  47.000(Ft.)
Distance from crown to crossfall grade break  =  46.990(Ft.)
Slope from gutter to grade break (v/hz) =   0.014
Slope from grade break to crown (v/hz)  =   0.014
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   0.000(Ft.)
Slope from curb to property line (v/hz) =   0.000
Gutter width =   0.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     45.330(CFS)
Depth of flow =   0.745(Ft.), Average velocity =   3.796(Ft/s)
Warning: depth of flow exceeds top of curb
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  41.305(Ft.)
Flow velocity =   3.80(Ft/s)
Travel time =    2.64 min.     TC =   22.13  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.500
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.50
Adjusted SCS curve number for AMC 3 = 70.50
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.052(In/Hr)
Rainfall intensity =      2.171(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.878
Subarea runoff =     10.811(CFS) for    7.490(Ac.)
Total runoff =     50.696(CFS)
Effective area this stream =       26.59(Ac.)
```

```
Total Study Area (Main Stream No. 1) =       26.59(Ac.)
Area averaged Fm value =    0.052(In/Hr)
Street flow at end of street =     50.696(CFS)
Half street flow at end of street =     50.696(CFS)
Depth of flow =   0.770(Ft.), Average velocity =   3.905(Ft/s)
Warning: depth of flow exceeds top of curb
Flow width (from curb towards crown)=  43.066(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    25.000(Ft.)
Downstream point/station elevation =    15.000(Ft.)
Pipe length  =    78.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    50.696(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    50.696(CFS)
Normal flow depth in pipe =   15.49(In.)
Flow top width inside pipe =   18.47(In.)
Critical depth could not be calculated.
Pipe flow velocity =     26.67(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    22.18 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      305.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     26.590(Ac.)
Runoff from this stream =     50.696(CFS)
Time of concentration =   22.18 min.
Rainfall intensity =     2.168(In/Hr)
Area averaged loss rate (Fm) =    0.0525(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

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


1     50.70    26.590     22.18    0.052      2.168
Qmax(1) =
           1.000 *    1.000 *    50.696) + =      50.696

Total of 1 streams to confluence:
Flow rates before confluence point:
```

```
      50.696
Maximum flow rates at confluence using above data:
       50.696
Area of streams before confluence:
       26.590
Effective area values after confluence:
       26.590
Results of confluence:
Total flow rate =     50.696(CFS)
Time of concentration =    22.179 min.
Effective stream area after confluence =     26.590(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.052(In/Hr)
Study area total (this main stream) =      26.59(Ac.)
End of computations, Total Study Area =           26.59 (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) = 0.100
Area averaged SCS curve number =  50.5
```

APPENDIX 'D'

Unit Hydrograph Method Analysis

Offsite existing condition 10 and 100 year, 24 hour storm events

Onsite existing 10 and 100 year, 24 hour Storm events

Developed 10 and 100 year, 24 hour storm event

Offsite10-year existing condition Unit hydrograph Area A1 and A2

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 09/12/22

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

Program License Serial Number 6385

Quarry Site
10-yr existing condition
offsite area A1

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		
344.51	1	0.60
Rainfall data for year 10		
344.51	6	1.24
Rainfall data for year 10		
344.51	24	2.21

++

******** 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)
78.0	78.0	24.12	0.070	0.404	1.000	0.404
91.0	91.0	254.94	0.740	0.174	1.000	0.174
93.0	93.0	65.45	0.190	0.136	1.000	0.136

Area-averaged adjusted loss rate Fm (In/Hr) = 0.183

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
24.12	0.070	78.0	78.0	2.82	0.274
254.94	0.740	91.0	91.0	0.99	0.610
65.45	0.190	93.0	93.0	0.75	0.682

Area-averaged catchment yield fraction, Y = 0.601
Area-averaged low loss fraction, Yb = 0.399
++
Watercourse length = 6172.00(Ft.)
Length from concentration point to centroid = 2960.00(Ft.)
Elevation difference along watercourse = 162.00(Ft.)
Mannings friction factor along watercourse = 0.030
Watershed area = 344.51(Ac.)
Catchment Lag time = 0.240 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 34.6867
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.183(In/Hr)
Average low loss rate fraction (Yb) = 0.399 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.203(In)
Computed peak 30-minute rainfall = 0.483(In)
Specified peak 1-hour rainfall = 0.601(In)
Computed peak 3-hour rainfall = 0.924(In)
Specified peak 6-hour rainfall = 1.240(In)
Specified peak 24-hour rainfall = 2.210(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 344.51(Ac.) (Ref: fig. E-4)

5-minute factor = 0.984 Adjusted rainfall = 0.200(In)

30-minute factor = 0.984 Adjusted rainfall = 0.475(In)
1-hour factor = 0.984 Adjusted rainfall = 0.591(In)
3-hour factor = 0.998 Adjusted rainfall = 0.922(In)
6-hour factor = 0.999 Adjusted rainfall = 1.239(In)
24-hour factor = 1.000 Adjusted rainfall = 2.209(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 = 4166.42 (CFS))	
1	2.202	91.747
2	13.098	453.984
3	40.370	1136.270
4	59.582	800.435
5	69.849	427.759
6	76.693	285.138
7	81.551	202.441
8	85.264	154.680
9	88.244	124.165
10	90.444	91.647
11	92.278	76.439
12	93.813	63.953
13	95.042	51.176
14	96.075	43.051
15	96.929	35.595
16	97.575	26.888
17	98.023	18.690
18	98.387	15.165
19	98.800	17.214
20	99.217	17.342
21	99.566	14.553
22	99.786	9.168
23	100.000	8.915

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.1997	0.1997
2	0.2793	0.0796
3	0.3398	0.0605
4	0.3906	0.0507
5	0.4351	0.0445
6	0.4752	0.0401
7	0.4989	0.0237
8	0.5203	0.0215
9	0.5400	0.0197
10	0.5583	0.0182

11	0.5753	0.0170
12	0.5913	0.0160
13	0.6108	0.0195
14	0.6293	0.0186
15	0.6471	0.0178
16	0.6643	0.0171
17	0.6807	0.0165
18	0.6967	0.0159
19	0.7121	0.0154
20	0.7270	0.0149
21	0.7415	0.0145
22	0.7556	0.0141
23	0.7693	0.0137
24	0.7826	0.0134
25	0.7957	0.0130
26	0.8084	0.0127
27	0.8208	0.0124
28	0.8330	0.0122
29	0.8449	0.0119
30	0.8566	0.0117
31	0.8680	0.0114
32	0.8792	0.0112
33	0.8902	0.0110
34	0.9010	0.0108
35	0.9117	0.0106
36	0.9221	0.0104
37	0.9329	0.0108
38	0.9436	0.0107
39	0.9541	0.0105
40	0.9644	0.0103
41	0.9746	0.0102
42	0.9847	0.0101
43	0.9946	0.0099
44	1.0044	0.0098
45	1.0140	0.0097
46	1.0235	0.0095
47	1.0330	0.0094
48	1.0423	0.0093
49	1.0515	0.0092
50	1.0605	0.0091
51	1.0695	0.0090
52	1.0784	0.0089
53	1.0872	0.0088
54	1.0959	0.0087
55	1.1045	0.0086
56	1.1130	0.0085
57	1.1214	0.0084
58	1.1297	0.0083
59	1.1380	0.0083
60	1.1461	0.0082

61	1.1542	0.0081
62	1.1623	0.0080
63	1.1702	0.0079
64	1.1781	0.0079
65	1.1859	0.0078
66	1.1936	0.0077
67	1.2013	0.0077
68	1.2089	0.0076
69	1.2164	0.0075
70	1.2239	0.0075
71	1.2313	0.0074
72	1.2387	0.0074
73	1.2458	0.0072
74	1.2529	0.0071
75	1.2599	0.0070
76	1.2669	0.0070
77	1.2739	0.0069
78	1.2807	0.0069
79	1.2876	0.0068
80	1.2943	0.0068
81	1.3011	0.0067
82	1.3077	0.0067
83	1.3144	0.0066
84	1.3210	0.0066
85	1.3275	0.0065
86	1.3340	0.0065
87	1.3405	0.0065
88	1.3469	0.0064
89	1.3532	0.0064
90	1.3596	0.0063
91	1.3658	0.0063
92	1.3721	0.0062
93	1.3783	0.0062
94	1.3845	0.0062
95	1.3906	0.0061
96	1.3967	0.0061
97	1.4027	0.0061
98	1.4087	0.0060
99	1.4147	0.0060
100	1.4207	0.0059
101	1.4266	0.0059
102	1.4325	0.0059
103	1.4383	0.0058
104	1.4441	0.0058
105	1.4499	0.0058
106	1.4556	0.0057
107	1.4613	0.0057
108	1.4670	0.0057
109	1.4727	0.0057
110	1.4783	0.0056

111	1.4839	0.0056
112	1.4895	0.0056
113	1.4950	0.0055
114	1.5005	0.0055
115	1.5060	0.0055
116	1.5114	0.0055
117	1.5169	0.0054
118	1.5223	0.0054
119	1.5276	0.0054
120	1.5330	0.0053
121	1.5383	0.0053
122	1.5436	0.0053
123	1.5489	0.0053
124	1.5541	0.0052
125	1.5593	0.0052
126	1.5645	0.0052
127	1.5697	0.0052
128	1.5748	0.0051
129	1.5799	0.0051
130	1.5850	0.0051
131	1.5901	0.0051
132	1.5952	0.0051
133	1.6002	0.0050
134	1.6052	0.0050
135	1.6102	0.0050
136	1.6152	0.0050
137	1.6201	0.0049
138	1.6250	0.0049
139	1.6300	0.0049
140	1.6348	0.0049
141	1.6397	0.0049
142	1.6445	0.0048
143	1.6494	0.0048
144	1.6542	0.0048
145	1.6590	0.0048
146	1.6637	0.0048
147	1.6685	0.0047
148	1.6732	0.0047
149	1.6779	0.0047
150	1.6826	0.0047
151	1.6873	0.0047
152	1.6919	0.0047
153	1.6966	0.0046
154	1.7012	0.0046
155	1.7058	0.0046
156	1.7104	0.0046
157	1.7149	0.0046
158	1.7195	0.0045
159	1.7240	0.0045
160	1.7285	0.0045

161	1.7330	0.0045
162	1.7375	0.0045
163	1.7420	0.0045
164	1.7464	0.0045
165	1.7509	0.0044
166	1.7553	0.0044
167	1.7597	0.0044
168	1.7641	0.0044
169	1.7685	0.0044
170	1.7728	0.0044
171	1.7772	0.0043
172	1.7815	0.0043
173	1.7858	0.0043
174	1.7901	0.0043
175	1.7944	0.0043
176	1.7987	0.0043
177	1.8029	0.0043
178	1.8072	0.0042
179	1.8114	0.0042
180	1.8156	0.0042
181	1.8198	0.0042
182	1.8240	0.0042
183	1.8282	0.0042
184	1.8323	0.0042
185	1.8365	0.0041
186	1.8406	0.0041
187	1.8447	0.0041
188	1.8489	0.0041
189	1.8530	0.0041
190	1.8570	0.0041
191	1.8611	0.0041
192	1.8652	0.0041
193	1.8692	0.0040
194	1.8733	0.0040
195	1.8773	0.0040
196	1.8813	0.0040
197	1.8853	0.0040
198	1.8893	0.0040
199	1.8933	0.0040
200	1.8972	0.0040
201	1.9012	0.0040
202	1.9051	0.0039
203	1.9090	0.0039
204	1.9130	0.0039
205	1.9169	0.0039
206	1.9208	0.0039
207	1.9247	0.0039
208	1.9285	0.0039
209	1.9324	0.0039
210	1.9362	0.0039

211	1.9401	0.0038
212	1.9439	0.0038
213	1.9477	0.0038
214	1.9516	0.0038
215	1.9554	0.0038
216	1.9591	0.0038
217	1.9629	0.0038
218	1.9667	0.0038
219	1.9705	0.0038
220	1.9742	0.0037
221	1.9779	0.0037
222	1.9817	0.0037
223	1.9854	0.0037
224	1.9891	0.0037
225	1.9928	0.0037
226	1.9965	0.0037
227	2.0002	0.0037
228	2.0038	0.0037
229	2.0075	0.0037
230	2.0112	0.0037
231	2.0148	0.0036
232	2.0184	0.0036
233	2.0221	0.0036
234	2.0257	0.0036
235	2.0293	0.0036
236	2.0329	0.0036
237	2.0365	0.0036
238	2.0401	0.0036
239	2.0436	0.0036
240	2.0472	0.0036
241	2.0508	0.0036
242	2.0543	0.0035
243	2.0578	0.0035
244	2.0614	0.0035
245	2.0649	0.0035
246	2.0684	0.0035
247	2.0719	0.0035
248	2.0754	0.0035
249	2.0789	0.0035
250	2.0824	0.0035
251	2.0859	0.0035
252	2.0893	0.0035
253	2.0928	0.0035
254	2.0962	0.0034
255	2.0997	0.0034
256	2.1031	0.0034
257	2.1065	0.0034
258	2.1099	0.0034
259	2.1133	0.0034
260	2.1167	0.0034

261	2.1201	0.0034
262	2.1235	0.0034
263	2.1269	0.0034
264	2.1303	0.0034
265	2.1336	0.0034
266	2.1370	0.0034
267	2.1403	0.0033
268	2.1437	0.0033
269	2.1470	0.0033
270	2.1503	0.0033
271	2.1537	0.0033
272	2.1570	0.0033
273	2.1603	0.0033
274	2.1636	0.0033
275	2.1669	0.0033
276	2.1702	0.0033
277	2.1734	0.0033
278	2.1767	0.0033
279	2.1800	0.0033
280	2.1832	0.0033
281	2.1865	0.0033
282	2.1897	0.0032
283	2.1930	0.0032
284	2.1962	0.0032
285	2.1994	0.0032
286	2.2026	0.0032
287	2.2058	0.0032
288	2.2090	0.0032

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0032	0.0013	0.0019
2	0.0032	0.0013	0.0019
3	0.0032	0.0013	0.0019
4	0.0032	0.0013	0.0019
5	0.0032	0.0013	0.0019
6	0.0033	0.0013	0.0020
7	0.0033	0.0013	0.0020
8	0.0033	0.0013	0.0020
9	0.0033	0.0013	0.0020
10	0.0033	0.0013	0.0020
11	0.0033	0.0013	0.0020
12	0.0033	0.0013	0.0020
13	0.0033	0.0013	0.0020
14	0.0033	0.0013	0.0020
15	0.0033	0.0013	0.0020
16	0.0034	0.0013	0.0020
17	0.0034	0.0013	0.0020

18	0.0034	0.0013	0.0020
19	0.0034	0.0014	0.0020
20	0.0034	0.0014	0.0020
21	0.0034	0.0014	0.0021
22	0.0034	0.0014	0.0021
23	0.0034	0.0014	0.0021
24	0.0034	0.0014	0.0021
25	0.0035	0.0014	0.0021
26	0.0035	0.0014	0.0021
27	0.0035	0.0014	0.0021
28	0.0035	0.0014	0.0021
29	0.0035	0.0014	0.0021
30	0.0035	0.0014	0.0021
31	0.0035	0.0014	0.0021
32	0.0035	0.0014	0.0021
33	0.0036	0.0014	0.0021
34	0.0036	0.0014	0.0021
35	0.0036	0.0014	0.0022
36	0.0036	0.0014	0.0022
37	0.0036	0.0014	0.0022
38	0.0036	0.0014	0.0022
39	0.0036	0.0015	0.0022
40	0.0037	0.0015	0.0022
41	0.0037	0.0015	0.0022
42	0.0037	0.0015	0.0022
43	0.0037	0.0015	0.0022
44	0.0037	0.0015	0.0022
45	0.0037	0.0015	0.0022
46	0.0037	0.0015	0.0022
47	0.0038	0.0015	0.0023
48	0.0038	0.0015	0.0023
49	0.0038	0.0015	0.0023
50	0.0038	0.0015	0.0023
51	0.0038	0.0015	0.0023
52	0.0038	0.0015	0.0023
53	0.0039	0.0015	0.0023
54	0.0039	0.0015	0.0023
55	0.0039	0.0016	0.0023
56	0.0039	0.0016	0.0023
57	0.0039	0.0016	0.0024
58	0.0039	0.0016	0.0024
59	0.0040	0.0016	0.0024
60	0.0040	0.0016	0.0024
61	0.0040	0.0016	0.0024
62	0.0040	0.0016	0.0024
63	0.0040	0.0016	0.0024
64	0.0040	0.0016	0.0024
65	0.0041	0.0016	0.0024
66	0.0041	0.0016	0.0024
67	0.0041	0.0016	0.0025

68	0.0041	0.0016	0.0025
69	0.0041	0.0017	0.0025
70	0.0041	0.0017	0.0025
71	0.0042	0.0017	0.0025
72	0.0042	0.0017	0.0025
73	0.0042	0.0017	0.0025
74	0.0042	0.0017	0.0025
75	0.0043	0.0017	0.0026
76	0.0043	0.0017	0.0026
77	0.0043	0.0017	0.0026
78	0.0043	0.0017	0.0026
79	0.0043	0.0017	0.0026
80	0.0044	0.0017	0.0026
81	0.0044	0.0018	0.0026
82	0.0044	0.0018	0.0026
83	0.0044	0.0018	0.0027
84	0.0045	0.0018	0.0027
85	0.0045	0.0018	0.0027
86	0.0045	0.0018	0.0027
87	0.0045	0.0018	0.0027
88	0.0045	0.0018	0.0027
89	0.0046	0.0018	0.0028
90	0.0046	0.0018	0.0028
91	0.0046	0.0019	0.0028
92	0.0047	0.0019	0.0028
93	0.0047	0.0019	0.0028
94	0.0047	0.0019	0.0028
95	0.0047	0.0019	0.0029
96	0.0048	0.0019	0.0029
97	0.0048	0.0019	0.0029
98	0.0048	0.0019	0.0029
99	0.0049	0.0019	0.0029
100	0.0049	0.0020	0.0029
101	0.0049	0.0020	0.0030
102	0.0049	0.0020	0.0030
103	0.0050	0.0020	0.0030
104	0.0050	0.0020	0.0030
105	0.0051	0.0020	0.0030
106	0.0051	0.0020	0.0030
107	0.0051	0.0020	0.0031
108	0.0051	0.0021	0.0031
109	0.0052	0.0021	0.0031
110	0.0052	0.0021	0.0031
111	0.0053	0.0021	0.0032
112	0.0053	0.0021	0.0032
113	0.0053	0.0021	0.0032
114	0.0054	0.0021	0.0032
115	0.0054	0.0022	0.0033
116	0.0055	0.0022	0.0033
117	0.0055	0.0022	0.0033

118	0.0055	0.0022	0.0033
119	0.0056	0.0022	0.0034
120	0.0056	0.0022	0.0034
121	0.0057	0.0023	0.0034
122	0.0057	0.0023	0.0034
123	0.0058	0.0023	0.0035
124	0.0058	0.0023	0.0035
125	0.0059	0.0023	0.0035
126	0.0059	0.0024	0.0036
127	0.0060	0.0024	0.0036
128	0.0060	0.0024	0.0036
129	0.0061	0.0024	0.0037
130	0.0061	0.0024	0.0037
131	0.0062	0.0025	0.0037
132	0.0062	0.0025	0.0038
133	0.0063	0.0025	0.0038
134	0.0064	0.0025	0.0038
135	0.0065	0.0026	0.0039
136	0.0065	0.0026	0.0039
137	0.0066	0.0026	0.0040
138	0.0066	0.0026	0.0040
139	0.0067	0.0027	0.0040
140	0.0068	0.0027	0.0041
141	0.0069	0.0027	0.0041
142	0.0069	0.0028	0.0042
143	0.0070	0.0028	0.0042
144	0.0071	0.0028	0.0043
145	0.0074	0.0029	0.0044
146	0.0074	0.0030	0.0045
147	0.0075	0.0030	0.0045
148	0.0076	0.0030	0.0046
149	0.0077	0.0031	0.0046
150	0.0078	0.0031	0.0047
151	0.0079	0.0032	0.0048
152	0.0080	0.0032	0.0048
153	0.0082	0.0033	0.0049
154	0.0083	0.0033	0.0050
155	0.0084	0.0034	0.0051
156	0.0085	0.0034	0.0051
157	0.0087	0.0035	0.0052
158	0.0088	0.0035	0.0053
159	0.0090	0.0036	0.0054
160	0.0091	0.0036	0.0055
161	0.0093	0.0037	0.0056
162	0.0094	0.0038	0.0057
163	0.0097	0.0039	0.0058
164	0.0098	0.0039	0.0059
165	0.0101	0.0040	0.0060
166	0.0102	0.0041	0.0061
167	0.0105	0.0042	0.0063

168	0.0107	0.0043	0.0064
169	0.0104	0.0042	0.0063
170	0.0106	0.0042	0.0064
171	0.0110	0.0044	0.0066
172	0.0112	0.0045	0.0067
173	0.0117	0.0047	0.0070
174	0.0119	0.0048	0.0072
175	0.0124	0.0050	0.0075
176	0.0127	0.0051	0.0076
177	0.0134	0.0053	0.0080
178	0.0137	0.0055	0.0082
179	0.0145	0.0058	0.0087
180	0.0149	0.0060	0.0090
181	0.0159	0.0064	0.0096
182	0.0165	0.0066	0.0099
183	0.0178	0.0071	0.0107
184	0.0186	0.0074	0.0112
185	0.0160	0.0064	0.0096
186	0.0170	0.0068	0.0102
187	0.0197	0.0079	0.0118
188	0.0215	0.0086	0.0129
189	0.0401	0.0152	0.0249
190	0.0445	0.0152	0.0293
191	0.0605	0.0152	0.0453
192	0.0796	0.0152	0.0643
193	0.1997	0.0152	0.1845
194	0.0507	0.0152	0.0355
195	0.0237	0.0095	0.0142
196	0.0182	0.0073	0.0110
197	0.0195	0.0078	0.0117
198	0.0171	0.0068	0.0103
199	0.0154	0.0062	0.0093
200	0.0141	0.0056	0.0085
201	0.0130	0.0052	0.0078
202	0.0122	0.0049	0.0073
203	0.0114	0.0046	0.0069
204	0.0108	0.0043	0.0065
205	0.0108	0.0043	0.0065
206	0.0103	0.0041	0.0062
207	0.0099	0.0040	0.0060
208	0.0095	0.0038	0.0057
209	0.0092	0.0037	0.0055
210	0.0089	0.0035	0.0053
211	0.0086	0.0034	0.0052
212	0.0083	0.0033	0.0050
213	0.0081	0.0032	0.0049
214	0.0079	0.0031	0.0047
215	0.0077	0.0031	0.0046
216	0.0075	0.0030	0.0045
217	0.0072	0.0029	0.0043

218	0.0070	0.0028	0.0042
219	0.0068	0.0027	0.0041
220	0.0067	0.0027	0.0040
221	0.0065	0.0026	0.0039
222	0.0064	0.0026	0.0038
223	0.0063	0.0025	0.0038
224	0.0062	0.0025	0.0037
225	0.0061	0.0024	0.0036
226	0.0059	0.0024	0.0036
227	0.0058	0.0023	0.0035
228	0.0057	0.0023	0.0035
229	0.0057	0.0023	0.0034
230	0.0056	0.0022	0.0033
231	0.0055	0.0022	0.0033
232	0.0054	0.0022	0.0032
233	0.0053	0.0021	0.0032
234	0.0052	0.0021	0.0031
235	0.0052	0.0021	0.0031
236	0.0051	0.0020	0.0031
237	0.0050	0.0020	0.0030
238	0.0050	0.0020	0.0030
239	0.0049	0.0020	0.0029
240	0.0048	0.0019	0.0029
241	0.0048	0.0019	0.0029
242	0.0047	0.0019	0.0028
243	0.0047	0.0019	0.0028
244	0.0046	0.0018	0.0028
245	0.0046	0.0018	0.0027
246	0.0045	0.0018	0.0027
247	0.0045	0.0018	0.0027
248	0.0044	0.0018	0.0027
249	0.0044	0.0017	0.0026
250	0.0043	0.0017	0.0026
251	0.0043	0.0017	0.0026
252	0.0042	0.0017	0.0025
253	0.0042	0.0017	0.0025
254	0.0042	0.0017	0.0025
255	0.0041	0.0016	0.0025
256	0.0041	0.0016	0.0025
257	0.0040	0.0016	0.0024
258	0.0040	0.0016	0.0024
259	0.0040	0.0016	0.0024
260	0.0039	0.0016	0.0024
261	0.0039	0.0016	0.0023
262	0.0039	0.0015	0.0023
263	0.0038	0.0015	0.0023
264	0.0038	0.0015	0.0023
265	0.0038	0.0015	0.0023
266	0.0037	0.0015	0.0023
267	0.0037	0.0015	0.0022

268	0.0037	0.0015	0.0022
269	0.0037	0.0015	0.0022
270	0.0036	0.0015	0.0022
271	0.0036	0.0014	0.0022
272	0.0036	0.0014	0.0022
273	0.0036	0.0014	0.0021
274	0.0035	0.0014	0.0021
275	0.0035	0.0014	0.0021
276	0.0035	0.0014	0.0021
277	0.0035	0.0014	0.0021
278	0.0034	0.0014	0.0021
279	0.0034	0.0014	0.0020
280	0.0034	0.0014	0.0020
281	0.0034	0.0013	0.0020
282	0.0033	0.0013	0.0020
283	0.0033	0.0013	0.0020
284	0.0033	0.0013	0.0020
285	0.0033	0.0013	0.0020
286	0.0033	0.0013	0.0020
287	0.0032	0.0013	0.0019
288	0.0032	0.0013	0.0019

Total soil rain loss = 0.78(In)
Total effective rainfall = 1.43(In)
Peak flow rate in flood hydrograph = 319.53(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	100.0	200.0	300.0	400.0
0+ 5	0.0012	0.18	Q	|	|	|	|
0+10	0.0085	1.05	Q	|	|	|	|
0+15	0.0308	3.24	Q	|	|	|	|
0+20	0.0637	4.79	Q	|	|	|	|
0+25	0.1025	5.63	Q	|	|	|	|
0+30	0.1451	6.19	Q	|	|	|	|
0+35	0.1906	6.60	Q	|	|	|	|
0+40	0.2382	6.92	Q	|	|	|	|
0+45	0.2877	7.18	Q	|	|	|	|
0+50	0.3385	7.38	Q	|	|	|	|
0+55	0.3905	7.55	Q	|	|	|	|
1+ 0	0.4435	7.69	Q	|	|	|	|
1+ 5	0.4973	7.82	Q	|	|	|	|
1+10	0.5519	7.93	Q	|	|	|	|

1+15	0.6071	8.02	Q	|	|	|	|
1+20	0.6629	8.10	Q	|	|	|	|
1+25	0.7191	8.16	Q	|	|	|	|
1+30	0.7756	8.21	Q	|	|	|	|
1+35	0.8326	8.27	Q	|	|	|	|
1+40	0.8900	8.33	Q	|	|	|	|
1+45	0.9478	8.39	Q	|	|	|	|
1+50	1.0059	8.44	Q	|	|	|	|
1+55	1.0643	8.48	QV	|	|	|	|
2+ 0	1.1230	8.51	QV	|	|	|	|
2+ 5	1.1818	8.54	QV	|	|	|	|
2+10	1.2408	8.57	QV	|	|	|	|
2+15	1.3000	8.60	QV	|	|	|	|
2+20	1.3594	8.63	QV	|	|	|	|
2+25	1.4190	8.66	QV	|	|	|	|
2+30	1.4788	8.69	QV	|	|	|	|
2+35	1.5389	8.72	QV	|	|	|	|
2+40	1.5991	8.75	QV	|	|	|	|
2+45	1.6596	8.78	QV	|	|	|	|
2+50	1.7203	8.81	QV	|	|	|	|
2+55	1.7812	8.84	QV	|	|	|	|
3+ 0	1.8423	8.87	QV	|	|	|	|
3+ 5	1.9036	8.91	QV	|	|	|	|
3+10	1.9652	8.94	QV	|	|	|	|
3+15	2.0270	8.97	QV	|	|	|	|
3+20	2.0890	9.01	Q V	|	|	|	|
3+25	2.1513	9.04	Q V	|	|	|	|
3+30	2.2137	9.07	Q V	|	|	|	|
3+35	2.2765	9.11	Q V	|	|	|	|
3+40	2.3394	9.14	Q V	|	|	|	|
3+45	2.4026	9.18	Q V	|	|	|	|
3+50	2.4661	9.21	Q V	|	|	|	|
3+55	2.5298	9.25	Q V	|	|	|	|
4+ 0	2.5937	9.28	Q V	|	|	|	|
4+ 5	2.6579	9.32	Q V	|	|	|	|
4+10	2.7223	9.36	Q V	|	|	|	|
4+15	2.7871	9.40	Q V	|	|	|	|
4+20	2.8520	9.43	Q V	|	|	|	|
4+25	2.9172	9.47	Q V	|	|	|	|
4+30	2.9827	9.51	Q V	|	|	|	|
4+35	3.0485	9.55	Q V	|	|	|	|
4+40	3.1145	9.59	Q V	|	|	|	|
4+45	3.1808	9.63	Q V	|	|	|	|
4+50	3.2474	9.67	Q V	|	|	|	|
4+55	3.3143	9.71	Q V	|	|	|	|
5+ 0	3.3814	9.75	Q V	|	|	|	|
5+ 5	3.4489	9.79	Q V	|	|	|	|
5+10	3.5166	9.83	Q V	|	|	|	|
5+15	3.5846	9.88	Q V	|	|	|	|
5+20	3.6529	9.92	Q V	|	|	|	|

5+25	3.7215	9.96	Q V	|	|	|	|
5+30	3.7905	10.01	|Q V	|	|	|	|
5+35	3.8597	10.05	|Q V	|	|	|	|
5+40	3.9292	10.10	|Q V	|	|	|	|
5+45	3.9991	10.14	|Q V	|	|	|	|
5+50	4.0693	10.19	|Q V	|	|	|	|
5+55	4.1398	10.24	|Q V	|	|	|	|
6+ 0	4.2106	10.28	|Q V	|	|	|	|
6+ 5	4.2818	10.33	|Q V	|	|	|	|
6+10	4.3533	10.38	|Q V	|	|	|	|
6+15	4.4251	10.43	|Q V	|	|	|	|
6+20	4.4973	10.48	|Q V	|	|	|	|
6+25	4.5698	10.53	|Q V	|	|	|	|
6+30	4.6427	10.58	|Q V	|	|	|	|
6+35	4.7160	10.64	|Q V	|	|	|	|
6+40	4.7896	10.69	|Q V	|	|	|	|
6+45	4.8636	10.74	|Q V	|	|	|	|
6+50	4.9380	10.80	|Q V	|	|	|	|
6+55	5.0127	10.85	|Q V	|	|	|	|
7+ 0	5.0878	10.91	|Q V	|	|	|	|
7+ 5	5.1633	10.97	|Q V	|	|	|	|
7+10	5.2393	11.02	|Q V	|	|	|	|
7+15	5.3156	11.08	|Q V	|	|	|	|
7+20	5.3923	11.14	|Q V	|	|	|	|
7+25	5.4694	11.20	|Q V	|	|	|	|
7+30	5.5470	11.26	|Q V	|	|	|	|
7+35	5.6250	11.32	|Q V	|	|	|	|
7+40	5.7034	11.38	|Q V	|	|	|	|
7+45	5.7822	11.45	|Q V	|	|	|	|
7+50	5.8615	11.51	|Q V	|	|	|	|
7+55	5.9413	11.58	|Q V	|	|	|	|
8+ 0	6.0215	11.65	|Q V	|	|	|	|
8+ 5	6.1022	11.71	|Q V	|	|	|	|
8+10	6.1833	11.78	|Q V	|	|	|	|
8+15	6.2649	11.85	|Q V	|	|	|	|
8+20	6.3471	11.92	|Q V	|	|	|	|
8+25	6.4297	12.00	|Q V	|	|	|	|
8+30	6.5128	12.07	|Q V	|	|	|	|
8+35	6.5964	12.15	|Q V	|	|	|	|
8+40	6.6806	12.22	|Q V	|	|	|	|
8+45	6.7653	12.30	|Q V	|	|	|	|
8+50	6.8505	12.38	|Q V	|	|	|	|
8+55	6.9363	12.46	|Q V	|	|	|	|
9+ 0	7.0227	12.54	|Q V	|	|	|	|
9+ 5	7.1096	12.62	|Q V	|	|	|	|
9+10	7.1971	12.70	|Q V	|	|	|	|
9+15	7.2852	12.79	|Q V	|	|	|	|
9+20	7.3739	12.88	|Q V	|	|	|	|
9+25	7.4632	12.97	|Q V	|	|	|	|
9+30	7.5532	13.06	|Q V	|	|	|	|

9+35	7.6437	13.15	Q V				
9+40	7.7350	13.25	Q V				
9+45	7.8269	13.34	Q V				
9+50	7.9194	13.44	Q V				
9+55	8.0127	13.54	Q V				
10+ 0	8.1067	13.64	Q V				
10+ 5	8.2014	13.75	Q V				
10+10	8.2968	13.85	Q V				
10+15	8.3929	13.97	Q V				
10+20	8.4899	14.07	Q V				
10+25	8.5876	14.19	Q V				
10+30	8.6861	14.30	Q V				
10+35	8.7855	14.43	Q V				
10+40	8.8857	14.55	Q V				
10+45	8.9867	14.67	Q V				
10+50	9.0886	14.80	Q V				
10+55	9.1915	14.93	Q V				
11+ 0	9.2952	15.06	Q V				
11+ 5	9.3999	15.20	Q V				
11+10	9.5055	15.34	Q V				
11+15	9.6122	15.49	Q V				
11+20	9.7198	15.63	Q V				
11+25	9.8286	15.79	Q V				
11+30	9.9383	15.94	Q V				
11+35	10.0492	16.10	Q V				
11+40	10.1613	16.26	Q V				
11+45	10.2745	16.44	Q V				
11+50	10.3888	16.61	Q V				
11+55	10.5045	16.79	Q V				
12+ 0	10.6214	16.97	Q V				
12+ 5	10.7396	17.17	Q V				
12+10	10.8595	17.41	Q V				
12+15	10.9815	17.71	Q V				
12+20	11.1054	17.99	Q V				
12+25	11.2310	18.25	Q V				
12+30	11.3584	18.49	Q V				
12+35	11.4875	18.75	Q V				
12+40	11.6183	18.99	Q V				
12+45	11.7509	19.26	Q V				
12+50	11.8854	19.52	Q V				
12+55	12.0217	19.80	Q V				
13+ 0	12.1600	20.08	Q V				
13+ 5	12.3003	20.38	Q V				
13+10	12.4427	20.68	Q V				
13+15	12.5874	21.00	Q V				
13+20	12.7342	21.32	Q V				
13+25	12.8835	21.67	Q V				
13+30	13.0352	22.03	Q V				
13+35	13.1895	22.41	Q V				
13+40	13.3465	22.79	Q V				

13+45	13.5064	23.22	Q	V			
13+50	13.6692	23.64	Q	V			
13+55	13.8353	24.11	Q	V			
14+ 0	14.0046	24.58	Q	V			
14+ 5	14.1772	25.07	Q	V			
14+10	14.3525	25.45	Q	V			
14+15	14.5292	25.66	Q	V			
14+20	14.7082	25.99	Q	V			
14+25	14.8908	26.51	Q	V			
14+30	15.0773	27.09	Q	V			
14+35	15.2687	27.78	Q	V			
14+40	15.4651	28.51	Q	V			
14+45	15.6673	29.36	Q	V			
14+50	15.8756	30.25	Q	V			
14+55	16.0910	31.27	Q	V			
15+ 0	16.3138	32.36	Q	V			
15+ 5	16.5453	33.62	Q	V			
15+10	16.7862	34.97	Q	V			
15+15	17.0379	36.56	Q	V			
15+20	17.3015	38.28	Q	V			
15+25	17.5778	40.11	Q	V			
15+30	17.8616	41.21	Q	V			
15+35	18.1440	41.01	Q	V			
15+40	18.4335	42.04	Q	V			
15+45	18.7490	45.81	Q	V			
15+50	19.1236	54.39	Q	V			
15+55	19.6279	73.23	Q	V			
16+ 0	20.3022	97.91	Q	V			
16+ 5	21.3020	145.17	Q	V			
16+10	22.8610	226.37	Q	V			
16+15	25.0616	319.53	Q	V			
16+20	26.7989	252.25	Q	V			
16+25	27.9690	169.90	Q	V			
16+30	28.8512	128.09	Q	V			
16+35	29.5725	104.74	Q	V			
16+40	30.1871	89.23	Q	V			
16+45	30.7205	77.46	Q	V			
16+50	31.1812	66.89	Q	V			
16+55	31.5922	59.67	Q	V			
17+ 0	31.9618	53.67	Q	V			
17+ 5	32.2939	48.22	Q	V			
17+10	32.5966	43.95	Q	V			
17+15	32.8748	40.40	Q	V			
17+20	33.1293	36.95	Q	V			
17+25	33.3630	33.94	Q	V			
17+30	33.5830	31.94	Q	V			
17+35	33.7960	30.92	Q	V			
17+40	33.9994	29.54	Q	V			
17+45	34.1902	27.70	Q	V			
17+50	34.3661	25.55	Q	V			

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17+55      34.5323     24.12  | Q       |         |         |  V      |
18+ 0      34.6827     21.84  | Q       |         |         |  V      |
18+ 5      34.8270     20.95  | Q       |         |         |   V     |
18+10      34.9665     20.26  | Q       |         |         |   V     |
18+15      35.1014     19.58  |Q        |         |         |   V     |
18+20      35.2320     18.96  |Q        |         |         |   V     |
18+25      35.3588     18.42  |Q        |         |         |   V     |
18+30      35.4824     17.94  |Q        |         |         |   V     |
18+35      35.6028     17.49  |Q        |         |         |   V     |
18+40      35.7204     17.08  |Q        |         |         |   V     |
18+45      35.8354     16.69  |Q        |         |         |    V    |
18+50      35.9479     16.33  |Q        |         |         |    V    |
18+55      36.0580     15.99  |Q        |         |         |    V    |
19+ 0      36.1660     15.67  |Q        |         |         |    V    |
19+ 5      36.2719     15.37  |Q        |         |         |    V    |
19+10      36.3757     15.08  |Q        |         |         |    V    |
19+15      36.4778     14.81  |Q        |         |         |    V    |
19+20      36.5780     14.55  |Q        |         |         |    V    |
19+25      36.6765     14.31  |Q        |         |         |    V    |
19+30      36.7735     14.07  |Q        |         |         |    V    |
19+35      36.8688     13.85  |Q        |         |         |     V   |
19+40      36.9628     13.64  |Q        |         |         |     V   |
19+45      37.0553     13.43  |Q        |         |         |     V   |
19+50      37.1464     13.23  |Q        |         |         |     V   |
19+55      37.2362     13.04  |Q        |         |         |     V   |
20+ 0      37.3248     12.86  |Q        |         |         |     V   |
20+ 5      37.4122     12.69  |Q        |         |         |     V   |
20+10      37.4984     12.52  |Q        |         |         |     V   |
20+15      37.5836     12.36  |Q        |         |         |     V   |
20+20      37.6676     12.20  |Q        |         |         |     V   |
20+25      37.7506     12.05  |Q        |         |         |     V   |
20+30      37.8326     11.91  |Q        |         |         |      V  |
20+35      37.9136     11.76  |Q        |         |         |      V  |
20+40      37.9937     11.63  |Q        |         |         |      V  |
20+45      38.0729     11.50  |Q        |         |         |      V  |
20+50      38.1512     11.37  |Q        |         |         |      V  |
20+55      38.2286     11.24  |Q        |         |         |      V  |
21+ 0      38.3052     11.12  |Q        |         |         |      V  |
21+ 5      38.3810     11.00  |Q        |         |         |      V  |
21+10      38.4560     10.89  |Q        |         |         |      V  |
21+15      38.5302     10.78  |Q        |         |         |      V  |
21+20      38.6037     10.67  |Q        |         |         |      V  |
21+25      38.6765     10.57  |Q        |         |         |      V  |
21+30      38.7485     10.46  |Q        |         |         |      V  |
21+35      38.8199     10.36  |Q        |         |         |      V  |
21+40      38.8906     10.27  |Q        |         |         |       V |
21+45      38.9607     10.17  |Q        |         |         |       V |
21+50      39.0301     10.08  |Q        |         |         |       V |
21+55      39.0989      9.99  Q         |         |         |       V |
22+ 0      39.1671      9.90  Q         |         |         |       V |
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22+ 5	39.2347	9.82	Q	|	|	|	V |
22+10	39.3017	9.73	Q	|	|	|	V |
22+15	39.3682	9.65	Q	|	|	|	V |
22+20	39.4341	9.57	Q	|	|	|	V |
22+25	39.4995	9.49	Q	|	|	|	V |
22+30	39.5644	9.42	Q	|	|	|	V |
22+35	39.6287	9.34	Q	|	|	|	V |
22+40	39.6925	9.27	Q	|	|	|	V |
22+45	39.7559	9.20	Q	|	|	|	V |
22+50	39.8187	9.13	Q	|	|	|	V |
22+55	39.8811	9.06	Q	|	|	|	V|
23+ 0	39.9430	8.99	Q	|	|	|	V|
23+ 5	40.0045	8.92	Q	|	|	|	V|
23+10	40.0655	8.86	Q	|	|	|	V|
23+15	40.1261	8.80	Q	|	|	|	V|
23+20	40.1863	8.73	Q	|	|	|	V|
23+25	40.2460	8.67	Q	|	|	|	V|
23+30	40.3053	8.61	Q	|	|	|	V|
23+35	40.3642	8.55	Q	|	|	|	V|
23+40	40.4227	8.50	Q	|	|	|	V|
23+45	40.4809	8.44	Q	|	|	|	V|
23+50	40.5386	8.38	Q	|	|	|	V|
23+55	40.5960	8.33	Q	|	|	|	V|
24+ 0	40.6530	8.28	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 09/12/22

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

Program License Serial Number 6385

Quarry Site
10-year existing
offsite area A2

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		
80.67	1	0.60
Rainfall data for year 10		
80.67	6	1.24
Rainfall data for year 10		
80.67	24	2.21

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******** 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)
91.0	91.0	80.67	1.000	0.174	1.000	0.174

Area-averaged adjusted loss rate Fm (In/Hr) = 0.174

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
80.67	1.000	91.0	91.0	0.99	0.610

Area-averaged catchment yield fraction, Y = 0.610
Area-averaged low loss fraction, Yb = 0.390
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Watercourse length = 4782.00(Ft.)
Length from concentration point to centroid = 2290.00(Ft.)
Elevation difference along watercourse = 90.00(Ft.)
Mannings friction factor along watercourse = 0.030
Watershed area = 80.67(Ac.)
Catchment Lag time = 0.211 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 39.5530
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.174(In/Hr)
Average low loss rate fraction (Yb) = 0.390 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.203(In)
Computed peak 30-minute rainfall = 0.483(In)
Specified peak 1-hour rainfall = 0.601(In)
Computed peak 3-hour rainfall = 0.924(In)
Specified peak 6-hour rainfall = 1.240(In)
Specified peak 24-hour rainfall = 2.210(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 80.67(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.202(In)
30-minute factor = 0.996 Adjusted rainfall = 0.481(In)
1-hour factor = 0.996 Adjusted rainfall = 0.599(In)
3-hour factor = 1.000 Adjusted rainfall = 0.924(In)
6-hour factor = 1.000 Adjusted rainfall = 1.240(In)
24-hour factor = 1.000 Adjusted rainfall = 2.210(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 = 975.60 (CFS))	
1	2.699	26.335
2	18.193	151.158
3	48.499	295.666
4	65.175	162.686
5	74.421	90.204
6	80.567	59.967
7	84.956	42.817
8	88.364	33.245
9	90.820	23.964
10	92.815	19.463
11	94.418	15.639
12	95.704	12.546
13	96.734	10.054
14	97.510	7.567
15	98.035	5.124
16	98.458	4.125
17	98.931	4.619
18	99.396	4.529
19	99.698	2.952
20	100.000	2.943

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2022	0.2022
2	0.2828	0.0806
3	0.3441	0.0613
4	0.3955	0.0514
5	0.4406	0.0451
6	0.4812	0.0406
7	0.5051	0.0240
8	0.5269	0.0217
9	0.5468	0.0199
10	0.5653	0.0185
11	0.5825	0.0172
12	0.5987	0.0162
13	0.6179	0.0192
14	0.6363	0.0183
15	0.6538	0.0176
16	0.6707	0.0169
17	0.6869	0.0162
18	0.7026	0.0157
19	0.7177	0.0151

20	0.7324	0.0147
21	0.7466	0.0142
22	0.7605	0.0138
23	0.7739	0.0135
24	0.7870	0.0131
25	0.7998	0.0128
26	0.8123	0.0125
27	0.8245	0.0122
28	0.8364	0.0119
29	0.8480	0.0117
30	0.8595	0.0114
31	0.8706	0.0112
32	0.8816	0.0110
33	0.8924	0.0108
34	0.9030	0.0106
35	0.9133	0.0104
36	0.9236	0.0102
37	0.9344	0.0108
38	0.9450	0.0106
39	0.9555	0.0105
40	0.9658	0.0103
41	0.9760	0.0102
42	0.9860	0.0100
43	0.9959	0.0099
44	1.0057	0.0098
45	1.0154	0.0096
46	1.0249	0.0095
47	1.0343	0.0094
48	1.0436	0.0093
49	1.0528	0.0092
50	1.0618	0.0091
51	1.0708	0.0090
52	1.0797	0.0089
53	1.0884	0.0088
54	1.0971	0.0087
55	1.1057	0.0086
56	1.1142	0.0085
57	1.1226	0.0084
58	1.1309	0.0083
59	1.1392	0.0082
60	1.1473	0.0082
61	1.1554	0.0081
62	1.1634	0.0080
63	1.1713	0.0079
64	1.1792	0.0079
65	1.1870	0.0078
66	1.1947	0.0077
67	1.2024	0.0077
68	1.2100	0.0076
69	1.2175	0.0075

70	1.2249	0.0075
71	1.2323	0.0074
72	1.2397	0.0073
73	1.2468	0.0072
74	1.2539	0.0071
75	1.2610	0.0070
76	1.2680	0.0070
77	1.2749	0.0069
78	1.2818	0.0069
79	1.2886	0.0068
80	1.2954	0.0068
81	1.3021	0.0067
82	1.3088	0.0067
83	1.3154	0.0066
84	1.3220	0.0066
85	1.3285	0.0065
86	1.3350	0.0065
87	1.3415	0.0065
88	1.3479	0.0064
89	1.3542	0.0064
90	1.3606	0.0063
91	1.3669	0.0063
92	1.3731	0.0062
93	1.3793	0.0062
94	1.3855	0.0062
95	1.3916	0.0061
96	1.3977	0.0061
97	1.4037	0.0061
98	1.4097	0.0060
99	1.4157	0.0060
100	1.4217	0.0059
101	1.4276	0.0059
102	1.4335	0.0059
103	1.4393	0.0058
104	1.4451	0.0058
105	1.4509	0.0058
106	1.4566	0.0057
107	1.4623	0.0057
108	1.4680	0.0057
109	1.4737	0.0057
110	1.4793	0.0056
111	1.4849	0.0056
112	1.4905	0.0056
113	1.4960	0.0055
114	1.5015	0.0055
115	1.5070	0.0055
116	1.5124	0.0055
117	1.5179	0.0054
118	1.5233	0.0054
119	1.5286	0.0054

120	1.5340	0.0053
121	1.5393	0.0053
122	1.5446	0.0053
123	1.5498	0.0053
124	1.5551	0.0052
125	1.5603	0.0052
126	1.5655	0.0052
127	1.5707	0.0052
128	1.5758	0.0051
129	1.5809	0.0051
130	1.5860	0.0051
131	1.5911	0.0051
132	1.5962	0.0051
133	1.6012	0.0050
134	1.6062	0.0050
135	1.6112	0.0050
136	1.6161	0.0050
137	1.6211	0.0049
138	1.6260	0.0049
139	1.6309	0.0049
140	1.6358	0.0049
141	1.6407	0.0049
142	1.6455	0.0048
143	1.6503	0.0048
144	1.6551	0.0048
145	1.6599	0.0048
146	1.6647	0.0048
147	1.6694	0.0047
148	1.6741	0.0047
149	1.6788	0.0047
150	1.6835	0.0047
151	1.6882	0.0047
152	1.6929	0.0047
153	1.6975	0.0046
154	1.7021	0.0046
155	1.7067	0.0046
156	1.7113	0.0046
157	1.7159	0.0046
158	1.7204	0.0045
159	1.7249	0.0045
160	1.7295	0.0045
161	1.7340	0.0045
162	1.7384	0.0045
163	1.7429	0.0045
164	1.7474	0.0045
165	1.7518	0.0044
166	1.7562	0.0044
167	1.7606	0.0044
168	1.7650	0.0044
169	1.7694	0.0044

170	1.7737	0.0044
171	1.7781	0.0043
172	1.7824	0.0043
173	1.7867	0.0043
174	1.7910	0.0043
175	1.7953	0.0043
176	1.7996	0.0043
177	1.8038	0.0043
178	1.8081	0.0042
179	1.8123	0.0042
180	1.8165	0.0042
181	1.8207	0.0042
182	1.8249	0.0042
183	1.8291	0.0042
184	1.8332	0.0042
185	1.8374	0.0041
186	1.8415	0.0041
187	1.8456	0.0041
188	1.8497	0.0041
189	1.8538	0.0041
190	1.8579	0.0041
191	1.8620	0.0041
192	1.8661	0.0041
193	1.8701	0.0040
194	1.8741	0.0040
195	1.8782	0.0040
196	1.8822	0.0040
197	1.8862	0.0040
198	1.8902	0.0040
199	1.8941	0.0040
200	1.8981	0.0040
201	1.9020	0.0040
202	1.9060	0.0039
203	1.9099	0.0039
204	1.9138	0.0039
205	1.9177	0.0039
206	1.9216	0.0039
207	1.9255	0.0039
208	1.9294	0.0039
209	1.9333	0.0039
210	1.9371	0.0039
211	1.9409	0.0038
212	1.9448	0.0038
213	1.9486	0.0038
214	1.9524	0.0038
215	1.9562	0.0038
216	1.9600	0.0038
217	1.9638	0.0038
218	1.9675	0.0038
219	1.9713	0.0038

220	1.9750	0.0037
221	1.9788	0.0037
222	1.9825	0.0037
223	1.9862	0.0037
224	1.9899	0.0037
225	1.9936	0.0037
226	1.9973	0.0037
227	2.0010	0.0037
228	2.0047	0.0037
229	2.0083	0.0037
230	2.0120	0.0037
231	2.0156	0.0036
232	2.0193	0.0036
233	2.0229	0.0036
234	2.0265	0.0036
235	2.0301	0.0036
236	2.0337	0.0036
237	2.0373	0.0036
238	2.0409	0.0036
239	2.0445	0.0036
240	2.0480	0.0036
241	2.0516	0.0036
242	2.0551	0.0035
243	2.0586	0.0035
244	2.0622	0.0035
245	2.0657	0.0035
246	2.0692	0.0035
247	2.0727	0.0035
248	2.0762	0.0035
249	2.0797	0.0035
250	2.0832	0.0035
251	2.0866	0.0035
252	2.0901	0.0035
253	2.0936	0.0035
254	2.0970	0.0034
255	2.1004	0.0034
256	2.1039	0.0034
257	2.1073	0.0034
258	2.1107	0.0034
259	2.1141	0.0034
260	2.1175	0.0034
261	2.1209	0.0034
262	2.1243	0.0034
263	2.1277	0.0034
264	2.1310	0.0034
265	2.1344	0.0034
266	2.1378	0.0034
267	2.1411	0.0033
268	2.1444	0.0033
269	2.1478	0.0033

270	2.1511	0.0033
271	2.1544	0.0033
272	2.1577	0.0033
273	2.1610	0.0033
274	2.1643	0.0033
275	2.1676	0.0033
276	2.1709	0.0033
277	2.1742	0.0033
278	2.1775	0.0033
279	2.1807	0.0033
280	2.1840	0.0033
281	2.1872	0.0032
282	2.1905	0.0032
283	2.1937	0.0032
284	2.1969	0.0032
285	2.2001	0.0032
286	2.2034	0.0032
287	2.2066	0.0032
288	2.2098	0.0032

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0032	0.0012	0.0020
2	0.0032	0.0013	0.0020
3	0.0032	0.0013	0.0020
4	0.0032	0.0013	0.0020
5	0.0032	0.0013	0.0020
6	0.0032	0.0013	0.0020
7	0.0033	0.0013	0.0020
8	0.0033	0.0013	0.0020
9	0.0033	0.0013	0.0020
10	0.0033	0.0013	0.0020
11	0.0033	0.0013	0.0020
12	0.0033	0.0013	0.0020
13	0.0033	0.0013	0.0020
14	0.0033	0.0013	0.0020
15	0.0033	0.0013	0.0020
16	0.0034	0.0013	0.0020
17	0.0034	0.0013	0.0021
18	0.0034	0.0013	0.0021
19	0.0034	0.0013	0.0021
20	0.0034	0.0013	0.0021
21	0.0034	0.0013	0.0021
22	0.0034	0.0013	0.0021
23	0.0034	0.0013	0.0021
24	0.0034	0.0013	0.0021
25	0.0035	0.0013	0.0021
26	0.0035	0.0014	0.0021

27	0.0035	0.0014	0.0021
28	0.0035	0.0014	0.0021
29	0.0035	0.0014	0.0021
30	0.0035	0.0014	0.0021
31	0.0035	0.0014	0.0022
32	0.0035	0.0014	0.0022
33	0.0036	0.0014	0.0022
34	0.0036	0.0014	0.0022
35	0.0036	0.0014	0.0022
36	0.0036	0.0014	0.0022
37	0.0036	0.0014	0.0022
38	0.0036	0.0014	0.0022
39	0.0036	0.0014	0.0022
40	0.0037	0.0014	0.0022
41	0.0037	0.0014	0.0022
42	0.0037	0.0014	0.0022
43	0.0037	0.0014	0.0023
44	0.0037	0.0014	0.0023
45	0.0037	0.0015	0.0023
46	0.0037	0.0015	0.0023
47	0.0038	0.0015	0.0023
48	0.0038	0.0015	0.0023
49	0.0038	0.0015	0.0023
50	0.0038	0.0015	0.0023
51	0.0038	0.0015	0.0023
52	0.0038	0.0015	0.0023
53	0.0039	0.0015	0.0024
54	0.0039	0.0015	0.0024
55	0.0039	0.0015	0.0024
56	0.0039	0.0015	0.0024
57	0.0039	0.0015	0.0024
58	0.0039	0.0015	0.0024
59	0.0040	0.0015	0.0024
60	0.0040	0.0015	0.0024
61	0.0040	0.0016	0.0024
62	0.0040	0.0016	0.0024
63	0.0040	0.0016	0.0025
64	0.0040	0.0016	0.0025
65	0.0041	0.0016	0.0025
66	0.0041	0.0016	0.0025
67	0.0041	0.0016	0.0025
68	0.0041	0.0016	0.0025
69	0.0041	0.0016	0.0025
70	0.0041	0.0016	0.0025
71	0.0042	0.0016	0.0025
72	0.0042	0.0016	0.0026
73	0.0042	0.0016	0.0026
74	0.0042	0.0016	0.0026
75	0.0043	0.0017	0.0026
76	0.0043	0.0017	0.0026

77	0.0043	0.0017	0.0026
78	0.0043	0.0017	0.0026
79	0.0043	0.0017	0.0027
80	0.0044	0.0017	0.0027
81	0.0044	0.0017	0.0027
82	0.0044	0.0017	0.0027
83	0.0044	0.0017	0.0027
84	0.0045	0.0017	0.0027
85	0.0045	0.0017	0.0027
86	0.0045	0.0018	0.0027
87	0.0045	0.0018	0.0028
88	0.0045	0.0018	0.0028
89	0.0046	0.0018	0.0028
90	0.0046	0.0018	0.0028
91	0.0046	0.0018	0.0028
92	0.0047	0.0018	0.0028
93	0.0047	0.0018	0.0029
94	0.0047	0.0018	0.0029
95	0.0047	0.0018	0.0029
96	0.0048	0.0019	0.0029
97	0.0048	0.0019	0.0029
98	0.0048	0.0019	0.0029
99	0.0049	0.0019	0.0030
100	0.0049	0.0019	0.0030
101	0.0049	0.0019	0.0030
102	0.0049	0.0019	0.0030
103	0.0050	0.0019	0.0030
104	0.0050	0.0020	0.0031
105	0.0051	0.0020	0.0031
106	0.0051	0.0020	0.0031
107	0.0051	0.0020	0.0031
108	0.0051	0.0020	0.0031
109	0.0052	0.0020	0.0032
110	0.0052	0.0020	0.0032
111	0.0053	0.0021	0.0032
112	0.0053	0.0021	0.0032
113	0.0053	0.0021	0.0033
114	0.0054	0.0021	0.0033
115	0.0054	0.0021	0.0033
116	0.0055	0.0021	0.0033
117	0.0055	0.0021	0.0034
118	0.0055	0.0022	0.0034
119	0.0056	0.0022	0.0034
120	0.0056	0.0022	0.0034
121	0.0057	0.0022	0.0035
122	0.0057	0.0022	0.0035
123	0.0058	0.0023	0.0035
124	0.0058	0.0023	0.0035
125	0.0059	0.0023	0.0036
126	0.0059	0.0023	0.0036

127	0.0060	0.0023	0.0037
128	0.0060	0.0023	0.0037
129	0.0061	0.0024	0.0037
130	0.0061	0.0024	0.0037
131	0.0062	0.0024	0.0038
132	0.0062	0.0024	0.0038
133	0.0063	0.0025	0.0039
134	0.0064	0.0025	0.0039
135	0.0065	0.0025	0.0039
136	0.0065	0.0025	0.0040
137	0.0066	0.0026	0.0040
138	0.0066	0.0026	0.0040
139	0.0067	0.0026	0.0041
140	0.0068	0.0026	0.0041
141	0.0069	0.0027	0.0042
142	0.0069	0.0027	0.0042
143	0.0070	0.0027	0.0043
144	0.0071	0.0028	0.0043
145	0.0073	0.0029	0.0045
146	0.0074	0.0029	0.0045
147	0.0075	0.0029	0.0046
148	0.0076	0.0030	0.0046
149	0.0077	0.0030	0.0047
150	0.0078	0.0030	0.0048
151	0.0079	0.0031	0.0048
152	0.0080	0.0031	0.0049
153	0.0082	0.0032	0.0050
154	0.0082	0.0032	0.0050
155	0.0084	0.0033	0.0051
156	0.0085	0.0033	0.0052
157	0.0087	0.0034	0.0053
158	0.0088	0.0034	0.0054
159	0.0090	0.0035	0.0055
160	0.0091	0.0035	0.0055
161	0.0093	0.0036	0.0057
162	0.0094	0.0037	0.0057
163	0.0096	0.0038	0.0059
164	0.0098	0.0038	0.0060
165	0.0100	0.0039	0.0061
166	0.0102	0.0040	0.0062
167	0.0105	0.0041	0.0064
168	0.0106	0.0041	0.0065
169	0.0102	0.0040	0.0062
170	0.0104	0.0040	0.0063
171	0.0108	0.0042	0.0066
172	0.0110	0.0043	0.0067
173	0.0114	0.0044	0.0070
174	0.0117	0.0045	0.0071
175	0.0122	0.0047	0.0074
176	0.0125	0.0049	0.0076

177	0.0131	0.0051	0.0080
178	0.0135	0.0052	0.0082
179	0.0142	0.0055	0.0087
180	0.0147	0.0057	0.0090
181	0.0157	0.0061	0.0096
182	0.0162	0.0063	0.0099
183	0.0176	0.0068	0.0107
184	0.0183	0.0071	0.0112
185	0.0162	0.0063	0.0099
186	0.0172	0.0067	0.0105
187	0.0199	0.0078	0.0122
188	0.0217	0.0085	0.0133
189	0.0406	0.0145	0.0261
190	0.0451	0.0145	0.0306
191	0.0613	0.0145	0.0468
192	0.0806	0.0145	0.0661
193	0.2022	0.0145	0.1877
194	0.0514	0.0145	0.0369
195	0.0240	0.0093	0.0146
196	0.0185	0.0072	0.0113
197	0.0192	0.0075	0.0117
198	0.0169	0.0066	0.0103
199	0.0151	0.0059	0.0092
200	0.0138	0.0054	0.0084
201	0.0128	0.0050	0.0078
202	0.0119	0.0046	0.0073
203	0.0112	0.0044	0.0068
204	0.0106	0.0041	0.0065
205	0.0108	0.0042	0.0066
206	0.0103	0.0040	0.0063
207	0.0099	0.0039	0.0060
208	0.0095	0.0037	0.0058
209	0.0092	0.0036	0.0056
210	0.0089	0.0035	0.0054
211	0.0086	0.0033	0.0052
212	0.0083	0.0032	0.0051
213	0.0081	0.0031	0.0049
214	0.0079	0.0031	0.0048
215	0.0077	0.0030	0.0047
216	0.0075	0.0029	0.0046
217	0.0072	0.0028	0.0044
218	0.0070	0.0027	0.0043
219	0.0068	0.0027	0.0042
220	0.0067	0.0026	0.0041
221	0.0065	0.0025	0.0040
222	0.0064	0.0025	0.0039
223	0.0063	0.0024	0.0038
224	0.0062	0.0024	0.0038
225	0.0061	0.0024	0.0037
226	0.0059	0.0023	0.0036

227	0.0058	0.0023	0.0036
228	0.0057	0.0022	0.0035
229	0.0057	0.0022	0.0035
230	0.0056	0.0022	0.0034
231	0.0055	0.0021	0.0033
232	0.0054	0.0021	0.0033
233	0.0053	0.0021	0.0032
234	0.0052	0.0020	0.0032
235	0.0052	0.0020	0.0032
236	0.0051	0.0020	0.0031
237	0.0050	0.0020	0.0031
238	0.0050	0.0019	0.0030
239	0.0049	0.0019	0.0030
240	0.0048	0.0019	0.0030
241	0.0048	0.0019	0.0029
242	0.0047	0.0018	0.0029
243	0.0047	0.0018	0.0029
244	0.0046	0.0018	0.0028
245	0.0046	0.0018	0.0028
246	0.0045	0.0018	0.0028
247	0.0045	0.0017	0.0027
248	0.0044	0.0017	0.0027
249	0.0044	0.0017	0.0027
250	0.0043	0.0017	0.0026
251	0.0043	0.0017	0.0026
252	0.0042	0.0017	0.0026
253	0.0042	0.0016	0.0026
254	0.0042	0.0016	0.0025
255	0.0041	0.0016	0.0025
256	0.0041	0.0016	0.0025
257	0.0040	0.0016	0.0025
258	0.0040	0.0016	0.0024
259	0.0040	0.0015	0.0024
260	0.0039	0.0015	0.0024
261	0.0039	0.0015	0.0024
262	0.0039	0.0015	0.0024
263	0.0038	0.0015	0.0023
264	0.0038	0.0015	0.0023
265	0.0038	0.0015	0.0023
266	0.0037	0.0015	0.0023
267	0.0037	0.0014	0.0023
268	0.0037	0.0014	0.0023
269	0.0037	0.0014	0.0022
270	0.0036	0.0014	0.0022
271	0.0036	0.0014	0.0022
272	0.0036	0.0014	0.0022
273	0.0036	0.0014	0.0022
274	0.0035	0.0014	0.0022
275	0.0035	0.0014	0.0021
276	0.0035	0.0014	0.0021

277	0.0035	0.0013	0.0021
278	0.0034	0.0013	0.0021
279	0.0034	0.0013	0.0021
280	0.0034	0.0013	0.0021
281	0.0034	0.0013	0.0021
282	0.0033	0.0013	0.0020
283	0.0033	0.0013	0.0020
284	0.0033	0.0013	0.0020
285	0.0033	0.0013	0.0020
286	0.0033	0.0013	0.0020
287	0.0032	0.0013	0.0020
288	0.0032	0.0013	0.0020

Total soil rain loss = 0.76(In)
Total effective rainfall = 1.45(In)
Peak flow rate in flood hydrograph = 81.03(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

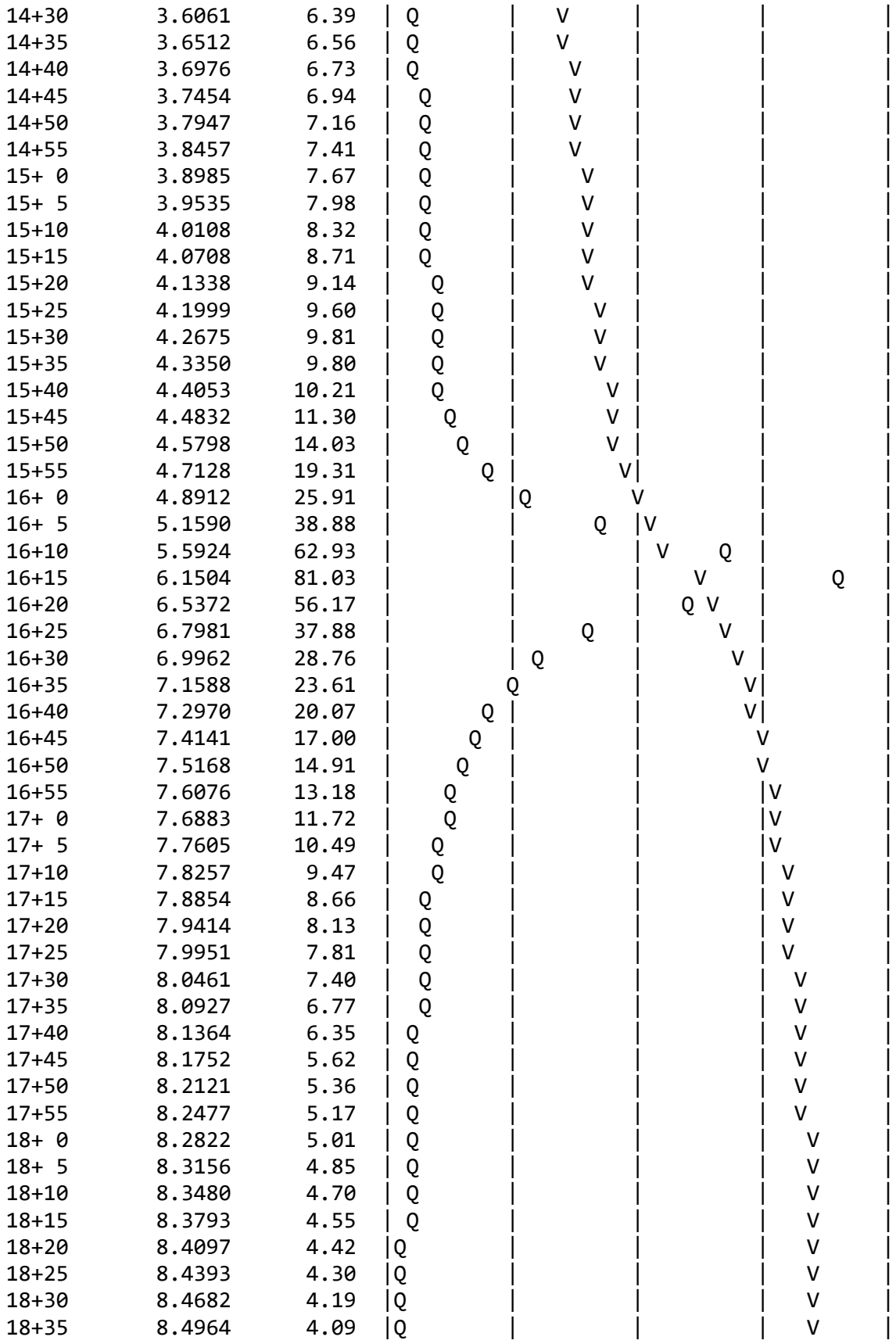
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0
0+ 5	0.0004	0.05	Q	|	|	|	|
0+10	0.0027	0.35	Q	|	|	|	|
0+15	0.0091	0.93	Q	|	|	|	|
0+20	0.0177	1.25	Q	|	|	|	|
0+25	0.0275	1.43	Q	|	|	|	|
0+30	0.0382	1.55	Q	|	|	|	|
0+35	0.0495	1.64	Q	|	|	|	|
0+40	0.0612	1.71	Q	|	|	|	|
0+45	0.0733	1.76	Q	|	|	|	|
0+50	0.0857	1.80	Q	|	|	|	|
0+55	0.0984	1.84	Q	|	|	|	|
1+ 0	0.1113	1.87	Q	|	|	|	|
1+ 5	0.1243	1.89	Q	|	|	|	|
1+10	0.1375	1.92	Q	|	|	|	|
1+15	0.1508	1.93	Q	|	|	|	|
1+20	0.1642	1.95	Q	|	|	|	|
1+25	0.1777	1.96	Q	|	|	|	|
1+30	0.1913	1.98	Q	|	|	|	|
1+35	0.2050	1.99	Q	|	|	|	|
1+40	0.2188	2.00	Q	|	|	|	|
1+45	0.2326	2.01	Q	|	|	|	|
1+50	0.2465	2.01	QV	|	|	|	|
1+55	0.2604	2.02	QV	|	|	|	|

2+ 0	0.2744	2.03	QV	|	|	|	|
2+ 5	0.2884	2.03	QV	|	|	|	|
2+10	0.3025	2.04	QV	|	|	|	|
2+15	0.3166	2.05	QV	|	|	|	|
2+20	0.3307	2.06	QV	|	|	|	|
2+25	0.3450	2.06	QV	|	|	|	|
2+30	0.3592	2.07	QV	|	|	|	|
2+35	0.3735	2.08	QV	|	|	|	|
2+40	0.3879	2.08	QV	|	|	|	|
2+45	0.4023	2.09	QV	|	|	|	|
2+50	0.4168	2.10	QV	|	|	|	|
2+55	0.4313	2.11	QV	|	|	|	|
3+ 0	0.4458	2.11	QV	|	|	|	|
3+ 5	0.4604	2.12	QV	|	|	|	|
3+10	0.4751	2.13	QV	|	|	|	|
3+15	0.4899	2.14	Q V	|	|	|	|
3+20	0.5046	2.15	Q V	|	|	|	|
3+25	0.5195	2.15	Q V	|	|	|	|
3+30	0.5344	2.16	Q V	|	|	|	|
3+35	0.5493	2.17	Q V	|	|	|	|
3+40	0.5643	2.18	Q V	|	|	|	|
3+45	0.5794	2.19	Q V	|	|	|	|
3+50	0.5945	2.20	Q V	|	|	|	|
3+55	0.6097	2.20	Q V	|	|	|	|
4+ 0	0.6249	2.21	Q V	|	|	|	|
4+ 5	0.6402	2.22	Q V	|	|	|	|
4+10	0.6556	2.23	Q V	|	|	|	|
4+15	0.6710	2.24	Q V	|	|	|	|
4+20	0.6865	2.25	Q V	|	|	|	|
4+25	0.7021	2.26	|QV	|	|	|	|
4+30	0.7177	2.27	|QV	|	|	|	|
4+35	0.7333	2.28	|Q V	|	|	|	|
4+40	0.7491	2.29	|Q V	|	|	|	|
4+45	0.7649	2.30	|Q V	|	|	|	|
4+50	0.7808	2.30	|Q V	|	|	|	|
4+55	0.7967	2.31	|Q V	|	|	|	|
5+ 0	0.8127	2.32	|Q V	|	|	|	|
5+ 5	0.8288	2.33	|Q V	|	|	|	|
5+10	0.8449	2.34	|Q V	|	|	|	|
5+15	0.8612	2.35	|Q V	|	|	|	|
5+20	0.8774	2.37	|Q V	|	|	|	|
5+25	0.8938	2.38	|Q V	|	|	|	|
5+30	0.9102	2.39	|Q V	|	|	|	|
5+35	0.9268	2.40	|Q V	|	|	|	|
5+40	0.9433	2.41	|Q V	|	|	|	|
5+45	0.9600	2.42	|Q V	|	|	|	|
5+50	0.9767	2.43	|Q V	|	|	|	|
5+55	0.9935	2.44	|Q V	|	|	|	|
6+ 0	1.0104	2.45	|Q V	|	|	|	|
6+ 5	1.0274	2.46	|Q V	|	|	|	|

6+10	1.0445	2.48	|Q V	|	|	|	|
6+15	1.0616	2.49	|Q V	|	|	|	|
6+20	1.0788	2.50	|Q V	|	|	|	|
6+25	1.0961	2.51	|Q V	|	|	|	|
6+30	1.1135	2.52	|Q V	|	|	|	|
6+35	1.1310	2.54	|Q V	|	|	|	|
6+40	1.1485	2.55	|Q V	|	|	|	|
6+45	1.1662	2.56	|Q V	|	|	|	|
6+50	1.1839	2.58	|Q V	|	|	|	|
6+55	1.2017	2.59	|Q V	|	|	|	|
7+ 0	1.2197	2.60	|Q V	|	|	|	|
7+ 5	1.2377	2.62	|Q V	|	|	|	|
7+10	1.2558	2.63	|Q V	|	|	|	|
7+15	1.2740	2.64	|Q V	|	|	|	|
7+20	1.2923	2.66	|Q V	|	|	|	|
7+25	1.3107	2.67	|Q V	|	|	|	|
7+30	1.3292	2.69	|Q V	|	|	|	|
7+35	1.3478	2.70	|Q V	|	|	|	|
7+40	1.3665	2.72	|Q V	|	|	|	|
7+45	1.3853	2.73	|Q V	|	|	|	|
7+50	1.4042	2.75	|Q V	|	|	|	|
7+55	1.4233	2.76	|Q V	|	|	|	|
8+ 0	1.4424	2.78	|Q V	|	|	|	|
8+ 5	1.4617	2.80	|Q V	|	|	|	|
8+10	1.4810	2.81	|Q V	|	|	|	|
8+15	1.5005	2.83	|Q V	|	|	|	|
8+20	1.5201	2.85	|Q V	|	|	|	|
8+25	1.5398	2.86	|Q V	|	|	|	|
8+30	1.5597	2.88	|Q V	|	|	|	|
8+35	1.5796	2.90	|Q V	|	|	|	|
8+40	1.5997	2.92	|Q V	|	|	|	|
8+45	1.6199	2.94	|Q V	|	|	|	|
8+50	1.6403	2.95	|Q V	|	|	|	|
8+55	1.6608	2.97	|Q V	|	|	|	|
9+ 0	1.6814	2.99	|Q V	|	|	|	|
9+ 5	1.7021	3.01	|Q V	|	|	|	|
9+10	1.7230	3.03	|Q V	|	|	|	|
9+15	1.7440	3.05	|Q V	|	|	|	|
9+20	1.7652	3.07	|Q V	|	|	|	|
9+25	1.7865	3.10	|Q V	|	|	|	|
9+30	1.8080	3.12	|Q V	|	|	|	|
9+35	1.8297	3.14	|Q V	|	|	|	|
9+40	1.8514	3.16	|Q V	|	|	|	|
9+45	1.8734	3.19	|Q V	|	|	|	|
9+50	1.8955	3.21	|Q V	|	|	|	|
9+55	1.9178	3.23	|Q V	|	|	|	|
10+ 0	1.9402	3.26	|Q V	|	|	|	|
10+ 5	1.9628	3.28	|Q V	|	|	|	|
10+10	1.9856	3.31	|Q V	|	|	|	|
10+15	2.0086	3.34	|Q V	|	|	|	|

```
10+20       2.0318      3.36  |Q      V |          |          |          |
10+25       2.0551      3.39  |Q      V |          |          |          |
10+30       2.0786      3.42  |Q      V |          |          |          |
10+35       2.1024      3.45  |Q      V |          |          |          |
10+40       2.1263      3.48  |Q      V |          |          |          |
10+45       2.1505      3.51  |Q      V |          |          |          |
10+50       2.1748      3.54  |Q      V |          |          |          |
10+55       2.1994      3.57  |Q       V|          |          |          |
11+ 0       2.2242      3.60  |Q       V|          |          |          |
11+ 5       2.2492      3.63  |Q       V|          |          |          |
11+10       2.2745      3.67  |Q       V|          |          |          |
11+15       2.3000      3.70  |Q       V|          |          |          |
11+20       2.3257      3.74  |Q       V|          |          |          |
11+25       2.3517      3.77  |Q       V|          |          |          |
11+30       2.3780      3.81  |Q       V|          |          |          |
11+35       2.4045      3.85  |Q       V|          |          |          |
11+40       2.4313      3.89  |Q       V|          |          |          |
11+45       2.4584      3.93  |Q        V          |          |          |
11+50       2.4857      3.97  |Q        V          |          |          |
11+55       2.5134      4.02  |Q        V          |          |          |
12+ 0       2.5414      4.06  |Q        V          |          |          |
12+ 5       2.5697      4.11  |Q        V          |          |          |
12+10       2.5984      4.17  |Q        V          |          |          |
12+15       2.6276      4.24  |Q        V          |          |          |
12+20       2.6572      4.31  |Q        V          |          |          |
12+25       2.6873      4.37  |Q         |V          |          |          |
12+30       2.7178      4.42  |Q         |V          |          |          |
12+35       2.7487      4.49  |Q         |V          |          |          |
12+40       2.7800      4.54  | Q        |V          |          |          |
12+45       2.8117      4.61  | Q        |V          |          |          |
12+50       2.8439      4.67  | Q        |V          |          |          |
12+55       2.8765      4.74  | Q        |V          |          |          |
13+ 0       2.9096      4.81  | Q        |V          |          |          |
13+ 5       2.9432      4.88  | Q        | V         |          |          |
13+10       2.9773      4.95  | Q        | V         |          |          |
13+15       3.0119      5.03  | Q        | V         |          |          |
13+20       3.0471      5.11  | Q        | V         |          |          |
13+25       3.0828      5.19  | Q        | V         |          |          |
13+30       3.1192      5.28  | Q        | V         |          |          |
13+35       3.1562      5.37  | Q        | V         |          |          |
13+40       3.1938      5.46  | Q        |  V        |          |          |
13+45       3.2321      5.57  | Q        |  V        |          |          |
13+50       3.2712      5.67  | Q        |  V        |          |          |
13+55       3.3110      5.78  | Q        |  V        |          |          |
14+ 0       3.3516      5.90  | Q        |  V        |          |          |
14+ 5       3.3930      6.01  | Q        |  V        |          |          |
14+10       3.4348      6.07  | Q        |   V       |          |          |
14+15       3.4766      6.07  | Q        |   V       |          |          |
14+20       3.5189      6.14  | Q        |   V       |          |          |
14+25       3.5620      6.26  | Q        |   V       |          |          |
```



```
18+40       8.5239      4.00  |Q        |         |         |    V    |
18+45       8.5509      3.91  |Q        |         |         |    V    |
18+50       8.5773      3.83  |Q        |         |         |    V    |
18+55       8.6031      3.75  |Q        |         |         |    V    |
19+ 0       8.6285      3.68  |Q        |         |         |    V    |
19+ 5       8.6534      3.61  |Q        |         |         |    V    |
19+10       8.6778      3.55  |Q        |         |         |    V    |
19+15       8.7018      3.48  |Q        |         |         |    V    |
19+20       8.7254      3.43  |Q        |         |         |    V    |
19+25       8.7486      3.37  |Q        |         |         |    V    |
19+30       8.7714      3.31  |Q        |         |         |     V   |
19+35       8.7939      3.26  |Q        |         |         |     V   |
19+40       8.8160      3.21  |Q        |         |         |     V   |
19+45       8.8378      3.17  |Q        |         |         |     V   |
19+50       8.8593      3.12  |Q        |         |         |     V   |
19+55       8.8805      3.08  |Q        |         |         |     V   |
20+ 0       8.9014      3.04  |Q        |         |         |     V   |
20+ 5       8.9221      3.00  |Q        |         |         |     V   |
20+10       8.9424      2.96  |Q        |         |         |     V   |
20+15       8.9625      2.92  |Q        |         |         |     V   |
20+20       8.9824      2.88  |Q        |         |         |     V   |
20+25       9.0020      2.85  |Q        |         |         |     V   |
20+30       9.0213      2.81  |Q        |         |         |      V  |
20+35       9.0405      2.78  |Q        |         |         |      V  |
20+40       9.0594      2.75  |Q        |         |         |      V  |
20+45       9.0781      2.72  |Q        |         |         |      V  |
20+50       9.0966      2.69  |Q        |         |         |      V  |
20+55       9.1149      2.66  |Q        |         |         |      V  |
21+ 0       9.1330      2.63  |Q        |         |         |      V  |
21+ 5       9.1510      2.60  |Q        |         |         |      V  |
21+10       9.1687      2.58  |Q        |         |         |      V  |
21+15       9.1863      2.55  |Q        |         |         |      V  |
21+20       9.2036      2.52  |Q        |         |         |      V  |
21+25       9.2209      2.50  |Q        |         |         |      V  |
21+30       9.2379      2.48  |Q        |         |         |      V  |
21+35       9.2548      2.45  |Q        |         |         |       V |
21+40       9.2715      2.43  |Q        |         |         |       V |
21+45       9.2881      2.41  |Q        |         |         |       V |
21+50       9.3045      2.39  |Q        |         |         |       V |
21+55       9.3208      2.36  |Q        |         |         |       V |
22+ 0       9.3370      2.34  |Q        |         |         |       V |
22+ 5       9.3530      2.32  |Q        |         |         |       V |
22+10       9.3688      2.30  |Q        |         |         |       V |
22+15       9.3846      2.29  |Q        |         |         |       V |
22+20       9.4002      2.27  |Q        |         |         |       V |
22+25       9.4157      2.25  Q         |         |         |       V |
22+30       9.4310      2.23  Q         |         |         |       V |
22+35       9.4463      2.21  Q         |         |         |       V |
22+40       9.4614      2.20  Q         |         |         |       V |
22+45       9.4764      2.18  Q         |         |         |       V |
```

22+50	9.4913	2.16	Q	|	|	|	V |
22+55	9.5061	2.15	Q	|	|	|	V|
23+ 0	9.5207	2.13	Q	|	|	|	V|
23+ 5	9.5353	2.11	Q	|	|	|	V|
23+10	9.5498	2.10	Q	|	|	|	V|
23+15	9.5641	2.08	Q	|	|	|	V|
23+20	9.5784	2.07	Q	|	|	|	V|
23+25	9.5925	2.06	Q	|	|	|	V|
23+30	9.6066	2.04	Q	|	|	|	V|
23+35	9.6205	2.03	Q	|	|	|	V|
23+40	9.6344	2.01	Q	|	|	|	V|
23+45	9.6482	2.00	Q	|	|	|	V|
23+50	9.6619	1.99	Q	|	|	|	V|
23+55	9.6755	1.97	Q	|	|	|	V|
24+ 0	9.6890	1.96	Q	|	|	|	V|

Offsite100-year existing condition Unit hydrograph

Area A1 and A2

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 09/12/22

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

Program License Serial Number 6385

Quarry Site
100-yr existing condition
offsite area A1

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		
344.51	1	1.06
Rainfall data for year 100		
344.51	6	2.03
Rainfall data for year 100		
344.51	24	3.62

++

******** 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)
78.0	92.8	24.12	0.070	0.140	1.000	0.140
91.0	98.2	254.94	0.740	0.036	1.000	0.036
93.0	98.6	65.45	0.190	0.028	1.000	0.028

Area-averaged adjusted loss rate Fm (In/Hr) = 0.042

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
24.12	0.070	78.0	92.8	0.78	0.782
254.94	0.740	91.0	98.2	0.18	0.942
65.45	0.190	93.0	98.6	0.14	0.954

Area-averaged catchment yield fraction, Y = 0.933
Area-averaged low loss fraction, Yb = 0.067
++
Watercourse length = 6172.00(Ft.)
Length from concentration point to centroid = 2960.00(Ft.)
Elevation difference along watercourse = 162.00(Ft.)
Mannings friction factor along watercourse = 0.030
Watershed area = 344.51(Ac.)
Catchment Lag time = 0.240 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 34.6867
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.042(In/Hr)
Average low loss rate fraction (Yb) = 0.067 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.357(In)
Computed peak 30-minute rainfall = 0.849(In)
Specified peak 1-hour rainfall = 1.060(In)
Computed peak 3-hour rainfall = 1.550(In)
Specified peak 6-hour rainfall = 2.030(In)
Specified peak 24-hour rainfall = 3.620(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 344.51(Ac.) (Ref: fig. E-4)

5-minute factor = 0.984 Adjusted rainfall = 0.351(In)

30-minute factor = 0.984 Adjusted rainfall = 0.835(In)
1-hour factor = 0.984 Adjusted rainfall = 1.043(In)
3-hour factor = 0.998 Adjusted rainfall = 1.547(In)
6-hour factor = 0.999 Adjusted rainfall = 2.028(In)
24-hour factor = 1.000 Adjusted rainfall = 3.618(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 = 4166.42 (CFS))	
1	2.202	91.747
2	13.098	453.984
3	40.370	1136.270
4	59.582	800.435
5	69.849	427.759
6	76.693	285.138
7	81.551	202.441
8	85.264	154.680
9	88.244	124.165
10	90.444	91.647
11	92.278	76.439
12	93.813	63.953
13	95.042	51.176
14	96.075	43.051
15	96.929	35.595
16	97.575	26.888
17	98.023	18.690
18	98.387	15.165
19	98.800	17.214
20	99.217	17.342
21	99.566	14.553
22	99.786	9.168
23	100.000	8.915

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3512	0.3512
2	0.4911	0.1398
3	0.5974	0.1064
4	0.6866	0.0892
5	0.7648	0.0782
6	0.8353	0.0705
7	0.8776	0.0423
8	0.9159	0.0383
9	0.9511	0.0352
10	0.9837	0.0326

11	1.0142	0.0305
12	1.0429	0.0287
13	1.0733	0.0304
14	1.1022	0.0289
15	1.1298	0.0276
16	1.1563	0.0265
17	1.1817	0.0254
18	1.2062	0.0245
19	1.2298	0.0236
20	1.2527	0.0228
21	1.2748	0.0221
22	1.2963	0.0215
23	1.3171	0.0208
24	1.3374	0.0203
25	1.3571	0.0197
26	1.3763	0.0192
27	1.3951	0.0188
28	1.4134	0.0183
29	1.4314	0.0179
30	1.4489	0.0175
31	1.4660	0.0171
32	1.4828	0.0168
33	1.4993	0.0165
34	1.5154	0.0161
35	1.5313	0.0158
36	1.5468	0.0156
37	1.5635	0.0166
38	1.5798	0.0164
39	1.5960	0.0161
40	1.6118	0.0159
41	1.6274	0.0156
42	1.6428	0.0154
43	1.6580	0.0152
44	1.6730	0.0150
45	1.6877	0.0148
46	1.7023	0.0146
47	1.7166	0.0144
48	1.7308	0.0142
49	1.7448	0.0140
50	1.7586	0.0138
51	1.7723	0.0137
52	1.7858	0.0135
53	1.7991	0.0133
54	1.8123	0.0132
55	1.8253	0.0130
56	1.8382	0.0129
57	1.8510	0.0128
58	1.8636	0.0126
59	1.8761	0.0125
60	1.8884	0.0124

61	1.9007	0.0122
62	1.9128	0.0121
63	1.9248	0.0120
64	1.9366	0.0119
65	1.9484	0.0118
66	1.9601	0.0117
67	1.9716	0.0115
68	1.9830	0.0114
69	1.9944	0.0113
70	2.0056	0.0112
71	2.0168	0.0111
72	2.0278	0.0110
73	2.0395	0.0117
74	2.0512	0.0116
75	2.0627	0.0115
76	2.0741	0.0114
77	2.0855	0.0114
78	2.0968	0.0113
79	2.1079	0.0112
80	2.1191	0.0111
81	2.1301	0.0110
82	2.1410	0.0109
83	2.1519	0.0109
84	2.1627	0.0108
85	2.1734	0.0107
86	2.1840	0.0106
87	2.1946	0.0106
88	2.2051	0.0105
89	2.2156	0.0104
90	2.2259	0.0104
91	2.2362	0.0103
92	2.2465	0.0102
93	2.2566	0.0102
94	2.2667	0.0101
95	2.2768	0.0100
96	2.2867	0.0100
97	2.2967	0.0099
98	2.3065	0.0099
99	2.3163	0.0098
100	2.3261	0.0097
101	2.3358	0.0097
102	2.3454	0.0096
103	2.3550	0.0096
104	2.3645	0.0095
105	2.3740	0.0095
106	2.3834	0.0094
107	2.3928	0.0094
108	2.4021	0.0093
109	2.4113	0.0093
110	2.4206	0.0092

111	2.4297	0.0092
112	2.4388	0.0091
113	2.4479	0.0091
114	2.4569	0.0090
115	2.4659	0.0090
116	2.4749	0.0089
117	2.4837	0.0089
118	2.4926	0.0088
119	2.5014	0.0088
120	2.5101	0.0088
121	2.5189	0.0087
122	2.5275	0.0087
123	2.5362	0.0086
124	2.5448	0.0086
125	2.5533	0.0086
126	2.5618	0.0085
127	2.5703	0.0085
128	2.5787	0.0084
129	2.5871	0.0084
130	2.5955	0.0084
131	2.6038	0.0083
132	2.6121	0.0083
133	2.6203	0.0082
134	2.6286	0.0082
135	2.6367	0.0082
136	2.6449	0.0081
137	2.6530	0.0081
138	2.6611	0.0081
139	2.6691	0.0080
140	2.6771	0.0080
141	2.6851	0.0080
142	2.6930	0.0079
143	2.7009	0.0079
144	2.7088	0.0079
145	2.7166	0.0078
146	2.7244	0.0078
147	2.7322	0.0078
148	2.7400	0.0077
149	2.7477	0.0077
150	2.7554	0.0077
151	2.7630	0.0077
152	2.7707	0.0076
153	2.7783	0.0076
154	2.7858	0.0076
155	2.7934	0.0075
156	2.8009	0.0075
157	2.8084	0.0075
158	2.8158	0.0075
159	2.8233	0.0074
160	2.8307	0.0074

161	2.8380	0.0074
162	2.8454	0.0074
163	2.8527	0.0073
164	2.8600	0.0073
165	2.8673	0.0073
166	2.8745	0.0072
167	2.8818	0.0072
168	2.8889	0.0072
169	2.8961	0.0072
170	2.9033	0.0071
171	2.9104	0.0071
172	2.9175	0.0071
173	2.9246	0.0071
174	2.9316	0.0070
175	2.9386	0.0070
176	2.9456	0.0070
177	2.9526	0.0070
178	2.9596	0.0070
179	2.9665	0.0069
180	2.9734	0.0069
181	2.9803	0.0069
182	2.9872	0.0069
183	2.9940	0.0068
184	3.0008	0.0068
185	3.0076	0.0068
186	3.0144	0.0068
187	3.0212	0.0068
188	3.0279	0.0067
189	3.0346	0.0067
190	3.0413	0.0067
191	3.0480	0.0067
192	3.0547	0.0067
193	3.0613	0.0066
194	3.0679	0.0066
195	3.0745	0.0066
196	3.0811	0.0066
197	3.0877	0.0066
198	3.0942	0.0065
199	3.1007	0.0065
200	3.1072	0.0065
201	3.1137	0.0065
202	3.1201	0.0065
203	3.1266	0.0064
204	3.1330	0.0064
205	3.1394	0.0064
206	3.1458	0.0064
207	3.1522	0.0064
208	3.1585	0.0064
209	3.1649	0.0063
210	3.1712	0.0063

211	3.1775	0.0063
212	3.1838	0.0063
213	3.1900	0.0063
214	3.1963	0.0062
215	3.2025	0.0062
216	3.2087	0.0062
217	3.2149	0.0062
218	3.2211	0.0062
219	3.2273	0.0062
220	3.2334	0.0061
221	3.2395	0.0061
222	3.2457	0.0061
223	3.2518	0.0061
224	3.2578	0.0061
225	3.2639	0.0061
226	3.2700	0.0061
227	3.2760	0.0060
228	3.2820	0.0060
229	3.2880	0.0060
230	3.2940	0.0060
231	3.3000	0.0060
232	3.3059	0.0060
233	3.3119	0.0059
234	3.3178	0.0059
235	3.3237	0.0059
236	3.3296	0.0059
237	3.3355	0.0059
238	3.3414	0.0059
239	3.3473	0.0059
240	3.3531	0.0058
241	3.3589	0.0058
242	3.3647	0.0058
243	3.3705	0.0058
244	3.3763	0.0058
245	3.3821	0.0058
246	3.3879	0.0058
247	3.3936	0.0057
248	3.3993	0.0057
249	3.4051	0.0057
250	3.4108	0.0057
251	3.4165	0.0057
252	3.4221	0.0057
253	3.4278	0.0057
254	3.4335	0.0057
255	3.4391	0.0056
256	3.4447	0.0056
257	3.4503	0.0056
258	3.4559	0.0056
259	3.4615	0.0056
260	3.4671	0.0056

261	3.4727	0.0056
262	3.4782	0.0056
263	3.4838	0.0055
264	3.4893	0.0055
265	3.4948	0.0055
266	3.5003	0.0055
267	3.5058	0.0055
268	3.5113	0.0055
269	3.5167	0.0055
270	3.5222	0.0055
271	3.5276	0.0054
272	3.5331	0.0054
273	3.5385	0.0054
274	3.5439	0.0054
275	3.5493	0.0054
276	3.5547	0.0054
277	3.5601	0.0054
278	3.5654	0.0054
279	3.5708	0.0054
280	3.5761	0.0053
281	3.5814	0.0053
282	3.5868	0.0053
283	3.5921	0.0053
284	3.5974	0.0053
285	3.6026	0.0053
286	3.6079	0.0053
287	3.6132	0.0053
288	3.6184	0.0053

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0053	0.0004	0.0049
2	0.0053	0.0004	0.0049
3	0.0053	0.0004	0.0049
4	0.0053	0.0004	0.0049
5	0.0053	0.0004	0.0050
6	0.0053	0.0004	0.0050
7	0.0054	0.0004	0.0050
8	0.0054	0.0004	0.0050
9	0.0054	0.0004	0.0050
10	0.0054	0.0004	0.0050
11	0.0054	0.0004	0.0051
12	0.0054	0.0004	0.0051
13	0.0055	0.0004	0.0051
14	0.0055	0.0004	0.0051
15	0.0055	0.0004	0.0051
16	0.0055	0.0004	0.0051
17	0.0055	0.0004	0.0052

18	0.0055	0.0004	0.0052
19	0.0056	0.0004	0.0052
20	0.0056	0.0004	0.0052
21	0.0056	0.0004	0.0052
22	0.0056	0.0004	0.0052
23	0.0056	0.0004	0.0053
24	0.0057	0.0004	0.0053
25	0.0057	0.0004	0.0053
26	0.0057	0.0004	0.0053
27	0.0057	0.0004	0.0053
28	0.0057	0.0004	0.0053
29	0.0058	0.0004	0.0054
30	0.0058	0.0004	0.0054
31	0.0058	0.0004	0.0054
32	0.0058	0.0004	0.0054
33	0.0058	0.0004	0.0055
34	0.0059	0.0004	0.0055
35	0.0059	0.0004	0.0055
36	0.0059	0.0004	0.0055
37	0.0059	0.0004	0.0055
38	0.0059	0.0004	0.0055
39	0.0060	0.0004	0.0056
40	0.0060	0.0004	0.0056
41	0.0060	0.0004	0.0056
42	0.0060	0.0004	0.0056
43	0.0061	0.0004	0.0057
44	0.0061	0.0004	0.0057
45	0.0061	0.0004	0.0057
46	0.0061	0.0004	0.0057
47	0.0062	0.0004	0.0058
48	0.0062	0.0004	0.0058
49	0.0062	0.0004	0.0058
50	0.0062	0.0004	0.0058
51	0.0063	0.0004	0.0058
52	0.0063	0.0004	0.0059
53	0.0063	0.0004	0.0059
54	0.0063	0.0004	0.0059
55	0.0064	0.0004	0.0059
56	0.0064	0.0004	0.0060
57	0.0064	0.0004	0.0060
58	0.0064	0.0004	0.0060
59	0.0065	0.0004	0.0060
60	0.0065	0.0004	0.0061
61	0.0065	0.0004	0.0061
62	0.0066	0.0004	0.0061
63	0.0066	0.0004	0.0062
64	0.0066	0.0004	0.0062
65	0.0067	0.0004	0.0062
66	0.0067	0.0004	0.0062
67	0.0067	0.0005	0.0063

68	0.0067	0.0005	0.0063
69	0.0068	0.0005	0.0063
70	0.0068	0.0005	0.0063
71	0.0068	0.0005	0.0064
72	0.0069	0.0005	0.0064
73	0.0069	0.0005	0.0064
74	0.0069	0.0005	0.0065
75	0.0070	0.0005	0.0065
76	0.0070	0.0005	0.0065
77	0.0070	0.0005	0.0066
78	0.0071	0.0005	0.0066
79	0.0071	0.0005	0.0066
80	0.0071	0.0005	0.0067
81	0.0072	0.0005	0.0067
82	0.0072	0.0005	0.0067
83	0.0073	0.0005	0.0068
84	0.0073	0.0005	0.0068
85	0.0074	0.0005	0.0069
86	0.0074	0.0005	0.0069
87	0.0074	0.0005	0.0069
88	0.0075	0.0005	0.0070
89	0.0075	0.0005	0.0070
90	0.0075	0.0005	0.0070
91	0.0076	0.0005	0.0071
92	0.0076	0.0005	0.0071
93	0.0077	0.0005	0.0072
94	0.0077	0.0005	0.0072
95	0.0078	0.0005	0.0073
96	0.0078	0.0005	0.0073
97	0.0079	0.0005	0.0073
98	0.0079	0.0005	0.0074
99	0.0080	0.0005	0.0074
100	0.0080	0.0005	0.0075
101	0.0081	0.0005	0.0075
102	0.0081	0.0005	0.0076
103	0.0082	0.0005	0.0076
104	0.0082	0.0006	0.0077
105	0.0083	0.0006	0.0077
106	0.0083	0.0006	0.0078
107	0.0084	0.0006	0.0078
108	0.0084	0.0006	0.0079
109	0.0085	0.0006	0.0079
110	0.0086	0.0006	0.0080
111	0.0086	0.0006	0.0081
112	0.0087	0.0006	0.0081
113	0.0088	0.0006	0.0082
114	0.0088	0.0006	0.0082
115	0.0089	0.0006	0.0083
116	0.0089	0.0006	0.0083
117	0.0090	0.0006	0.0084

118	0.0091	0.0006	0.0085
119	0.0092	0.0006	0.0086
120	0.0092	0.0006	0.0086
121	0.0093	0.0006	0.0087
122	0.0094	0.0006	0.0087
123	0.0095	0.0006	0.0088
124	0.0095	0.0006	0.0089
125	0.0096	0.0006	0.0090
126	0.0097	0.0006	0.0090
127	0.0098	0.0007	0.0091
128	0.0099	0.0007	0.0092
129	0.0100	0.0007	0.0093
130	0.0100	0.0007	0.0094
131	0.0102	0.0007	0.0095
132	0.0102	0.0007	0.0095
133	0.0104	0.0007	0.0097
134	0.0104	0.0007	0.0097
135	0.0106	0.0007	0.0099
136	0.0106	0.0007	0.0099
137	0.0108	0.0007	0.0101
138	0.0109	0.0007	0.0101
139	0.0110	0.0007	0.0103
140	0.0111	0.0007	0.0104
141	0.0113	0.0008	0.0105
142	0.0114	0.0008	0.0106
143	0.0115	0.0008	0.0108
144	0.0116	0.0008	0.0108
145	0.0110	0.0007	0.0103
146	0.0111	0.0007	0.0104
147	0.0113	0.0008	0.0106
148	0.0114	0.0008	0.0107
149	0.0117	0.0008	0.0109
150	0.0118	0.0008	0.0110
151	0.0120	0.0008	0.0112
152	0.0121	0.0008	0.0113
153	0.0124	0.0008	0.0115
154	0.0125	0.0008	0.0116
155	0.0128	0.0009	0.0119
156	0.0129	0.0009	0.0120
157	0.0132	0.0009	0.0123
158	0.0133	0.0009	0.0124
159	0.0137	0.0009	0.0127
160	0.0138	0.0009	0.0129
161	0.0142	0.0010	0.0132
162	0.0144	0.0010	0.0134
163	0.0148	0.0010	0.0138
164	0.0150	0.0010	0.0140
165	0.0154	0.0010	0.0144
166	0.0156	0.0010	0.0146
167	0.0161	0.0011	0.0150

168	0.0164	0.0011	0.0153
169	0.0156	0.0010	0.0145
170	0.0158	0.0011	0.0148
171	0.0165	0.0011	0.0154
172	0.0168	0.0011	0.0157
173	0.0175	0.0012	0.0163
174	0.0179	0.0012	0.0167
175	0.0188	0.0013	0.0175
176	0.0192	0.0013	0.0179
177	0.0203	0.0014	0.0189
178	0.0208	0.0014	0.0194
179	0.0221	0.0015	0.0206
180	0.0228	0.0015	0.0213
181	0.0245	0.0016	0.0228
182	0.0254	0.0017	0.0237
183	0.0276	0.0019	0.0258
184	0.0289	0.0019	0.0270
185	0.0287	0.0019	0.0267
186	0.0305	0.0020	0.0284
187	0.0352	0.0024	0.0328
188	0.0383	0.0026	0.0358
189	0.0705	0.0035	0.0670
190	0.0782	0.0035	0.0748
191	0.1064	0.0035	0.1029
192	0.1398	0.0035	0.1364
193	0.3512	0.0035	0.3478
194	0.0892	0.0035	0.0857
195	0.0423	0.0028	0.0394
196	0.0326	0.0022	0.0304
197	0.0304	0.0020	0.0284
198	0.0265	0.0018	0.0247
199	0.0236	0.0016	0.0220
200	0.0215	0.0014	0.0200
201	0.0197	0.0013	0.0184
202	0.0183	0.0012	0.0171
203	0.0171	0.0011	0.0160
204	0.0161	0.0011	0.0151
205	0.0166	0.0011	0.0155
206	0.0159	0.0011	0.0148
207	0.0152	0.0010	0.0142
208	0.0146	0.0010	0.0136
209	0.0140	0.0009	0.0131
210	0.0135	0.0009	0.0126
211	0.0130	0.0009	0.0122
212	0.0126	0.0008	0.0118
213	0.0122	0.0008	0.0114
214	0.0119	0.0008	0.0111
215	0.0115	0.0008	0.0108
216	0.0112	0.0008	0.0105
217	0.0117	0.0008	0.0109

218	0.0114	0.0008	0.0107
219	0.0112	0.0008	0.0104
220	0.0109	0.0007	0.0102
221	0.0107	0.0007	0.0100
222	0.0105	0.0007	0.0098
223	0.0103	0.0007	0.0096
224	0.0101	0.0007	0.0094
225	0.0099	0.0007	0.0093
226	0.0097	0.0007	0.0091
227	0.0096	0.0006	0.0089
228	0.0094	0.0006	0.0088
229	0.0093	0.0006	0.0086
230	0.0091	0.0006	0.0085
231	0.0090	0.0006	0.0084
232	0.0088	0.0006	0.0083
233	0.0087	0.0006	0.0081
234	0.0086	0.0006	0.0080
235	0.0085	0.0006	0.0079
236	0.0084	0.0006	0.0078
237	0.0082	0.0006	0.0077
238	0.0081	0.0005	0.0076
239	0.0080	0.0005	0.0075
240	0.0079	0.0005	0.0074
241	0.0078	0.0005	0.0073
242	0.0077	0.0005	0.0072
243	0.0077	0.0005	0.0071
244	0.0076	0.0005	0.0071
245	0.0075	0.0005	0.0070
246	0.0074	0.0005	0.0069
247	0.0073	0.0005	0.0068
248	0.0072	0.0005	0.0068
249	0.0072	0.0005	0.0067
250	0.0071	0.0005	0.0066
251	0.0070	0.0005	0.0066
252	0.0070	0.0005	0.0065
253	0.0069	0.0005	0.0064
254	0.0068	0.0005	0.0064
255	0.0068	0.0005	0.0063
256	0.0067	0.0004	0.0062
257	0.0066	0.0004	0.0062
258	0.0066	0.0004	0.0061
259	0.0065	0.0004	0.0061
260	0.0065	0.0004	0.0060
261	0.0064	0.0004	0.0060
262	0.0064	0.0004	0.0059
263	0.0063	0.0004	0.0059
264	0.0062	0.0004	0.0058
265	0.0062	0.0004	0.0058
266	0.0061	0.0004	0.0057
267	0.0061	0.0004	0.0057

268	0.0061	0.0004	0.0056
269	0.0060	0.0004	0.0056
270	0.0060	0.0004	0.0056
271	0.0059	0.0004	0.0055
272	0.0059	0.0004	0.0055
273	0.0058	0.0004	0.0054
274	0.0058	0.0004	0.0054
275	0.0057	0.0004	0.0054
276	0.0057	0.0004	0.0053
277	0.0057	0.0004	0.0053
278	0.0056	0.0004	0.0052
279	0.0056	0.0004	0.0052
280	0.0056	0.0004	0.0052
281	0.0055	0.0004	0.0051
282	0.0055	0.0004	0.0051
283	0.0054	0.0004	0.0051
284	0.0054	0.0004	0.0050
285	0.0054	0.0004	0.0050
286	0.0053	0.0004	0.0050
287	0.0053	0.0004	0.0050
288	0.0053	0.0004	0.0049

Total soil rain loss = 0.21(In)
Total effective rainfall = 3.41(In)
Peak flow rate in flood hydrograph = 647.33(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	175.0	350.0	525.0	700.0
0+ 5	0.0031	0.45	Q	|	|	|	|	|
0+10	0.0215	2.68	Q	|	|	|	|	|
0+15	0.0784	8.25	Q	|	|	|	|	|
0+20	0.1623	12.20	Q	|	|	|	|	|
0+25	0.2610	14.33	Q	|	|	|	|	|
0+30	0.3696	15.77	Q	|	|	|	|	|
0+35	0.4854	16.81	Q	|	|	|	|	|
0+40	0.6068	17.62	VQ	|	|	|	|	|
0+45	0.7327	18.28	VQ	|	|	|	|	|
0+50	0.8621	18.79	VQ	|	|	|	|	|
0+55	0.9945	19.22	VQ	|	|	|	|	|
1+ 0	1.1294	19.60	VQ	|	|	|	|	|
1+ 5	1.2665	19.91	VQ	|	|	|	|	|
1+10	1.4055	20.18	VQ	|	|	|	|	|

1+15	1.5462	20.42	VQ	|	|	|	|
1+20	1.6882	20.62	VQ	|	|	|	|
1+25	1.8313	20.78	VQ	|	|	|	|
1+30	1.9754	20.92	VQ	|	|	|	|
1+35	2.1205	21.07	VQ	|	|	|	|
1+40	2.2667	21.23	VQ	|	|	|	|
1+45	2.4139	21.37	VQ	|	|	|	|
1+50	2.5619	21.48	|Q	|	|	|	|
1+55	2.7106	21.60	|Q	|	|	|	|
2+ 0	2.8599	21.67	|Q	|	|	|	|
2+ 5	3.0097	21.75	|Q	|	|	|	|
2+10	3.1599	21.82	|Q	|	|	|	|
2+15	3.3107	21.90	|Q	|	|	|	|
2+20	3.4620	21.97	|Q	|	|	|	|
2+25	3.6139	22.05	|Q	|	|	|	|
2+30	3.7662	22.12	|Q	|	|	|	|
2+35	3.9191	22.20	|Q	|	|	|	|
2+40	4.0726	22.28	|Q	|	|	|	|
2+45	4.2265	22.36	|Q	|	|	|	|
2+50	4.3811	22.44	|Q	|	|	|	|
2+55	4.5362	22.52	|Q	|	|	|	|
3+ 0	4.6918	22.60	|Q	|	|	|	|
3+ 5	4.8480	22.68	|Q	|	|	|	|
3+10	5.0048	22.76	|QV	|	|	|	|
3+15	5.1622	22.85	|QV	|	|	|	|
3+20	5.3201	22.93	|QV	|	|	|	|
3+25	5.4786	23.02	|QV	|	|	|	|
3+30	5.6377	23.10	|QV	|	|	|	|
3+35	5.7975	23.19	|QV	|	|	|	|
3+40	5.9578	23.28	|QV	|	|	|	|
3+45	6.1188	23.37	|QV	|	|	|	|
3+50	6.2803	23.46	|QV	|	|	|	|
3+55	6.4425	23.55	|QV	|	|	|	|
4+ 0	6.6053	23.64	|QV	|	|	|	|
4+ 5	6.7688	23.74	|QV	|	|	|	|
4+10	6.9329	23.83	|QV	|	|	|	|
4+15	7.0977	23.93	|QV	|	|	|	|
4+20	7.2631	24.02	|QV	|	|	|	|
4+25	7.4292	24.12	|Q V	|	|	|	|
4+30	7.5960	24.21	|Q V	|	|	|	|
4+35	7.7634	24.32	|Q V	|	|	|	|
4+40	7.9316	24.41	|Q V	|	|	|	|
4+45	8.1004	24.52	|Q V	|	|	|	|
4+50	8.2700	24.62	|Q V	|	|	|	|
4+55	8.4403	24.72	|Q V	|	|	|	|
5+ 0	8.6112	24.83	|Q V	|	|	|	|
5+ 5	8.7830	24.93	|Q V	|	|	|	|
5+10	8.9554	25.04	|Q V	|	|	|	|
5+15	9.1286	25.15	|Q V	|	|	|	|
5+20	9.3026	25.26	|Q V	|	|	|	|

5+25	9.4773	25.37	|Q V	|	|	|	|
5+30	9.6528	25.48	|Q V	|	|	|	|
5+35	9.8291	25.60	|Q V	|	|	|	|
5+40	10.0062	25.71	|Q V	|	|	|	|
5+45	10.1841	25.83	|Q V	|	|	|	|
5+50	10.3628	25.95	|Q V	|	|	|	|
5+55	10.5423	26.07	|Q V	|	|	|	|
6+ 0	10.7227	26.19	|Q V	|	|	|	|
6+ 5	10.9039	26.31	|Q V	|	|	|	|
6+10	11.0860	26.44	|Q V	|	|	|	|
6+15	11.2689	26.56	|Q V	|	|	|	|
6+20	11.4527	26.69	|Q V	|	|	|	|
6+25	11.6374	26.82	|Q V	|	|	|	|
6+30	11.8230	26.95	|Q V	|	|	|	|
6+35	12.0096	27.08	|Q V	|	|	|	|
6+40	12.1970	27.22	|Q V	|	|	|	|
6+45	12.3854	27.36	|Q V	|	|	|	|
6+50	12.5748	27.49	|Q V	|	|	|	|
6+55	12.7651	27.63	|Q V	|	|	|	|
7+ 0	12.9564	27.77	|Q V	|	|	|	|
7+ 5	13.1487	27.92	|Q V	|	|	|	|
7+10	13.3419	28.06	|Q V	|	|	|	|
7+15	13.5363	28.22	|Q V	|	|	|	|
7+20	13.7316	28.36	|Q V	|	|	|	|
7+25	13.9280	28.52	|Q V	|	|	|	|
7+30	14.1255	28.67	|Q V	|	|	|	|
7+35	14.3240	28.83	|Q V	|	|	|	|
7+40	14.5237	28.99	|Q V	|	|	|	|
7+45	14.7245	29.15	|Q V	|	|	|	|
7+50	14.9263	29.31	|Q V	|	|	|	|
7+55	15.1294	29.49	|Q V	|	|	|	|
8+ 0	15.3336	29.65	|Q V	|	|	|	|
8+ 5	15.5391	29.83	|Q V	|	|	|	|
8+10	15.7457	30.00	|Q V	|	|	|	|
8+15	15.9535	30.18	|Q V	|	|	|	|
8+20	16.1626	30.36	|Q V	|	|	|	|
8+25	16.3730	30.55	|Q V	|	|	|	|
8+30	16.5846	30.73	|Q V	|	|	|	|
8+35	16.7976	30.92	|Q V	|	|	|	|
8+40	17.0118	31.11	|Q V	|	|	|	|
8+45	17.2275	31.31	|Q V	|	|	|	|
8+50	17.4445	31.51	|Q V	|	|	|	|
8+55	17.6629	31.72	|Q V	|	|	|	|
9+ 0	17.8828	31.92	|Q V	|	|	|	|
9+ 5	18.1041	32.14	|Q V	|	|	|	|
9+10	18.3269	32.35	|Q V	|	|	|	|
9+15	18.5512	32.57	|Q V	|	|	|	|
9+20	18.7770	32.79	|Q V	|	|	|	|
9+25	19.0044	33.02	|Q V	|	|	|	|
9+30	19.2334	33.25	|Q V	|	|	|	|

9+35	19.4640	33.49	Q V				
9+40	19.6962	33.72	Q V				
9+45	19.9302	33.97	Q V				
9+50	20.1659	34.22	Q V				
9+55	20.4033	34.48	Q V				
10+ 0	20.6425	34.73	Q V				
10+ 5	20.8836	35.00	Q V				
10+10	21.1265	35.27	Q V				
10+15	21.3714	35.55	Q V				
10+20	21.6181	35.83	Q V				
10+25	21.8670	36.13	Q V				
10+30	22.1178	36.42	Q V				
10+35	22.3707	36.73	Q V				
10+40	22.6257	37.03	Q V				
10+45	22.8830	37.35	Q V				
10+50	23.1424	37.67	Q V				
10+55	23.4042	38.01	Q V				
11+ 0	23.6683	38.34	Q V				
11+ 5	23.9348	38.70	Q V				
11+10	24.2037	39.05	Q V				
11+15	24.4752	39.42	Q V				
11+20	24.7493	39.79	Q V				
11+25	25.0261	40.19	Q V				
11+30	25.3055	40.58	Q V				
11+35	25.5878	40.99	Q V				
11+40	25.8729	41.40	Q V				
11+45	26.1611	41.84	Q V				
11+50	26.4522	42.27	Q V				
11+55	26.7466	42.74	Q V				
12+ 0	27.0441	43.20	Q V				
12+ 5	27.3446	43.63	Q V				
12+10	27.6462	43.79	Q V				
12+15	27.9459	43.51	Q V				
12+20	28.2451	43.45	Q V				
12+25	28.5461	43.70	Q V				
12+30	28.8495	44.05	Q V				
12+35	29.1559	44.49	Q V				
12+40	29.4657	44.97	Q V				
12+45	29.7791	45.52	Q V				
12+50	30.0965	46.08	Q V				
12+55	30.4182	46.71	Q V				
13+ 0	30.7442	47.34	Q V				
13+ 5	31.0751	48.04	Q V				
13+10	31.4108	48.75	Q V				
13+15	31.7519	49.52	Q V				
13+20	32.0984	50.31	Q V				
13+25	32.4507	51.17	Q V				
13+30	32.8091	52.03	Q V				
13+35	33.1739	52.98	Q V				
13+40	33.5454	53.93	Q V				

13+45	33.9240	54.98	Q	V			
13+50	34.3099	56.04	Q	V			
13+55	34.7039	57.20	Q	V			
14+ 0	35.1060	58.39	Q	V			
14+ 5	35.5164	59.59	Q	V			
14+10	35.9319	60.34	Q	V			
14+15	36.3477	60.36	Q	V			
14+20	36.7666	60.83	Q	V			
14+25	37.1932	61.94	Q	V			
14+30	37.6289	63.27	Q	V			
14+35	38.0760	64.91	Q	V			
14+40	38.5352	66.68	Q	V			
14+45	39.0087	68.75	Q	V			
14+50	39.4973	70.95	Q	V			
14+55	40.0036	73.51	Q	V			
15+ 0	40.5285	76.23	Q	V			
15+ 5	41.0754	79.41	Q	V			
15+10	41.6458	82.82	Q	V			
15+15	42.2441	86.87	Q	V			
15+20	42.8728	91.28	Q	V			
15+25	43.5363	96.34	Q	V			
15+30	44.2310	100.87	Q	V			
15+35	44.9519	104.68	Q	V			
15+40	45.7136	110.60	Q	V			
15+45	46.5570	122.46	Q	V			
15+50	47.5622	145.94	Q	V			
15+55	48.8918	193.06	Q	V			
16+ 0	50.5875	246.21	Q	V			
16+ 5	52.8936	334.85	Q	V			
16+10	56.2095	481.48	Q	V			
16+15	60.6677	647.33	Q	V			
16+20	64.2961	526.84	Q	V			
16+25	66.8575	371.92	Q	V			
16+30	68.8361	287.29	Q	V			
16+35	70.4649	236.49	Q	V			
16+40	71.8541	201.72	Q	V			
16+45	73.0617	175.35	Q	V			
16+50	74.1100	152.21	Q	V			
16+55	75.0449	135.75	Q	V			
17+ 0	75.8856	122.06	Q	V			
17+ 5	76.6422	109.86	Q	V			
17+10	77.3333	100.35	Q	V			
17+15	77.9733	92.94	Q	V			
17+20	78.5637	85.73	Q	V			
17+25	79.1091	79.19	Q	V			
17+30	79.6224	74.53	Q	V			
17+35	80.1163	71.71	Q	V			
17+40	80.5867	68.30	Q	V			
17+45	81.0285	64.16	Q	V			
17+50	81.4384	59.51	Q	V			

17+55	81.8256	56.22	| Q	|	|	| V	|
18+ 0	82.1803	51.51	| Q	|	|	| V	|
18+ 5	82.5205	49.39	| Q	|	|	| V	|
18+10	82.8514	48.05	| Q	|	|	| V	|
18+15	83.1778	47.39	| Q	|	|	| V	|
18+20	83.4987	46.60	| Q	|	|	| V	|
18+25	83.8130	45.64	| Q	|	|	| V	|
18+30	84.1208	44.68	| Q	|	|	| V	|
18+35	84.4221	43.75	| Q	|	|	| V	|
18+40	84.7173	42.86	| Q	|	|	| V	|
18+45	85.0066	42.01	| Q	|	|	| V	|
18+50	85.2903	41.19	| Q	|	|	| V	|
18+55	85.5685	40.41	| Q	|	|	| V	|
19+ 0	85.8416	39.65	| Q	|	|	| V	|
19+ 5	86.1097	38.93	| Q	|	|	| V	|
19+10	86.3731	38.24	| Q	|	|	| V	|
19+15	86.6320	37.58	| Q	|	|	| V	|
19+20	86.8865	36.95	| Q	|	|	| V	|
19+25	87.1368	36.35	| Q	|	|	| V	|
19+30	87.3831	35.77	| Q	|	|	| V	|
19+35	87.6256	35.21	| Q	|	|	| V	|
19+40	87.8645	34.68	|Q	|	|	| V	|
19+45	88.0999	34.18	|Q	|	|	| V	|
19+50	88.3319	33.68	|Q	|	|	| V	|
19+55	88.5606	33.21	|Q	|	|	| V	|
20+ 0	88.7861	32.75	|Q	|	|	| V	|
20+ 5	89.0086	32.31	|Q	|	|	| V	|
20+10	89.2282	31.88	|Q	|	|	| V	|
20+15	89.4449	31.47	|Q	|	|	| V	|
20+20	89.6589	31.07	|Q	|	|	| V	|
20+25	89.8702	30.68	|Q	|	|	| V	|
20+30	90.0790	30.31	|Q	|	|	| V	|
20+35	90.2853	29.95	|Q	|	|	| V	|
20+40	90.4892	29.61	|Q	|	|	| V	|
20+45	90.6907	29.27	|Q	|	|	| V	|
20+50	90.8901	28.94	|Q	|	|	| V	|
20+55	91.0872	28.62	|Q	|	|	| V	|
21+ 0	91.2822	28.32	|Q	|	|	| V	|
21+ 5	91.4752	28.02	|Q	|	|	| V	|
21+10	91.6662	27.73	|Q	|	|	| V	|
21+15	91.8552	27.45	|Q	|	|	| V	|
21+20	92.0423	27.17	|Q	|	|	| V	|
21+25	92.2276	26.90	|Q	|	|	| V	|
21+30	92.4111	26.64	|Q	|	|	| V	|
21+35	92.5929	26.39	|Q	|	|	| V	|
21+40	92.7729	26.14	|Q	|	|	| V	|
21+45	92.9513	25.90	|Q	|	|	| V	|
21+50	93.1281	25.67	|Q	|	|	| V	|
21+55	93.3033	25.44	|Q	|	|	| V	|
22+ 0	93.4770	25.22	|Q	|	|	| V	|

22+ 5	93.6491	25.00	Q			V
22+10	93.8198	24.79	Q			V
22+15	93.9891	24.58	Q			V
22+20	94.1570	24.37	Q			V
22+25	94.3234	24.17	Q			V
22+30	94.4886	23.98	Q			V
22+35	94.6524	23.79	Q			V
22+40	94.8150	23.60	Q			V
22+45	94.9763	23.42	Q			V
22+50	95.1364	23.24	Q			V
22+55	95.2952	23.07	Q			V
23+ 0	95.4529	22.90	Q			V
23+ 5	95.6094	22.73	Q			V
23+10	95.7648	22.56	Q			V
23+15	95.9191	22.40	Q			V
23+20	96.0723	22.24	Q			V
23+25	96.2244	22.09	Q			V
23+30	96.3755	21.94	Q			V
23+35	96.5255	21.79	Q			V
23+40	96.6746	21.64	Q			V
23+45	96.8226	21.49	Q			V
23+50	96.9696	21.35	Q			V
23+55	97.1158	21.21	Q			V
24+ 0	97.2609	21.08	Q			V

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

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Study date 09/12/22

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

Program License Serial Number 6385

Quarry Site
100-yr existing
offsite area A2

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		
80.67	1	1.06
Rainfall data for year 100		
80.67	6	2.03
Rainfall data for year 100		
80.67	24	3.62

++

******** 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)
91.0	98.2	80.67	1.000	0.036	1.000	0.036

Area-averaged adjusted loss rate Fm (In/Hr) = 0.036

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
80.67	1.000	91.0	98.2	0.18	0.942

Area-averaged catchment yield fraction, Y = 0.942
Area-averaged low loss fraction, Yb = 0.058
++
Watercourse length = 4782.00(Ft.)
Length from concentration point to centroid = 2290.00(Ft.)
Elevation difference along watercourse = 90.00(Ft.)
Mannings friction factor along watercourse = 0.030
Watershed area = 80.67(Ac.)
Catchment Lag time = 0.211 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 39.5530
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.036(In/Hr)
Average low loss rate fraction (Yb) = 0.058 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.357(In)
Computed peak 30-minute rainfall = 0.849(In)
Specified peak 1-hour rainfall = 1.060(In)
Computed peak 3-hour rainfall = 1.550(In)
Specified peak 6-hour rainfall = 2.030(In)
Specified peak 24-hour rainfall = 3.620(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 80.67(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.356(In)
30-minute factor = 0.996 Adjusted rainfall = 0.846(In)
1-hour factor = 0.996 Adjusted rainfall = 1.056(In)
3-hour factor = 1.000 Adjusted rainfall = 1.549(In)
6-hour factor = 1.000 Adjusted rainfall = 2.029(In)
24-hour factor = 1.000 Adjusted rainfall = 3.620(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 = 975.60 (CFS))	
1	2.699	26.335
2	18.193	151.158
3	48.499	295.666
4	65.175	162.686
5	74.421	90.204
6	80.567	59.967
7	84.956	42.817
8	88.364	33.245
9	90.820	23.964
10	92.815	19.463
11	94.418	15.639
12	95.704	12.546
13	96.734	10.054
14	97.510	7.567
15	98.035	5.124
16	98.458	4.125
17	98.931	4.619
18	99.396	4.529
19	99.698	2.952
20	100.000	2.943

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3557	0.3557
2	0.4972	0.1416
3	0.6049	0.1077
4	0.6952	0.0903
5	0.7744	0.0792
6	0.8458	0.0714
7	0.8886	0.0428
8	0.9274	0.0388
9	0.9631	0.0356
10	0.9961	0.0330
11	1.0270	0.0309
12	1.0560	0.0290
13	1.0859	0.0299
14	1.1143	0.0284
15	1.1415	0.0271
16	1.1675	0.0260
17	1.1924	0.0250
18	1.2165	0.0240
19	1.2396	0.0232

20	1.2620	0.0224
21	1.2837	0.0217
22	1.3047	0.0210
23	1.3251	0.0204
24	1.3449	0.0198
25	1.3642	0.0193
26	1.3830	0.0188
27	1.4013	0.0183
28	1.4192	0.0179
29	1.4367	0.0175
30	1.4538	0.0171
31	1.4705	0.0167
32	1.4869	0.0164
33	1.5029	0.0160
34	1.5187	0.0157
35	1.5341	0.0154
36	1.5493	0.0152
37	1.5659	0.0166
38	1.5822	0.0164
39	1.5983	0.0161
40	1.6142	0.0158
41	1.6298	0.0156
42	1.6451	0.0154
43	1.6603	0.0151
44	1.6752	0.0149
45	1.6900	0.0147
46	1.7045	0.0145
47	1.7188	0.0143
48	1.7330	0.0142
49	1.7469	0.0140
50	1.7608	0.0138
51	1.7744	0.0136
52	1.7879	0.0135
53	1.8012	0.0133
54	1.8143	0.0132
55	1.8274	0.0130
56	1.8402	0.0129
57	1.8530	0.0127
58	1.8656	0.0126
59	1.8780	0.0125
60	1.8904	0.0123
61	1.9026	0.0122
62	1.9147	0.0121
63	1.9266	0.0120
64	1.9385	0.0119
65	1.9502	0.0117
66	1.9619	0.0116
67	1.9734	0.0115
68	1.9848	0.0114
69	1.9961	0.0113

70	2.0073	0.0112
71	2.0185	0.0111
72	2.0295	0.0110
73	2.0412	0.0117
74	2.0528	0.0116
75	2.0644	0.0115
76	2.0758	0.0114
77	2.0872	0.0114
78	2.0984	0.0113
79	2.1096	0.0112
80	2.1207	0.0111
81	2.1317	0.0110
82	2.1427	0.0109
83	2.1536	0.0109
84	2.1644	0.0108
85	2.1751	0.0107
86	2.1857	0.0106
87	2.1963	0.0106
88	2.2068	0.0105
89	2.2172	0.0104
90	2.2276	0.0104
91	2.2379	0.0103
92	2.2481	0.0102
93	2.2583	0.0102
94	2.2684	0.0101
95	2.2784	0.0100
96	2.2884	0.0100
97	2.2983	0.0099
98	2.3082	0.0099
99	2.3180	0.0098
100	2.3277	0.0097
101	2.3374	0.0097
102	2.3470	0.0096
103	2.3566	0.0096
104	2.3661	0.0095
105	2.3756	0.0095
106	2.3850	0.0094
107	2.3944	0.0094
108	2.4037	0.0093
109	2.4130	0.0093
110	2.4222	0.0092
111	2.4313	0.0092
112	2.4405	0.0091
113	2.4495	0.0091
114	2.4586	0.0090
115	2.4675	0.0090
116	2.4765	0.0089
117	2.4854	0.0089
118	2.4942	0.0088
119	2.5030	0.0088

120	2.5118	0.0088
121	2.5205	0.0087
122	2.5291	0.0087
123	2.5378	0.0086
124	2.5464	0.0086
125	2.5549	0.0086
126	2.5634	0.0085
127	2.5719	0.0085
128	2.5803	0.0084
129	2.5887	0.0084
130	2.5971	0.0084
131	2.6054	0.0083
132	2.6137	0.0083
133	2.6219	0.0082
134	2.6301	0.0082
135	2.6383	0.0082
136	2.6465	0.0081
137	2.6546	0.0081
138	2.6626	0.0081
139	2.6707	0.0080
140	2.6787	0.0080
141	2.6866	0.0080
142	2.6946	0.0079
143	2.7025	0.0079
144	2.7104	0.0079
145	2.7182	0.0078
146	2.7260	0.0078
147	2.7338	0.0078
148	2.7415	0.0077
149	2.7492	0.0077
150	2.7569	0.0077
151	2.7646	0.0077
152	2.7722	0.0076
153	2.7798	0.0076
154	2.7874	0.0076
155	2.7949	0.0075
156	2.8024	0.0075
157	2.8099	0.0075
158	2.8174	0.0075
159	2.8248	0.0074
160	2.8322	0.0074
161	2.8396	0.0074
162	2.8469	0.0073
163	2.8542	0.0073
164	2.8615	0.0073
165	2.8688	0.0073
166	2.8760	0.0072
167	2.8833	0.0072
168	2.8905	0.0072
169	2.8976	0.0072

170	2.9048	0.0071
171	2.9119	0.0071
172	2.9190	0.0071
173	2.9261	0.0071
174	2.9331	0.0070
175	2.9401	0.0070
176	2.9471	0.0070
177	2.9541	0.0070
178	2.9611	0.0070
179	2.9680	0.0069
180	2.9749	0.0069
181	2.9818	0.0069
182	2.9887	0.0069
183	2.9955	0.0068
184	3.0023	0.0068
185	3.0091	0.0068
186	3.0159	0.0068
187	3.0226	0.0068
188	3.0294	0.0067
189	3.0361	0.0067
190	3.0428	0.0067
191	3.0495	0.0067
192	3.0561	0.0067
193	3.0628	0.0066
194	3.0694	0.0066
195	3.0760	0.0066
196	3.0825	0.0066
197	3.0891	0.0066
198	3.0956	0.0065
199	3.1021	0.0065
200	3.1086	0.0065
201	3.1151	0.0065
202	3.1216	0.0065
203	3.1280	0.0064
204	3.1344	0.0064
205	3.1408	0.0064
206	3.1472	0.0064
207	3.1536	0.0064
208	3.1599	0.0063
209	3.1663	0.0063
210	3.1726	0.0063
211	3.1789	0.0063
212	3.1852	0.0063
213	3.1914	0.0063
214	3.1977	0.0062
215	3.2039	0.0062
216	3.2101	0.0062
217	3.2163	0.0062
218	3.2225	0.0062
219	3.2286	0.0062

220	3.2348	0.0061
221	3.2409	0.0061
222	3.2470	0.0061
223	3.2531	0.0061
224	3.2592	0.0061
225	3.2653	0.0061
226	3.2713	0.0060
227	3.2774	0.0060
228	3.2834	0.0060
229	3.2894	0.0060
230	3.2954	0.0060
231	3.3013	0.0060
232	3.3073	0.0060
233	3.3132	0.0059
234	3.3192	0.0059
235	3.3251	0.0059
236	3.3310	0.0059
237	3.3369	0.0059
238	3.3427	0.0059
239	3.3486	0.0059
240	3.3544	0.0058
241	3.3602	0.0058
242	3.3661	0.0058
243	3.3719	0.0058
244	3.3776	0.0058
245	3.3834	0.0058
246	3.3892	0.0058
247	3.3949	0.0057
248	3.4006	0.0057
249	3.4064	0.0057
250	3.4121	0.0057
251	3.4178	0.0057
252	3.4234	0.0057
253	3.4291	0.0057
254	3.4347	0.0057
255	3.4404	0.0056
256	3.4460	0.0056
257	3.4516	0.0056
258	3.4572	0.0056
259	3.4628	0.0056
260	3.4684	0.0056
261	3.4739	0.0056
262	3.4795	0.0055
263	3.4850	0.0055
264	3.4905	0.0055
265	3.4961	0.0055
266	3.5016	0.0055
267	3.5070	0.0055
268	3.5125	0.0055
269	3.5180	0.0055

270	3.5234	0.0055
271	3.5289	0.0054
272	3.5343	0.0054
273	3.5397	0.0054
274	3.5451	0.0054
275	3.5505	0.0054
276	3.5559	0.0054
277	3.5613	0.0054
278	3.5666	0.0054
279	3.5720	0.0053
280	3.5773	0.0053
281	3.5827	0.0053
282	3.5880	0.0053
283	3.5933	0.0053
284	3.5986	0.0053
285	3.6039	0.0053
286	3.6091	0.0053
287	3.6144	0.0053
288	3.6196	0.0053

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0053	0.0003	0.0049
2	0.0053	0.0003	0.0050
3	0.0053	0.0003	0.0050
4	0.0053	0.0003	0.0050
5	0.0053	0.0003	0.0050
6	0.0053	0.0003	0.0050
7	0.0053	0.0003	0.0050
8	0.0054	0.0003	0.0050
9	0.0054	0.0003	0.0051
10	0.0054	0.0003	0.0051
11	0.0054	0.0003	0.0051
12	0.0054	0.0003	0.0051
13	0.0055	0.0003	0.0051
14	0.0055	0.0003	0.0051
15	0.0055	0.0003	0.0052
16	0.0055	0.0003	0.0052
17	0.0055	0.0003	0.0052
18	0.0055	0.0003	0.0052
19	0.0056	0.0003	0.0052
20	0.0056	0.0003	0.0052
21	0.0056	0.0003	0.0053
22	0.0056	0.0003	0.0053
23	0.0056	0.0003	0.0053
24	0.0057	0.0003	0.0053
25	0.0057	0.0003	0.0053
26	0.0057	0.0003	0.0054

27	0.0057	0.0003	0.0054
28	0.0057	0.0003	0.0054
29	0.0058	0.0003	0.0054
30	0.0058	0.0003	0.0054
31	0.0058	0.0003	0.0055
32	0.0058	0.0003	0.0055
33	0.0058	0.0003	0.0055
34	0.0059	0.0003	0.0055
35	0.0059	0.0003	0.0055
36	0.0059	0.0003	0.0056
37	0.0059	0.0003	0.0056
38	0.0059	0.0003	0.0056
39	0.0060	0.0003	0.0056
40	0.0060	0.0003	0.0056
41	0.0060	0.0004	0.0057
42	0.0060	0.0004	0.0057
43	0.0061	0.0004	0.0057
44	0.0061	0.0004	0.0057
45	0.0061	0.0004	0.0058
46	0.0061	0.0004	0.0058
47	0.0062	0.0004	0.0058
48	0.0062	0.0004	0.0058
49	0.0062	0.0004	0.0058
50	0.0062	0.0004	0.0059
51	0.0063	0.0004	0.0059
52	0.0063	0.0004	0.0059
53	0.0063	0.0004	0.0059
54	0.0063	0.0004	0.0060
55	0.0064	0.0004	0.0060
56	0.0064	0.0004	0.0060
57	0.0064	0.0004	0.0060
58	0.0064	0.0004	0.0061
59	0.0065	0.0004	0.0061
60	0.0065	0.0004	0.0061
61	0.0065	0.0004	0.0062
62	0.0066	0.0004	0.0062
63	0.0066	0.0004	0.0062
64	0.0066	0.0004	0.0062
65	0.0067	0.0004	0.0063
66	0.0067	0.0004	0.0063
67	0.0067	0.0004	0.0063
68	0.0067	0.0004	0.0063
69	0.0068	0.0004	0.0064
70	0.0068	0.0004	0.0064
71	0.0068	0.0004	0.0064
72	0.0069	0.0004	0.0065
73	0.0069	0.0004	0.0065
74	0.0069	0.0004	0.0065
75	0.0070	0.0004	0.0066
76	0.0070	0.0004	0.0066

77	0.0070	0.0004	0.0066
78	0.0071	0.0004	0.0067
79	0.0071	0.0004	0.0067
80	0.0071	0.0004	0.0067
81	0.0072	0.0004	0.0068
82	0.0072	0.0004	0.0068
83	0.0073	0.0004	0.0068
84	0.0073	0.0004	0.0069
85	0.0073	0.0004	0.0069
86	0.0074	0.0004	0.0069
87	0.0074	0.0004	0.0070
88	0.0075	0.0004	0.0070
89	0.0075	0.0004	0.0071
90	0.0075	0.0004	0.0071
91	0.0076	0.0004	0.0072
92	0.0076	0.0004	0.0072
93	0.0077	0.0004	0.0072
94	0.0077	0.0004	0.0073
95	0.0078	0.0005	0.0073
96	0.0078	0.0005	0.0074
97	0.0079	0.0005	0.0074
98	0.0079	0.0005	0.0074
99	0.0080	0.0005	0.0075
100	0.0080	0.0005	0.0075
101	0.0081	0.0005	0.0076
102	0.0081	0.0005	0.0076
103	0.0082	0.0005	0.0077
104	0.0082	0.0005	0.0077
105	0.0083	0.0005	0.0078
106	0.0083	0.0005	0.0078
107	0.0084	0.0005	0.0079
108	0.0084	0.0005	0.0079
109	0.0085	0.0005	0.0080
110	0.0086	0.0005	0.0081
111	0.0086	0.0005	0.0081
112	0.0087	0.0005	0.0082
113	0.0088	0.0005	0.0082
114	0.0088	0.0005	0.0083
115	0.0089	0.0005	0.0084
116	0.0089	0.0005	0.0084
117	0.0090	0.0005	0.0085
118	0.0091	0.0005	0.0085
119	0.0092	0.0005	0.0086
120	0.0092	0.0005	0.0087
121	0.0093	0.0005	0.0088
122	0.0094	0.0005	0.0088
123	0.0095	0.0006	0.0089
124	0.0095	0.0006	0.0090
125	0.0096	0.0006	0.0091
126	0.0097	0.0006	0.0091

127	0.0098	0.0006	0.0092
128	0.0099	0.0006	0.0093
129	0.0100	0.0006	0.0094
130	0.0100	0.0006	0.0095
131	0.0102	0.0006	0.0096
132	0.0102	0.0006	0.0096
133	0.0104	0.0006	0.0098
134	0.0104	0.0006	0.0098
135	0.0106	0.0006	0.0100
136	0.0106	0.0006	0.0100
137	0.0108	0.0006	0.0102
138	0.0109	0.0006	0.0102
139	0.0110	0.0006	0.0104
140	0.0111	0.0006	0.0105
141	0.0113	0.0007	0.0106
142	0.0114	0.0007	0.0107
143	0.0115	0.0007	0.0109
144	0.0116	0.0007	0.0109
145	0.0110	0.0006	0.0104
146	0.0111	0.0006	0.0105
147	0.0113	0.0007	0.0107
148	0.0114	0.0007	0.0108
149	0.0116	0.0007	0.0110
150	0.0117	0.0007	0.0111
151	0.0120	0.0007	0.0113
152	0.0121	0.0007	0.0114
153	0.0123	0.0007	0.0116
154	0.0125	0.0007	0.0117
155	0.0127	0.0007	0.0120
156	0.0129	0.0008	0.0121
157	0.0132	0.0008	0.0124
158	0.0133	0.0008	0.0125
159	0.0136	0.0008	0.0128
160	0.0138	0.0008	0.0130
161	0.0142	0.0008	0.0133
162	0.0143	0.0008	0.0135
163	0.0147	0.0009	0.0139
164	0.0149	0.0009	0.0141
165	0.0154	0.0009	0.0145
166	0.0156	0.0009	0.0147
167	0.0161	0.0009	0.0152
168	0.0164	0.0010	0.0154
169	0.0152	0.0009	0.0143
170	0.0154	0.0009	0.0145
171	0.0160	0.0009	0.0151
172	0.0164	0.0010	0.0154
173	0.0171	0.0010	0.0161
174	0.0175	0.0010	0.0165
175	0.0183	0.0011	0.0173
176	0.0188	0.0011	0.0177

177	0.0198	0.0012	0.0187
178	0.0204	0.0012	0.0192
179	0.0217	0.0013	0.0204
180	0.0224	0.0013	0.0211
181	0.0240	0.0014	0.0226
182	0.0250	0.0015	0.0235
183	0.0271	0.0016	0.0256
184	0.0284	0.0017	0.0268
185	0.0290	0.0017	0.0273
186	0.0309	0.0018	0.0291
187	0.0356	0.0021	0.0336
188	0.0388	0.0023	0.0366
189	0.0714	0.0030	0.0684
190	0.0792	0.0030	0.0762
191	0.1077	0.0030	0.1047
192	0.1416	0.0030	0.1386
193	0.3557	0.0030	0.3527
194	0.0903	0.0030	0.0873
195	0.0428	0.0025	0.0403
196	0.0330	0.0019	0.0311
197	0.0299	0.0017	0.0282
198	0.0260	0.0015	0.0245
199	0.0232	0.0014	0.0218
200	0.0210	0.0012	0.0198
201	0.0193	0.0011	0.0182
202	0.0179	0.0010	0.0169
203	0.0167	0.0010	0.0158
204	0.0157	0.0009	0.0148
205	0.0166	0.0010	0.0157
206	0.0158	0.0009	0.0149
207	0.0151	0.0009	0.0143
208	0.0145	0.0008	0.0137
209	0.0140	0.0008	0.0132
210	0.0135	0.0008	0.0127
211	0.0130	0.0008	0.0123
212	0.0126	0.0007	0.0119
213	0.0122	0.0007	0.0115
214	0.0119	0.0007	0.0112
215	0.0115	0.0007	0.0109
216	0.0112	0.0007	0.0106
217	0.0117	0.0007	0.0110
218	0.0114	0.0007	0.0108
219	0.0112	0.0007	0.0105
220	0.0109	0.0006	0.0103
221	0.0107	0.0006	0.0101
222	0.0105	0.0006	0.0099
223	0.0103	0.0006	0.0097
224	0.0101	0.0006	0.0095
225	0.0099	0.0006	0.0093
226	0.0097	0.0006	0.0092

227	0.0096	0.0006	0.0090
228	0.0094	0.0005	0.0089
229	0.0093	0.0005	0.0087
230	0.0091	0.0005	0.0086
231	0.0090	0.0005	0.0085
232	0.0088	0.0005	0.0083
233	0.0087	0.0005	0.0082
234	0.0086	0.0005	0.0081
235	0.0085	0.0005	0.0080
236	0.0084	0.0005	0.0079
237	0.0082	0.0005	0.0078
238	0.0081	0.0005	0.0077
239	0.0080	0.0005	0.0076
240	0.0079	0.0005	0.0075
241	0.0078	0.0005	0.0074
242	0.0077	0.0005	0.0073
243	0.0077	0.0004	0.0072
244	0.0076	0.0004	0.0071
245	0.0075	0.0004	0.0070
246	0.0074	0.0004	0.0070
247	0.0073	0.0004	0.0069
248	0.0072	0.0004	0.0068
249	0.0072	0.0004	0.0068
250	0.0071	0.0004	0.0067
251	0.0070	0.0004	0.0066
252	0.0070	0.0004	0.0065
253	0.0069	0.0004	0.0065
254	0.0068	0.0004	0.0064
255	0.0068	0.0004	0.0064
256	0.0067	0.0004	0.0063
257	0.0066	0.0004	0.0062
258	0.0066	0.0004	0.0062
259	0.0065	0.0004	0.0061
260	0.0065	0.0004	0.0061
261	0.0064	0.0004	0.0060
262	0.0063	0.0004	0.0060
263	0.0063	0.0004	0.0059
264	0.0062	0.0004	0.0059
265	0.0062	0.0004	0.0058
266	0.0061	0.0004	0.0058
267	0.0061	0.0004	0.0057
268	0.0060	0.0004	0.0057
269	0.0060	0.0003	0.0057
270	0.0060	0.0003	0.0056
271	0.0059	0.0003	0.0056
272	0.0059	0.0003	0.0055
273	0.0058	0.0003	0.0055
274	0.0058	0.0003	0.0054
275	0.0057	0.0003	0.0054
276	0.0057	0.0003	0.0054

277	0.0057	0.0003	0.0053
278	0.0056	0.0003	0.0053
279	0.0056	0.0003	0.0053
280	0.0055	0.0003	0.0052
281	0.0055	0.0003	0.0052
282	0.0055	0.0003	0.0052
283	0.0054	0.0003	0.0051
284	0.0054	0.0003	0.0051
285	0.0054	0.0003	0.0051
286	0.0053	0.0003	0.0050
287	0.0053	0.0003	0.0050
288	0.0053	0.0003	0.0050

Total soil rain loss = 0.18(In)
Total effective rainfall = 3.44(In)
Peak flow rate in flood hydrograph = 162.30(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

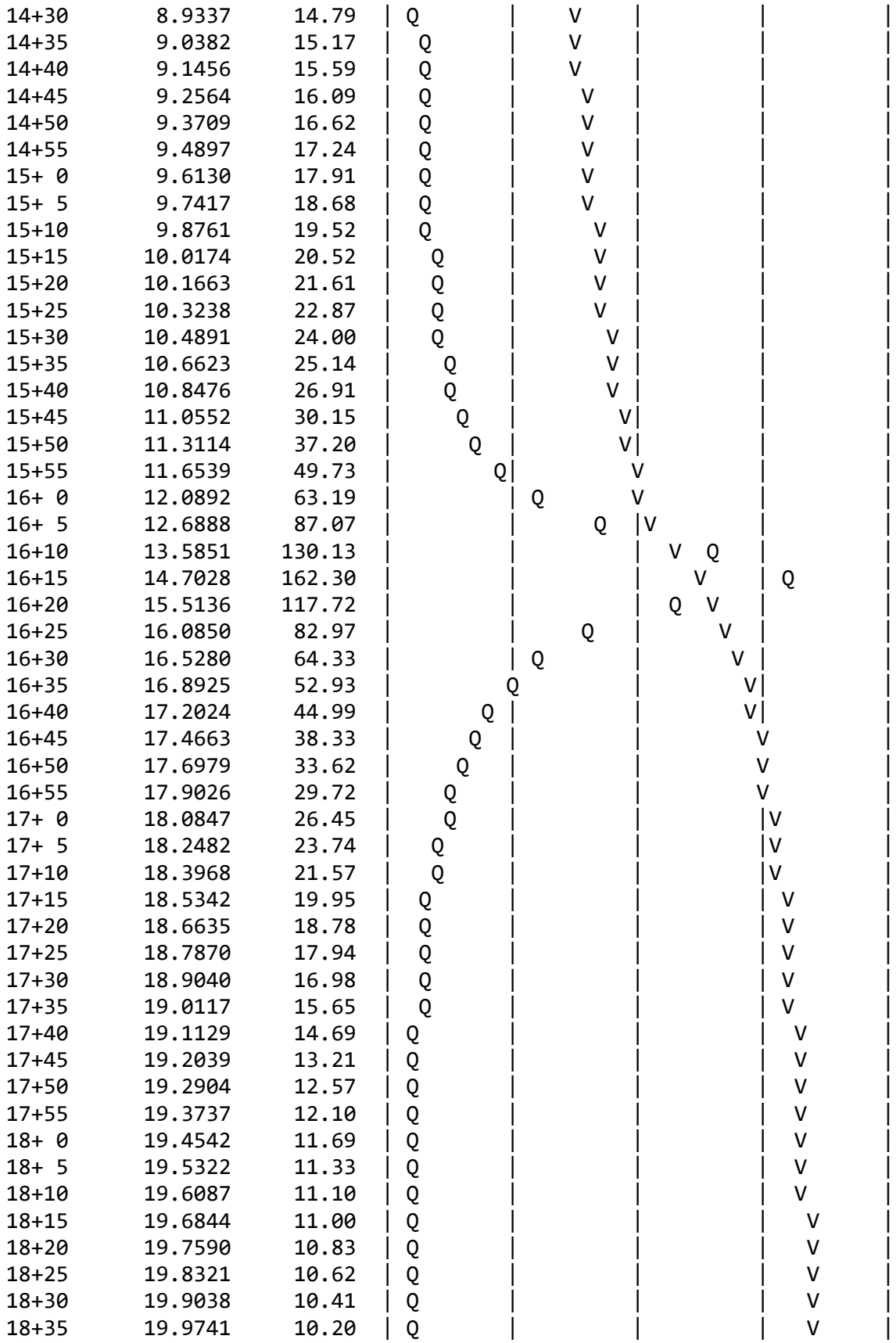
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0009	0.13	Q	|	|	|	|
0+10	0.0069	0.88	Q	|	|	|	|
0+15	0.0231	2.34	Q	|	|	|	|
0+20	0.0448	3.15	Q	|	|	|	|
0+25	0.0696	3.61	Q	|	|	|	|
0+30	0.0966	3.92	Q	|	|	|	|
0+35	0.1251	4.14	Q	|	|	|	|
0+40	0.1548	4.32	Q	|	|	|	|
0+45	0.1855	4.45	Q	|	|	|	|
0+50	0.2169	4.56	Q	|	|	|	|
0+55	0.2489	4.65	Q	|	|	|	|
1+ 0	0.2815	4.73	Q	|	|	|	|
1+ 5	0.3145	4.79	Q	|	|	|	|
1+10	0.3478	4.84	Q	|	|	|	|
1+15	0.3815	4.89	Q	|	|	|	|
1+20	0.4154	4.92	Q	|	|	|	|
1+25	0.4495	4.96	Q	|	|	|	|
1+30	0.4839	5.00	Q	|	|	|	|
1+35	0.5186	5.03	VQ	|	|	|	|
1+40	0.5534	5.06	VQ	|	|	|	|
1+45	0.5884	5.08	|Q	|	|	|	|
1+50	0.6235	5.09	|Q	|	|	|	|
1+55	0.6587	5.11	|Q	|	|	|	|

2+ 0	0.6940	5.13	Q				
2+ 5	0.7295	5.15	Q				
2+10	0.7650	5.16	Q				
2+15	0.8007	5.18	Q				
2+20	0.8365	5.20	Q				
2+25	0.8725	5.22	Q				
2+30	0.9085	5.24	Q				
2+35	0.9447	5.25	Q				
2+40	0.9810	5.27	Q				
2+45	1.0175	5.29	Q				
2+50	1.0540	5.31	Q				
2+55	1.0907	5.33	Q				
3+ 0	1.1276	5.35	Q				
3+ 5	1.1646	5.37	QV				
3+10	1.2017	5.39	QV				
3+15	1.2389	5.41	QV				
3+20	1.2763	5.43	QV				
3+25	1.3138	5.45	QV				
3+30	1.3515	5.47	QV				
3+35	1.3893	5.49	QV				
3+40	1.4273	5.51	QV				
3+45	1.4654	5.53	QV				
3+50	1.5036	5.55	QV				
3+55	1.5420	5.58	QV				
4+ 0	1.5805	5.60	QV				
4+ 5	1.6192	5.62	QV				
4+10	1.6581	5.64	QV				
4+15	1.6971	5.66	QV				
4+20	1.7363	5.69	Q V				
4+25	1.7756	5.71	Q V				
4+30	1.8151	5.73	Q V				
4+35	1.8547	5.76	Q V				
4+40	1.8945	5.78	Q V				
4+45	1.9345	5.80	Q V				
4+50	1.9746	5.83	Q V				
4+55	2.0150	5.85	Q V				
5+ 0	2.0554	5.88	Q V				
5+ 5	2.0961	5.90	Q V				
5+10	2.1369	5.93	Q V				
5+15	2.1779	5.96	Q V				
5+20	2.2191	5.98	Q V				
5+25	2.2605	6.01	Q V				
5+30	2.3021	6.03	Q V				
5+35	2.3438	6.06	Q V				
5+40	2.3858	6.09	Q V				
5+45	2.4279	6.12	Q V				
5+50	2.4702	6.14	Q V				
5+55	2.5127	6.17	Q V				
6+ 0	2.5554	6.20	Q V				
6+ 5	2.5984	6.23	Q V				

6+10	2.6415	6.26	|Q V	|	|	|	|
6+15	2.6848	6.29	|Q V	|	|	|	|
6+20	2.7283	6.32	|Q V	|	|	|	|
6+25	2.7721	6.35	|Q V	|	|	|	|
6+30	2.8161	6.38	|Q V	|	|	|	|
6+35	2.8602	6.42	|Q V	|	|	|	|
6+40	2.9046	6.45	|Q V	|	|	|	|
6+45	2.9493	6.48	|Q V	|	|	|	|
6+50	2.9941	6.51	|Q V	|	|	|	|
6+55	3.0392	6.55	|Q V	|	|	|	|
7+ 0	3.0845	6.58	|Q V	|	|	|	|
7+ 5	3.1301	6.61	|Q V	|	|	|	|
7+10	3.1759	6.65	|Q V	|	|	|	|
7+15	3.2219	6.68	|Q V	|	|	|	|
7+20	3.2682	6.72	|Q V	|	|	|	|
7+25	3.3147	6.76	|Q V	|	|	|	|
7+30	3.3615	6.79	|Q V	|	|	|	|
7+35	3.4086	6.83	|Q V	|	|	|	|
7+40	3.4559	6.87	|Q V	|	|	|	|
7+45	3.5034	6.91	|Q V	|	|	|	|
7+50	3.5513	6.95	|Q V	|	|	|	|
7+55	3.5994	6.99	|Q V	|	|	|	|
8+ 0	3.6478	7.03	|Q V	|	|	|	|
8+ 5	3.6965	7.07	|Q V	|	|	|	|
8+10	3.7454	7.11	|Q V	|	|	|	|
8+15	3.7947	7.15	|Q V	|	|	|	|
8+20	3.8442	7.20	|Q V	|	|	|	|
8+25	3.8941	7.24	|Q V	|	|	|	|
8+30	3.9443	7.28	|Q V	|	|	|	|
8+35	3.9948	7.33	|Q V	|	|	|	|
8+40	4.0455	7.37	|Q V	|	|	|	|
8+45	4.0967	7.42	|Q V	|	|	|	|
8+50	4.1481	7.47	|Q V	|	|	|	|
8+55	4.1999	7.52	|Q V	|	|	|	|
9+ 0	4.2520	7.57	|Q V	|	|	|	|
9+ 5	4.3045	7.62	|Q V	|	|	|	|
9+10	4.3573	7.67	|Q V	|	|	|	|
9+15	4.4105	7.72	|Q V	|	|	|	|
9+20	4.4640	7.77	|Q V	|	|	|	|
9+25	4.5179	7.83	|Q V	|	|	|	|
9+30	4.5722	7.88	|Q V	|	|	|	|
9+35	4.6269	7.94	|Q V	|	|	|	|
9+40	4.6820	8.00	|Q V	|	|	|	|
9+45	4.7375	8.06	|Q V	|	|	|	|
9+50	4.7934	8.12	|Q V	|	|	|	|
9+55	4.8497	8.18	|Q V	|	|	|	|
10+ 0	4.9065	8.24	|Q V	|	|	|	|
10+ 5	4.9637	8.30	|Q V	|	|	|	|
10+10	5.0213	8.37	|Q V	|	|	|	|
10+15	5.0794	8.43	|Q V	|	|	|	|

```
10+20       5.1379      8.50  |Q      V |          |          |          |
10+25       5.1970      8.57  |Q      V |          |          |          |
10+30       5.2565      8.64  |Q       V|          |          |          |
10+35       5.3165      8.72  |Q       V|          |          |          |
10+40       5.3770      8.79  |Q       V|          |          |          |
10+45       5.4381      8.86  |Q       V|          |          |          |
10+50       5.4996      8.94  |Q       V|          |          |          |
10+55       5.5618      9.02  |Q       V|          |          |          |
11+ 0       5.6245      9.10  |Q       V|          |          |          |
11+ 5       5.6877      9.19  |Q       V|          |          |          |
11+10       5.7516      9.27  |Q       V|          |          |          |
11+15       5.8160      9.36  |Q        V          |          |          |
11+20       5.8811      9.45  |Q        V          |          |          |
11+25       5.9468      9.54  |Q        V          |          |          |
11+30       6.0132      9.64  |Q        V          |          |          |
11+35       6.0802      9.74  |Q        V          |          |          |
11+40       6.1480      9.83  |Q        V          |          |          |
11+45       6.2164      9.94  |Q        V          |          |          |
11+50       6.2856     10.04  | Q       V          |          |          |
11+55       6.3555     10.15  | Q       V          |          |          |
12+ 0       6.4262     10.27  | Q       |V          |          |          |
12+ 5       6.4976     10.36  | Q       |V          |          |          |
12+10       6.5690     10.37  | Q       |V          |          |          |
12+15       6.6398     10.28  | Q       |V          |          |          |
12+20       6.7106     10.28  | Q       |V          |          |          |
12+25       6.7819     10.35  | Q       |V          |          |          |
12+30       6.8537     10.43  | Q       |V          |          |          |
12+35       6.9263     10.54  | Q       |V          |          |          |
12+40       6.9997     10.66  | Q       | V         |          |          |
12+45       7.0741     10.79  | Q       | V         |          |          |
12+50       7.1494     10.93  | Q       | V         |          |          |
12+55       7.2257     11.08  | Q       | V         |          |          |
13+ 0       7.3031     11.24  | Q       | V         |          |          |
13+ 5       7.3817     11.41  | Q       | V         |          |          |
13+10       7.4614     11.58  | Q       | V         |          |          |
13+15       7.5425     11.77  | Q       |  V        |          |          |
13+20       7.6248     11.96  | Q       |  V        |          |          |
13+25       7.7086     12.17  | Q       |  V        |          |          |
13+30       7.7938     12.37  | Q       |  V        |          |          |
13+35       7.8806     12.60  | Q       |  V        |          |          |
13+40       7.9690     12.83  | Q       |  V        |          |          |
13+45       8.0592     13.09  | Q       |  V        |          |          |
13+50       8.1511     13.35  | Q       |   V       |          |          |
13+55       8.2450     13.63  | Q       |   V       |          |          |
14+ 0       8.3408     13.92  | Q       |   V       |          |          |
14+ 5       8.4386     14.19  | Q       |   V       |          |          |
14+10       8.5368     14.27  | Q       |   V       |          |          |
14+15       8.6342     14.14  | Q       |   V       |          |          |
14+20       8.7321     14.23  | Q       |    V      |          |          |
14+25       8.8318     14.48  | Q       |    V      |          |          |
```



18+40	20.0430	10.00	Q			V	
18+45	20.1105	9.81	Q			V	
18+50	20.1768	9.62	Q			V	
18+55	20.2418	9.44	Q			V	
19+ 0	20.3056	9.27	Q			V	
19+ 5	20.3683	9.10	Q			V	
19+10	20.4299	8.94	Q			V	
19+15	20.4904	8.79	Q			V	
19+20	20.5500	8.65	Q			V	
19+25	20.6086	8.51	Q			V	
19+30	20.6662	8.38	Q			V	
19+35	20.7231	8.25	Q			V	
19+40	20.7790	8.13	Q			V	
19+45	20.8342	8.01	Q			V	
19+50	20.8885	7.89	Q			V	
19+55	20.9421	7.78	Q			V	
20+ 0	20.9950	7.68	Q			V	
20+ 5	21.0471	7.57	Q			V	
20+10	21.0986	7.47	Q			V	
20+15	21.1494	7.38	Q			V	
20+20	21.1996	7.29	Q			V	
20+25	21.2492	7.20	Q			V	
20+30	21.2981	7.11	Q			V	
20+35	21.3466	7.03	Q			V	
20+40	21.3944	6.95	Q			V	
20+45	21.4417	6.87	Q			V	
20+50	21.4885	6.79	Q			V	
20+55	21.5348	6.72	Q			V	
21+ 0	21.5806	6.65	Q			V	
21+ 5	21.6259	6.58	Q			V	
21+10	21.6708	6.51	Q			V	
21+15	21.7152	6.45	Q			V	
21+20	21.7591	6.38	Q			V	
21+25	21.8027	6.32	Q			V	
21+30	21.8458	6.26	Q			V	
21+35	21.8885	6.20	Q			V	
21+40	21.9308	6.14	Q			V	
21+45	21.9727	6.09	Q			V	
21+50	22.0143	6.03	Q			V	
21+55	22.0555	5.98	Q			V	
22+ 0	22.0963	5.93	Q			V	
22+ 5	22.1368	5.88	Q			V	
22+10	22.1769	5.83	Q			V	
22+15	22.2167	5.78	Q			V	
22+20	22.2562	5.73	Q			V	
22+25	22.2954	5.69	Q			V	
22+30	22.3342	5.64	Q			V	
22+35	22.3727	5.60	Q			V	
22+40	22.4110	5.55	Q			V	
22+45	22.4489	5.51	Q			V	

```
   22+50      22.4866      5.47  |Q        |         |         |       V |
   22+55      22.5239      5.43  |Q        |         |         |       V |
   23+ 0      22.5610      5.39  |Q        |         |         |        V|
   23+ 5      22.5979      5.35  |Q        |         |         |        V|
   23+10      22.6344      5.31  |Q        |         |         |        V|
   23+15      22.6707      5.27  |Q        |         |         |        V|
   23+20      22.7068      5.23  |Q        |         |         |        V|
   23+25      22.7426      5.20  |Q        |         |         |        V|
   23+30      22.7781      5.16  |Q        |         |         |        V|
   23+35      22.8134      5.13  |Q        |         |         |        V|
   23+40      22.8485      5.09  |Q        |         |         |        V|
   23+45      22.8834      5.06  |Q        |         |         |        V|
   23+50      22.9180      5.03  |Q        |         |         |        V|
   23+55      22.9524      4.99  Q         |         |         |        V|
   24+ 0      22.9865      4.96  Q         |         |         |        V|
-------------------------------------------------------------------------
```

Onsite10-year existing condition Unit hydrograph

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 10/02/22

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

Program License Serial Number 6385

Quarry Site
10-yr existing condition

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		
80.00	1	0.61
Rainfall data for year 10		
80.00	6	1.23
Rainfall data for year 10		
80.00	24	2.13

++

******** 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)
80.0	80.0	80.00	1.000	0.370	1.000	0.370

Area-averaged adjusted loss rate Fm (In/Hr) = 0.370

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
80.00	1.000	80.0	80.0	2.50	0.302

Area-averaged catchment yield fraction, Y = 0.302
Area-averaged low loss fraction, Yb = 0.698
++
Watercourse length = 3000.00(Ft.)
Length from concentration point to centroid = 1500.00(Ft.)
Elevation difference along watercourse = 50.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 80.00(Ac.)
Catchment Lag time = 0.179 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 46.4486
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.370(In/Hr)
Average low loss rate fraction (Yb) = 0.698 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.202(In)
Computed peak 30-minute rainfall = 0.481(In)
Specified peak 1-hour rainfall = 0.609(In)
Computed peak 3-hour rainfall = 0.931(In)
Specified peak 6-hour rainfall = 1.230(In)
Specified peak 24-hour rainfall = 2.130(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 80.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.201(In)
30-minute factor = 0.996 Adjusted rainfall = 0.479(In)
1-hour factor = 0.996 Adjusted rainfall = 0.607(In)
3-hour factor = 1.000 Adjusted rainfall = 0.931(In)
6-hour factor = 1.000 Adjusted rainfall = 1.230(In)
24-hour factor = 1.000 Adjusted rainfall = 2.130(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 = 967.50 (CFS))	
1	3.508	33.942
2	26.304	220.552
3	57.102	297.964
4	71.224	136.631
5	79.398	79.090
6	84.782	52.084
7	88.717	38.075
8	91.468	26.617
9	93.636	20.975
10	95.285	15.950
11	96.570	12.436
12	97.510	9.094
13	98.106	5.769
14	98.625	5.014
15	99.182	5.393
16	99.624	4.276
17	100.000	3.637

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2012	0.2012
2	0.2815	0.0803
3	0.3426	0.0611
4	0.3938	0.0512
5	0.4387	0.0449
6	0.4792	0.0405
7	0.5050	0.0258
8	0.5285	0.0235
9	0.5501	0.0216
10	0.5702	0.0201
11	0.5890	0.0188
12	0.6067	0.0177
13	0.6259	0.0192
14	0.6442	0.0183
15	0.6618	0.0175
16	0.6786	0.0168
17	0.6948	0.0162
18	0.7105	0.0156
19	0.7256	0.0151
20	0.7402	0.0146
21	0.7544	0.0142
22	0.7682	0.0138

23	0.7816	0.0134
24	0.7947	0.0131
25	0.8074	0.0127
26	0.8198	0.0124
27	0.8320	0.0121
28	0.8438	0.0119
29	0.8554	0.0116
30	0.8668	0.0114
31	0.8779	0.0111
32	0.8888	0.0109
33	0.8996	0.0107
34	0.9101	0.0105
35	0.9204	0.0103
36	0.9306	0.0102
37	0.9409	0.0103
38	0.9510	0.0101
39	0.9610	0.0100
40	0.9708	0.0098
41	0.9805	0.0097
42	0.9901	0.0095
43	0.9995	0.0094
44	1.0088	0.0093
45	1.0179	0.0092
46	1.0270	0.0090
47	1.0359	0.0089
48	1.0447	0.0088
49	1.0534	0.0087
50	1.0620	0.0086
51	1.0705	0.0085
52	1.0789	0.0084
53	1.0872	0.0083
54	1.0954	0.0082
55	1.1035	0.0081
56	1.1115	0.0080
57	1.1194	0.0079
58	1.1273	0.0079
59	1.1351	0.0078
60	1.1428	0.0077
61	1.1504	0.0076
62	1.1579	0.0075
63	1.1654	0.0075
64	1.1728	0.0074
65	1.1801	0.0073
66	1.1874	0.0073
67	1.1946	0.0072
68	1.2018	0.0071
69	1.2088	0.0071
70	1.2158	0.0070
71	1.2228	0.0070
72	1.2297	0.0069

73	1.2364	0.0067
74	1.2431	0.0067
75	1.2497	0.0066
76	1.2563	0.0066
77	1.2628	0.0065
78	1.2693	0.0065
79	1.2757	0.0064
80	1.2821	0.0064
81	1.2884	0.0063
82	1.2947	0.0063
83	1.3009	0.0062
84	1.3071	0.0062
85	1.3133	0.0061
86	1.3194	0.0061
87	1.3254	0.0061
88	1.3315	0.0060
89	1.3374	0.0060
90	1.3434	0.0059
91	1.3493	0.0059
92	1.3551	0.0059
93	1.3609	0.0058
94	1.3667	0.0058
95	1.3724	0.0057
96	1.3782	0.0057
97	1.3838	0.0057
98	1.3895	0.0056
99	1.3951	0.0056
100	1.4006	0.0056
101	1.4062	0.0055
102	1.4117	0.0055
103	1.4171	0.0055
104	1.4226	0.0054
105	1.4280	0.0054
106	1.4333	0.0054
107	1.4387	0.0053
108	1.4440	0.0053
109	1.4493	0.0053
110	1.4545	0.0053
111	1.4598	0.0052
112	1.4649	0.0052
113	1.4701	0.0052
114	1.4753	0.0051
115	1.4804	0.0051
116	1.4855	0.0051
117	1.4905	0.0051
118	1.4956	0.0050
119	1.5006	0.0050
120	1.5055	0.0050
121	1.5105	0.0050
122	1.5154	0.0049

123	1.5203	0.0049
124	1.5252	0.0049
125	1.5301	0.0049
126	1.5349	0.0048
127	1.5397	0.0048
128	1.5445	0.0048
129	1.5493	0.0048
130	1.5541	0.0047
131	1.5588	0.0047
132	1.5635	0.0047
133	1.5682	0.0047
134	1.5728	0.0047
135	1.5775	0.0046
136	1.5821	0.0046
137	1.5867	0.0046
138	1.5913	0.0046
139	1.5958	0.0046
140	1.6004	0.0045
141	1.6049	0.0045
142	1.6094	0.0045
143	1.6139	0.0045
144	1.6183	0.0045
145	1.6228	0.0044
146	1.6272	0.0044
147	1.6316	0.0044
148	1.6360	0.0044
149	1.6404	0.0044
150	1.6447	0.0044
151	1.6491	0.0043
152	1.6534	0.0043
153	1.6577	0.0043
154	1.6620	0.0043
155	1.6662	0.0043
156	1.6705	0.0043
157	1.6747	0.0042
158	1.6789	0.0042
159	1.6831	0.0042
160	1.6873	0.0042
161	1.6915	0.0042
162	1.6956	0.0042
163	1.6998	0.0041
164	1.7039	0.0041
165	1.7080	0.0041
166	1.7121	0.0041
167	1.7162	0.0041
168	1.7202	0.0041
169	1.7243	0.0040
170	1.7283	0.0040
171	1.7324	0.0040
172	1.7364	0.0040

173	1.7404	0.0040
174	1.7443	0.0040
175	1.7483	0.0040
176	1.7522	0.0040
177	1.7562	0.0039
178	1.7601	0.0039
179	1.7640	0.0039
180	1.7679	0.0039
181	1.7718	0.0039
182	1.7757	0.0039
183	1.7795	0.0039
184	1.7834	0.0038
185	1.7872	0.0038
186	1.7910	0.0038
187	1.7948	0.0038
188	1.7986	0.0038
189	1.8024	0.0038
190	1.8062	0.0038
191	1.8100	0.0038
192	1.8137	0.0037
193	1.8174	0.0037
194	1.8212	0.0037
195	1.8249	0.0037
196	1.8286	0.0037
197	1.8323	0.0037
198	1.8360	0.0037
199	1.8396	0.0037
200	1.8433	0.0037
201	1.8469	0.0036
202	1.8506	0.0036
203	1.8542	0.0036
204	1.8578	0.0036
205	1.8614	0.0036
206	1.8650	0.0036
207	1.8686	0.0036
208	1.8722	0.0036
209	1.8757	0.0036
210	1.8793	0.0036
211	1.8828	0.0035
212	1.8863	0.0035
213	1.8899	0.0035
214	1.8934	0.0035
215	1.8969	0.0035
216	1.9004	0.0035
217	1.9038	0.0035
218	1.9073	0.0035
219	1.9108	0.0035
220	1.9142	0.0035
221	1.9177	0.0034
222	1.9211	0.0034

223	1.9245	0.0034
224	1.9279	0.0034
225	1.9313	0.0034
226	1.9347	0.0034
227	1.9381	0.0034
228	1.9415	0.0034
229	1.9449	0.0034
230	1.9482	0.0034
231	1.9516	0.0034
232	1.9549	0.0033
233	1.9583	0.0033
234	1.9616	0.0033
235	1.9649	0.0033
236	1.9682	0.0033
237	1.9715	0.0033
238	1.9748	0.0033
239	1.9781	0.0033
240	1.9814	0.0033
241	1.9846	0.0033
242	1.9879	0.0033
243	1.9911	0.0033
244	1.9944	0.0032
245	1.9976	0.0032
246	2.0008	0.0032
247	2.0041	0.0032
248	2.0073	0.0032
249	2.0105	0.0032
250	2.0137	0.0032
251	2.0169	0.0032
252	2.0200	0.0032
253	2.0232	0.0032
254	2.0264	0.0032
255	2.0295	0.0032
256	2.0327	0.0031
257	2.0358	0.0031
258	2.0390	0.0031
259	2.0421	0.0031
260	2.0452	0.0031
261	2.0483	0.0031
262	2.0514	0.0031
263	2.0545	0.0031
264	2.0576	0.0031
265	2.0607	0.0031
266	2.0638	0.0031
267	2.0668	0.0031
268	2.0699	0.0031
269	2.0730	0.0031
270	2.0760	0.0030
271	2.0791	0.0030
272	2.0821	0.0030

273	2.0851	0.0030
274	2.0881	0.0030
275	2.0912	0.0030
276	2.0942	0.0030
277	2.0972	0.0030
278	2.1002	0.0030
279	2.1032	0.0030
280	2.1061	0.0030
281	2.1091	0.0030
282	2.1121	0.0030
283	2.1151	0.0030
284	2.1180	0.0030
285	2.1210	0.0030
286	2.1239	0.0029
287	2.1269	0.0029
288	2.1298	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0020	0.0009
2	0.0029	0.0021	0.0009
3	0.0030	0.0021	0.0009
4	0.0030	0.0021	0.0009
5	0.0030	0.0021	0.0009
6	0.0030	0.0021	0.0009
7	0.0030	0.0021	0.0009
8	0.0030	0.0021	0.0009
9	0.0030	0.0021	0.0009
10	0.0030	0.0021	0.0009
11	0.0030	0.0021	0.0009
12	0.0030	0.0021	0.0009
13	0.0030	0.0021	0.0009
14	0.0031	0.0021	0.0009
15	0.0031	0.0021	0.0009
16	0.0031	0.0021	0.0009
17	0.0031	0.0022	0.0009
18	0.0031	0.0022	0.0009
19	0.0031	0.0022	0.0009
20	0.0031	0.0022	0.0009
21	0.0031	0.0022	0.0009
22	0.0031	0.0022	0.0009
23	0.0032	0.0022	0.0010
24	0.0032	0.0022	0.0010
25	0.0032	0.0022	0.0010
26	0.0032	0.0022	0.0010
27	0.0032	0.0022	0.0010
28	0.0032	0.0022	0.0010
29	0.0032	0.0023	0.0010

30	0.0032	0.0023	0.0010
31	0.0033	0.0023	0.0010
32	0.0033	0.0023	0.0010
33	0.0033	0.0023	0.0010
34	0.0033	0.0023	0.0010
35	0.0033	0.0023	0.0010
36	0.0033	0.0023	0.0010
37	0.0033	0.0023	0.0010
38	0.0033	0.0023	0.0010
39	0.0034	0.0023	0.0010
40	0.0034	0.0023	0.0010
41	0.0034	0.0024	0.0010
42	0.0034	0.0024	0.0010
43	0.0034	0.0024	0.0010
44	0.0034	0.0024	0.0010
45	0.0034	0.0024	0.0010
46	0.0034	0.0024	0.0010
47	0.0035	0.0024	0.0010
48	0.0035	0.0024	0.0010
49	0.0035	0.0024	0.0011
50	0.0035	0.0024	0.0011
51	0.0035	0.0025	0.0011
52	0.0035	0.0025	0.0011
53	0.0036	0.0025	0.0011
54	0.0036	0.0025	0.0011
55	0.0036	0.0025	0.0011
56	0.0036	0.0025	0.0011
57	0.0036	0.0025	0.0011
58	0.0036	0.0025	0.0011
59	0.0036	0.0025	0.0011
60	0.0037	0.0026	0.0011
61	0.0037	0.0026	0.0011
62	0.0037	0.0026	0.0011
63	0.0037	0.0026	0.0011
64	0.0037	0.0026	0.0011
65	0.0037	0.0026	0.0011
66	0.0038	0.0026	0.0011
67	0.0038	0.0026	0.0011
68	0.0038	0.0026	0.0011
69	0.0038	0.0027	0.0012
70	0.0038	0.0027	0.0012
71	0.0039	0.0027	0.0012
72	0.0039	0.0027	0.0012
73	0.0039	0.0027	0.0012
74	0.0039	0.0027	0.0012
75	0.0039	0.0027	0.0012
76	0.0040	0.0028	0.0012
77	0.0040	0.0028	0.0012
78	0.0040	0.0028	0.0012
79	0.0040	0.0028	0.0012

80	0.0040	0.0028	0.0012
81	0.0041	0.0028	0.0012
82	0.0041	0.0028	0.0012
83	0.0041	0.0029	0.0012
84	0.0041	0.0029	0.0012
85	0.0042	0.0029	0.0013
86	0.0042	0.0029	0.0013
87	0.0042	0.0029	0.0013
88	0.0042	0.0029	0.0013
89	0.0043	0.0030	0.0013
90	0.0043	0.0030	0.0013
91	0.0043	0.0030	0.0013
92	0.0043	0.0030	0.0013
93	0.0044	0.0030	0.0013
94	0.0044	0.0031	0.0013
95	0.0044	0.0031	0.0013
96	0.0044	0.0031	0.0013
97	0.0045	0.0031	0.0013
98	0.0045	0.0031	0.0014
99	0.0045	0.0032	0.0014
100	0.0045	0.0032	0.0014
101	0.0046	0.0032	0.0014
102	0.0046	0.0032	0.0014
103	0.0046	0.0032	0.0014
104	0.0047	0.0033	0.0014
105	0.0047	0.0033	0.0014
106	0.0047	0.0033	0.0014
107	0.0048	0.0033	0.0014
108	0.0048	0.0033	0.0014
109	0.0048	0.0034	0.0015
110	0.0049	0.0034	0.0015
111	0.0049	0.0034	0.0015
112	0.0049	0.0034	0.0015
113	0.0050	0.0035	0.0015
114	0.0050	0.0035	0.0015
115	0.0051	0.0035	0.0015
116	0.0051	0.0036	0.0015
117	0.0051	0.0036	0.0016
118	0.0052	0.0036	0.0016
119	0.0052	0.0036	0.0016
120	0.0053	0.0037	0.0016
121	0.0053	0.0037	0.0016
122	0.0053	0.0037	0.0016
123	0.0054	0.0038	0.0016
124	0.0054	0.0038	0.0016
125	0.0055	0.0038	0.0017
126	0.0055	0.0039	0.0017
127	0.0056	0.0039	0.0017
128	0.0056	0.0039	0.0017
129	0.0057	0.0040	0.0017

130	0.0057	0.0040	0.0017
131	0.0058	0.0041	0.0018
132	0.0059	0.0041	0.0018
133	0.0059	0.0041	0.0018
134	0.0060	0.0042	0.0018
135	0.0061	0.0042	0.0018
136	0.0061	0.0043	0.0018
137	0.0062	0.0043	0.0019
138	0.0062	0.0044	0.0019
139	0.0063	0.0044	0.0019
140	0.0064	0.0044	0.0019
141	0.0065	0.0045	0.0020
142	0.0065	0.0046	0.0020
143	0.0066	0.0046	0.0020
144	0.0067	0.0047	0.0020
145	0.0069	0.0048	0.0021
146	0.0070	0.0049	0.0021
147	0.0071	0.0049	0.0021
148	0.0071	0.0050	0.0022
149	0.0073	0.0051	0.0022
150	0.0073	0.0051	0.0022
151	0.0075	0.0052	0.0023
152	0.0075	0.0053	0.0023
153	0.0077	0.0054	0.0023
154	0.0078	0.0054	0.0023
155	0.0079	0.0055	0.0024
156	0.0080	0.0056	0.0024
157	0.0082	0.0057	0.0025
158	0.0083	0.0058	0.0025
159	0.0085	0.0059	0.0026
160	0.0086	0.0060	0.0026
161	0.0088	0.0061	0.0027
162	0.0089	0.0062	0.0027
163	0.0092	0.0064	0.0028
164	0.0093	0.0065	0.0028
165	0.0095	0.0067	0.0029
166	0.0097	0.0068	0.0029
167	0.0100	0.0070	0.0030
168	0.0101	0.0071	0.0031
169	0.0102	0.0071	0.0031
170	0.0103	0.0072	0.0031
171	0.0107	0.0075	0.0032
172	0.0109	0.0076	0.0033
173	0.0114	0.0079	0.0034
174	0.0116	0.0081	0.0035
175	0.0121	0.0085	0.0037
176	0.0124	0.0087	0.0038
177	0.0131	0.0091	0.0039
178	0.0134	0.0094	0.0041
179	0.0142	0.0099	0.0043

180	0.0146	0.0102	0.0044
181	0.0156	0.0109	0.0047
182	0.0162	0.0113	0.0049
183	0.0175	0.0122	0.0053
184	0.0183	0.0128	0.0055
185	0.0177	0.0124	0.0053
186	0.0188	0.0131	0.0057
187	0.0216	0.0151	0.0065
188	0.0235	0.0164	0.0071
189	0.0405	0.0283	0.0122
190	0.0449	0.0308	0.0141
191	0.0611	0.0308	0.0303
192	0.0803	0.0308	0.0494
193	0.2012	0.0308	0.1704
194	0.0512	0.0308	0.0204
195	0.0258	0.0180	0.0078
196	0.0201	0.0140	0.0061
197	0.0192	0.0134	0.0058
198	0.0168	0.0118	0.0051
199	0.0151	0.0105	0.0046
200	0.0138	0.0096	0.0042
201	0.0127	0.0089	0.0038
202	0.0119	0.0083	0.0036
203	0.0111	0.0078	0.0034
204	0.0105	0.0073	0.0032
205	0.0103	0.0072	0.0031
206	0.0098	0.0069	0.0030
207	0.0094	0.0066	0.0028
208	0.0090	0.0063	0.0027
209	0.0087	0.0061	0.0026
210	0.0084	0.0059	0.0025
211	0.0081	0.0057	0.0025
212	0.0079	0.0055	0.0024
213	0.0076	0.0053	0.0023
214	0.0074	0.0052	0.0022
215	0.0072	0.0050	0.0022
216	0.0070	0.0049	0.0021
217	0.0067	0.0047	0.0020
218	0.0066	0.0046	0.0020
219	0.0064	0.0045	0.0019
220	0.0063	0.0044	0.0019
221	0.0061	0.0043	0.0019
222	0.0060	0.0042	0.0018
223	0.0059	0.0041	0.0018
224	0.0058	0.0040	0.0017
225	0.0057	0.0040	0.0017
226	0.0056	0.0039	0.0017
227	0.0055	0.0038	0.0017
228	0.0054	0.0038	0.0016
229	0.0053	0.0037	0.0016

230	0.0052	0.0036	0.0016
231	0.0051	0.0036	0.0015
232	0.0050	0.0035	0.0015
233	0.0050	0.0035	0.0015
234	0.0049	0.0034	0.0015
235	0.0048	0.0034	0.0015
236	0.0047	0.0033	0.0014
237	0.0047	0.0033	0.0014
238	0.0046	0.0032	0.0014
239	0.0046	0.0032	0.0014
240	0.0045	0.0031	0.0014
241	0.0044	0.0031	0.0013
242	0.0044	0.0031	0.0013
243	0.0043	0.0030	0.0013
244	0.0043	0.0030	0.0013
245	0.0042	0.0030	0.0013
246	0.0042	0.0029	0.0013
247	0.0041	0.0029	0.0013
248	0.0041	0.0029	0.0012
249	0.0040	0.0028	0.0012
250	0.0040	0.0028	0.0012
251	0.0040	0.0028	0.0012
252	0.0039	0.0027	0.0012
253	0.0039	0.0027	0.0012
254	0.0038	0.0027	0.0012
255	0.0038	0.0027	0.0012
256	0.0038	0.0026	0.0011
257	0.0037	0.0026	0.0011
258	0.0037	0.0026	0.0011
259	0.0037	0.0026	0.0011
260	0.0036	0.0025	0.0011
261	0.0036	0.0025	0.0011
262	0.0036	0.0025	0.0011
263	0.0035	0.0025	0.0011
264	0.0035	0.0025	0.0011
265	0.0035	0.0024	0.0011
266	0.0035	0.0024	0.0010
267	0.0034	0.0024	0.0010
268	0.0034	0.0024	0.0010
269	0.0034	0.0024	0.0010
270	0.0033	0.0023	0.0010
271	0.0033	0.0023	0.0010
272	0.0033	0.0023	0.0010
273	0.0033	0.0023	0.0010
274	0.0032	0.0023	0.0010
275	0.0032	0.0022	0.0010
276	0.0032	0.0022	0.0010
277	0.0032	0.0022	0.0010
278	0.0031	0.0022	0.0010
279	0.0031	0.0022	0.0009

280	0.0031	0.0022	0.0009
281	0.0031	0.0022	0.0009
282	0.0031	0.0021	0.0009
283	0.0030	0.0021	0.0009
284	0.0030	0.0021	0.0009
285	0.0030	0.0021	0.0009
286	0.0030	0.0021	0.0009
287	0.0030	0.0021	0.0009
288	0.0029	0.0021	0.0009

Total soil rain loss = 1.33(In)
Total effective rainfall = 0.80(In)
Peak flow rate in flood hydrograph = 66.54(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

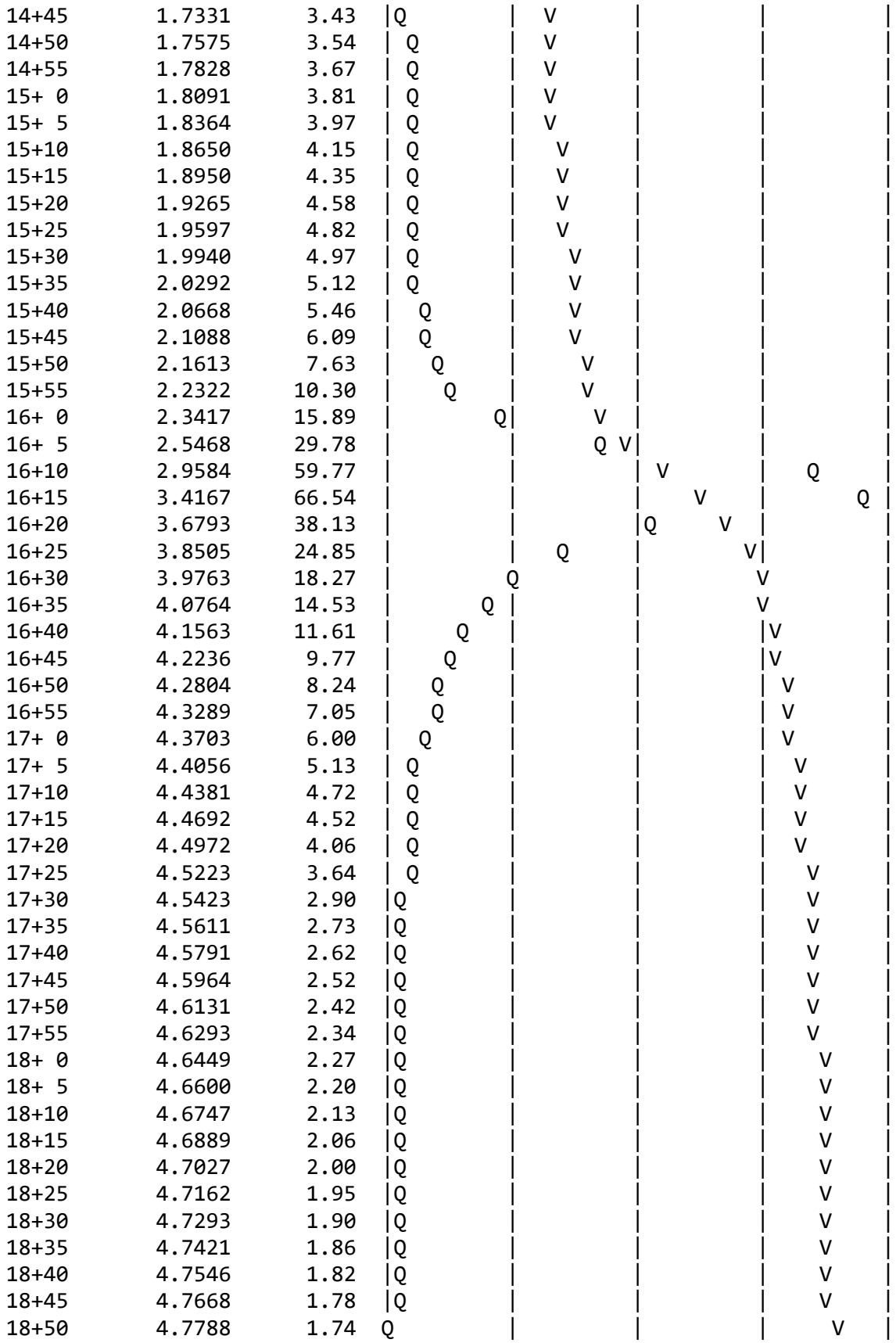
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	17.5	35.0	52.5	70.0
0+ 5	0.0002	0.03	Q	|	|	|	|
0+10	0.0018	0.23	Q	|	|	|	|
0+15	0.0051	0.49	Q	|	|	|	|
0+20	0.0094	0.61	Q	|	|	|	|
0+25	0.0141	0.68	Q	|	|	|	|
0+30	0.0191	0.73	Q	|	|	|	|
0+35	0.0244	0.77	Q	|	|	|	|
0+40	0.0299	0.79	Q	|	|	|	|
0+45	0.0355	0.82	Q	|	|	|	|
0+50	0.0412	0.83	Q	|	|	|	|
0+55	0.0471	0.85	Q	|	|	|	|
1+ 0	0.0530	0.86	Q	|	|	|	|
1+ 5	0.0589	0.87	Q	|	|	|	|
1+10	0.0649	0.87	Q	|	|	|	|
1+15	0.0710	0.88	Q	|	|	|	|
1+20	0.0771	0.89	Q	|	|	|	|
1+25	0.0833	0.89	Q	|	|	|	|
1+30	0.0894	0.90	Q	|	|	|	|
1+35	0.0956	0.90	Q	|	|	|	|
1+40	0.1018	0.90	Q	|	|	|	|
1+45	0.1081	0.91	Q	|	|	|	|
1+50	0.1143	0.91	Q	|	|	|	|
1+55	0.1206	0.91	Q	|	|	|	|
2+ 0	0.1269	0.91	Q	|	|	|	|
2+ 5	0.1332	0.92	QV	|	|	|	|
2+10	0.1396	0.92	QV	|	|	|	|

2+15	0.1460	0.92	QV	|	|	|	|
2+20	0.1524	0.93	QV	|	|	|	|
2+25	0.1588	0.93	QV	|	|	|	|
2+30	0.1652	0.93	QV	|	|	|	|
2+35	0.1717	0.94	QV	|	|	|	|
2+40	0.1782	0.94	QV	|	|	|	|
2+45	0.1847	0.95	QV	|	|	|	|
2+50	0.1912	0.95	QV	|	|	|	|
2+55	0.1978	0.95	QV	|	|	|	|
3+ 0	0.2043	0.96	QV	|	|	|	|
3+ 5	0.2109	0.96	QV	|	|	|	|
3+10	0.2176	0.96	QV	|	|	|	|
3+15	0.2242	0.97	QV	|	|	|	|
3+20	0.2309	0.97	QV	|	|	|	|
3+25	0.2376	0.97	QV	|	|	|	|
3+30	0.2444	0.98	QV	|	|	|	|
3+35	0.2511	0.98	QV	|	|	|	|
3+40	0.2579	0.99	QV	|	|	|	|
3+45	0.2647	0.99	QV	|	|	|	|
3+50	0.2716	0.99	Q V	|	|	|	|
3+55	0.2785	1.00	Q V	|	|	|	|
4+ 0	0.2854	1.00	Q V	|	|	|	|
4+ 5	0.2923	1.01	Q V	|	|	|	|
4+10	0.2992	1.01	Q V	|	|	|	|
4+15	0.3062	1.01	Q V	|	|	|	|
4+20	0.3132	1.02	Q V	|	|	|	|
4+25	0.3203	1.02	Q V	|	|	|	|
4+30	0.3274	1.03	Q V	|	|	|	|
4+35	0.3345	1.03	Q V	|	|	|	|
4+40	0.3416	1.04	Q V	|	|	|	|
4+45	0.3488	1.04	Q V	|	|	|	|
4+50	0.3560	1.05	Q V	|	|	|	|
4+55	0.3632	1.05	Q V	|	|	|	|
5+ 0	0.3705	1.05	Q V	|	|	|	|
5+ 5	0.3778	1.06	Q V	|	|	|	|
5+10	0.3851	1.06	Q V	|	|	|	|
5+15	0.3924	1.07	Q V	|	|	|	|
5+20	0.3998	1.07	Q V	|	|	|	|
5+25	0.4073	1.08	Q V	|	|	|	|
5+30	0.4147	1.08	Q V	|	|	|	|
5+35	0.4222	1.09	Q V	|	|	|	|
5+40	0.4298	1.09	Q V	|	|	|	|
5+45	0.4373	1.10	Q V	|	|	|	|
5+50	0.4449	1.10	Q V	|	|	|	|
5+55	0.4526	1.11	Q V	|	|	|	|
6+ 0	0.4603	1.11	Q V	|	|	|	|
6+ 5	0.4680	1.12	Q V	|	|	|	|
6+10	0.4757	1.13	Q V	|	|	|	|
6+15	0.4835	1.13	Q V	|	|	|	|
6+20	0.4914	1.14	Q V	|	|	|	|

6+25	0.4992	1.14	Q	V	|	|	|	|
6+30	0.5071	1.15	Q	V	|	|	|	|
6+35	0.5151	1.15	Q	V	|	|	|	|
6+40	0.5231	1.16	Q	V	|	|	|	|
6+45	0.5311	1.17	Q	V	|	|	|	|
6+50	0.5392	1.17	Q	V	|	|	|	|
6+55	0.5473	1.18	Q	V	|	|	|	|
7+ 0	0.5555	1.19	Q	V	|	|	|	|
7+ 5	0.5637	1.19	Q	V	|	|	|	|
7+10	0.5720	1.20	Q	V	|	|	|	|
7+15	0.5803	1.21	Q	V	|	|	|	|
7+20	0.5886	1.21	Q	V	|	|	|	|
7+25	0.5970	1.22	Q	V	|	|	|	|
7+30	0.6054	1.23	Q	V	|	|	|	|
7+35	0.6139	1.23	Q	V	|	|	|	|
7+40	0.6225	1.24	Q	V	|	|	|	|
7+45	0.6311	1.25	Q	V	|	|	|	|
7+50	0.6397	1.25	Q	V	|	|	|	|
7+55	0.6484	1.26	Q	V	|	|	|	|
8+ 0	0.6571	1.27	Q	V	|	|	|	|
8+ 5	0.6659	1.28	Q	V	|	|	|	|
8+10	0.6748	1.29	Q	V	|	|	|	|
8+15	0.6837	1.29	Q	V	|	|	|	|
8+20	0.6927	1.30	Q	V	|	|	|	|
8+25	0.7017	1.31	Q	V	|	|	|	|
8+30	0.7108	1.32	Q	V	|	|	|	|
8+35	0.7199	1.33	Q	V	|	|	|	|
8+40	0.7291	1.34	Q	V	|	|	|	|
8+45	0.7384	1.34	Q	V	|	|	|	|
8+50	0.7477	1.35	Q	V	|	|	|	|
8+55	0.7571	1.36	Q	V	|	|	|	|
9+ 0	0.7665	1.37	Q	V	|	|	|	|
9+ 5	0.7760	1.38	Q	V	|	|	|	|
9+10	0.7856	1.39	Q	V	|	|	|	|
9+15	0.7952	1.40	Q	V	|	|	|	|
9+20	0.8050	1.41	Q	V	|	|	|	|
9+25	0.8147	1.42	Q	V	|	|	|	|
9+30	0.8246	1.43	Q	V	|	|	|	|
9+35	0.8345	1.44	Q	V	|	|	|	|
9+40	0.8445	1.45	Q	V	|	|	|	|
9+45	0.8546	1.46	Q	V	|	|	|	|
9+50	0.8648	1.48	Q	V	|	|	|	|
9+55	0.8750	1.49	Q	V	|	|	|	|
10+ 0	0.8854	1.50	Q	V	|	|	|	|
10+ 5	0.8958	1.51	Q	V	|	|	|	|
10+10	0.9063	1.52	Q	V	|	|	|	|
10+15	0.9168	1.54	Q	V	|	|	|	|
10+20	0.9275	1.55	Q	V	|	|	|	|
10+25	0.9383	1.56	Q	V	|	|	|	|
10+30	0.9491	1.58	Q	V	|	|	|	|

```
10+35       0.9601      1.59  Q      V  |          |          |          |
10+40       0.9711      1.60  Q      V  |          |          |          |
10+45       0.9822      1.62  Q      V  |          |          |          |
10+50       0.9935      1.63  Q      V  |          |          |          |
10+55       1.0048      1.65  Q      V  |          |          |          |
11+ 0       1.0163      1.66  Q      V  |          |          |          |
11+ 5       1.0278      1.68  Q      V  |          |          |          |
11+10       1.0395      1.70  Q      V  |          |          |          |
11+15       1.0513      1.71  Q      V  |          |          |          |
11+20       1.0632      1.73  Q       V |          |          |          |
11+25       1.0753      1.75  Q       V |          |          |          |
11+30       1.0874      1.77  |Q      V |          |          |          |
11+35       1.0997      1.78  |Q      V |          |          |          |
11+40       1.1121      1.80  |Q      V |          |          |          |
11+45       1.1247      1.82  |Q      V |          |          |          |
11+50       1.1374      1.84  |Q      V |          |          |          |
11+55       1.1502      1.86  |Q      V |          |          |          |
12+ 0       1.1632      1.89  |Q      V |          |          |          |
12+ 5       1.1763      1.91  |Q      V |          |          |          |
12+10       1.1897      1.94  |Q      V |          |          |          |
12+15       1.2033      1.97  |Q       V|          |          |          |
12+20       1.2171      2.00  |Q       V|          |          |          |
12+25       1.2310      2.03  |Q       V|          |          |          |
12+30       1.2452      2.06  |Q       V|          |          |          |
12+35       1.2596      2.09  |Q       V|          |          |          |
12+40       1.2741      2.11  |Q       V|          |          |          |
12+45       1.2889      2.14  |Q       V|          |          |          |
12+50       1.3039      2.18  |Q       V|          |          |          |
12+55       1.3191      2.21  |Q       V|          |          |          |
13+ 0       1.3345      2.24  |Q        V          |          |          |
13+ 5       1.3502      2.28  |Q        V          |          |          |
13+10       1.3661      2.31  |Q        V          |          |          |
13+15       1.3823      2.35  |Q        V          |          |          |
13+20       1.3988      2.39  |Q        V          |          |          |
13+25       1.4155      2.43  |Q        V          |          |          |
13+30       1.4325      2.47  |Q        V          |          |          |
13+35       1.4499      2.52  |Q        V          |          |          |
13+40       1.4675      2.56  |Q         |V         |          |          |
13+45       1.4855      2.61  |Q         |V         |          |          |
13+50       1.5039      2.67  |Q         |V         |          |          |
13+55       1.5226      2.72  |Q         |V         |          |          |
14+ 0       1.5418      2.78  |Q         |V         |          |          |
14+ 5       1.5613      2.84  |Q         |V         |          |          |
14+10       1.5812      2.88  |Q         |V         |          |          |
14+15       1.6013      2.92  |Q         | V        |          |          |
14+20       1.6219      2.98  |Q         | V        |          |          |
14+25       1.6429      3.05  |Q         | V        |          |          |
14+30       1.6645      3.13  |Q         | V        |          |          |
14+35       1.6867      3.22  |Q         | V        |          |          |
14+40       1.7096      3.32  |Q         | V        |          |          |
```


14+45 1.7331 3.43
14+50 1.7575 3.54
14+55 1.7828 3.67
15+ 0 1.8091 3.81
15+ 5 1.8364 3.97
15+10 1.8650 4.15
15+15 1.8950 4.35
15+20 1.9265 4.58
15+25 1.9597 4.82
15+30 1.9940 4.97
15+35 2.0292 5.12
15+40 2.0668 5.46
15+45 2.1088 6.09
15+50 2.1613 7.63
15+55 2.2322 10.30
16+ 0 2.3417 15.89
16+ 5 2.5468 29.78
16+10 2.9584 59.77
16+15 3.4167 66.54
16+20 3.6793 38.13
16+25 3.8505 24.85
16+30 3.9763 18.27
16+35 4.0764 14.53
16+40 4.1563 11.61
16+45 4.2236 9.77
16+50 4.2804 8.24
16+55 4.3289 7.05
17+ 0 4.3703 6.00
17+ 5 4.4056 5.13
17+10 4.4381 4.72
17+15 4.4692 4.52
17+20 4.4972 4.06
17+25 4.5223 3.64
17+30 4.5423 2.90
17+35 4.5611 2.73
17+40 4.5791 2.62
17+45 4.5964 2.52
17+50 4.6131 2.42
17+55 4.6293 2.34
18+ 0 4.6449 2.27
18+ 5 4.6600 2.20
18+10 4.6747 2.13
18+15 4.6889 2.06
18+20 4.7027 2.00
18+25 4.7162 1.95
18+30 4.7293 1.90
18+35 4.7421 1.86
18+40 4.7546 1.82
18+45 4.7668 1.78
18+50 4.7788 1.74

18+55	4.7905	1.70	Q	|	|	|	V |
19+ 0	4.8020	1.67	Q	|	|	|	V |
19+ 5	4.8133	1.64	Q	|	|	|	V |
19+10	4.8244	1.61	Q	|	|	|	V |
19+15	4.8353	1.58	Q	|	|	|	V |
19+20	4.8460	1.55	Q	|	|	|	V |
19+25	4.8565	1.53	Q	|	|	|	V |
19+30	4.8669	1.50	Q	|	|	|	V |
19+35	4.8771	1.48	Q	|	|	|	V |
19+40	4.8871	1.46	Q	|	|	|	V |
19+45	4.8970	1.44	Q	|	|	|	V |
19+50	4.9067	1.41	Q	|	|	|	V |
19+55	4.9163	1.39	Q	|	|	|	V |
20+ 0	4.9258	1.37	Q	|	|	|	V |
20+ 5	4.9351	1.36	Q	|	|	|	V |
20+10	4.9444	1.34	Q	|	|	|	V |
20+15	4.9535	1.32	Q	|	|	|	V |
20+20	4.9624	1.30	Q	|	|	|	V |
20+25	4.9713	1.29	Q	|	|	|	V |
20+30	4.9801	1.27	Q	|	|	|	V |
20+35	4.9887	1.26	Q	|	|	|	V |
20+40	4.9973	1.24	Q	|	|	|	V |
20+45	5.0057	1.23	Q	|	|	|	V |
20+50	5.0141	1.21	Q	|	|	|	V |
20+55	5.0224	1.20	Q	|	|	|	V |
21+ 0	5.0305	1.19	Q	|	|	|	V |
21+ 5	5.0386	1.17	Q	|	|	|	V |
21+10	5.0466	1.16	Q	|	|	|	V |
21+15	5.0546	1.15	Q	|	|	|	V |
21+20	5.0624	1.14	Q	|	|	|	V |
21+25	5.0702	1.13	Q	|	|	|	V |
21+30	5.0779	1.12	Q	|	|	|	V |
21+35	5.0855	1.11	Q	|	|	|	V |
21+40	5.0930	1.10	Q	|	|	|	V |
21+45	5.1005	1.08	Q	|	|	|	V |
21+50	5.1079	1.07	Q	|	|	|	V |
21+55	5.1152	1.07	Q	|	|	|	V |
22+ 0	5.1225	1.06	Q	|	|	|	V |
22+ 5	5.1297	1.05	Q	|	|	|	V |
22+10	5.1368	1.04	Q	|	|	|	V |
22+15	5.1439	1.03	Q	|	|	|	V |
22+20	5.1509	1.02	Q	|	|	|	V |
22+25	5.1579	1.01	Q	|	|	|	V |
22+30	5.1648	1.00	Q	|	|	|	V |
22+35	5.1717	0.99	Q	|	|	|	V|
22+40	5.1785	0.99	Q	|	|	|	V|
22+45	5.1852	0.98	Q	|	|	|	V|
22+50	5.1919	0.97	Q	|	|	|	V|
22+55	5.1985	0.96	Q	|	|	|	V|
23+ 0	5.2051	0.96	Q	|	|	|	V|

23+ 5	5.2116	0.95	Q	|	|	|	V|
23+10	5.2181	0.94	Q	|	|	|	V|
23+15	5.2246	0.94	Q	|	|	|	V|
23+20	5.2310	0.93	Q	|	|	|	V|
23+25	5.2373	0.92	Q	|	|	|	V|
23+30	5.2436	0.92	Q	|	|	|	V|
23+35	5.2499	0.91	Q	|	|	|	V|
23+40	5.2561	0.90	Q	|	|	|	V|
23+45	5.2623	0.90	Q	|	|	|	V|
23+50	5.2684	0.89	Q	|	|	|	V|
23+55	5.2745	0.88	Q	|	|	|	V|
24+ 0	5.2806	0.88	Q	|	|	|	V|

Onsite100-year existing condition Unit hydrograph

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 10/02/22

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

Program License Serial Number 6385

Quarry Site
100-yr existing condition

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		
80.00	1	1.08
Rainfall data for year 100		
80.00	6	2.02
Rainfall data for year 100		
80.00	24	3.45

++

******** 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)
80.0	94.0	80.00	1.000	0.117	1.000	0.117

Area-averaged adjusted loss rate Fm (In/Hr) = 0.117

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
80.00	1.000	80.0	94.0	0.64	0.808

Area-averaged catchment yield fraction, Y = 0.808
Area-averaged low loss fraction, Yb = 0.192
++
Watercourse length = 3000.00(Ft.)
Length from concentration point to centroid = 1500.00(Ft.)
Elevation difference along watercourse = 50.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 80.00(Ac.)
Catchment Lag time = 0.179 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 46.4486
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.117(In/Hr)
Average low loss rate fraction (Yb) = 0.192 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.359(In)
Computed peak 30-minute rainfall = 0.854(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.560(In)
Specified peak 6-hour rainfall = 2.020(In)
Specified peak 24-hour rainfall = 3.450(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 80.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.358(In)
30-minute factor = 0.996 Adjusted rainfall = 0.851(In)
1-hour factor = 0.996 Adjusted rainfall = 1.076(In)
3-hour factor = 1.000 Adjusted rainfall = 1.559(In)
6-hour factor = 1.000 Adjusted rainfall = 2.019(In)
24-hour factor = 1.000 Adjusted rainfall = 3.450(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 = 967.50 (CFS))	
1	3.508	33.942
2	26.304	220.552
3	57.102	297.964
4	71.224	136.631
5	79.398	79.090
6	84.782	52.084
7	88.717	38.075
8	91.468	26.617
9	93.636	20.975
10	95.285	15.950
11	96.570	12.436
12	97.510	9.094
13	98.106	5.769
14	98.625	5.014
15	99.182	5.393
16	99.624	4.276
17	100.000	3.637

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3577	0.3577
2	0.5001	0.1424
3	0.6085	0.1084
4	0.6993	0.0908
5	0.7790	0.0797
6	0.8508	0.0718
7	0.8964	0.0456
8	0.9379	0.0415
9	0.9761	0.0382
10	1.0115	0.0355
11	1.0447	0.0332
12	1.0760	0.0312
13	1.1054	0.0295
14	1.1334	0.0280
15	1.1602	0.0267
16	1.1857	0.0256
17	1.2103	0.0245
18	1.2338	0.0236
19	1.2566	0.0227
20	1.2785	0.0220
21	1.2998	0.0212
22	1.3204	0.0206

23	1.3403	0.0200
24	1.3597	0.0194
25	1.3786	0.0189
26	1.3970	0.0184
27	1.4149	0.0179
28	1.4324	0.0175
29	1.4495	0.0171
30	1.4661	0.0167
31	1.4825	0.0163
32	1.4985	0.0160
33	1.5141	0.0157
34	1.5294	0.0153
35	1.5445	0.0150
36	1.5593	0.0148
37	1.5753	0.0160
38	1.5910	0.0158
39	1.6065	0.0155
40	1.6218	0.0152
41	1.6368	0.0150
42	1.6516	0.0148
43	1.6661	0.0146
44	1.6805	0.0144
45	1.6946	0.0142
46	1.7086	0.0140
47	1.7224	0.0138
48	1.7359	0.0136
49	1.7494	0.0134
50	1.7626	0.0132
51	1.7757	0.0131
52	1.7886	0.0129
53	1.8013	0.0128
54	1.8139	0.0126
55	1.8264	0.0125
56	1.8387	0.0123
57	1.8509	0.0122
58	1.8630	0.0121
59	1.8749	0.0119
60	1.8867	0.0118
61	1.8983	0.0117
62	1.9099	0.0116
63	1.9213	0.0114
64	1.9327	0.0113
65	1.9439	0.0112
66	1.9550	0.0111
67	1.9660	0.0110
68	1.9769	0.0109
69	1.9877	0.0108
70	1.9984	0.0107
71	2.0090	0.0106
72	2.0195	0.0105

73	2.0303	0.0108
74	2.0410	0.0107
75	2.0516	0.0106
76	2.0621	0.0105
77	2.0725	0.0104
78	2.0829	0.0104
79	2.0932	0.0103
80	2.1034	0.0102
81	2.1135	0.0101
82	2.1235	0.0100
83	2.1335	0.0100
84	2.1434	0.0099
85	2.1532	0.0098
86	2.1630	0.0097
87	2.1726	0.0097
88	2.1822	0.0096
89	2.1918	0.0095
90	2.2013	0.0095
91	2.2107	0.0094
92	2.2200	0.0094
93	2.2293	0.0093
94	2.2385	0.0092
95	2.2477	0.0092
96	2.2568	0.0091
97	2.2659	0.0091
98	2.2749	0.0090
99	2.2838	0.0089
100	2.2927	0.0089
101	2.3015	0.0088
102	2.3103	0.0088
103	2.3190	0.0087
104	2.3277	0.0087
105	2.3363	0.0086
106	2.3449	0.0086
107	2.3534	0.0085
108	2.3619	0.0085
109	2.3703	0.0084
110	2.3787	0.0084
111	2.3870	0.0083
112	2.3953	0.0083
113	2.4035	0.0082
114	2.4117	0.0082
115	2.4198	0.0081
116	2.4280	0.0081
117	2.4360	0.0081
118	2.4440	0.0080
119	2.4520	0.0080
120	2.4600	0.0079
121	2.4679	0.0079
122	2.4757	0.0079

123	2.4835	0.0078
124	2.4913	0.0078
125	2.4990	0.0077
126	2.5068	0.0077
127	2.5144	0.0077
128	2.5220	0.0076
129	2.5296	0.0076
130	2.5372	0.0076
131	2.5447	0.0075
132	2.5522	0.0075
133	2.5596	0.0075
134	2.5671	0.0074
135	2.5744	0.0074
136	2.5818	0.0073
137	2.5891	0.0073
138	2.5964	0.0073
139	2.6036	0.0073
140	2.6109	0.0072
141	2.6180	0.0072
142	2.6252	0.0072
143	2.6323	0.0071
144	2.6394	0.0071
145	2.6465	0.0071
146	2.6535	0.0070
147	2.6605	0.0070
148	2.6675	0.0070
149	2.6745	0.0069
150	2.6814	0.0069
151	2.6883	0.0069
152	2.6951	0.0069
153	2.7020	0.0068
154	2.7088	0.0068
155	2.7155	0.0068
156	2.7223	0.0068
157	2.7290	0.0067
158	2.7357	0.0067
159	2.7424	0.0067
160	2.7490	0.0066
161	2.7557	0.0066
162	2.7623	0.0066
163	2.7688	0.0066
164	2.7754	0.0065
165	2.7819	0.0065
166	2.7884	0.0065
167	2.7949	0.0065
168	2.8013	0.0065
169	2.8078	0.0064
170	2.8142	0.0064
171	2.8206	0.0064
172	2.8269	0.0064

173	2.8333	0.0063
174	2.8396	0.0063
175	2.8459	0.0063
176	2.8521	0.0063
177	2.8584	0.0062
178	2.8646	0.0062
179	2.8708	0.0062
180	2.8770	0.0062
181	2.8832	0.0062
182	2.8893	0.0061
183	2.8954	0.0061
184	2.9015	0.0061
185	2.9076	0.0061
186	2.9137	0.0061
187	2.9197	0.0060
188	2.9257	0.0060
189	2.9317	0.0060
190	2.9377	0.0060
191	2.9437	0.0060
192	2.9496	0.0059
193	2.9555	0.0059
194	2.9614	0.0059
195	2.9673	0.0059
196	2.9732	0.0059
197	2.9790	0.0058
198	2.9849	0.0058
199	2.9907	0.0058
200	2.9965	0.0058
201	3.0023	0.0058
202	3.0080	0.0058
203	3.0138	0.0057
204	3.0195	0.0057
205	3.0252	0.0057
206	3.0309	0.0057
207	3.0366	0.0057
208	3.0422	0.0057
209	3.0479	0.0056
210	3.0535	0.0056
211	3.0591	0.0056
212	3.0647	0.0056
213	3.0703	0.0056
214	3.0758	0.0056
215	3.0814	0.0055
216	3.0869	0.0055
217	3.0924	0.0055
218	3.0979	0.0055
219	3.1034	0.0055
220	3.1088	0.0055
221	3.1143	0.0055
222	3.1197	0.0054

223	3.1251	0.0054
224	3.1306	0.0054
225	3.1359	0.0054
226	3.1413	0.0054
227	3.1467	0.0054
228	3.1520	0.0053
229	3.1574	0.0053
230	3.1627	0.0053
231	3.1680	0.0053
232	3.1733	0.0053
233	3.1785	0.0053
234	3.1838	0.0053
235	3.1891	0.0052
236	3.1943	0.0052
237	3.1995	0.0052
238	3.2047	0.0052
239	3.2099	0.0052
240	3.2151	0.0052
241	3.2203	0.0052
242	3.2254	0.0052
243	3.2306	0.0051
244	3.2357	0.0051
245	3.2408	0.0051
246	3.2459	0.0051
247	3.2510	0.0051
248	3.2561	0.0051
249	3.2611	0.0051
250	3.2662	0.0051
251	3.2712	0.0050
252	3.2763	0.0050
253	3.2813	0.0050
254	3.2863	0.0050
255	3.2913	0.0050
256	3.2962	0.0050
257	3.3012	0.0050
258	3.3062	0.0050
259	3.3111	0.0049
260	3.3160	0.0049
261	3.3210	0.0049
262	3.3259	0.0049
263	3.3308	0.0049
264	3.3357	0.0049
265	3.3405	0.0049
266	3.3454	0.0049
267	3.3502	0.0049
268	3.3551	0.0048
269	3.3599	0.0048
270	3.3647	0.0048
271	3.3695	0.0048
272	3.3743	0.0048

273	3.3791	0.0048
274	3.3839	0.0048
275	3.3887	0.0048
276	3.3934	0.0048
277	3.3982	0.0047
278	3.4029	0.0047
279	3.4076	0.0047
280	3.4123	0.0047
281	3.4170	0.0047
282	3.4217	0.0047
283	3.4264	0.0047
284	3.4311	0.0047
285	3.4357	0.0047
286	3.4404	0.0047
287	3.4450	0.0046
288	3.4497	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0009	0.0037
2	0.0046	0.0009	0.0037
3	0.0047	0.0009	0.0038
4	0.0047	0.0009	0.0038
5	0.0047	0.0009	0.0038
6	0.0047	0.0009	0.0038
7	0.0047	0.0009	0.0038
8	0.0047	0.0009	0.0038
9	0.0048	0.0009	0.0038
10	0.0048	0.0009	0.0038
11	0.0048	0.0009	0.0039
12	0.0048	0.0009	0.0039
13	0.0048	0.0009	0.0039
14	0.0048	0.0009	0.0039
15	0.0049	0.0009	0.0039
16	0.0049	0.0009	0.0039
17	0.0049	0.0009	0.0039
18	0.0049	0.0009	0.0040
19	0.0049	0.0009	0.0040
20	0.0049	0.0009	0.0040
21	0.0050	0.0010	0.0040
22	0.0050	0.0010	0.0040
23	0.0050	0.0010	0.0040
24	0.0050	0.0010	0.0040
25	0.0050	0.0010	0.0041
26	0.0050	0.0010	0.0041
27	0.0051	0.0010	0.0041
28	0.0051	0.0010	0.0041
29	0.0051	0.0010	0.0041

30	0.0051	0.0010	0.0041
31	0.0051	0.0010	0.0042
32	0.0052	0.0010	0.0042
33	0.0052	0.0010	0.0042
34	0.0052	0.0010	0.0042
35	0.0052	0.0010	0.0042
36	0.0052	0.0010	0.0042
37	0.0053	0.0010	0.0043
38	0.0053	0.0010	0.0043
39	0.0053	0.0010	0.0043
40	0.0053	0.0010	0.0043
41	0.0053	0.0010	0.0043
42	0.0054	0.0010	0.0043
43	0.0054	0.0010	0.0044
44	0.0054	0.0010	0.0044
45	0.0054	0.0010	0.0044
46	0.0055	0.0010	0.0044
47	0.0055	0.0011	0.0044
48	0.0055	0.0011	0.0044
49	0.0055	0.0011	0.0045
50	0.0055	0.0011	0.0045
51	0.0056	0.0011	0.0045
52	0.0056	0.0011	0.0045
53	0.0056	0.0011	0.0045
54	0.0056	0.0011	0.0046
55	0.0057	0.0011	0.0046
56	0.0057	0.0011	0.0046
57	0.0057	0.0011	0.0046
58	0.0057	0.0011	0.0046
59	0.0058	0.0011	0.0047
60	0.0058	0.0011	0.0047
61	0.0058	0.0011	0.0047
62	0.0058	0.0011	0.0047
63	0.0059	0.0011	0.0048
64	0.0059	0.0011	0.0048
65	0.0059	0.0011	0.0048
66	0.0060	0.0011	0.0048
67	0.0060	0.0012	0.0048
68	0.0060	0.0012	0.0049
69	0.0061	0.0012	0.0049
70	0.0061	0.0012	0.0049
71	0.0061	0.0012	0.0049
72	0.0061	0.0012	0.0050
73	0.0062	0.0012	0.0050
74	0.0062	0.0012	0.0050
75	0.0062	0.0012	0.0050
76	0.0063	0.0012	0.0051
77	0.0063	0.0012	0.0051
78	0.0063	0.0012	0.0051
79	0.0064	0.0012	0.0052

80	0.0064	0.0012	0.0052
81	0.0065	0.0012	0.0052
82	0.0065	0.0012	0.0052
83	0.0065	0.0013	0.0053
84	0.0065	0.0013	0.0053
85	0.0066	0.0013	0.0053
86	0.0066	0.0013	0.0054
87	0.0067	0.0013	0.0054
88	0.0067	0.0013	0.0054
89	0.0068	0.0013	0.0055
90	0.0068	0.0013	0.0055
91	0.0068	0.0013	0.0055
92	0.0069	0.0013	0.0055
93	0.0069	0.0013	0.0056
94	0.0069	0.0013	0.0056
95	0.0070	0.0013	0.0057
96	0.0070	0.0014	0.0057
97	0.0071	0.0014	0.0057
98	0.0071	0.0014	0.0058
99	0.0072	0.0014	0.0058
100	0.0072	0.0014	0.0058
101	0.0073	0.0014	0.0059
102	0.0073	0.0014	0.0059
103	0.0074	0.0014	0.0060
104	0.0074	0.0014	0.0060
105	0.0075	0.0014	0.0060
106	0.0075	0.0014	0.0061
107	0.0076	0.0015	0.0061
108	0.0076	0.0015	0.0062
109	0.0077	0.0015	0.0062
110	0.0077	0.0015	0.0063
111	0.0078	0.0015	0.0063
112	0.0079	0.0015	0.0063
113	0.0079	0.0015	0.0064
114	0.0080	0.0015	0.0064
115	0.0081	0.0015	0.0065
116	0.0081	0.0016	0.0065
117	0.0082	0.0016	0.0066
118	0.0082	0.0016	0.0067
119	0.0083	0.0016	0.0067
120	0.0084	0.0016	0.0068
121	0.0085	0.0016	0.0068
122	0.0085	0.0016	0.0069
123	0.0086	0.0017	0.0070
124	0.0087	0.0017	0.0070
125	0.0088	0.0017	0.0071
126	0.0088	0.0017	0.0071
127	0.0089	0.0017	0.0072
128	0.0090	0.0017	0.0073
129	0.0091	0.0018	0.0074

130	0.0092	0.0018	0.0074
131	0.0093	0.0018	0.0075
132	0.0094	0.0018	0.0076
133	0.0095	0.0018	0.0077
134	0.0095	0.0018	0.0077
135	0.0097	0.0019	0.0078
136	0.0097	0.0019	0.0079
137	0.0099	0.0019	0.0080
138	0.0100	0.0019	0.0080
139	0.0101	0.0019	0.0082
140	0.0102	0.0020	0.0082
141	0.0104	0.0020	0.0084
142	0.0104	0.0020	0.0084
143	0.0106	0.0020	0.0086
144	0.0107	0.0021	0.0086
145	0.0105	0.0020	0.0085
146	0.0106	0.0020	0.0086
147	0.0108	0.0021	0.0087
148	0.0109	0.0021	0.0088
149	0.0111	0.0021	0.0090
150	0.0112	0.0022	0.0091
151	0.0114	0.0022	0.0092
152	0.0116	0.0022	0.0093
153	0.0118	0.0023	0.0095
154	0.0119	0.0023	0.0096
155	0.0122	0.0023	0.0098
156	0.0123	0.0024	0.0100
157	0.0126	0.0024	0.0102
158	0.0128	0.0025	0.0103
159	0.0131	0.0025	0.0106
160	0.0132	0.0025	0.0107
161	0.0136	0.0026	0.0110
162	0.0138	0.0026	0.0111
163	0.0142	0.0027	0.0114
164	0.0144	0.0028	0.0116
165	0.0148	0.0028	0.0119
166	0.0150	0.0029	0.0121
167	0.0155	0.0030	0.0125
168	0.0158	0.0030	0.0127
169	0.0148	0.0028	0.0119
170	0.0150	0.0029	0.0122
171	0.0157	0.0030	0.0126
172	0.0160	0.0031	0.0129
173	0.0167	0.0032	0.0135
174	0.0171	0.0033	0.0138
175	0.0179	0.0034	0.0145
176	0.0184	0.0035	0.0148
177	0.0194	0.0037	0.0157
178	0.0200	0.0038	0.0161
179	0.0212	0.0041	0.0172

180	0.0220	0.0042	0.0177
181	0.0236	0.0045	0.0191
182	0.0245	0.0047	0.0198
183	0.0267	0.0051	0.0216
184	0.0280	0.0054	0.0226
185	0.0312	0.0060	0.0252
186	0.0332	0.0064	0.0268
187	0.0382	0.0073	0.0308
188	0.0415	0.0080	0.0335
189	0.0718	0.0098	0.0620
190	0.0797	0.0098	0.0699
191	0.1084	0.0098	0.0986
192	0.1424	0.0098	0.1327
193	0.3577	0.0098	0.3479
194	0.0908	0.0098	0.0811
195	0.0456	0.0088	0.0368
196	0.0355	0.0068	0.0286
197	0.0295	0.0057	0.0238
198	0.0256	0.0049	0.0207
199	0.0227	0.0044	0.0184
200	0.0206	0.0040	0.0166
201	0.0189	0.0036	0.0152
202	0.0175	0.0034	0.0141
203	0.0163	0.0031	0.0132
204	0.0153	0.0029	0.0124
205	0.0160	0.0031	0.0129
206	0.0152	0.0029	0.0123
207	0.0146	0.0028	0.0118
208	0.0140	0.0027	0.0113
209	0.0134	0.0026	0.0108
210	0.0129	0.0025	0.0104
211	0.0125	0.0024	0.0101
212	0.0121	0.0023	0.0097
213	0.0117	0.0022	0.0094
214	0.0113	0.0022	0.0091
215	0.0110	0.0021	0.0089
216	0.0107	0.0021	0.0086
217	0.0108	0.0021	0.0087
218	0.0105	0.0020	0.0085
219	0.0103	0.0020	0.0083
220	0.0100	0.0019	0.0081
221	0.0098	0.0019	0.0079
222	0.0096	0.0018	0.0078
223	0.0094	0.0018	0.0076
224	0.0092	0.0018	0.0075
225	0.0091	0.0017	0.0073
226	0.0089	0.0017	0.0072
227	0.0087	0.0017	0.0070
228	0.0086	0.0016	0.0069
229	0.0084	0.0016	0.0068

230	0.0083	0.0016	0.0067
231	0.0081	0.0016	0.0066
232	0.0080	0.0015	0.0065
233	0.0079	0.0015	0.0064
234	0.0078	0.0015	0.0063
235	0.0077	0.0015	0.0062
236	0.0076	0.0015	0.0061
237	0.0075	0.0014	0.0060
238	0.0073	0.0014	0.0059
239	0.0073	0.0014	0.0059
240	0.0072	0.0014	0.0058
241	0.0071	0.0014	0.0057
242	0.0070	0.0013	0.0056
243	0.0069	0.0013	0.0056
244	0.0068	0.0013	0.0055
245	0.0067	0.0013	0.0054
246	0.0066	0.0013	0.0054
247	0.0066	0.0013	0.0053
248	0.0065	0.0012	0.0053
249	0.0064	0.0012	0.0052
250	0.0064	0.0012	0.0051
251	0.0063	0.0012	0.0051
252	0.0062	0.0012	0.0050
253	0.0062	0.0012	0.0050
254	0.0061	0.0012	0.0049
255	0.0060	0.0012	0.0049
256	0.0060	0.0011	0.0048
257	0.0059	0.0011	0.0048
258	0.0059	0.0011	0.0047
259	0.0058	0.0011	0.0047
260	0.0058	0.0011	0.0047
261	0.0057	0.0011	0.0046
262	0.0057	0.0011	0.0046
263	0.0056	0.0011	0.0045
264	0.0056	0.0011	0.0045
265	0.0055	0.0011	0.0045
266	0.0055	0.0011	0.0044
267	0.0054	0.0010	0.0044
268	0.0054	0.0010	0.0043
269	0.0053	0.0010	0.0043
270	0.0053	0.0010	0.0043
271	0.0052	0.0010	0.0042
272	0.0052	0.0010	0.0042
273	0.0052	0.0010	0.0042
274	0.0051	0.0010	0.0041
275	0.0051	0.0010	0.0041
276	0.0051	0.0010	0.0041
277	0.0050	0.0010	0.0041
278	0.0050	0.0010	0.0040
279	0.0049	0.0010	0.0040

280	0.0049	0.0009	0.0040
281	0.0049	0.0009	0.0039
282	0.0048	0.0009	0.0039
283	0.0048	0.0009	0.0039
284	0.0048	0.0009	0.0039
285	0.0047	0.0009	0.0038
286	0.0047	0.0009	0.0038
287	0.0047	0.0009	0.0038
288	0.0047	0.0009	0.0038

Total soil rain loss = 0.56(In)
Total effective rainfall = 2.89(In)
Peak flow rate in flood hydrograph = 157.67(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

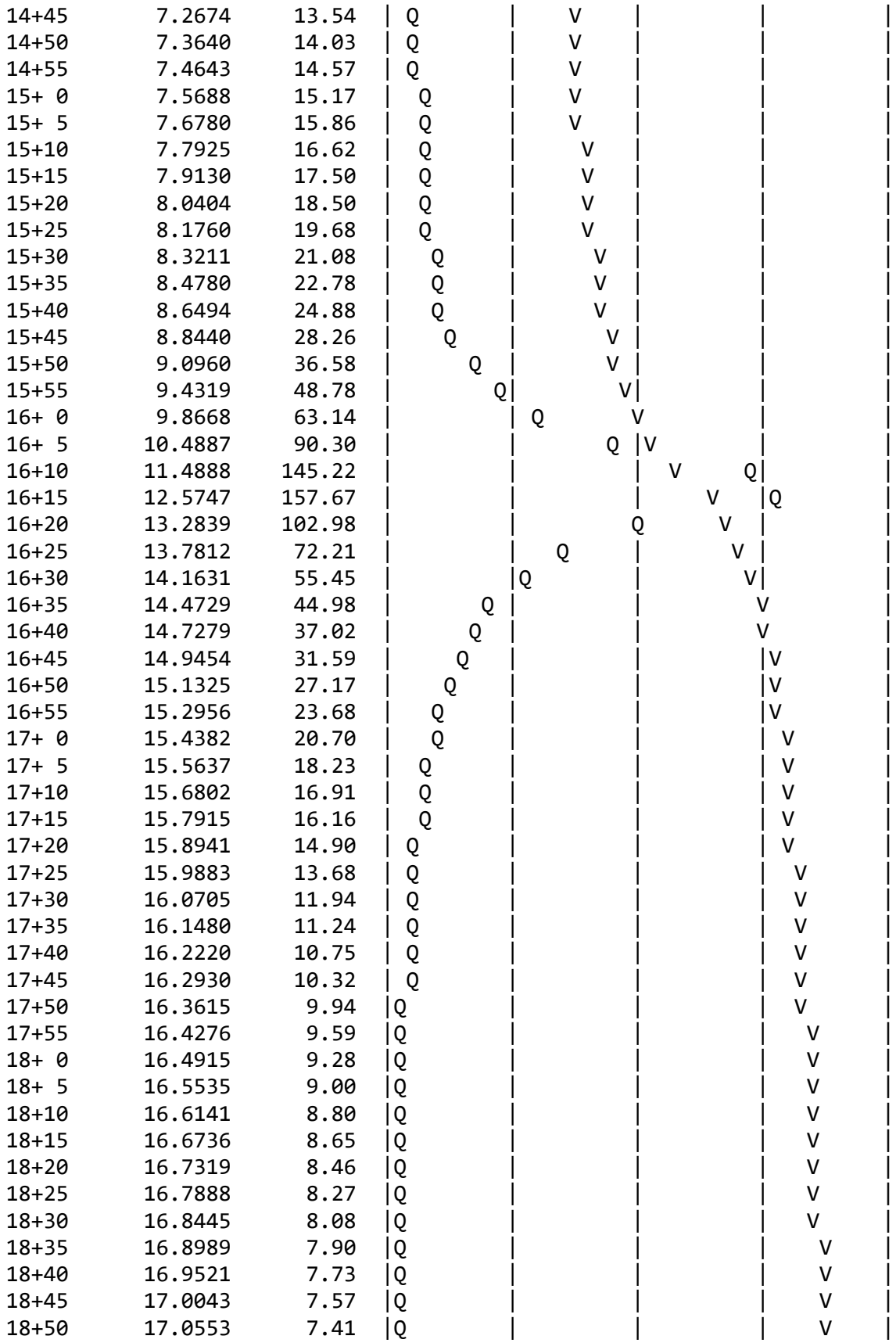
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0009	0.13	Q	|	|	|	|
0+10	0.0074	0.95	Q	|	|	|	|
0+15	0.0217	2.07	Q	|	|	|	|
0+20	0.0395	2.59	Q	|	|	|	|
0+25	0.0594	2.89	Q	|	|	|	|
0+30	0.0807	3.09	Q	|	|	|	|
0+35	0.1031	3.25	Q	|	|	|	|
0+40	0.1262	3.36	Q	|	|	|	|
0+45	0.1500	3.45	Q	|	|	|	|
0+50	0.1742	3.52	Q	|	|	|	|
0+55	0.1988	3.58	Q	|	|	|	|
1+ 0	0.2238	3.62	Q	|	|	|	|
1+ 5	0.2489	3.66	Q	|	|	|	|
1+10	0.2743	3.69	Q	|	|	|	|
1+15	0.2999	3.72	Q	|	|	|	|
1+20	0.3258	3.75	Q	|	|	|	|
1+25	0.3518	3.77	Q	|	|	|	|
1+30	0.3778	3.79	Q	|	|	|	|
1+35	0.4040	3.80	Q	|	|	|	|
1+40	0.4303	3.81	Q	|	|	|	|
1+45	0.4567	3.83	Q	|	|	|	|
1+50	0.4831	3.84	QV	|	|	|	|
1+55	0.5097	3.85	QV	|	|	|	|
2+ 0	0.5363	3.87	QV	|	|	|	|
2+ 5	0.5630	3.88	QV	|	|	|	|
2+10	0.5899	3.90	QV	|	|	|	|

2+15	0.6168	3.91	QV	|	|	|	|
2+20	0.6438	3.92	QV	|	|	|	|
2+25	0.6710	3.94	QV	|	|	|	|
2+30	0.6982	3.95	QV	|	|	|	|
2+35	0.7255	3.97	QV	|	|	|	|
2+40	0.7529	3.98	QV	|	|	|	|
2+45	0.7805	4.00	QV	|	|	|	|
2+50	0.8081	4.01	QV	|	|	|	|
2+55	0.8359	4.03	QV	|	|	|	|
3+ 0	0.8637	4.04	QV	|	|	|	|
3+ 5	0.8917	4.06	QV	|	|	|	|
3+10	0.9197	4.08	QV	|	|	|	|
3+15	0.9479	4.09	QV	|	|	|	|
3+20	0.9762	4.11	Q V	|	|	|	|
3+25	1.0046	4.12	Q V	|	|	|	|
3+30	1.0331	4.14	Q V	|	|	|	|
3+35	1.0617	4.16	Q V	|	|	|	|
3+40	1.0905	4.17	Q V	|	|	|	|
3+45	1.1193	4.19	Q V	|	|	|	|
3+50	1.1483	4.21	Q V	|	|	|	|
3+55	1.1774	4.22	Q V	|	|	|	|
4+ 0	1.2066	4.24	Q V	|	|	|	|
4+ 5	1.2360	4.26	Q V	|	|	|	|
4+10	1.2654	4.28	Q V	|	|	|	|
4+15	1.2950	4.30	Q V	|	|	|	|
4+20	1.3247	4.31	Q V	|	|	|	|
4+25	1.3546	4.33	Q V	|	|	|	|
4+30	1.3845	4.35	Q V	|	|	|	|
4+35	1.4146	4.37	Q V	|	|	|	|
4+40	1.4449	4.39	Q V	|	|	|	|
4+45	1.4752	4.41	Q V	|	|	|	|
4+50	1.5057	4.43	Q V	|	|	|	|
4+55	1.5364	4.45	Q V	|	|	|	|
5+ 0	1.5671	4.47	Q V	|	|	|	|
5+ 5	1.5981	4.49	Q V	|	|	|	|
5+10	1.6291	4.51	Q V	|	|	|	|
5+15	1.6603	4.53	Q V	|	|	|	|
5+20	1.6916	4.55	Q V	|	|	|	|
5+25	1.7231	4.57	Q V	|	|	|	|
5+30	1.7548	4.59	Q V	|	|	|	|
5+35	1.7866	4.62	Q V	|	|	|	|
5+40	1.8185	4.64	Q V	|	|	|	|
5+45	1.8506	4.66	Q V	|	|	|	|
5+50	1.8829	4.68	Q V	|	|	|	|
5+55	1.9153	4.71	Q V	|	|	|	|
6+ 0	1.9478	4.73	Q V	|	|	|	|
6+ 5	1.9806	4.75	Q V	|	|	|	|
6+10	2.0135	4.78	Q V	|	|	|	|
6+15	2.0465	4.80	Q V	|	|	|	|
6+20	2.0798	4.83	Q V	|	|	|	|

6+25	2.1132	4.85	Q V	|	|	|	|
6+30	2.1467	4.88	Q V	|	|	|	|
6+35	2.1805	4.90	Q V	|	|	|	|
6+40	2.2144	4.93	Q V	|	|	|	|
6+45	2.2485	4.95	Q V	|	|	|	|
6+50	2.2828	4.98	Q V	|	|	|	|
6+55	2.3173	5.01	|Q V	|	|	|	|
7+ 0	2.3520	5.03	|Q V	|	|	|	|
7+ 5	2.3869	5.06	|Q V	|	|	|	|
7+10	2.4219	5.09	|Q V	|	|	|	|
7+15	2.4572	5.12	|Q V	|	|	|	|
7+20	2.4926	5.15	|Q V	|	|	|	|
7+25	2.5283	5.18	|Q V	|	|	|	|
7+30	2.5641	5.21	|Q V	|	|	|	|
7+35	2.6002	5.24	|Q V	|	|	|	|
7+40	2.6365	5.27	|Q V	|	|	|	|
7+45	2.6730	5.30	|Q V	|	|	|	|
7+50	2.7097	5.33	|Q V	|	|	|	|
7+55	2.7467	5.36	|Q V	|	|	|	|
8+ 0	2.7838	5.40	|Q V	|	|	|	|
8+ 5	2.8212	5.43	|Q V	|	|	|	|
8+10	2.8589	5.46	|Q V	|	|	|	|
8+15	2.8967	5.50	|Q V	|	|	|	|
8+20	2.9349	5.53	|Q V	|	|	|	|
8+25	2.9732	5.57	|Q V	|	|	|	|
8+30	3.0118	5.61	|Q V	|	|	|	|
8+35	3.0507	5.64	|Q V	|	|	|	|
8+40	3.0898	5.68	|Q V	|	|	|	|
8+45	3.1292	5.72	|Q V	|	|	|	|
8+50	3.1689	5.76	|Q V	|	|	|	|
8+55	3.2088	5.80	|Q V	|	|	|	|
9+ 0	3.2490	5.84	|Q V	|	|	|	|
9+ 5	3.2895	5.88	|Q V	|	|	|	|
9+10	3.3303	5.92	|Q V	|	|	|	|
9+15	3.3713	5.96	|Q V	|	|	|	|
9+20	3.4127	6.01	|Q V	|	|	|	|
9+25	3.4544	6.05	|Q V	|	|	|	|
9+30	3.4964	6.10	|Q V	|	|	|	|
9+35	3.5387	6.14	|Q V	|	|	|	|
9+40	3.5813	6.19	|Q V	|	|	|	|
9+45	3.6243	6.24	|Q V	|	|	|	|
9+50	3.6676	6.29	|Q V	|	|	|	|
9+55	3.7113	6.34	|Q V	|	|	|	|
10+ 0	3.7553	6.39	|Q V	|	|	|	|
10+ 5	3.7996	6.44	|Q V	|	|	|	|
10+10	3.8443	6.49	|Q V	|	|	|	|
10+15	3.8894	6.55	|Q V	|	|	|	|
10+20	3.9349	6.60	|Q V	|	|	|	|
10+25	3.9808	6.66	|Q V	|	|	|	|
10+30	4.0271	6.72	|Q V	|	|	|	|

10+35	4.0738	6.78	Q	V			
10+40	4.1209	6.84	Q	V			
10+45	4.1684	6.90	Q	V			
10+50	4.2164	6.97	Q	V			
10+55	4.2649	7.03	Q	V			
11+ 0	4.3138	7.10	Q	V			
11+ 5	4.3632	7.17	Q	V			
11+10	4.4130	7.24	Q	V			
11+15	4.4634	7.31	Q	V			
11+20	4.5143	7.39	Q	V			
11+25	4.5657	7.47	Q	V			
11+30	4.6177	7.54	Q	V			
11+35	4.6702	7.63	Q	V			
11+40	4.7233	7.71	Q	V			
11+45	4.7770	7.80	Q	V			
11+50	4.8313	7.88	Q	V			
11+55	4.8862	7.98	Q	V			
12+ 0	4.9418	8.07	Q	V			
12+ 5	4.9979	8.16	Q	V			
12+10	5.0543	8.19	Q	V			
12+15	5.1109	8.21	Q	V			
12+20	5.1678	8.27	Q	V			
12+25	5.2254	8.36	Q	V			
12+30	5.2836	8.46	Q	V			
12+35	5.3426	8.56	Q	V			
12+40	5.4023	8.68	Q	V			
12+45	5.4629	8.80	Q	V			
12+50	5.5244	8.92	Q	V			
12+55	5.5867	9.06	Q	V			
13+ 0	5.6501	9.19	Q	V			
13+ 5	5.7144	9.34	Q	V			
13+10	5.7798	9.49	Q	V			
13+15	5.8463	9.65	Q	V			
13+20	5.9139	9.82	Q	V			
13+25	5.9827	10.00	Q	V			
13+30	6.0529	10.18	Q	V			
13+35	6.1243	10.38	Q	V			
13+40	6.1972	10.58	Q	V			
13+45	6.2715	10.79	Q	V			
13+50	6.3474	11.02	Q	V			
13+55	6.4249	11.26	Q	V			
14+ 0	6.5042	11.51	Q	V			
14+ 5	6.5851	11.74	Q	V			
14+10	6.6660	11.75	Q	V			
14+15	6.7465	11.68	Q	V			
14+20	6.8280	11.83	Q	V			
14+25	6.9111	12.07	Q	V			
14+30	6.9963	12.37	Q	V			
14+35	7.0838	12.72	Q	V			
14+40	7.1741	13.10	Q	V			



```
18+55      17.1053      7.27  |Q        |         |         |    V    |
19+ 0      17.1544      7.13  |Q        |         |         |    V    |
19+ 5      17.2026      6.99  |Q        |         |         |    V    |
19+10      17.2498      6.86  |Q        |         |         |    V    |
19+15      17.2963      6.74  |Q        |         |         |    V    |
19+20      17.3419      6.63  |Q        |         |         |     V   |
19+25      17.3868      6.52  |Q        |         |         |     V   |
19+30      17.4309      6.41  |Q        |         |         |     V   |
19+35      17.4743      6.31  |Q        |         |         |     V   |
19+40      17.5171      6.21  |Q        |         |         |     V   |
19+45      17.5592      6.11  |Q        |         |         |     V   |
19+50      17.6007      6.02  |Q        |         |         |     V   |
19+55      17.6416      5.94  |Q        |         |         |     V   |
20+ 0      17.6819      5.85  |Q        |         |         |     V   |
20+ 5      17.7216      5.77  |Q        |         |         |     V   |
20+10      17.7608      5.69  |Q        |         |         |     V   |
20+15      17.7995      5.62  |Q        |         |         |     V   |
20+20      17.8377      5.55  |Q        |         |         |      V  |
20+25      17.8754      5.47  |Q        |         |         |      V  |
20+30      17.9126      5.41  |Q        |         |         |      V  |
20+35      17.9494      5.34  |Q        |         |         |      V  |
20+40      17.9858      5.28  |Q        |         |         |      V  |
20+45      18.0217      5.22  |Q        |         |         |      V  |
20+50      18.0572      5.16  |Q        |         |         |      V  |
20+55      18.0923      5.10  |Q        |         |         |      V  |
21+ 0      18.1270      5.04  |Q        |         |         |      V  |
21+ 5      18.1614      4.99  Q        |         |         |      V  |
21+10      18.1953      4.93  Q        |         |         |      V  |
21+15      18.2290      4.88  Q        |         |         |      V  |
21+20      18.2622      4.83  Q        |         |         |      V  |
21+25      18.2952      4.78  Q        |         |         |      V  |
21+30      18.3278      4.73  Q        |         |         |       V |
21+35      18.3601      4.69  Q        |         |         |       V |
21+40      18.3921      4.64  Q        |         |         |       V |
21+45      18.4237      4.60  Q        |         |         |       V |
21+50      18.4551      4.56  Q        |         |         |       V |
21+55      18.4862      4.51  Q        |         |         |       V |
22+ 0      18.5170      4.47  Q        |         |         |       V |
22+ 5      18.5475      4.43  Q        |         |         |       V |
22+10      18.5778      4.39  Q        |         |         |       V |
22+15      18.6078      4.36  Q        |         |         |       V |
22+20      18.6375      4.32  Q        |         |         |       V |
22+25      18.6670      4.28  Q        |         |         |       V |
22+30      18.6963      4.25  Q        |         |         |       V |
22+35      18.7253      4.21  Q        |         |         |       V |
22+40      18.7540      4.18  Q        |         |         |       V |
22+45      18.7826      4.14  Q        |         |         |       V |
22+50      18.8109      4.11  Q        |         |         |        V|
22+55      18.8390      4.08  Q        |         |         |        V|
23+ 0      18.8668      4.05  Q        |         |         |        V|
```

```
   23+ 5      18.8945      4.02  Q         |         |         |         V|
   23+10      18.9219      3.99  Q         |         |         |         V|
   23+15      18.9492      3.96  Q         |         |         |         V|
   23+20      18.9762      3.93  Q         |         |         |         V|
   23+25      19.0031      3.90  Q         |         |         |         V|
   23+30      19.0298      3.87  Q         |         |         |         V|
   23+35      19.0562      3.84  Q         |         |         |         V|
   23+40      19.0825      3.82  Q         |         |         |         V|
   23+45      19.1086      3.79  Q         |         |         |         V|
   23+50      19.1345      3.76  Q         |         |         |         V|
   23+55      19.1603      3.74  Q         |         |         |         V|
   24+ 0      19.1859      3.71  Q         |         |         |         V|
-------------------------------------------------------------------------
```

10-year developed condition
Unit hydrograph

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 10/02/22

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

Program License Serial Number 6385

Quarry site
10-yr developed

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		
80.00	1	0.61
Rainfall data for year 10		
80.00	6	1.23
Rainfall data for year 10		
80.00	24	2.13

++

******** 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)
69.0	69.0	80.00	1.000	0.548	0.100	0.055

Area-averaged adjusted loss rate Fm (In/Hr) = 0.055

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
8.00	0.100	69.0	69.0	4.49	0.124
72.00	0.900	98.0	98.0	0.20	0.894

Area-averaged catchment yield fraction, Y = 0.817
Area-averaged low loss fraction, Yb = 0.183
++
Watercourse length = 3996.00(Ft.)
Length from concentration point to centroid = 1654.00(Ft.)
Elevation difference along watercourse = 50.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 80.00(Ac.)
Catchment Lag time = 0.219 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 38.0081
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.055(In/Hr)
Average low loss rate fraction (Yb) = 0.183 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.202(In)
Computed peak 30-minute rainfall = 0.481(In)
Specified peak 1-hour rainfall = 0.609(In)
Computed peak 3-hour rainfall = 0.931(In)
Specified peak 6-hour rainfall = 1.230(In)
Specified peak 24-hour rainfall = 2.130(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 80.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.201(In)
30-minute factor = 0.996 Adjusted rainfall = 0.479(In)
1-hour factor = 0.996 Adjusted rainfall = 0.607(In)
3-hour factor = 1.000 Adjusted rainfall = 0.931(In)
6-hour factor = 1.000 Adjusted rainfall = 1.230(In)
24-hour factor = 1.000 Adjusted rainfall = 2.130(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 = 967.50 (CFS))	
1	2.535	24.531
2	16.483	134.946
3	46.124	286.768
4	63.556	168.659
5	73.078	92.120
6	79.444	61.595
7	83.941	43.509
8	87.484	34.276
9	90.069	25.011
10	92.124	19.881
11	93.817	16.380
12	95.157	12.970
13	96.253	10.598
14	97.132	8.511
15	97.778	6.242
16	98.193	4.020
17	98.626	4.185
18	99.082	4.413
19	99.501	4.054
20	99.757	2.482
21	100.000	2.349

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.2012	0.2012
2	0.2815	0.0803
3	0.3426	0.0611
4	0.3938	0.0512
5	0.4387	0.0449
6	0.4792	0.0405
7	0.5050	0.0258
8	0.5285	0.0235
9	0.5501	0.0216
10	0.5702	0.0201
11	0.5890	0.0188
12	0.6067	0.0177
13	0.6259	0.0192
14	0.6442	0.0183
15	0.6618	0.0175
16	0.6786	0.0168
17	0.6948	0.0162

18	0.7105	0.0156
19	0.7256	0.0151
20	0.7402	0.0146
21	0.7544	0.0142
22	0.7682	0.0138
23	0.7816	0.0134
24	0.7947	0.0131
25	0.8074	0.0127
26	0.8198	0.0124
27	0.8320	0.0121
28	0.8438	0.0119
29	0.8554	0.0116
30	0.8668	0.0114
31	0.8779	0.0111
32	0.8888	0.0109
33	0.8996	0.0107
34	0.9101	0.0105
35	0.9204	0.0103
36	0.9306	0.0102
37	0.9409	0.0103
38	0.9510	0.0101
39	0.9610	0.0100
40	0.9708	0.0098
41	0.9805	0.0097
42	0.9901	0.0095
43	0.9995	0.0094
44	1.0088	0.0093
45	1.0179	0.0092
46	1.0270	0.0090
47	1.0359	0.0089
48	1.0447	0.0088
49	1.0534	0.0087
50	1.0620	0.0086
51	1.0705	0.0085
52	1.0789	0.0084
53	1.0872	0.0083
54	1.0954	0.0082
55	1.1035	0.0081
56	1.1115	0.0080
57	1.1194	0.0079
58	1.1273	0.0079
59	1.1351	0.0078
60	1.1428	0.0077
61	1.1504	0.0076
62	1.1579	0.0075
63	1.1654	0.0075
64	1.1728	0.0074
65	1.1801	0.0073
66	1.1874	0.0073
67	1.1946	0.0072

68	1.2018	0.0071
69	1.2088	0.0071
70	1.2158	0.0070
71	1.2228	0.0070
72	1.2297	0.0069
73	1.2364	0.0067
74	1.2431	0.0067
75	1.2497	0.0066
76	1.2563	0.0066
77	1.2628	0.0065
78	1.2693	0.0065
79	1.2757	0.0064
80	1.2821	0.0064
81	1.2884	0.0063
82	1.2947	0.0063
83	1.3009	0.0062
84	1.3071	0.0062
85	1.3133	0.0061
86	1.3194	0.0061
87	1.3254	0.0061
88	1.3315	0.0060
89	1.3374	0.0060
90	1.3434	0.0059
91	1.3493	0.0059
92	1.3551	0.0059
93	1.3609	0.0058
94	1.3667	0.0058
95	1.3724	0.0057
96	1.3782	0.0057
97	1.3838	0.0057
98	1.3895	0.0056
99	1.3951	0.0056
100	1.4006	0.0056
101	1.4062	0.0055
102	1.4117	0.0055
103	1.4171	0.0055
104	1.4226	0.0054
105	1.4280	0.0054
106	1.4333	0.0054
107	1.4387	0.0053
108	1.4440	0.0053
109	1.4493	0.0053
110	1.4545	0.0053
111	1.4598	0.0052
112	1.4649	0.0052
113	1.4701	0.0052
114	1.4753	0.0051
115	1.4804	0.0051
116	1.4855	0.0051
117	1.4905	0.0051

118	1.4956	0.0050
119	1.5006	0.0050
120	1.5055	0.0050
121	1.5105	0.0050
122	1.5154	0.0049
123	1.5203	0.0049
124	1.5252	0.0049
125	1.5301	0.0049
126	1.5349	0.0048
127	1.5397	0.0048
128	1.5445	0.0048
129	1.5493	0.0048
130	1.5541	0.0047
131	1.5588	0.0047
132	1.5635	0.0047
133	1.5682	0.0047
134	1.5728	0.0047
135	1.5775	0.0046
136	1.5821	0.0046
137	1.5867	0.0046
138	1.5913	0.0046
139	1.5958	0.0046
140	1.6004	0.0045
141	1.6049	0.0045
142	1.6094	0.0045
143	1.6139	0.0045
144	1.6183	0.0045
145	1.6228	0.0044
146	1.6272	0.0044
147	1.6316	0.0044
148	1.6360	0.0044
149	1.6404	0.0044
150	1.6447	0.0044
151	1.6491	0.0043
152	1.6534	0.0043
153	1.6577	0.0043
154	1.6620	0.0043
155	1.6662	0.0043
156	1.6705	0.0043
157	1.6747	0.0042
158	1.6789	0.0042
159	1.6831	0.0042
160	1.6873	0.0042
161	1.6915	0.0042
162	1.6956	0.0042
163	1.6998	0.0041
164	1.7039	0.0041
165	1.7080	0.0041
166	1.7121	0.0041
167	1.7162	0.0041

168	1.7202	0.0041
169	1.7243	0.0040
170	1.7283	0.0040
171	1.7324	0.0040
172	1.7364	0.0040
173	1.7404	0.0040
174	1.7443	0.0040
175	1.7483	0.0040
176	1.7522	0.0040
177	1.7562	0.0039
178	1.7601	0.0039
179	1.7640	0.0039
180	1.7679	0.0039
181	1.7718	0.0039
182	1.7757	0.0039
183	1.7795	0.0039
184	1.7834	0.0038
185	1.7872	0.0038
186	1.7910	0.0038
187	1.7948	0.0038
188	1.7986	0.0038
189	1.8024	0.0038
190	1.8062	0.0038
191	1.8100	0.0038
192	1.8137	0.0037
193	1.8174	0.0037
194	1.8212	0.0037
195	1.8249	0.0037
196	1.8286	0.0037
197	1.8323	0.0037
198	1.8360	0.0037
199	1.8396	0.0037
200	1.8433	0.0037
201	1.8469	0.0036
202	1.8506	0.0036
203	1.8542	0.0036
204	1.8578	0.0036
205	1.8614	0.0036
206	1.8650	0.0036
207	1.8686	0.0036
208	1.8722	0.0036
209	1.8757	0.0036
210	1.8793	0.0036
211	1.8828	0.0035
212	1.8863	0.0035
213	1.8899	0.0035
214	1.8934	0.0035
215	1.8969	0.0035
216	1.9004	0.0035
217	1.9038	0.0035

218	1.9073	0.0035
219	1.9108	0.0035
220	1.9142	0.0035
221	1.9177	0.0034
222	1.9211	0.0034
223	1.9245	0.0034
224	1.9279	0.0034
225	1.9313	0.0034
226	1.9347	0.0034
227	1.9381	0.0034
228	1.9415	0.0034
229	1.9449	0.0034
230	1.9482	0.0034
231	1.9516	0.0034
232	1.9549	0.0033
233	1.9583	0.0033
234	1.9616	0.0033
235	1.9649	0.0033
236	1.9682	0.0033
237	1.9715	0.0033
238	1.9748	0.0033
239	1.9781	0.0033
240	1.9814	0.0033
241	1.9846	0.0033
242	1.9879	0.0033
243	1.9911	0.0033
244	1.9944	0.0032
245	1.9976	0.0032
246	2.0008	0.0032
247	2.0041	0.0032
248	2.0073	0.0032
249	2.0105	0.0032
250	2.0137	0.0032
251	2.0169	0.0032
252	2.0200	0.0032
253	2.0232	0.0032
254	2.0264	0.0032
255	2.0295	0.0032
256	2.0327	0.0031
257	2.0358	0.0031
258	2.0390	0.0031
259	2.0421	0.0031
260	2.0452	0.0031
261	2.0483	0.0031
262	2.0514	0.0031
263	2.0545	0.0031
264	2.0576	0.0031
265	2.0607	0.0031
266	2.0638	0.0031
267	2.0668	0.0031

268	2.0699	0.0031
269	2.0730	0.0031
270	2.0760	0.0030
271	2.0791	0.0030
272	2.0821	0.0030
273	2.0851	0.0030
274	2.0881	0.0030
275	2.0912	0.0030
276	2.0942	0.0030
277	2.0972	0.0030
278	2.1002	0.0030
279	2.1032	0.0030
280	2.1061	0.0030
281	2.1091	0.0030
282	2.1121	0.0030
283	2.1151	0.0030
284	2.1180	0.0030
285	2.1210	0.0030
286	2.1239	0.0029
287	2.1269	0.0029
288	2.1298	0.0029

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0029	0.0005	0.0024
2	0.0029	0.0005	0.0024
3	0.0030	0.0005	0.0024
4	0.0030	0.0005	0.0024
5	0.0030	0.0005	0.0024
6	0.0030	0.0005	0.0024
7	0.0030	0.0005	0.0024
8	0.0030	0.0005	0.0024
9	0.0030	0.0006	0.0025
10	0.0030	0.0006	0.0025
11	0.0030	0.0006	0.0025
12	0.0030	0.0006	0.0025
13	0.0030	0.0006	0.0025
14	0.0031	0.0006	0.0025
15	0.0031	0.0006	0.0025
16	0.0031	0.0006	0.0025
17	0.0031	0.0006	0.0025
18	0.0031	0.0006	0.0025
19	0.0031	0.0006	0.0025
20	0.0031	0.0006	0.0025
21	0.0031	0.0006	0.0026
22	0.0031	0.0006	0.0026
23	0.0032	0.0006	0.0026
24	0.0032	0.0006	0.0026

25	0.0032	0.0006	0.0026
26	0.0032	0.0006	0.0026
27	0.0032	0.0006	0.0026
28	0.0032	0.0006	0.0026
29	0.0032	0.0006	0.0026
30	0.0032	0.0006	0.0026
31	0.0033	0.0006	0.0027
32	0.0033	0.0006	0.0027
33	0.0033	0.0006	0.0027
34	0.0033	0.0006	0.0027
35	0.0033	0.0006	0.0027
36	0.0033	0.0006	0.0027
37	0.0033	0.0006	0.0027
38	0.0033	0.0006	0.0027
39	0.0034	0.0006	0.0027
40	0.0034	0.0006	0.0027
41	0.0034	0.0006	0.0028
42	0.0034	0.0006	0.0028
43	0.0034	0.0006	0.0028
44	0.0034	0.0006	0.0028
45	0.0034	0.0006	0.0028
46	0.0034	0.0006	0.0028
47	0.0035	0.0006	0.0028
48	0.0035	0.0006	0.0028
49	0.0035	0.0006	0.0029
50	0.0035	0.0006	0.0029
51	0.0035	0.0006	0.0029
52	0.0035	0.0006	0.0029
53	0.0036	0.0007	0.0029
54	0.0036	0.0007	0.0029
55	0.0036	0.0007	0.0029
56	0.0036	0.0007	0.0029
57	0.0036	0.0007	0.0030
58	0.0036	0.0007	0.0030
59	0.0036	0.0007	0.0030
60	0.0037	0.0007	0.0030
61	0.0037	0.0007	0.0030
62	0.0037	0.0007	0.0030
63	0.0037	0.0007	0.0030
64	0.0037	0.0007	0.0030
65	0.0037	0.0007	0.0031
66	0.0038	0.0007	0.0031
67	0.0038	0.0007	0.0031
68	0.0038	0.0007	0.0031
69	0.0038	0.0007	0.0031
70	0.0038	0.0007	0.0031
71	0.0039	0.0007	0.0032
72	0.0039	0.0007	0.0032
73	0.0039	0.0007	0.0032
74	0.0039	0.0007	0.0032

75	0.0039	0.0007	0.0032
76	0.0040	0.0007	0.0032
77	0.0040	0.0007	0.0032
78	0.0040	0.0007	0.0033
79	0.0040	0.0007	0.0033
80	0.0040	0.0007	0.0033
81	0.0041	0.0007	0.0033
82	0.0041	0.0007	0.0033
83	0.0041	0.0008	0.0034
84	0.0041	0.0008	0.0034
85	0.0042	0.0008	0.0034
86	0.0042	0.0008	0.0034
87	0.0042	0.0008	0.0034
88	0.0042	0.0008	0.0034
89	0.0043	0.0008	0.0035
90	0.0043	0.0008	0.0035
91	0.0043	0.0008	0.0035
92	0.0043	0.0008	0.0035
93	0.0044	0.0008	0.0036
94	0.0044	0.0008	0.0036
95	0.0044	0.0008	0.0036
96	0.0044	0.0008	0.0036
97	0.0045	0.0008	0.0036
98	0.0045	0.0008	0.0037
99	0.0045	0.0008	0.0037
100	0.0045	0.0008	0.0037
101	0.0046	0.0008	0.0037
102	0.0046	0.0008	0.0038
103	0.0046	0.0009	0.0038
104	0.0047	0.0009	0.0038
105	0.0047	0.0009	0.0038
106	0.0047	0.0009	0.0039
107	0.0048	0.0009	0.0039
108	0.0048	0.0009	0.0039
109	0.0048	0.0009	0.0040
110	0.0049	0.0009	0.0040
111	0.0049	0.0009	0.0040
112	0.0049	0.0009	0.0040
113	0.0050	0.0009	0.0041
114	0.0050	0.0009	0.0041
115	0.0051	0.0009	0.0041
116	0.0051	0.0009	0.0042
117	0.0051	0.0009	0.0042
118	0.0052	0.0009	0.0042
119	0.0052	0.0010	0.0043
120	0.0053	0.0010	0.0043
121	0.0053	0.0010	0.0043
122	0.0053	0.0010	0.0044
123	0.0054	0.0010	0.0044
124	0.0054	0.0010	0.0044

125	0.0055	0.0010	0.0045
126	0.0055	0.0010	0.0045
127	0.0056	0.0010	0.0046
128	0.0056	0.0010	0.0046
129	0.0057	0.0010	0.0047
130	0.0057	0.0011	0.0047
131	0.0058	0.0011	0.0048
132	0.0059	0.0011	0.0048
133	0.0059	0.0011	0.0048
134	0.0060	0.0011	0.0049
135	0.0061	0.0011	0.0049
136	0.0061	0.0011	0.0050
137	0.0062	0.0011	0.0051
138	0.0062	0.0011	0.0051
139	0.0063	0.0012	0.0052
140	0.0064	0.0012	0.0052
141	0.0065	0.0012	0.0053
142	0.0065	0.0012	0.0053
143	0.0066	0.0012	0.0054
144	0.0067	0.0012	0.0055
145	0.0069	0.0013	0.0056
146	0.0070	0.0013	0.0057
147	0.0071	0.0013	0.0058
148	0.0071	0.0013	0.0058
149	0.0073	0.0013	0.0059
150	0.0073	0.0013	0.0060
151	0.0075	0.0014	0.0061
152	0.0075	0.0014	0.0062
153	0.0077	0.0014	0.0063
154	0.0078	0.0014	0.0064
155	0.0079	0.0015	0.0065
156	0.0080	0.0015	0.0066
157	0.0082	0.0015	0.0067
158	0.0083	0.0015	0.0068
159	0.0085	0.0016	0.0069
160	0.0086	0.0016	0.0070
161	0.0088	0.0016	0.0072
162	0.0089	0.0016	0.0073
163	0.0092	0.0017	0.0075
164	0.0093	0.0017	0.0076
165	0.0095	0.0018	0.0078
166	0.0097	0.0018	0.0079
167	0.0100	0.0018	0.0082
168	0.0101	0.0019	0.0083
169	0.0102	0.0019	0.0083
170	0.0103	0.0019	0.0084
171	0.0107	0.0020	0.0087
172	0.0109	0.0020	0.0089
173	0.0114	0.0021	0.0093
174	0.0116	0.0021	0.0095

175	0.0121	0.0022	0.0099
176	0.0124	0.0023	0.0101
177	0.0131	0.0024	0.0107
178	0.0134	0.0025	0.0110
179	0.0142	0.0026	0.0116
180	0.0146	0.0027	0.0120
181	0.0156	0.0029	0.0128
182	0.0162	0.0030	0.0132
183	0.0175	0.0032	0.0143
184	0.0183	0.0034	0.0150
185	0.0177	0.0032	0.0145
186	0.0188	0.0034	0.0154
187	0.0216	0.0040	0.0177
188	0.0235	0.0043	0.0192
189	0.0405	0.0046	0.0359
190	0.0449	0.0046	0.0404
191	0.0611	0.0046	0.0565
192	0.0803	0.0046	0.0757
193	0.2012	0.0046	0.1967
194	0.0512	0.0046	0.0466
195	0.0258	0.0046	0.0213
196	0.0201	0.0037	0.0164
197	0.0192	0.0035	0.0157
198	0.0168	0.0031	0.0138
199	0.0151	0.0028	0.0123
200	0.0138	0.0025	0.0113
201	0.0127	0.0023	0.0104
202	0.0119	0.0022	0.0097
203	0.0111	0.0020	0.0091
204	0.0105	0.0019	0.0086
205	0.0103	0.0019	0.0084
206	0.0098	0.0018	0.0080
207	0.0094	0.0017	0.0077
208	0.0090	0.0017	0.0074
209	0.0087	0.0016	0.0071
210	0.0084	0.0015	0.0069
211	0.0081	0.0015	0.0066
212	0.0079	0.0014	0.0064
213	0.0076	0.0014	0.0062
214	0.0074	0.0014	0.0060
215	0.0072	0.0013	0.0059
216	0.0070	0.0013	0.0057
217	0.0067	0.0012	0.0055
218	0.0066	0.0012	0.0054
219	0.0064	0.0012	0.0052
220	0.0063	0.0012	0.0051
221	0.0061	0.0011	0.0050
222	0.0060	0.0011	0.0049
223	0.0059	0.0011	0.0048
224	0.0058	0.0011	0.0047

225	0.0057	0.0010	0.0046
226	0.0056	0.0010	0.0045
227	0.0055	0.0010	0.0045
228	0.0054	0.0010	0.0044
229	0.0053	0.0010	0.0043
230	0.0052	0.0010	0.0042
231	0.0051	0.0009	0.0042
232	0.0050	0.0009	0.0041
233	0.0050	0.0009	0.0040
234	0.0049	0.0009	0.0040
235	0.0048	0.0009	0.0039
236	0.0047	0.0009	0.0039
237	0.0047	0.0009	0.0038
238	0.0046	0.0008	0.0038
239	0.0046	0.0008	0.0037
240	0.0045	0.0008	0.0037
241	0.0044	0.0008	0.0036
242	0.0044	0.0008	0.0036
243	0.0043	0.0008	0.0035
244	0.0043	0.0008	0.0035
245	0.0042	0.0008	0.0035
246	0.0042	0.0008	0.0034
247	0.0041	0.0008	0.0034
248	0.0041	0.0008	0.0033
249	0.0040	0.0007	0.0033
250	0.0040	0.0007	0.0033
251	0.0040	0.0007	0.0032
252	0.0039	0.0007	0.0032
253	0.0039	0.0007	0.0032
254	0.0038	0.0007	0.0031
255	0.0038	0.0007	0.0031
256	0.0038	0.0007	0.0031
257	0.0037	0.0007	0.0031
258	0.0037	0.0007	0.0030
259	0.0037	0.0007	0.0030
260	0.0036	0.0007	0.0030
261	0.0036	0.0007	0.0029
262	0.0036	0.0007	0.0029
263	0.0035	0.0006	0.0029
264	0.0035	0.0006	0.0029
265	0.0035	0.0006	0.0028
266	0.0035	0.0006	0.0028
267	0.0034	0.0006	0.0028
268	0.0034	0.0006	0.0028
269	0.0034	0.0006	0.0028
270	0.0033	0.0006	0.0027
271	0.0033	0.0006	0.0027
272	0.0033	0.0006	0.0027
273	0.0033	0.0006	0.0027
274	0.0032	0.0006	0.0026

275	0.0032	0.0006	0.0026
276	0.0032	0.0006	0.0026
277	0.0032	0.0006	0.0026
278	0.0031	0.0006	0.0026
279	0.0031	0.0006	0.0026
280	0.0031	0.0006	0.0025
281	0.0031	0.0006	0.0025
282	0.0031	0.0006	0.0025
283	0.0030	0.0006	0.0025
284	0.0030	0.0006	0.0025
285	0.0030	0.0006	0.0025
286	0.0030	0.0005	0.0024
287	0.0030	0.0005	0.0024
288	0.0029	0.0005	0.0024

Total soil rain loss = 0.33(In)
Total effective rainfall = 1.80(In)
Peak flow rate in flood hydrograph = 87.65(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

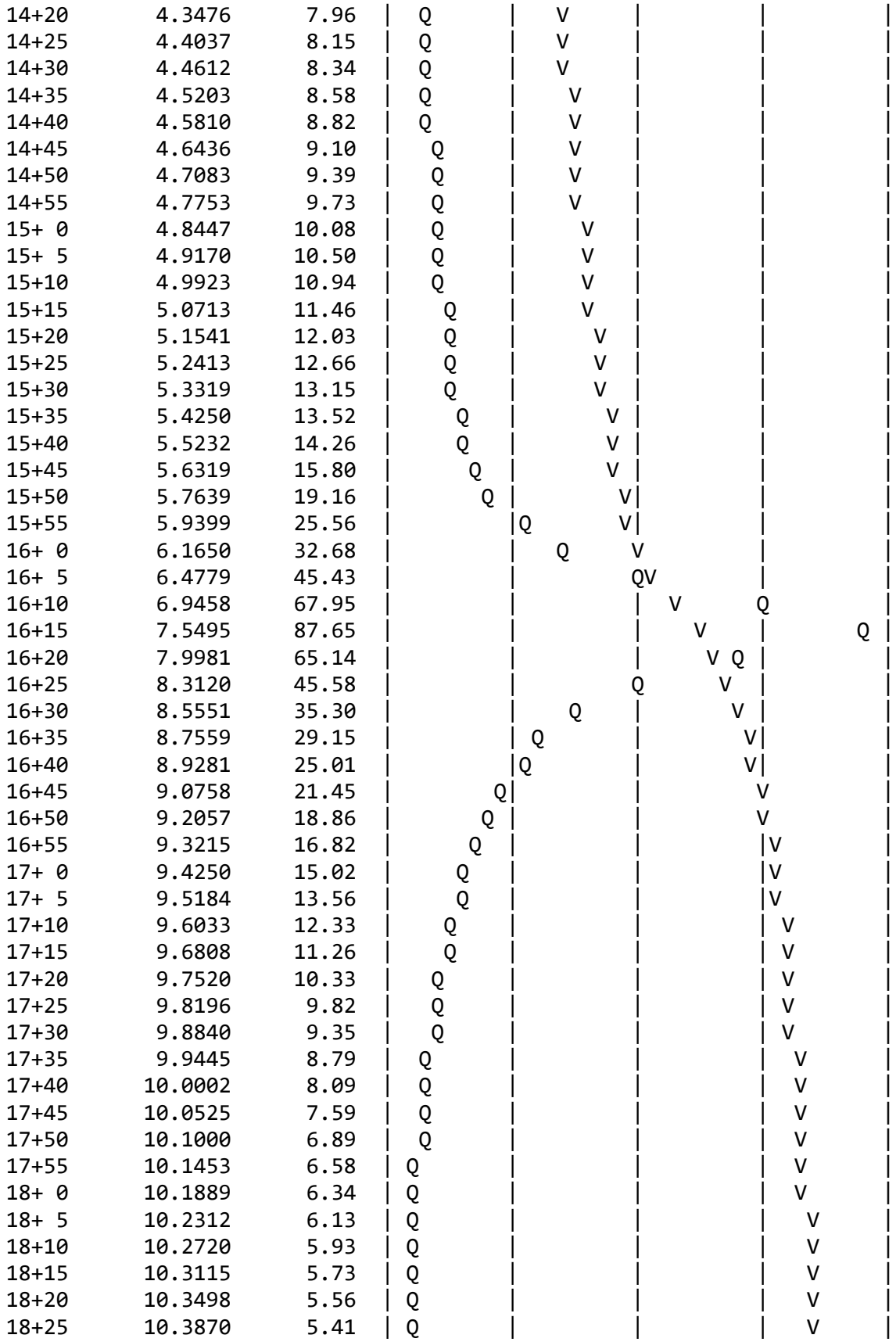
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	22.5	45.0	67.5	90.0
0+ 5	0.0004	0.06	Q	|	|	|	|
0+10	0.0030	0.38	Q	|	|	|	|
0+15	0.0104	1.07	Q	|	|	|	|
0+20	0.0206	1.48	Q	|	|	|	|
0+25	0.0323	1.70	Q	|	|	|	|
0+30	0.0451	1.85	Q	|	|	|	|
0+35	0.0586	1.97	Q	|	|	|	|
0+40	0.0727	2.05	Q	|	|	|	|
0+45	0.0874	2.12	Q	|	|	|	|
0+50	0.1023	2.17	Q	|	|	|	|
0+55	0.1176	2.22	Q	|	|	|	|
1+ 0	0.1332	2.26	VQ	|	|	|	|
1+ 5	0.1490	2.29	VQ	|	|	|	|
1+10	0.1649	2.32	VQ	|	|	|	|
1+15	0.1811	2.34	VQ	|	|	|	|
1+20	0.1973	2.36	VQ	|	|	|	|
1+25	0.2137	2.38	VQ	|	|	|	|
1+30	0.2302	2.40	VQ	|	|	|	|
1+35	0.2468	2.41	VQ	|	|	|	|
1+40	0.2636	2.43	VQ	|	|	|	|
1+45	0.2804	2.44	VQ	|	|	|	|

1+50	0.2973	2.45	VQ	|	|	|	|
1+55	0.3142	2.46	|Q	|	|	|	|
2+ 0	0.3312	2.47	|Q	|	|	|	|
2+ 5	0.3483	2.48	|Q	|	|	|	|
2+10	0.3654	2.49	|Q	|	|	|	|
2+15	0.3826	2.49	|Q	|	|	|	|
2+20	0.3998	2.50	|Q	|	|	|	|
2+25	0.4171	2.51	|Q	|	|	|	|
2+30	0.4345	2.52	|Q	|	|	|	|
2+35	0.4519	2.53	|Q	|	|	|	|
2+40	0.4694	2.54	|Q	|	|	|	|
2+45	0.4869	2.55	|Q	|	|	|	|
2+50	0.5046	2.56	|Q	|	|	|	|
2+55	0.5222	2.57	|Q	|	|	|	|
3+ 0	0.5400	2.58	|Q	|	|	|	|
3+ 5	0.5578	2.59	|Q	|	|	|	|
3+10	0.5757	2.60	|Q	|	|	|	|
3+15	0.5937	2.61	|Q	|	|	|	|
3+20	0.6117	2.62	|QV	|	|	|	|
3+25	0.6298	2.63	|QV	|	|	|	|
3+30	0.6479	2.64	|QV	|	|	|	|
3+35	0.6662	2.65	|QV	|	|	|	|
3+40	0.6845	2.66	|QV	|	|	|	|
3+45	0.7029	2.67	|QV	|	|	|	|
3+50	0.7213	2.68	|QV	|	|	|	|
3+55	0.7399	2.69	|QV	|	|	|	|
4+ 0	0.7585	2.70	|QV	|	|	|	|
4+ 5	0.7772	2.71	|QV	|	|	|	|
4+10	0.7959	2.72	|QV	|	|	|	|
4+15	0.8147	2.74	|QV	|	|	|	|
4+20	0.8337	2.75	|QV	|	|	|	|
4+25	0.8527	2.76	|QV	|	|	|	|
4+30	0.8717	2.77	|QV	|	|	|	|
4+35	0.8909	2.78	|QV	|	|	|	|
4+40	0.9101	2.79	|Q V	|	|	|	|
4+45	0.9294	2.81	|Q V	|	|	|	|
4+50	0.9488	2.82	|Q V	|	|	|	|
4+55	0.9683	2.83	|Q V	|	|	|	|
5+ 0	0.9879	2.84	|Q V	|	|	|	|
5+ 5	1.0076	2.86	|Q V	|	|	|	|
5+10	1.0273	2.87	|Q V	|	|	|	|
5+15	1.0472	2.88	|Q V	|	|	|	|
5+20	1.0671	2.89	|Q V	|	|	|	|
5+25	1.0871	2.91	|Q V	|	|	|	|
5+30	1.1072	2.92	|Q V	|	|	|	|
5+35	1.1274	2.93	|Q V	|	|	|	|
5+40	1.1477	2.95	|Q V	|	|	|	|
5+45	1.1681	2.96	|Q V	|	|	|	|
5+50	1.1886	2.98	|Q V	|	|	|	|
5+55	1.2092	2.99	|Q V	|	|	|	|

6+ 0	1.2299	3.00	|Q V |	|	|	|
6+ 5	1.2507	3.02	|Q V |	|	|	|
6+10	1.2716	3.03	|Q V |	|	|	|
6+15	1.2926	3.05	|Q V |	|	|	|
6+20	1.3137	3.06	|Q V |	|	|	|
6+25	1.3349	3.08	|Q V |	|	|	|
6+30	1.3563	3.10	|Q V |	|	|	|
6+35	1.3777	3.11	|Q V |	|	|	|
6+40	1.3992	3.13	|Q V |	|	|	|
6+45	1.4209	3.14	|Q V |	|	|	|
6+50	1.4426	3.16	|Q V |	|	|	|
6+55	1.4645	3.18	|Q V |	|	|	|
7+ 0	1.4865	3.19	|Q V |	|	|	|
7+ 5	1.5086	3.21	|Q V |	|	|	|
7+10	1.5309	3.23	|Q V |	|	|	|
7+15	1.5532	3.25	|Q V |	|	|	|
7+20	1.5757	3.26	|Q V |	|	|	|
7+25	1.5983	3.28	|Q V |	|	|	|
7+30	1.6211	3.30	|Q V |	|	|	|
7+35	1.6439	3.32	|Q V |	|	|	|
7+40	1.6669	3.34	|Q V |	|	|	|
7+45	1.6901	3.36	|Q V |	|	|	|
7+50	1.7133	3.38	|Q V |	|	|	|
7+55	1.7367	3.40	|Q V |	|	|	|
8+ 0	1.7603	3.42	|Q V |	|	|	|
8+ 5	1.7840	3.44	|Q V |	|	|	|
8+10	1.8078	3.46	|Q V |	|	|	|
8+15	1.8318	3.48	|Q V |	|	|	|
8+20	1.8559	3.50	|Q V |	|	|	|
8+25	1.8802	3.53	|Q V |	|	|	|
8+30	1.9047	3.55	|Q V |	|	|	|
8+35	1.9293	3.57	|Q V |	|	|	|
8+40	1.9540	3.59	|Q V |	|	|	|
8+45	1.9789	3.62	|Q V |	|	|	|
8+50	2.0040	3.64	|Q V |	|	|	|
8+55	2.0293	3.67	|Q V |	|	|	|
9+ 0	2.0547	3.69	|Q V |	|	|	|
9+ 5	2.0803	3.72	|Q V |	|	|	|
9+10	2.1061	3.74	|Q V |	|	|	|
9+15	2.1320	3.77	|Q V |	|	|	|
9+20	2.1582	3.80	|Q V |	|	|	|
9+25	2.1845	3.82	|Q V |	|	|	|
9+30	2.2110	3.85	|Q V |	|	|	|
9+35	2.2378	3.88	|Q V |	|	|	|
9+40	2.2647	3.91	|Q V |	|	|	|
9+45	2.2918	3.94	|Q V |	|	|	|
9+50	2.3191	3.97	|Q V |	|	|	|
9+55	2.3467	4.00	|Q V |	|	|	|
10+ 0	2.3745	4.03	|Q V |	|	|	|
10+ 5	2.4024	4.06	|Q V |	|	|	|

```
10+10       2.4307      4.10  |Q      V |          |          |          |
10+15       2.4591      4.13  |Q      V |          |          |          |
10+20       2.4878      4.16  |Q      V |          |          |          |
10+25       2.5167      4.20  |Q      V |          |          |          |
10+30       2.5459      4.23  |Q      V |          |          |          |
10+35       2.5753      4.27  |Q      V |          |          |          |
10+40       2.6050      4.31  |Q      V |          |          |          |
10+45       2.6349      4.35  |Q      V |          |          |          |
10+50       2.6651      4.39  |Q      V |          |          |          |
10+55       2.6956      4.43  |Q      V |          |          |          |
11+ 0       2.7264      4.47  |Q       V|          |          |          |
11+ 5       2.7575      4.51  | Q      V|          |          |          |
11+10       2.7888      4.55  | Q      V|          |          |          |
11+15       2.8205      4.60  | Q      V|          |          |          |
11+20       2.8525      4.64  | Q      V|          |          |          |
11+25       2.8848      4.69  | Q      V|          |          |          |
11+30       2.9174      4.74  | Q      V|          |          |          |
11+35       2.9504      4.79  | Q      V|          |          |          |
11+40       2.9838      4.84  | Q      V|          |          |          |
11+45       3.0175      4.89  | Q       V          |          |          |
11+50       3.0516      4.95  | Q       V          |          |          |
11+55       3.0860      5.00  | Q       V          |          |          |
12+ 0       3.1209      5.06  | Q       V          |          |          |
12+ 5       3.1561      5.12  | Q       V          |          |          |
12+10       3.1919      5.19  | Q       V          |          |          |
12+15       3.2283      5.28  | Q       V          |          |          |
12+20       3.2652      5.36  | Q       V          |          |          |
12+25       3.3026      5.44  | Q       |V         |          |          |
12+30       3.3406      5.51  | Q       |V         |          |          |
12+35       3.3791      5.59  | Q       |V         |          |          |
12+40       3.4181      5.66  | Q       |V         |          |          |
12+45       3.4576      5.75  | Q       |V         |          |          |
12+50       3.4978      5.83  | Q       |V         |          |          |
12+55       3.5385      5.91  | Q       |V         |          |          |
13+ 0       3.5798      6.00  | Q       |V         |          |          |
13+ 5       3.6218      6.09  | Q       | V        |          |          |
13+10       3.6644      6.19  | Q       | V        |          |          |
13+15       3.7077      6.29  | Q       | V        |          |          |
13+20       3.7517      6.39  | Q       | V        |          |          |
13+25       3.7964      6.50  | Q       | V        |          |          |
13+30       3.8419      6.61  | Q       | V        |          |          |
13+35       3.8883      6.73  | Q       | V        |          |          |
13+40       3.9355      6.85  |  Q      |  V       |          |          |
13+45       3.9836      6.98  |  Q      |  V       |          |          |
13+50       4.0326      7.12  |  Q      |  V       |          |          |
13+55       4.0827      7.27  |  Q      |  V       |          |          |
14+ 0       4.1337      7.42  |  Q      |  V       |          |          |
14+ 5       4.1859      7.58  |  Q      |  V       |          |          |
14+10       4.2390      7.71  |  Q      |   V      |          |          |
14+15       4.2928      7.81  |  Q      |   V      |          |          |
```



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18+30      10.4233      5.26  | Q       |         |         |   V     |
18+35      10.4586      5.13  | Q       |         |         |   V     |
18+40      10.4932      5.01  | Q       |         |         |   V     |
18+45      10.5269      4.90  | Q       |         |         |    V    |
18+50      10.5599      4.79  | Q       |         |         |    V    |
18+55      10.5922      4.69  | Q       |         |         |    V    |
19+ 0      10.6238      4.60  | Q       |         |         |    V    |
19+ 5      10.6549      4.51  | Q       |         |         |    V    |
19+10      10.6853      4.42  |Q        |         |         |    V    |
19+15      10.7152      4.34  |Q        |         |         |    V    |
19+20      10.7446      4.26  |Q        |         |         |    V    |
19+25      10.7734      4.19  |Q        |         |         |    V    |
19+30      10.8018      4.12  |Q        |         |         |     V   |
19+35      10.8297      4.05  |Q        |         |         |     V   |
19+40      10.8572      3.99  |Q        |         |         |     V   |
19+45      10.8843      3.93  |Q        |         |         |     V   |
19+50      10.9109      3.87  |Q        |         |         |     V   |
19+55      10.9372      3.81  |Q        |         |         |     V   |
20+ 0      10.9631      3.76  |Q        |         |         |     V   |
20+ 5      10.9886      3.71  |Q        |         |         |     V   |
20+10      11.0138      3.66  |Q        |         |         |     V   |
20+15      11.0386      3.61  |Q        |         |         |     V   |
20+20      11.0632      3.56  |Q        |         |         |     V   |
20+25      11.0874      3.52  |Q        |         |         |     V   |
20+30      11.1113      3.47  |Q        |         |         |      V  |
20+35      11.1349      3.43  |Q        |         |         |      V  |
20+40      11.1582      3.39  |Q        |         |         |      V  |
20+45      11.1813      3.35  |Q        |         |         |      V  |
20+50      11.2041      3.31  |Q        |         |         |      V  |
20+55      11.2267      3.27  |Q        |         |         |      V  |
21+ 0      11.2490      3.24  |Q        |         |         |      V  |
21+ 5      11.2710      3.20  |Q        |         |         |      V  |
21+10      11.2928      3.17  |Q        |         |         |      V  |
21+15      11.3144      3.14  |Q        |         |         |      V  |
21+20      11.3358      3.10  |Q        |         |         |      V  |
21+25      11.3570      3.07  |Q        |         |         |      V  |
21+30      11.3779      3.04  |Q        |         |         |      V  |
21+35      11.3987      3.01  |Q        |         |         |       V |
21+40      11.4192      2.98  |Q        |         |         |       V |
21+45      11.4395      2.95  |Q        |         |         |       V |
21+50      11.4597      2.93  |Q        |         |         |       V |
21+55      11.4797      2.90  |Q        |         |         |       V |
22+ 0      11.4995      2.87  |Q        |         |         |       V |
22+ 5      11.5191      2.85  |Q        |         |         |       V |
22+10      11.5385      2.82  |Q        |         |         |       V |
22+15      11.5578      2.80  |Q        |         |         |       V |
22+20      11.5769      2.77  |Q        |         |         |       V |
22+25      11.5958      2.75  |Q        |         |         |       V |
22+30      11.6146      2.73  |Q        |         |         |       V |
22+35      11.6333      2.71  |Q        |         |         |       V |
```

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   22+40      11.6518      2.68  |Q        |         |         |       V |
   22+45      11.6701      2.66  |Q        |         |         |       V |
   22+50      11.6883      2.64  |Q        |         |         |       V |
   22+55      11.7063      2.62  |Q        |         |         |        V|
   23+ 0      11.7243      2.60  |Q        |         |         |        V|
   23+ 5      11.7420      2.58  |Q        |         |         |        V|
   23+10      11.7597      2.56  |Q        |         |         |        V|
   23+15      11.7772      2.54  |Q        |         |         |        V|
   23+20      11.7946      2.52  |Q        |         |         |        V|
   23+25      11.8119      2.51  |Q        |         |         |        V|
   23+30      11.8290      2.49  |Q        |         |         |        V|
   23+35      11.8460      2.47  |Q        |         |         |        V|
   23+40      11.8629      2.45  |Q        |         |         |        V|
   23+45      11.8797      2.44  |Q        |         |         |        V|
   23+50      11.8964      2.42  |Q        |         |         |        V|
   23+55      11.9129      2.40  |Q        |         |         |        V|
   24+ 0      11.9294      2.39  |Q        |         |         |        V|
-------------------------------------------------------------------------
```

100-year developed condition Unit hydrograph

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 10/02/22

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

Program License Serial Number 6385

Quarry site
100-yr developed

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		
80.00	1	1.08
Rainfall data for year 100		
80.00	6	2.02
Rainfall data for year 100		
80.00	24	3.45

++

******** 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)
69.0	86.2	80.00	1.000	0.262	0.100	0.026

Area-averaged adjusted loss rate Fm (In/Hr) = 0.026

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC3)	S	Pervious Yield Fr
8.00	0.100	69.0	86.2	1.60	0.600
72.00	0.900	98.0	98.0	0.20	0.932

Area-averaged catchment yield fraction, Y = 0.899
Area-averaged low loss fraction, Yb = 0.101
++
Watercourse length = 3996.00(Ft.)
Length from concentration point to centroid = 1654.00(Ft.)
Elevation difference along watercourse = 50.00(Ft.)
Mannings friction factor along watercourse = 0.035
Watershed area = 80.00(Ac.)
Catchment Lag time = 0.219 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 38.0081
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.026(In/Hr)
Average low loss rate fraction (Yb) = 0.101 (decimal)
DESERT S-Graph Selected
Computed peak 5-minute rainfall = 0.359(In)
Computed peak 30-minute rainfall = 0.854(In)
Specified peak 1-hour rainfall = 1.080(In)
Computed peak 3-hour rainfall = 1.560(In)
Specified peak 6-hour rainfall = 2.020(In)
Specified peak 24-hour rainfall = 3.450(In)

Note: user specified rainfall values used.
Rainfall depth area reduction factors:
Using a total area of 80.00(Ac.) (Ref: fig. E-4)

5-minute factor = 0.996 Adjusted rainfall = 0.358(In)
30-minute factor = 0.996 Adjusted rainfall = 0.851(In)
1-hour factor = 0.996 Adjusted rainfall = 1.076(In)
3-hour factor = 1.000 Adjusted rainfall = 1.559(In)
6-hour factor = 1.000 Adjusted rainfall = 2.019(In)
24-hour factor = 1.000 Adjusted rainfall = 3.450(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 = 967.50 (CFS))	
1	2.535	24.531
2	16.483	134.946
3	46.124	286.768
4	63.556	168.659
5	73.078	92.120
6	79.444	61.595
7	83.941	43.509
8	87.484	34.276
9	90.069	25.011
10	92.124	19.881
11	93.817	16.380
12	95.157	12.970
13	96.253	10.598
14	97.132	8.511
15	97.778	6.242
16	98.193	4.020
17	98.626	4.185
18	99.082	4.413
19	99.501	4.054
20	99.757	2.482
21	100.000	2.349

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.3577	0.3577
2	0.5001	0.1424
3	0.6085	0.1084
4	0.6993	0.0908
5	0.7790	0.0797
6	0.8508	0.0718
7	0.8964	0.0456
8	0.9379	0.0415
9	0.9761	0.0382
10	1.0115	0.0355
11	1.0447	0.0332
12	1.0760	0.0312
13	1.1054	0.0295
14	1.1334	0.0280
15	1.1602	0.0267
16	1.1857	0.0256
17	1.2103	0.0245

18	1.2338	0.0236
19	1.2566	0.0227
20	1.2785	0.0220
21	1.2998	0.0212
22	1.3204	0.0206
23	1.3403	0.0200
24	1.3597	0.0194
25	1.3786	0.0189
26	1.3970	0.0184
27	1.4149	0.0179
28	1.4324	0.0175
29	1.4495	0.0171
30	1.4661	0.0167
31	1.4825	0.0163
32	1.4985	0.0160
33	1.5141	0.0157
34	1.5294	0.0153
35	1.5445	0.0150
36	1.5593	0.0148
37	1.5753	0.0160
38	1.5910	0.0158
39	1.6065	0.0155
40	1.6218	0.0152
41	1.6368	0.0150
42	1.6516	0.0148
43	1.6661	0.0146
44	1.6805	0.0144
45	1.6946	0.0142
46	1.7086	0.0140
47	1.7224	0.0138
48	1.7359	0.0136
49	1.7494	0.0134
50	1.7626	0.0132
51	1.7757	0.0131
52	1.7886	0.0129
53	1.8013	0.0128
54	1.8139	0.0126
55	1.8264	0.0125
56	1.8387	0.0123
57	1.8509	0.0122
58	1.8630	0.0121
59	1.8749	0.0119
60	1.8867	0.0118
61	1.8983	0.0117
62	1.9099	0.0116
63	1.9213	0.0114
64	1.9327	0.0113
65	1.9439	0.0112
66	1.9550	0.0111
67	1.9660	0.0110

68	1.9769	0.0109
69	1.9877	0.0108
70	1.9984	0.0107
71	2.0090	0.0106
72	2.0195	0.0105
73	2.0303	0.0108
74	2.0410	0.0107
75	2.0516	0.0106
76	2.0621	0.0105
77	2.0725	0.0104
78	2.0829	0.0104
79	2.0932	0.0103
80	2.1034	0.0102
81	2.1135	0.0101
82	2.1235	0.0100
83	2.1335	0.0100
84	2.1434	0.0099
85	2.1532	0.0098
86	2.1630	0.0097
87	2.1726	0.0097
88	2.1822	0.0096
89	2.1918	0.0095
90	2.2013	0.0095
91	2.2107	0.0094
92	2.2200	0.0094
93	2.2293	0.0093
94	2.2385	0.0092
95	2.2477	0.0092
96	2.2568	0.0091
97	2.2659	0.0091
98	2.2749	0.0090
99	2.2838	0.0089
100	2.2927	0.0089
101	2.3015	0.0088
102	2.3103	0.0088
103	2.3190	0.0087
104	2.3277	0.0087
105	2.3363	0.0086
106	2.3449	0.0086
107	2.3534	0.0085
108	2.3619	0.0085
109	2.3703	0.0084
110	2.3787	0.0084
111	2.3870	0.0083
112	2.3953	0.0083
113	2.4035	0.0082
114	2.4117	0.0082
115	2.4198	0.0081
116	2.4280	0.0081
117	2.4360	0.0081

118	2.4440	0.0080
119	2.4520	0.0080
120	2.4600	0.0079
121	2.4679	0.0079
122	2.4757	0.0079
123	2.4835	0.0078
124	2.4913	0.0078
125	2.4990	0.0077
126	2.5068	0.0077
127	2.5144	0.0077
128	2.5220	0.0076
129	2.5296	0.0076
130	2.5372	0.0076
131	2.5447	0.0075
132	2.5522	0.0075
133	2.5596	0.0075
134	2.5671	0.0074
135	2.5744	0.0074
136	2.5818	0.0073
137	2.5891	0.0073
138	2.5964	0.0073
139	2.6036	0.0073
140	2.6109	0.0072
141	2.6180	0.0072
142	2.6252	0.0072
143	2.6323	0.0071
144	2.6394	0.0071
145	2.6465	0.0071
146	2.6535	0.0070
147	2.6605	0.0070
148	2.6675	0.0070
149	2.6745	0.0069
150	2.6814	0.0069
151	2.6883	0.0069
152	2.6951	0.0069
153	2.7020	0.0068
154	2.7088	0.0068
155	2.7155	0.0068
156	2.7223	0.0068
157	2.7290	0.0067
158	2.7357	0.0067
159	2.7424	0.0067
160	2.7490	0.0066
161	2.7557	0.0066
162	2.7623	0.0066
163	2.7688	0.0066
164	2.7754	0.0065
165	2.7819	0.0065
166	2.7884	0.0065
167	2.7949	0.0065

168	2.8013	0.0065
169	2.8078	0.0064
170	2.8142	0.0064
171	2.8206	0.0064
172	2.8269	0.0064
173	2.8333	0.0063
174	2.8396	0.0063
175	2.8459	0.0063
176	2.8521	0.0063
177	2.8584	0.0062
178	2.8646	0.0062
179	2.8708	0.0062
180	2.8770	0.0062
181	2.8832	0.0062
182	2.8893	0.0061
183	2.8954	0.0061
184	2.9015	0.0061
185	2.9076	0.0061
186	2.9137	0.0061
187	2.9197	0.0060
188	2.9257	0.0060
189	2.9317	0.0060
190	2.9377	0.0060
191	2.9437	0.0060
192	2.9496	0.0059
193	2.9555	0.0059
194	2.9614	0.0059
195	2.9673	0.0059
196	2.9732	0.0059
197	2.9790	0.0058
198	2.9849	0.0058
199	2.9907	0.0058
200	2.9965	0.0058
201	3.0023	0.0058
202	3.0080	0.0058
203	3.0138	0.0057
204	3.0195	0.0057
205	3.0252	0.0057
206	3.0309	0.0057
207	3.0366	0.0057
208	3.0422	0.0057
209	3.0479	0.0056
210	3.0535	0.0056
211	3.0591	0.0056
212	3.0647	0.0056
213	3.0703	0.0056
214	3.0758	0.0056
215	3.0814	0.0055
216	3.0869	0.0055
217	3.0924	0.0055

218	3.0979	0.0055
219	3.1034	0.0055
220	3.1088	0.0055
221	3.1143	0.0055
222	3.1197	0.0054
223	3.1251	0.0054
224	3.1306	0.0054
225	3.1359	0.0054
226	3.1413	0.0054
227	3.1467	0.0054
228	3.1520	0.0053
229	3.1574	0.0053
230	3.1627	0.0053
231	3.1680	0.0053
232	3.1733	0.0053
233	3.1785	0.0053
234	3.1838	0.0053
235	3.1891	0.0052
236	3.1943	0.0052
237	3.1995	0.0052
238	3.2047	0.0052
239	3.2099	0.0052
240	3.2151	0.0052
241	3.2203	0.0052
242	3.2254	0.0052
243	3.2306	0.0051
244	3.2357	0.0051
245	3.2408	0.0051
246	3.2459	0.0051
247	3.2510	0.0051
248	3.2561	0.0051
249	3.2611	0.0051
250	3.2662	0.0051
251	3.2712	0.0050
252	3.2763	0.0050
253	3.2813	0.0050
254	3.2863	0.0050
255	3.2913	0.0050
256	3.2962	0.0050
257	3.3012	0.0050
258	3.3062	0.0050
259	3.3111	0.0049
260	3.3160	0.0049
261	3.3210	0.0049
262	3.3259	0.0049
263	3.3308	0.0049
264	3.3357	0.0049
265	3.3405	0.0049
266	3.3454	0.0049
267	3.3502	0.0049

268	3.3551	0.0048
269	3.3599	0.0048
270	3.3647	0.0048
271	3.3695	0.0048
272	3.3743	0.0048
273	3.3791	0.0048
274	3.3839	0.0048
275	3.3887	0.0048
276	3.3934	0.0048
277	3.3982	0.0047
278	3.4029	0.0047
279	3.4076	0.0047
280	3.4123	0.0047
281	3.4170	0.0047
282	3.4217	0.0047
283	3.4264	0.0047
284	3.4311	0.0047
285	3.4357	0.0047
286	3.4404	0.0047
287	3.4450	0.0046
288	3.4497	0.0046

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0046	0.0005	0.0042
2	0.0046	0.0005	0.0042
3	0.0047	0.0005	0.0042
4	0.0047	0.0005	0.0042
5	0.0047	0.0005	0.0042
6	0.0047	0.0005	0.0042
7	0.0047	0.0005	0.0042
8	0.0047	0.0005	0.0043
9	0.0048	0.0005	0.0043
10	0.0048	0.0005	0.0043
11	0.0048	0.0005	0.0043
12	0.0048	0.0005	0.0043
13	0.0048	0.0005	0.0043
14	0.0048	0.0005	0.0043
15	0.0049	0.0005	0.0044
16	0.0049	0.0005	0.0044
17	0.0049	0.0005	0.0044
18	0.0049	0.0005	0.0044
19	0.0049	0.0005	0.0044
20	0.0049	0.0005	0.0044
21	0.0050	0.0005	0.0045
22	0.0050	0.0005	0.0045
23	0.0050	0.0005	0.0045
24	0.0050	0.0005	0.0045

25	0.0050	0.0005	0.0045
26	0.0050	0.0005	0.0045
27	0.0051	0.0005	0.0046
28	0.0051	0.0005	0.0046
29	0.0051	0.0005	0.0046
30	0.0051	0.0005	0.0046
31	0.0051	0.0005	0.0046
32	0.0052	0.0005	0.0046
33	0.0052	0.0005	0.0047
34	0.0052	0.0005	0.0047
35	0.0052	0.0005	0.0047
36	0.0052	0.0005	0.0047
37	0.0053	0.0005	0.0047
38	0.0053	0.0005	0.0047
39	0.0053	0.0005	0.0048
40	0.0053	0.0005	0.0048
41	0.0053	0.0005	0.0048
42	0.0054	0.0005	0.0048
43	0.0054	0.0005	0.0048
44	0.0054	0.0005	0.0049
45	0.0054	0.0005	0.0049
46	0.0055	0.0005	0.0049
47	0.0055	0.0006	0.0049
48	0.0055	0.0006	0.0049
49	0.0055	0.0006	0.0050
50	0.0055	0.0006	0.0050
51	0.0056	0.0006	0.0050
52	0.0056	0.0006	0.0050
53	0.0056	0.0006	0.0051
54	0.0056	0.0006	0.0051
55	0.0057	0.0006	0.0051
56	0.0057	0.0006	0.0051
57	0.0057	0.0006	0.0051
58	0.0057	0.0006	0.0052
59	0.0058	0.0006	0.0052
60	0.0058	0.0006	0.0052
61	0.0058	0.0006	0.0052
62	0.0058	0.0006	0.0053
63	0.0059	0.0006	0.0053
64	0.0059	0.0006	0.0053
65	0.0059	0.0006	0.0053
66	0.0060	0.0006	0.0054
67	0.0060	0.0006	0.0054
68	0.0060	0.0006	0.0054
69	0.0061	0.0006	0.0054
70	0.0061	0.0006	0.0055
71	0.0061	0.0006	0.0055
72	0.0061	0.0006	0.0055
73	0.0062	0.0006	0.0056
74	0.0062	0.0006	0.0056

75	0.0062	0.0006	0.0056
76	0.0063	0.0006	0.0056
77	0.0063	0.0006	0.0057
78	0.0063	0.0006	0.0057
79	0.0064	0.0006	0.0057
80	0.0064	0.0006	0.0058
81	0.0065	0.0007	0.0058
82	0.0065	0.0007	0.0058
83	0.0065	0.0007	0.0059
84	0.0065	0.0007	0.0059
85	0.0066	0.0007	0.0059
86	0.0066	0.0007	0.0060
87	0.0067	0.0007	0.0060
88	0.0067	0.0007	0.0060
89	0.0068	0.0007	0.0061
90	0.0068	0.0007	0.0061
91	0.0068	0.0007	0.0061
92	0.0069	0.0007	0.0062
93	0.0069	0.0007	0.0062
94	0.0069	0.0007	0.0062
95	0.0070	0.0007	0.0063
96	0.0070	0.0007	0.0063
97	0.0071	0.0007	0.0064
98	0.0071	0.0007	0.0064
99	0.0072	0.0007	0.0065
100	0.0072	0.0007	0.0065
101	0.0073	0.0007	0.0065
102	0.0073	0.0007	0.0066
103	0.0074	0.0007	0.0066
104	0.0074	0.0007	0.0067
105	0.0075	0.0008	0.0067
106	0.0075	0.0008	0.0068
107	0.0076	0.0008	0.0068
108	0.0076	0.0008	0.0069
109	0.0077	0.0008	0.0069
110	0.0077	0.0008	0.0070
111	0.0078	0.0008	0.0070
112	0.0079	0.0008	0.0071
113	0.0079	0.0008	0.0071
114	0.0080	0.0008	0.0072
115	0.0081	0.0008	0.0072
116	0.0081	0.0008	0.0073
117	0.0082	0.0008	0.0074
118	0.0082	0.0008	0.0074
119	0.0083	0.0008	0.0075
120	0.0084	0.0008	0.0075
121	0.0085	0.0009	0.0076
122	0.0085	0.0009	0.0077
123	0.0086	0.0009	0.0077
124	0.0087	0.0009	0.0078

125	0.0088	0.0009	0.0079
126	0.0088	0.0009	0.0079
127	0.0089	0.0009	0.0080
128	0.0090	0.0009	0.0081
129	0.0091	0.0009	0.0082
130	0.0092	0.0009	0.0082
131	0.0093	0.0009	0.0084
132	0.0094	0.0009	0.0084
133	0.0095	0.0010	0.0085
134	0.0095	0.0010	0.0086
135	0.0097	0.0010	0.0087
136	0.0097	0.0010	0.0088
137	0.0099	0.0010	0.0089
138	0.0100	0.0010	0.0090
139	0.0101	0.0010	0.0091
140	0.0102	0.0010	0.0092
141	0.0104	0.0010	0.0093
142	0.0104	0.0011	0.0094
143	0.0106	0.0011	0.0095
144	0.0107	0.0011	0.0096
145	0.0105	0.0011	0.0095
146	0.0106	0.0011	0.0095
147	0.0108	0.0011	0.0097
148	0.0109	0.0011	0.0098
149	0.0111	0.0011	0.0100
150	0.0112	0.0011	0.0101
151	0.0114	0.0012	0.0103
152	0.0116	0.0012	0.0104
153	0.0118	0.0012	0.0106
154	0.0119	0.0012	0.0107
155	0.0122	0.0012	0.0110
156	0.0123	0.0012	0.0111
157	0.0126	0.0013	0.0113
158	0.0128	0.0013	0.0115
159	0.0131	0.0013	0.0118
160	0.0132	0.0013	0.0119
161	0.0136	0.0014	0.0122
162	0.0138	0.0014	0.0124
163	0.0142	0.0014	0.0127
164	0.0144	0.0014	0.0129
165	0.0148	0.0015	0.0133
166	0.0150	0.0015	0.0135
167	0.0155	0.0016	0.0139
168	0.0158	0.0016	0.0142
169	0.0148	0.0015	0.0133
170	0.0150	0.0015	0.0135
171	0.0157	0.0016	0.0141
172	0.0160	0.0016	0.0144
173	0.0167	0.0017	0.0150
174	0.0171	0.0017	0.0154

175	0.0179	0.0018	0.0161
176	0.0184	0.0019	0.0165
177	0.0194	0.0020	0.0174
178	0.0200	0.0020	0.0180
179	0.0212	0.0021	0.0191
180	0.0220	0.0022	0.0198
181	0.0236	0.0022	0.0214
182	0.0245	0.0022	0.0223
183	0.0267	0.0022	0.0245
184	0.0280	0.0022	0.0258
185	0.0312	0.0022	0.0291
186	0.0332	0.0022	0.0310
187	0.0382	0.0022	0.0360
188	0.0415	0.0022	0.0393
189	0.0718	0.0022	0.0696
190	0.0797	0.0022	0.0775
191	0.1084	0.0022	0.1062
192	0.1424	0.0022	0.1403
193	0.3577	0.0022	0.3555
194	0.0908	0.0022	0.0887
195	0.0456	0.0022	0.0434
196	0.0355	0.0022	0.0333
197	0.0295	0.0022	0.0273
198	0.0256	0.0022	0.0234
199	0.0227	0.0022	0.0206
200	0.0206	0.0021	0.0185
201	0.0189	0.0019	0.0170
202	0.0175	0.0018	0.0157
203	0.0163	0.0016	0.0147
204	0.0153	0.0015	0.0138
205	0.0160	0.0016	0.0144
206	0.0152	0.0015	0.0137
207	0.0146	0.0015	0.0131
208	0.0140	0.0014	0.0125
209	0.0134	0.0014	0.0121
210	0.0129	0.0013	0.0116
211	0.0125	0.0013	0.0112
212	0.0121	0.0012	0.0108
213	0.0117	0.0012	0.0105
214	0.0113	0.0011	0.0102
215	0.0110	0.0011	0.0099
216	0.0107	0.0011	0.0096
217	0.0108	0.0011	0.0097
218	0.0105	0.0011	0.0095
219	0.0103	0.0010	0.0092
220	0.0100	0.0010	0.0090
221	0.0098	0.0010	0.0088
222	0.0096	0.0010	0.0086
223	0.0094	0.0009	0.0085
224	0.0092	0.0009	0.0083

225	0.0091	0.0009	0.0081
226	0.0089	0.0009	0.0080
227	0.0087	0.0009	0.0078
228	0.0086	0.0009	0.0077
229	0.0084	0.0008	0.0076
230	0.0083	0.0008	0.0074
231	0.0081	0.0008	0.0073
232	0.0080	0.0008	0.0072
233	0.0079	0.0008	0.0071
234	0.0078	0.0008	0.0070
235	0.0077	0.0008	0.0069
236	0.0076	0.0008	0.0068
237	0.0075	0.0008	0.0067
238	0.0073	0.0007	0.0066
239	0.0073	0.0007	0.0065
240	0.0072	0.0007	0.0064
241	0.0071	0.0007	0.0064
242	0.0070	0.0007	0.0063
243	0.0069	0.0007	0.0062
244	0.0068	0.0007	0.0061
245	0.0067	0.0007	0.0060
246	0.0066	0.0007	0.0060
247	0.0066	0.0007	0.0059
248	0.0065	0.0007	0.0058
249	0.0064	0.0006	0.0058
250	0.0064	0.0006	0.0057
251	0.0063	0.0006	0.0057
252	0.0062	0.0006	0.0056
253	0.0062	0.0006	0.0055
254	0.0061	0.0006	0.0055
255	0.0060	0.0006	0.0054
256	0.0060	0.0006	0.0054
257	0.0059	0.0006	0.0053
258	0.0059	0.0006	0.0053
259	0.0058	0.0006	0.0052
260	0.0058	0.0006	0.0052
261	0.0057	0.0006	0.0051
262	0.0057	0.0006	0.0051
263	0.0056	0.0006	0.0050
264	0.0056	0.0006	0.0050
265	0.0055	0.0006	0.0050
266	0.0055	0.0006	0.0049
267	0.0054	0.0005	0.0049
268	0.0054	0.0005	0.0048
269	0.0053	0.0005	0.0048
270	0.0053	0.0005	0.0048
271	0.0052	0.0005	0.0047
272	0.0052	0.0005	0.0047
273	0.0052	0.0005	0.0046
274	0.0051	0.0005	0.0046

275	0.0051	0.0005	0.0046
276	0.0051	0.0005	0.0045
277	0.0050	0.0005	0.0045
278	0.0050	0.0005	0.0045
279	0.0049	0.0005	0.0044
280	0.0049	0.0005	0.0044
281	0.0049	0.0005	0.0044
282	0.0048	0.0005	0.0044
283	0.0048	0.0005	0.0043
284	0.0048	0.0005	0.0043
285	0.0047	0.0005	0.0043
286	0.0047	0.0005	0.0042
287	0.0047	0.0005	0.0042
288	0.0047	0.0005	0.0042

Total soil rain loss = 0.26(In)
Total effective rainfall = 3.19(In)
Peak flow rate in flood hydrograph = 160.86(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

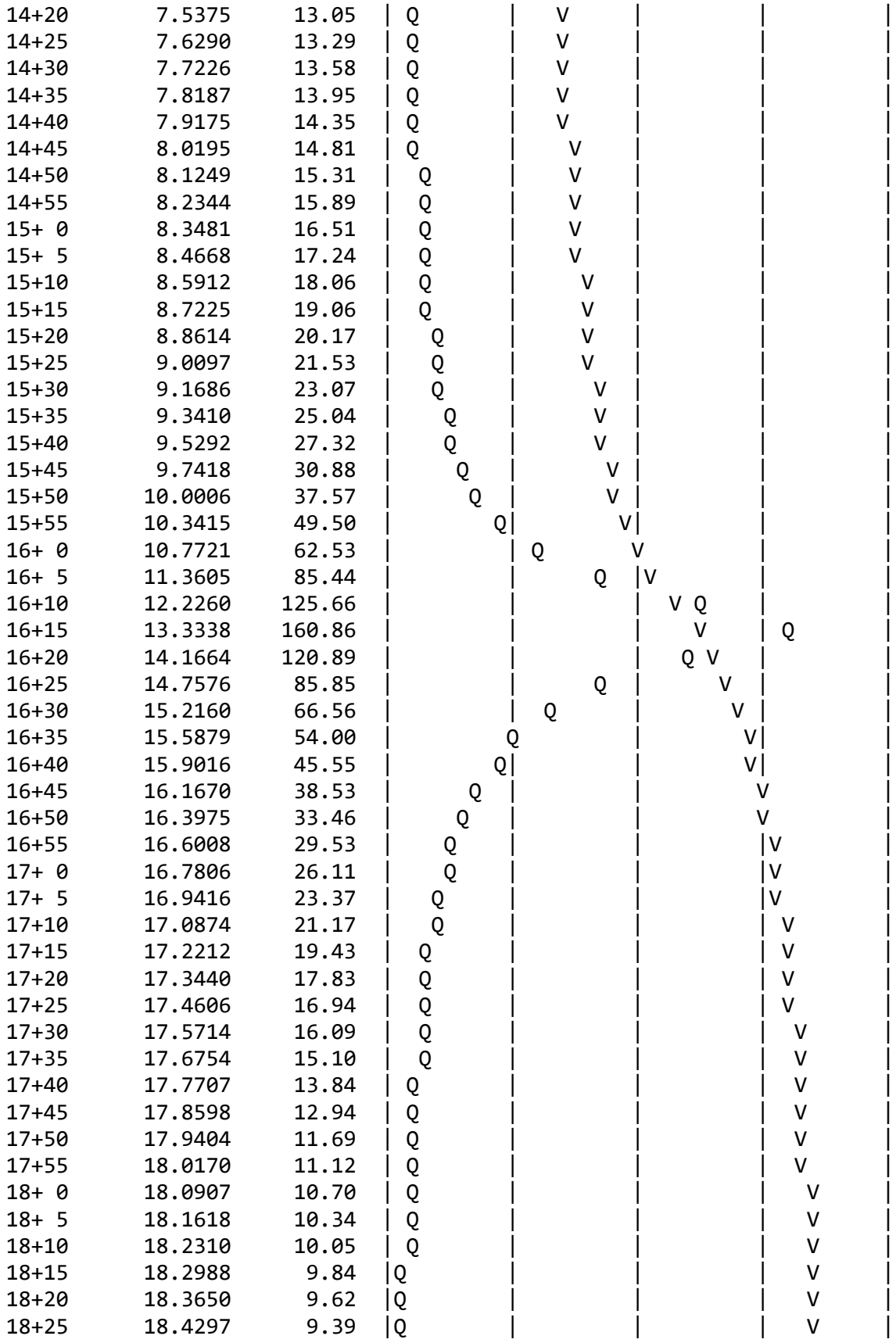
Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0007	0.10	Q	|	|	|	|
0+10	0.0053	0.66	Q	|	|	|	|
0+15	0.0181	1.86	Q	|	|	|	|
0+20	0.0358	2.57	Q	|	|	|	|
0+25	0.0562	2.96	Q	|	|	|	|
0+30	0.0784	3.23	Q	|	|	|	|
0+35	0.1019	3.42	Q	|	|	|	|
0+40	0.1265	3.57	Q	|	|	|	|
0+45	0.1519	3.69	Q	|	|	|	|
0+50	0.1779	3.78	Q	|	|	|	|
0+55	0.2045	3.86	Q	|	|	|	|
1+ 0	0.2316	3.93	Q	|	|	|	|
1+ 5	0.2590	3.99	Q	|	|	|	|
1+10	0.2868	4.03	Q	|	|	|	|
1+15	0.3149	4.07	Q	|	|	|	|
1+20	0.3432	4.11	Q	|	|	|	|
1+25	0.3716	4.14	Q	|	|	|	|
1+30	0.4004	4.17	Q	|	|	|	|
1+35	0.4293	4.20	Q	|	|	|	|
1+40	0.4584	4.23	Q	|	|	|	|
1+45	0.4877	4.25	Q	|	|	|	|

1+50	0.5170	4.26	Q	|	|	|	|
1+55	0.5465	4.28	QV	|	|	|	|
2+ 0	0.5761	4.29	QV	|	|	|	|
2+ 5	0.6058	4.31	QV	|	|	|	|
2+10	0.6356	4.33	QV	|	|	|	|
2+15	0.6655	4.34	QV	|	|	|	|
2+20	0.6955	4.36	QV	|	|	|	|
2+25	0.7256	4.37	QV	|	|	|	|
2+30	0.7558	4.39	QV	|	|	|	|
2+35	0.7862	4.41	QV	|	|	|	|
2+40	0.8166	4.42	QV	|	|	|	|
2+45	0.8472	4.44	QV	|	|	|	|
2+50	0.8779	4.46	QV	|	|	|	|
2+55	0.9087	4.47	QV	|	|	|	|
3+ 0	0.9396	4.49	QV	|	|	|	|
3+ 5	0.9706	4.51	QV	|	|	|	|
3+10	1.0018	4.52	QV	|	|	|	|
3+15	1.0331	4.54	QV	|	|	|	|
3+20	1.0645	4.56	Q V	|	|	|	|
3+25	1.0960	4.58	Q V	|	|	|	|
3+30	1.1276	4.60	Q V	|	|	|	|
3+35	1.1594	4.61	Q V	|	|	|	|
3+40	1.1913	4.63	Q V	|	|	|	|
3+45	1.2234	4.65	Q V	|	|	|	|
3+50	1.2555	4.67	Q V	|	|	|	|
3+55	1.2878	4.69	Q V	|	|	|	|
4+ 0	1.3202	4.71	Q V	|	|	|	|
4+ 5	1.3528	4.73	Q V	|	|	|	|
4+10	1.3855	4.75	Q V	|	|	|	|
4+15	1.4183	4.77	Q V	|	|	|	|
4+20	1.4513	4.79	Q V	|	|	|	|
4+25	1.4844	4.81	Q V	|	|	|	|
4+30	1.5177	4.83	Q V	|	|	|	|
4+35	1.5511	4.85	Q V	|	|	|	|
4+40	1.5846	4.87	Q V	|	|	|	|
4+45	1.6183	4.89	Q V	|	|	|	|
4+50	1.6522	4.91	Q V	|	|	|	|
4+55	1.6862	4.94	Q V	|	|	|	|
5+ 0	1.7203	4.96	Q V	|	|	|	|
5+ 5	1.7546	4.98	Q V	|	|	|	|
5+10	1.7891	5.00	|Q V	|	|	|	|
5+15	1.8237	5.03	|Q V	|	|	|	|
5+20	1.8585	5.05	|Q V	|	|	|	|
5+25	1.8934	5.07	|Q V	|	|	|	|
5+30	1.9285	5.10	|Q V	|	|	|	|
5+35	1.9638	5.12	|Q V	|	|	|	|
5+40	1.9992	5.15	|Q V	|	|	|	|
5+45	2.0348	5.17	|Q V	|	|	|	|
5+50	2.0706	5.19	|Q V	|	|	|	|
5+55	2.1066	5.22	|Q V	|	|	|	|

6+ 0	2.1427	5.25	|Q V	|	|	|	|
6+ 5	2.1790	5.27	|Q V	|	|	|	|
6+10	2.2155	5.30	|Q V	|	|	|	|
6+15	2.2522	5.33	|Q V	|	|	|	|
6+20	2.2890	5.35	|Q V	|	|	|	|
6+25	2.3261	5.38	|Q V	|	|	|	|
6+30	2.3633	5.41	|Q V	|	|	|	|
6+35	2.4007	5.44	|Q V	|	|	|	|
6+40	2.4384	5.46	|Q V	|	|	|	|
6+45	2.4762	5.49	|Q V	|	|	|	|
6+50	2.5142	5.52	|Q V	|	|	|	|
6+55	2.5525	5.55	|Q V	|	|	|	|
7+ 0	2.5909	5.58	|Q V	|	|	|	|
7+ 5	2.6296	5.61	|Q V	|	|	|	|
7+10	2.6685	5.64	|Q V	|	|	|	|
7+15	2.7076	5.68	|Q V	|	|	|	|
7+20	2.7469	5.71	|Q V	|	|	|	|
7+25	2.7864	5.74	|Q V	|	|	|	|
7+30	2.8262	5.77	|Q V	|	|	|	|
7+35	2.8662	5.81	|Q V	|	|	|	|
7+40	2.9064	5.84	|Q V	|	|	|	|
7+45	2.9468	5.88	|Q V	|	|	|	|
7+50	2.9875	5.91	|Q V	|	|	|	|
7+55	3.0285	5.95	|Q V	|	|	|	|
8+ 0	3.0697	5.98	|Q V	|	|	|	|
8+ 5	3.1112	6.02	|Q V	|	|	|	|
8+10	3.1529	6.06	|Q V	|	|	|	|
8+15	3.1948	6.10	|Q V	|	|	|	|
8+20	3.2371	6.13	|Q V	|	|	|	|
8+25	3.2796	6.17	|Q V	|	|	|	|
8+30	3.3224	6.21	|Q V	|	|	|	|
8+35	3.3655	6.25	|Q V	|	|	|	|
8+40	3.4088	6.29	|Q V	|	|	|	|
8+45	3.4525	6.34	|Q V	|	|	|	|
8+50	3.4964	6.38	|Q V	|	|	|	|
8+55	3.5406	6.42	|Q V	|	|	|	|
9+ 0	3.5852	6.47	|Q V	|	|	|	|
9+ 5	3.6300	6.51	|Q V	|	|	|	|
9+10	3.6752	6.56	|Q V	|	|	|	|
9+15	3.7207	6.61	|Q V	|	|	|	|
9+20	3.7665	6.65	|Q V	|	|	|	|
9+25	3.8127	6.70	|Q V	|	|	|	|
9+30	3.8592	6.75	|Q V	|	|	|	|
9+35	3.9060	6.80	|Q V	|	|	|	|
9+40	3.9533	6.85	|Q V	|	|	|	|
9+45	4.0008	6.91	|Q V	|	|	|	|
9+50	4.0488	6.96	|Q V	|	|	|	|
9+55	4.0971	7.02	|Q V	|	|	|	|
10+ 0	4.1458	7.07	|Q V	|	|	|	|
10+ 5	4.1949	7.13	|Q V	|	|	|	|

```
10+10       4.2444      7.19  |Q     V  |          |          |          |
10+15       4.2943      7.25  |Q      V |          |          |          |
10+20       4.3447      7.31  |Q      V |          |          |          |
10+25       4.3955      7.37  |Q      V |          |          |          |
10+30       4.4467      7.44  |Q      V |          |          |          |
10+35       4.4983      7.50  |Q      V |          |          |          |
10+40       4.5505      7.57  |Q      V |          |          |          |
10+45       4.6031      7.64  |Q      V |          |          |          |
10+50       4.6561      7.71  |Q      V |          |          |          |
10+55       4.7097      7.78  |Q      V |          |          |          |
11+ 0       4.7638      7.85  |Q      V |          |          |          |
11+ 5       4.8184      7.93  |Q       V|          |          |          |
11+10       4.8736      8.01  |Q       V|          |          |          |
11+15       4.9293      8.09  |Q       V|          |          |          |
11+20       4.9855      8.17  |Q       V|          |          |          |
11+25       5.0424      8.25  |Q       V|          |          |          |
11+30       5.0998      8.34  |Q       V|          |          |          |
11+35       5.1578      8.43  |Q       V|          |          |          |
11+40       5.2165      8.52  |Q       V|          |          |          |
11+45       5.2758      8.61  |Q       V|          |          |          |
11+50       5.3358      8.71  |Q        V          |          |          |
11+55       5.3965      8.81  |Q        V          |          |          |
12+ 0       5.4579      8.91  |Q        V          |          |          |
12+ 5       5.5199      9.01  |Q        V          |          |          |
12+10       5.5824      9.07  |Q        V          |          |          |
12+15       5.6451      9.09  |Q        V          |          |          |
12+20       5.7081      9.15  |Q        V          |          |          |
12+25       5.7717      9.24  |Q        V          |          |          |
12+30       5.8361      9.34  |Q        V          |          |          |
12+35       5.9013      9.46  |Q        |V          |          |          |
12+40       5.9672      9.58  |Q        |V          |          |          |
12+45       6.0341      9.71  |Q        |V          |          |          |
12+50       6.1019      9.84  |Q        |V          |          |          |
12+55       6.1707      9.99  |Q        |V          |          |          |
13+ 0       6.2405     10.14  | Q       |V          |          |          |
13+ 5       6.3115     10.30  | Q       |V          |          |          |
13+10       6.3835     10.46  | Q       | V         |          |          |
13+15       6.4567     10.64  | Q       | V         |          |          |
13+20       6.5312     10.81  | Q       | V         |          |          |
13+25       6.6070     11.01  | Q       | V         |          |          |
13+30       6.6841     11.20  | Q       | V         |          |          |
13+35       6.7628     11.41  | Q       | V         |          |          |
13+40       6.8428     11.63  | Q       | V         |          |          |
13+45       6.9246     11.86  | Q       |  V        |          |          |
13+50       7.0079     12.10  | Q       |  V        |          |          |
13+55       7.0931     12.37  | Q       |  V        |          |          |
14+ 0       7.1801     12.63  | Q       |  V        |          |          |
14+ 5       7.2689     12.90  | Q       |  V        |          |          |
14+10       7.3585     13.01  | Q       |  V        |          |          |
14+15       7.4477     12.94  | Q       |   V       |          |          |
```



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18+30      18.4928      9.17  |Q        |          |          |   V      |
18+35      18.5546      8.96  |Q        |          |          |   V      |
18+40      18.6149      8.76  |Q        |          |          |    V     |
18+45      18.6740      8.57  |Q        |          |          |    V     |
18+50      18.7318      8.39  |Q        |          |          |    V     |
18+55      18.7884      8.22  |Q        |          |          |    V     |
19+ 0      18.8439      8.06  |Q        |          |          |    V     |
19+ 5      18.8983      7.90  |Q        |          |          |    V     |
19+10      18.9517      7.75  |Q        |          |          |    V     |
19+15      19.0042      7.61  |Q        |          |          |    V     |
19+20      19.0557      7.48  |Q        |          |          |    V     |
19+25      19.1063      7.35  |Q        |          |          |    V     |
19+30      19.1561      7.23  |Q        |          |          |     V    |
19+35      19.2050      7.11  |Q        |          |          |     V    |
19+40      19.2532      7.00  |Q        |          |          |     V    |
19+45      19.3007      6.89  |Q        |          |          |     V    |
19+50      19.3474      6.78  |Q        |          |          |     V    |
19+55      19.3934      6.68  |Q        |          |          |     V    |
20+ 0      19.4388      6.59  |Q        |          |          |     V    |
20+ 5      19.4835      6.49  |Q        |          |          |     V    |
20+10      19.5276      6.41  |Q        |          |          |     V    |
20+15      19.5712      6.32  |Q        |          |          |     V    |
20+20      19.6141      6.24  |Q        |          |          |     V    |
20+25      19.6565      6.16  |Q        |          |          |      V   |
20+30      19.6983      6.08  |Q        |          |          |      V   |
20+35      19.7397      6.00  |Q        |          |          |      V   |
20+40      19.7805      5.93  |Q        |          |          |      V   |
20+45      19.8209      5.86  |Q        |          |          |      V   |
20+50      19.8608      5.79  |Q        |          |          |      V   |
20+55      19.9002      5.72  |Q        |          |          |      V   |
21+ 0      19.9392      5.66  |Q        |          |          |      V   |
21+ 5      19.9777      5.60  |Q        |          |          |      V   |
21+10      20.0158      5.54  |Q        |          |          |      V   |
21+15      20.0536      5.48  |Q        |          |          |      V   |
21+20      20.0909      5.42  |Q        |          |          |      V   |
21+25      20.1279      5.37  |Q        |          |          |      V   |
21+30      20.1644      5.31  |Q        |          |          |      V   |
21+35      20.2007      5.26  |Q        |          |          |       V  |
21+40      20.2365      5.21  |Q        |          |          |       V  |
21+45      20.2720      5.16  |Q        |          |          |       V  |
21+50      20.3072      5.11  |Q        |          |          |       V  |
21+55      20.3420      5.06  |Q        |          |          |       V  |
22+ 0      20.3766      5.01  |Q        |          |          |       V  |
22+ 5      20.4108      4.97  Q        |          |          |       V  |
22+10      20.4447      4.92  Q        |          |          |       V  |
22+15      20.4783      4.88  Q        |          |          |       V  |
22+20      20.5116      4.84  Q        |          |          |       V  |
22+25      20.5447      4.80  Q        |          |          |       V  |
22+30      20.5774      4.76  Q        |          |          |       V  |
22+35      20.6099      4.72  Q        |          |          |       V  |
```

22+40	20.6421	4.68	Q	|	|	|	V |
22+45	20.6741	4.64	Q	|	|	|	V |
22+50	20.7058	4.60	Q	|	|	|	V|
22+55	20.7372	4.57	Q	|	|	|	V|
23+ 0	20.7684	4.53	Q	|	|	|	V|
23+ 5	20.7994	4.50	Q	|	|	|	V|
23+10	20.8301	4.46	Q	|	|	|	V|
23+15	20.8606	4.43	Q	|	|	|	V|
23+20	20.8909	4.40	Q	|	|	|	V|
23+25	20.9209	4.36	Q	|	|	|	V|
23+30	20.9508	4.33	Q	|	|	|	V|
23+35	20.9804	4.30	Q	|	|	|	V|
23+40	21.0098	4.27	Q	|	|	|	V|
23+45	21.0390	4.24	Q	|	|	|	V|
23+50	21.0680	4.21	Q	|	|	|	V|
23+55	21.0968	4.18	Q	|	|	|	V|
24+ 0	21.1254	4.15	Q	|	|	|	V|

APPENDIX 'E'

Basin Routing

Detention Basin Tables
Outlet Sizing
Basin Routing—10 and 100 year storm events

Quarry Site Basin Table:

Elevation (ft.)	Basin Area (sf)	Depth (ft.)	Basin Volume (cft)	Basin Volume (ac-ft)	Basin Infiltration Flow* (cfs)	Weir Over Flow (cfs)	Total Outlet Flow (cfs)
3115	94,667	-	-	-	0.03	0.00	0.03
3116	99,161	1.00	96,914	2.22	0.03	0.00	0.03
3117	104,225	2.00	203,386	4.67	0.03	0.00	0.03
3118	109,320	3.00	310,159	7.12	0.03	0.00	0.03
3119	114,446	4.00	422,042	9.69	0.03	0.00	0.03
3120.5	122,191	5.50	599,519	13.76	0.03	0.00	0.03
3121	124,778	6.00	661,262	15.18	0.03	41.00	41.03

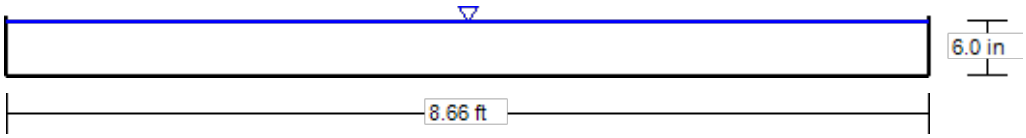
Note:

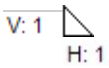
* Infiltration flow based on the engineer assumption Infiltration rate =0.3 in/hr with safty factor SF=2 & basin areas

Cross Section for Rectangular Channel - Overflow Outlet

Project Description	
Friction Method	Manning Formula
Solve For	Bottom Width

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.020 ft/ft
Normal Depth	6.0 in
Bottom Width	8.66 ft
Discharge	41.00 cfs





FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2004
Study date: 10/24/22

Quarry Complex Site
Basin Routing
10-year, 24-hour stomr

Program License Serial Number 4009

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

From study/file name: QuarryUHpr10.rte
**********HYDROGRAPH DATA**********
Number of intervals = 311
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 82.736 (CFS)
Total volume = 11.289 (Ac.Ft)

Status of hydrographs being held in storage

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

****

++
Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****
_____

User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 311
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
1.000	2.220	0.001	2.220	2.220
2.000	4.670	0.002	4.670	4.670
3.000	7.120	0.003	7.120	7.120
4.000	9.690	0.033	9.690	9.690
5.000	13.760	0.034	13.760	13.760
6.000	15.180	41.030	15.039	15.321

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 20.7 41.37 62.05 82.74	Depth (Ft.)
0.083	0.08	0.00	0.000	O | | | |	0.00
0.167	0.38	0.00	0.002	O | | | |	0.00
0.250	0.89	0.00	0.006	O | | | |	0.00
0.333	1.33	0.00	0.014	O | | | |	0.01
0.417	1.57	0.00	0.024	O | | | |	0.01
0.500	1.70	0.00	0.035	O | | | |	0.02
0.583	1.81	0.00	0.047	O | | | |	0.02
0.667	1.89	0.00	0.060	O | | | |	0.03
0.750	1.95	0.00	0.073	O | | | |	0.03
0.833	2.01	0.00	0.087	O | | | |	0.04
0.917	2.05	0.00	0.101	O | | | |	0.05
1.000	2.09	0.00	0.115	O | | | |	0.05
1.083	2.13	0.00	0.130	O | | | |	0.06
1.167	2.16	0.00	0.144	O | | | |	0.07
1.250	2.19	0.00	0.159	O | | | |	0.07
1.333	2.21	0.00	0.174	O | | | |	0.08
1.417	2.23	0.00	0.190	O | | | |	0.09
1.500	2.25	0.00	0.205	O | | | |	0.09
1.583	2.27	0.00	0.221	O | | | |	0.10
1.667	2.29	0.00	0.237	O | | | |	0.11
1.750	2.30	0.00	0.252	O | | | |	0.11
1.833	2.32	0.00	0.268	O | | | |	0.12
1.917	2.33	0.00	0.284	O | | | |	0.13
2.000	2.35	0.00	0.300	O | | | |	0.14
2.083	2.36	0.00	0.317	O | | | |	0.14
2.167	2.36	0.00	0.333	O | | | |	0.15
2.250	2.37	0.00	0.349	O | | | |	0.16
2.333	2.38	0.00	0.366	O | | | |	0.16

2.417	2.39	0.00	0.382	O				0.17
2.500	2.40	0.00	0.398	O				0.18
2.583	2.41	0.00	0.415	O				0.19
2.667	2.41	0.00	0.432	O				0.19
2.750	2.42	0.00	0.448	O				0.20
2.833	2.43	0.00	0.465	O				0.21
2.917	2.44	0.00	0.482	O				0.22
3.000	2.45	0.00	0.499	O				0.22
3.083	2.46	0.00	0.515	O				0.23
3.167	2.47	0.00	0.532	O				0.24
3.250	2.48	0.00	0.549	O				0.25
3.333	2.49	0.00	0.567	O				0.26
3.417	2.50	0.00	0.584	O				0.26
3.500	2.51	0.00	0.601	O				0.27
3.583	2.52	0.00	0.618	O				0.28
3.667	2.53	0.00	0.636	O				0.29
3.750	2.54	0.00	0.653	O				0.29
3.833	2.55	0.00	0.671	O				0.30
3.917	2.56	0.00	0.688	O				0.31
4.000	2.57	0.00	0.706	O				0.32
4.083	2.58	0.00	0.723	O				0.33
4.167	2.59	0.00	0.741	OI				0.33
4.250	2.60	0.00	0.759	OI				0.34
4.333	2.61	0.00	0.777	OI				0.35
4.417	2.62	0.00	0.795	OI				0.36
4.500	2.63	0.00	0.813	OI				0.37
4.583	2.64	0.00	0.831	OI				0.37
4.667	2.65	0.00	0.850	OI				0.38
4.750	2.66	0.00	0.868	OI				0.39
4.833	2.68	0.00	0.886	OI				0.40
4.917	2.69	0.00	0.905	OI				0.41
5.000	2.70	0.00	0.923	OI				0.42
5.083	2.71	0.00	0.942	OI				0.42
5.167	2.72	0.00	0.961	OI				0.43
5.250	2.74	0.00	0.979	OI				0.44
5.333	2.75	0.00	0.998	OI				0.45
5.417	2.76	0.00	1.017	OI				0.46
5.500	2.77	0.00	1.036	OI				0.47
5.583	2.79	0.00	1.055	OI				0.48
5.667	2.80	0.00	1.075	OI				0.48
5.750	2.81	0.00	1.094	OI				0.49
5.833	2.83	0.00	1.113	OI				0.50
5.917	2.84	0.00	1.133	OI				0.51
6.000	2.85	0.00	1.153	OI				0.52
6.083	2.87	0.00	1.172	OI				0.53
6.167	2.88	0.00	1.192	OI				0.54
6.250	2.89	0.00	1.212	OI				0.55
6.333	2.91	0.00	1.232	OI				0.55
6.417	2.92	0.00	1.252	OI				0.56
6.500	2.94	0.00	1.272	OI				0.57

6.583	2.95	0.00	1.292	OI				0.58
6.667	2.97	0.00	1.313	OI				0.59
6.750	2.98	0.00	1.333	OI				0.60
6.833	3.00	0.00	1.354	OI				0.61
6.917	3.01	0.00	1.375	OI				0.62
7.000	3.03	0.00	1.395	OI				0.63
7.083	3.05	0.00	1.416	OI				0.64
7.167	3.06	0.00	1.437	OI				0.65
7.250	3.08	0.00	1.459	OI				0.66
7.333	3.10	0.00	1.480	OI				0.67
7.417	3.11	0.00	1.501	OI				0.68
7.500	3.13	0.00	1.523	OI				0.69
7.583	3.15	0.00	1.544	OI				0.70
7.667	3.17	0.00	1.566	OI				0.71
7.750	3.19	0.00	1.588	OI				0.72
7.833	3.20	0.00	1.610	OI				0.73
7.917	3.22	0.00	1.632	OI				0.74
8.000	3.24	0.00	1.654	OI				0.75
8.083	3.26	0.00	1.677	OI				0.76
8.167	3.28	0.00	1.699	OI				0.77
8.250	3.30	0.00	1.722	OI				0.78
8.333	3.32	0.00	1.745	OI				0.79
8.417	3.34	0.00	1.768	OI				0.80
8.500	3.36	0.00	1.791	OI				0.81
8.583	3.39	0.00	1.814	OI				0.82
8.667	3.41	0.00	1.837	OI				0.83
8.750	3.43	0.00	1.861	OI				0.84
8.833	3.45	0.00	1.885	OI				0.85
8.917	3.48	0.00	1.908	OI				0.86
9.000	3.50	0.00	1.932	OI				0.87
9.083	3.52	0.00	1.957	OI				0.88
9.167	3.55	0.00	1.981	OI				0.89
9.250	3.57	0.00	2.005	OI				0.90
9.333	3.60	0.00	2.030	OI				0.91
9.417	3.62	0.00	2.055	OI				0.93
9.500	3.65	0.00	2.080	OI				0.94
9.583	3.68	0.00	2.105	OI				0.95
9.667	3.70	0.00	2.131	OI				0.96
9.750	3.73	0.00	2.156	OI				0.97
9.833	3.76	0.00	2.182	OI				0.98
9.917	3.79	0.00	2.208	OI				0.99
10.000	3.82	0.00	2.234	OI				1.01
10.083	3.85	0.00	2.261	OI				1.02
10.167	3.88	0.00	2.287	OI				1.03
10.250	3.91	0.00	2.314	OI				1.04
10.333	3.94	0.00	2.341	OI				1.05
10.417	3.97	0.00	2.368	OI				1.06
10.500	4.01	0.00	2.396	OI				1.07
10.583	4.04	0.00	2.423	OI				1.08
10.667	4.08	0.00	2.451	OI				1.09

10.750	4.11	0.00	2.480	OI	|	|	|	1.11
10.833	4.15	0.00	2.508	OI	|	|	|	1.12
10.917	4.19	0.00	2.537	OI	|	|	|	1.13
11.000	4.23	0.00	2.566	OI	|	|	|	1.14
11.083	4.27	0.00	2.595	OI	|	|	|	1.15
11.167	4.31	0.00	2.624	OI	|	|	|	1.17
11.250	4.35	0.00	2.654	OI	|	|	|	1.18
11.333	4.39	0.00	2.684	OI	|	|	|	1.19
11.417	4.44	0.00	2.715	OI	|	|	|	1.20
11.500	4.48	0.00	2.745	OI	|	|	|	1.21
11.583	4.53	0.00	2.776	OI	|	|	|	1.23
11.667	4.57	0.00	2.808	OI	|	|	|	1.24
11.750	4.62	0.00	2.839	OI	|	|	|	1.25
11.833	4.67	0.00	2.871	OI	|	|	|	1.27
11.917	4.73	0.00	2.904	OI	|	|	|	1.28
12.000	4.78	0.00	2.936	OI	|	|	|	1.29
12.083	4.83	0.00	2.970	OI	|	|	|	1.31
12.167	4.88	0.00	3.003	OI	|	|	|	1.32
12.250	4.92	0.00	3.037	OI	|	|	|	1.33
12.333	4.96	0.00	3.071	OI	|	|	|	1.35
12.417	5.01	0.00	3.105	OI	|	|	|	1.36
12.500	5.07	0.00	3.140	OI	|	|	|	1.38
12.583	5.13	0.00	3.175	OI	|	|	|	1.39
12.667	5.20	0.00	3.210	O I	|	|	|	1.40
12.750	5.27	0.00	3.246	O I	|	|	|	1.42
12.833	5.34	0.00	3.283	O I	|	|	|	1.43
12.917	5.42	0.00	3.320	O I	|	|	|	1.45
13.000	5.50	0.00	3.358	O I	|	|	|	1.46
13.083	5.58	0.00	3.396	O I	|	|	|	1.48
13.167	5.67	0.00	3.434	O I	|	|	|	1.50
13.250	5.76	0.00	3.474	O I	|	|	|	1.51
13.333	5.85	0.00	3.514	O I	|	|	|	1.53
13.417	5.95	0.00	3.554	O I	|	|	|	1.54
13.500	6.05	0.00	3.596	O I	|	|	|	1.56
13.583	6.16	0.00	3.638	O I	|	|	|	1.58
13.667	6.28	0.00	3.681	O I	|	|	|	1.60
13.750	6.40	0.00	3.724	O I	|	|	|	1.61
13.833	6.52	0.00	3.769	O I	|	|	|	1.63
13.917	6.65	0.00	3.814	O I	|	|	|	1.65
14.000	6.80	0.00	3.860	O I	|	|	|	1.67
14.083	6.95	0.00	3.908	O I	|	|	|	1.69
14.167	7.11	0.00	3.956	O I	|	|	|	1.71
14.250	7.29	0.00	4.006	O I	|	|	|	1.73
14.333	7.48	0.00	4.056	O I	|	|	|	1.75
14.417	7.68	0.00	4.109	O I	|	|	|	1.77
14.500	7.89	0.00	4.162	O I	|	|	|	1.79
14.583	8.11	0.00	4.217	O I	|	|	|	1.82
14.667	8.35	0.00	4.274	O I	|	|	|	1.84
14.750	8.61	0.00	4.332	O I	|	|	|	1.86
14.833	8.90	0.00	4.393	O I	|	|	|	1.89

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14.917    9.21    0.00      4.455  O  I    |        |        |        |     1.91
15.000    9.55    0.00      4.520  O  I    |        |        |        |     1.94
15.083    9.93    0.00      4.587  O  I    |        |        |        |     1.97
15.167   10.35    0.00      4.656  O   I   |        |        |        |     1.99
15.250   10.82    0.00      4.729  O   I   |        |        |        |     2.02
15.333   11.36    0.00      4.806  O   I   |        |        |        |     2.06
15.417   11.86    0.00      4.886  O   I   |        |        |        |     2.09
15.500   12.07    0.00      4.968  O   I   |        |        |        |     2.12
15.583   12.08    0.00      5.051  O   I   |        |        |        |     2.16
15.667   12.36    0.00      5.135  O   I   |        |        |        |     2.19
15.750   13.21    0.00      5.223  O    I  |        |        |        |     2.23
15.833   14.60    0.00      5.319  O    I  |        |        |        |     2.26
15.917   16.85    0.00      5.427  O     I |        |        |        |     2.31
16.000   20.97    0.00      5.558  O       I        |        |        |     2.36
16.083   34.90    0.00      5.750  O        |    I   |        |        |     2.44
16.167   62.58    0.00      6.086  O        |        |       I        |     2.58
16.250   82.74    0.00      6.586  O        |        |        |       I     2.78
16.333   71.25    0.00      7.116  O        |        |        |  I     |     3.00
16.417   46.47    0.01      7.522  O        |        |I       |        |     3.16
16.500   33.18    0.01      7.796  O        |   I    |        |        |     3.26
16.583   27.57    0.01      8.005  O        | I      |        |        |     3.34
16.667   24.04    0.02      8.183  O        |I       |        |        |     3.41
16.750   21.12    0.02      8.338  O       I       |        |        |     3.47
16.833   18.68    0.02      8.475  O      I|       |        |        |     3.53
16.917   16.89    0.02      8.597  O     I |       |        |        |     3.57
17.000   15.14    0.02      8.707  O    I  |       |        |        |     3.62
17.083   13.67    0.02      8.806  O    I  |       |        |        |     3.66
17.167   12.77    0.02      8.897  O   I   |       |        |        |     3.69
17.250   11.95    0.02      8.982  O   I   |       |        |        |     3.72
17.333   10.92    0.03      9.061  O   I   |       |        |        |     3.76
17.417   10.16    0.03      9.133  O  I    |       |        |        |     3.78
17.500    9.51    0.03      9.201  O  I    |       |        |        |     3.81
17.583    8.87    0.03      9.264  O  I    |       |        |        |     3.83
17.667    8.27    0.03      9.323  O  I    |       |        |        |     3.86
17.750    7.87    0.03      9.378  O  I    |       |        |        |     3.88
17.833    7.55    0.03      9.431  O I     |       |        |        |     3.90
17.917    7.21    0.03      9.482  O I     |       |        |        |     3.92
18.000    6.53    0.03      9.529  O I     |       |        |        |     3.94
18.083    5.85    0.03      9.571  O I     |       |        |        |     3.95
18.167    5.64    0.03      9.611  O I     |       |        |        |     3.97
18.250    5.48    0.03      9.649  O I     |       |        |        |     3.98
18.333    5.34    0.03      9.686  O I     |       |        |        |     4.00
18.417    5.19    0.03      9.722  O I     |       |        |        |     4.01
18.500    5.05    0.03      9.757  OI      |       |        |        |     4.02
18.583    4.93    0.03      9.791  OI      |       |        |        |     4.02
18.667    4.81    0.03      9.824  OI      |       |        |        |     4.03
18.750    4.70    0.03      9.857  OI      |       |        |        |     4.04
18.833    4.60    0.03      9.889  OI      |       |        |        |     4.05
18.917    4.50    0.03      9.920  OI      |       |        |        |     4.06
19.000    4.41    0.03      9.950  OI      |       |        |        |     4.06
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19.083	4.32	0.03	9.980	OI				4.07
19.167	4.24	0.03	10.009	OI				4.08
19.250	4.16	0.03	10.038	OI				4.09
19.333	4.09	0.03	10.066	OI				4.09
19.417	4.02	0.03	10.094	OI				4.10
19.500	3.95	0.03	10.121	OI				4.11
19.583	3.88	0.03	10.148	OI				4.11
19.667	3.82	0.03	10.174	OI				4.12
19.750	3.76	0.03	10.200	OI				4.13
19.833	3.71	0.03	10.225	OI				4.13
19.917	3.65	0.03	10.251	OI				4.14
20.000	3.60	0.03	10.275	OI				4.14
20.083	3.55	0.03	10.300	OI				4.15
20.167	3.50	0.03	10.324	OI				4.16
20.250	3.45	0.03	10.348	OI				4.16
20.333	3.41	0.03	10.371	OI				4.17
20.417	3.37	0.03	10.394	OI				4.17
20.500	3.32	0.03	10.417	OI				4.18
20.583	3.28	0.03	10.439	OI				4.18
20.667	3.24	0.03	10.462	OI				4.19
20.750	3.20	0.03	10.484	OI				4.19
20.833	3.17	0.03	10.505	OI				4.20
20.917	3.13	0.03	10.527	OI				4.21
21.000	3.10	0.03	10.548	OI				4.21
21.083	3.06	0.03	10.569	OI				4.22
21.167	3.03	0.03	10.590	OI				4.22
21.250	3.00	0.03	10.610	OI				4.23
21.333	2.97	0.03	10.631	OI				4.23
21.417	2.94	0.03	10.651	OI				4.24
21.500	2.91	0.03	10.671	OI				4.24
21.583	2.88	0.03	10.690	OI				4.25
21.667	2.85	0.03	10.710	OI				4.25
21.750	2.82	0.03	10.729	OI				4.26
21.833	2.80	0.03	10.748	OI				4.26
21.917	2.77	0.03	10.767	OI				4.26
22.000	2.75	0.03	10.786	OI				4.27
22.083	2.72	0.03	10.804	OI				4.27
22.167	2.70	0.03	10.823	OI				4.28
22.250	2.67	0.03	10.841	OI				4.28
22.333	2.65	0.03	10.859	OI				4.29
22.417	2.63	0.03	10.877	OI				4.29
22.500	2.61	0.03	10.895	OI				4.30
22.583	2.59	0.03	10.913	OI				4.30
22.667	2.57	0.03	10.930	O				4.30
22.750	2.54	0.03	10.948	O				4.31
22.833	2.52	0.03	10.965	O				4.31
22.917	2.51	0.03	10.982	O				4.32
23.000	2.49	0.03	10.999	O				4.32
23.083	2.47	0.03	11.016	O				4.33
23.167	2.45	0.03	11.032	O				4.33

23.250	2.43	0.03	11.049	O	|	|	|	|	4.33
23.333	2.41	0.03	11.065	O	|	|	|	|	4.34
23.417	2.40	0.03	11.082	O	|	|	|	|	4.34
23.500	2.38	0.03	11.098	O	|	|	|	|	4.35
23.583	2.36	0.03	11.114	O	|	|	|	|	4.35
23.667	2.35	0.03	11.130	O	|	|	|	|	4.35
23.750	2.33	0.03	11.146	O	|	|	|	|	4.36
23.833	2.31	0.03	11.162	O	|	|	|	|	4.36
23.917	2.30	0.03	11.177	O	|	|	|	|	4.37
24.000	2.28	0.03	11.193	O	|	|	|	|	4.37
24.083	2.19	0.03	11.208	O	|	|	|	|	4.37
24.167	1.87	0.03	11.222	O	|	|	|	|	4.38
24.250	1.35	0.03	11.233	O	|	|	|	|	4.38
24.333	0.91	0.03	11.240	O	|	|	|	|	4.38
24.417	0.67	0.03	11.245	O	|	|	|	|	4.38
24.500	0.53	0.03	11.249	O	|	|	|	|	4.38
24.583	0.43	0.03	11.252	O	|	|	|	|	4.38
24.667	0.36	0.03	11.255	O	|	|	|	|	4.38
24.750	0.29	0.03	11.257	O	|	|	|	|	4.38
24.833	0.24	0.03	11.258	O	|	|	|	|	4.39
24.917	0.20	0.03	11.260	O	|	|	|	|	4.39
25.000	0.17	0.03	11.261	O	|	|	|	|	4.39
25.083	0.14	0.03	11.262	O	|	|	|	|	4.39
25.167	0.12	0.03	11.262	O	|	|	|	|	4.39
25.250	0.09	0.03	11.263	O	|	|	|	|	4.39
25.333	0.08	0.03	11.263	O	|	|	|	|	4.39
25.417	0.06	0.03	11.263	O	|	|	|	|	4.39
25.500	0.05	0.03	11.264	O	|	|	|	|	4.39
25.583	0.04	0.03	11.264	O	|	|	|	|	4.39
25.667	0.03	0.03	11.264	O	|	|	|	|	4.39
25.750	0.02	0.03	11.264	O	|	|	|	|	4.39
25.833	0.01	0.03	11.263	O	|	|	|	|	4.39
25.917	0.00	0.03	11.263	O	|	|	|	|	4.39
26.000	0.00	0.03	11.263	O	|	|	|	|	4.39

Remaining water in basin = 11.26 (Ac.Ft)

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

Number of intervals = 312
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 0.033 (CFS)
Total volume = 0.026 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (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: 10/24/22

Quarry Complex Site
Basin Routing
100-year, 24-hour stomr

Program License Serial Number 4009

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

From study/file name: QuarryUhpr100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 311
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 151.751 (CFS)
Total volume = 19.220 (Ac.Ft)
Status of hydrographs being held in storage

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

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Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 311
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
1.000	2.220	0.001	2.220	2.220
2.000	4.670	0.002	4.670	4.670
3.000	7.120	0.003	7.120	7.120
4.000	9.690	0.033	9.690	9.690
5.000	13.760	0.034	13.760	13.760
6.000	15.180	107.000	14.812	15.548

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 37.9 75.88 113.81 151.75	Depth (Ft.)
0.083	0.13	0.00	0.000	O | | | |	0.00
0.167	0.63	0.00	0.003	O | | | |	0.00
0.250	1.46	0.00	0.010	O | | | |	0.00
0.333	2.18	0.00	0.023	O | | | |	0.01
0.417	2.57	0.00	0.039	O | | | |	0.02
0.500	2.79	0.00	0.058	O | | | |	0.03
0.583	2.96	0.00	0.077	O | | | |	0.03
0.667	3.09	0.00	0.098	O | | | |	0.04
0.750	3.20	0.00	0.120	O | | | |	0.05
0.833	3.29	0.00	0.142	O | | | |	0.06
0.917	3.37	0.00	0.165	O | | | |	0.07
1.000	3.43	0.00	0.189	O | | | |	0.08
1.083	3.48	0.00	0.212	O | | | |	0.10
1.167	3.53	0.00	0.237	O | | | |	0.11
1.250	3.58	0.00	0.261	O | | | |	0.12
1.333	3.62	0.00	0.286	O | | | |	0.13
1.417	3.66	0.00	0.311	O | | | |	0.14
1.500	3.69	0.00	0.336	O | | | |	0.15
1.583	3.72	0.00	0.362	O | | | |	0.16
1.667	3.75	0.00	0.388	O | | | |	0.17
1.750	3.78	0.00	0.413	O | | | |	0.19
1.833	3.80	0.00	0.440	O | | | |	0.20
1.917	3.83	0.00	0.466	O | | | |	0.21
2.000	3.85	0.00	0.492	O | | | |	0.22
2.083	3.86	0.00	0.519	O | | | |	0.23
2.167	3.88	0.00	0.545	O | | | |	0.25
2.250	3.89	0.00	0.572	O | | | |	0.26
2.333	3.90	0.00	0.599	O | | | |	0.27

2.417	3.92	0.00	0.626	O				0.28
2.500	3.93	0.00	0.653	O				0.29
2.583	3.95	0.00	0.680	O				0.31
2.667	3.96	0.00	0.707	O				0.32
2.750	3.98	0.00	0.735	O				0.33
2.833	3.99	0.00	0.762	O				0.34
2.917	4.01	0.00	0.790	O				0.36
3.000	4.02	0.00	0.817	O				0.37
3.083	4.04	0.00	0.845	O				0.38
3.167	4.05	0.00	0.873	O				0.39
3.250	4.07	0.00	0.901	O				0.41
3.333	4.09	0.00	0.929	O				0.42
3.417	4.10	0.00	0.957	O				0.43
3.500	4.12	0.00	0.986	O				0.44
3.583	4.13	0.00	1.014	O				0.46
3.667	4.15	0.00	1.042	O				0.47
3.750	4.17	0.00	1.071	O				0.48
3.833	4.18	0.00	1.100	O				0.50
3.917	4.20	0.00	1.129	O				0.51
4.000	4.22	0.00	1.158	O				0.52
4.083	4.24	0.00	1.187	O				0.53
4.167	4.25	0.00	1.216	O				0.55
4.250	4.27	0.00	1.245	O				0.56
4.333	4.29	0.00	1.275	O				0.57
4.417	4.31	0.00	1.305	O				0.59
4.500	4.33	0.00	1.334	O				0.60
4.583	4.35	0.00	1.364	O				0.61
4.667	4.36	0.00	1.394	O				0.63
4.750	4.38	0.00	1.424	O				0.64
4.833	4.40	0.00	1.454	O				0.66
4.917	4.42	0.00	1.485	O				0.67
5.000	4.44	0.00	1.515	O				0.68
5.083	4.46	0.00	1.546	O				0.70
5.167	4.48	0.00	1.577	O				0.71
5.250	4.50	0.00	1.608	O				0.72
5.333	4.52	0.00	1.639	O				0.74
5.417	4.55	0.00	1.670	O				0.75
5.500	4.57	0.00	1.701	O				0.77
5.583	4.59	0.00	1.733	O				0.78
5.667	4.61	0.00	1.765	O				0.79
5.750	4.63	0.00	1.797	O				0.81
5.833	4.65	0.00	1.828	O				0.82
5.917	4.68	0.00	1.861	O				0.84
6.000	4.70	0.00	1.893	O				0.85
6.083	4.72	0.00	1.925	O				0.87
6.167	4.75	0.00	1.958	OI				0.88
6.250	4.77	0.00	1.991	OI				0.90
6.333	4.80	0.00	2.024	OI				0.91
6.417	4.82	0.00	2.057	OI				0.93
6.500	4.85	0.00	2.090	OI				0.94

6.583	4.87	0.00	2.124	OI				0.96
6.667	4.90	0.00	2.157	OI				0.97
6.750	4.92	0.00	2.191	OI				0.99
6.833	4.95	0.00	2.225	OI				1.00
6.917	4.97	0.00	2.259	OI				1.02
7.000	5.00	0.00	2.293	OI				1.03
7.083	5.03	0.00	2.328	OI				1.04
7.167	5.06	0.00	2.363	OI				1.06
7.250	5.09	0.00	2.398	OI				1.07
7.333	5.11	0.00	2.433	OI				1.09
7.417	5.14	0.00	2.468	OI				1.10
7.500	5.17	0.00	2.504	OI				1.12
7.583	5.20	0.00	2.539	OI				1.13
7.667	5.23	0.00	2.575	OI				1.14
7.750	5.26	0.00	2.611	OI				1.16
7.833	5.30	0.00	2.648	OI				1.17
7.917	5.33	0.00	2.684	OI				1.19
8.000	5.36	0.00	2.721	OI				1.20
8.083	5.39	0.00	2.758	OI				1.22
8.167	5.43	0.00	2.795	OI				1.23
8.250	5.46	0.00	2.833	OI				1.25
8.333	5.49	0.00	2.871	OI				1.27
8.417	5.53	0.00	2.908	OI				1.28
8.500	5.57	0.00	2.947	OI				1.30
8.583	5.60	0.00	2.985	OI				1.31
8.667	5.64	0.00	3.024	OI				1.33
8.750	5.68	0.00	3.063	OI				1.34
8.833	5.72	0.00	3.102	OI				1.36
8.917	5.75	0.00	3.141	OI				1.38
9.000	5.79	0.00	3.181	OI				1.39
9.083	5.83	0.00	3.221	OI				1.41
9.167	5.88	0.00	3.262	OI				1.43
9.250	5.92	0.00	3.302	OI				1.44
9.333	5.96	0.00	3.343	OI				1.46
9.417	6.00	0.00	3.384	OI				1.48
9.500	6.05	0.00	3.426	OI				1.49
9.583	6.09	0.00	3.468	OI				1.51
9.667	6.14	0.00	3.510	OI				1.53
9.750	6.19	0.00	3.552	OI				1.54
9.833	6.24	0.00	3.595	OI				1.56
9.917	6.28	0.00	3.638	OI				1.58
10.000	6.33	0.00	3.681	OI				1.60
10.083	6.39	0.00	3.725	OI				1.61
10.167	6.44	0.00	3.769	OI				1.63
10.250	6.49	0.00	3.814	OI				1.65
10.333	6.55	0.00	3.859	OI				1.67
10.417	6.60	0.00	3.904	OI				1.69
10.500	6.66	0.00	3.950	OI				1.71
10.583	6.72	0.00	3.996	OI				1.72
10.667	6.78	0.00	4.042	OI				1.74

10.750	6.84	0.00	4.089	OI	|	|	|	1.76
10.833	6.90	0.00	4.136	OI	|	|	|	1.78
10.917	6.97	0.00	4.184	OI	|	|	|	1.80
11.000	7.03	0.00	4.232	OI	|	|	|	1.82
11.083	7.10	0.00	4.281	OI	|	|	|	1.84
11.167	7.17	0.00	4.330	OI	|	|	|	1.86
11.250	7.24	0.00	4.380	OI	|	|	|	1.88
11.333	7.31	0.00	4.430	OI	|	|	|	1.90
11.417	7.39	0.00	4.480	OI	|	|	|	1.92
11.500	7.47	0.00	4.532	OI	|	|	|	1.94
11.583	7.54	0.00	4.583	OI	|	|	|	1.96
11.667	7.63	0.00	4.635	OI	|	|	|	1.99
11.750	7.71	0.00	4.688	OI	|	|	|	2.01
11.833	7.80	0.00	4.742	OI	|	|	|	2.03
11.917	7.89	0.00	4.796	OI	|	|	|	2.05
12.000	7.98	0.00	4.850	OI	|	|	|	2.07
12.083	8.05	0.00	4.905	OI	|	|	|	2.10
12.167	8.05	0.00	4.961	OI	|	|	|	2.12
12.250	7.98	0.00	5.016	OI	|	|	|	2.14
12.333	7.94	0.00	5.071	OI	|	|	|	2.16
12.417	7.97	0.00	5.126	OI	|	|	|	2.19
12.500	8.04	0.00	5.181	OI	|	|	|	2.21
12.583	8.12	0.00	5.236	OI	|	|	|	2.23
12.667	8.21	0.00	5.293	OI	|	|	|	2.25
12.750	8.31	0.00	5.350	OI	|	|	|	2.28
12.833	8.42	0.00	5.407	OI	|	|	|	2.30
12.917	8.54	0.00	5.466	OI	|	|	|	2.32
13.000	8.66	0.00	5.525	OI	|	|	|	2.35
13.083	8.80	0.00	5.585	OI	|	|	|	2.37
13.167	8.94	0.00	5.646	OI	|	|	|	2.40
13.250	9.08	0.00	5.708	OI	|	|	|	2.42
13.333	9.24	0.00	5.771	OI	|	|	|	2.45
13.417	9.40	0.00	5.835	OI	|	|	|	2.48
13.500	9.57	0.00	5.900	O I	|	|	|	2.50
13.583	9.75	0.00	5.967	O I	|	|	|	2.53
13.667	9.94	0.00	6.035	O I	|	|	|	2.56
13.750	10.14	0.00	6.104	O I	|	|	|	2.59
13.833	10.35	0.00	6.174	O I	|	|	|	2.61
13.917	10.57	0.00	6.246	O I	|	|	|	2.64
14.000	10.81	0.00	6.320	O I	|	|	|	2.67
14.083	11.07	0.00	6.395	O I	|	|	|	2.70
14.167	11.35	0.00	6.473	O I	|	|	|	2.74
14.250	11.66	0.00	6.552	O I	|	|	|	2.77
14.333	11.98	0.00	6.633	O I	|	|	|	2.80
14.417	12.32	0.00	6.717	O I	|	|	|	2.84
14.500	12.68	0.00	6.803	O I	|	|	|	2.87
14.583	13.06	0.00	6.891	O I	|	|	|	2.91
14.667	13.48	0.00	6.983	O I	|	|	|	2.94
14.750	13.93	0.00	7.077	O I	|	|	|	2.98
14.833	14.42	0.00	7.175	O I	|	|	|	3.02

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14.917   14.96    0.00      7.276  O  I    |        |        |        |     3.06
15.000   15.55    0.01      7.381  O  I    |        |        |        |     3.10
15.083   16.21    0.01      7.490  O  I    |        |        |        |     3.14
15.167   16.94    0.01      7.604  O  I    |        |        |        |     3.19
15.250   17.77    0.01      7.724  O  I    |        |        |        |     3.23
15.333   18.72    0.01      7.849  O  I    |        |        |        |     3.28
15.417   19.68    0.01      7.982  O   I   |        |        |        |     3.34
15.500   20.41    0.01      8.120  O   I   |        |        |        |     3.39
15.583   21.02    0.02      8.262  O   I   |        |        |        |     3.44
15.667   22.05    0.02      8.410  O   I   |        |        |        |     3.50
15.750   23.92    0.02      8.568  O    I  |        |        |        |     3.56
15.833   26.79    0.02      8.743  O    I  |        |        |        |     3.63
15.917   31.45    0.02      8.943  O     I |        |        |        |     3.71
16.000   39.85    0.03      9.189  O       I        |        |        |     3.80
16.083   65.83    0.03      9.552  O        |    I   |        |        |     3.95
16.167  115.83    0.03     10.178  O        |        |       I        |     4.12
16.250  151.75    0.03     11.099  O        |        |        |       I     4.35
16.333  130.76    0.03     12.072  O        |        |        |  I     |     4.59
16.417   85.68    0.03     12.817  O        |        | I      |        |     4.77
16.500   60.92    0.03     13.321  O        |   I    |        |        |     4.89
16.583   49.93    0.03     13.703  O        | I      |        |        |     4.99
16.667   42.94   15.72     13.968  |  O     |I       |        |        |     5.15
16.750   37.34   25.78     14.102  |    O I |        |        |        |     5.24
16.833   32.76   29.60     14.152  |     O  |        |        |        |     5.28
16.917   29.41   30.21     14.161  |     O  |        |        |        |     5.28
17.000   26.19   29.22     14.147  |    IO  |        |        |        |     5.27
17.083   23.48   27.41     14.123  |   IO   |        |        |        |     5.26
17.167   21.82   25.45     14.097  |   IO   |        |        |        |     5.24
17.250   20.31   23.64     14.073  |   O    |        |        |        |     5.22
17.333   18.43   21.88     14.050  |  IO    |        |        |        |     5.20
17.417   17.06   20.18     14.027  |  IO    |        |        |        |     5.19
17.500   15.87   18.65     14.007  |  O     |        |        |        |     5.17
17.583   14.70   17.26     13.989  |  O     |        |        |        |     5.16
17.667   13.63   15.99     13.972  | IO     |        |        |        |     5.15
17.750   12.90   14.86     13.957  | IO     |        |        |        |     5.14
17.833   12.33   13.94     13.945  | O      |        |        |        |     5.13
17.917   11.71   13.15     13.934  | O      |        |        |        |     5.12
18.000   10.48   12.30     13.923  | O      |        |        |        |     5.11
18.083    9.29   11.30     13.910  |IO      |        |        |        |     5.11
18.167    9.00   10.41     13.898  |IO      |        |        |        |     5.10
18.250    8.84    9.80     13.890  |IO      |        |        |        |     5.09
18.333    8.70    9.37     13.884  |O       |        |        |        |     5.09
18.417    8.51    9.06     13.880  |O       |        |        |        |     5.08
18.500    8.31    8.79     13.876  |O       |        |        |        |     5.08
18.583    8.12    8.55     13.873  |O       |        |        |        |     5.08
18.667    7.94    8.34     13.870  |O       |        |        |        |     5.08
18.750    7.76    8.14     13.868  |O       |        |        |        |     5.08
18.833    7.60    7.95     13.865  |O       |        |        |        |     5.07
18.917    7.45    7.77     13.863  |O       |        |        |        |     5.07
19.000    7.30    7.61     13.861  |O       |        |        |        |     5.07
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19.083	7.16	7.45	13.858	|O	|	|	|	5.07
19.167	7.02	7.30	13.856	|O	|	|	|	5.07
19.250	6.90	7.16	13.855	|O	|	|	|	5.07
19.333	6.78	7.03	13.853	|O	|	|	|	5.07
19.417	6.66	6.90	13.851	|O	|	|	|	5.06
19.500	6.55	6.78	13.850	|O	|	|	|	5.06
19.583	6.44	6.66	13.848	|O	|	|	|	5.06
19.667	6.34	6.55	13.846	|O	|	|	|	5.06
19.750	6.24	6.44	13.845	|O	|	|	|	5.06
19.833	6.15	6.34	13.844	|O	|	|	|	5.06
19.917	6.05	6.24	13.842	|O	|	|	|	5.06
20.000	5.97	6.15	13.841	|O	|	|	|	5.06
20.083	5.88	6.05	13.840	|O	|	|	|	5.06
20.167	5.80	5.97	13.839	|O	|	|	|	5.06
20.250	5.72	5.88	13.838	|O	|	|	|	5.05
20.333	5.64	5.80	13.837	|O	|	|	|	5.05
20.417	5.57	5.72	13.835	|O	|	|	|	5.05
20.500	5.50	5.64	13.834	|O	|	|	|	5.05
20.583	5.43	5.57	13.833	|O	|	|	|	5.05
20.667	5.36	5.50	13.833	|O	|	|	|	5.05
20.750	5.30	5.43	13.832	|O	|	|	|	5.05
20.833	5.23	5.36	13.831	|O	|	|	|	5.05
20.917	5.17	5.30	13.830	|O	|	|	|	5.05
21.000	5.11	5.23	13.829	|O	|	|	|	5.05
21.083	5.06	5.17	13.828	|O	|	|	|	5.05
21.167	5.00	5.11	13.827	|O	|	|	|	5.05
21.250	4.95	5.06	13.827	|O	|	|	|	5.05
21.333	4.89	5.00	13.826	|O	|	|	|	5.05
21.417	4.84	4.95	13.825	|O	|	|	|	5.05
21.500	4.79	4.89	13.825	|O	|	|	|	5.05
21.583	4.75	4.84	13.824	|O	|	|	|	5.04
21.667	4.70	4.79	13.823	IO	|	|	|	5.04
21.750	4.65	4.74	13.823	IO	|	|	|	5.04
21.833	4.61	4.70	13.822	O	|	|	|	5.04
21.917	4.56	4.65	13.821	O	|	|	|	5.04
22.000	4.52	4.61	13.821	O	|	|	|	5.04
22.083	4.48	4.56	13.820	O	|	|	|	5.04
22.167	4.44	4.52	13.820	O	|	|	|	5.04
22.250	4.40	4.48	13.819	O	|	|	|	5.04
22.333	4.36	4.44	13.818	O	|	|	|	5.04
22.417	4.32	4.40	13.818	O	|	|	|	5.04
22.500	4.29	4.36	13.817	O	|	|	|	5.04
22.583	4.25	4.32	13.817	O	|	|	|	5.04
22.667	4.22	4.29	13.816	O	|	|	|	5.04
22.750	4.18	4.25	13.816	O	|	|	|	5.04
22.833	4.15	4.22	13.816	O	|	|	|	5.04
22.917	4.11	4.18	13.815	O	|	|	|	5.04
23.000	4.08	4.15	13.815	O	|	|	|	5.04
23.083	4.05	4.11	13.814	O	|	|	|	5.04
23.167	4.02	4.08	13.814	O	|	|	|	5.04

23.250	3.99	4.05	13.813	O	|	|	|	5.04
23.333	3.96	4.02	13.813	O	|	|	|	5.04
23.417	3.93	3.99	13.812	O	|	|	|	5.04
23.500	3.90	3.96	13.812	O	|	|	|	5.04
23.583	3.87	3.93	13.812	O	|	|	|	5.04
23.667	3.85	3.90	13.811	O	|	|	|	5.04
23.750	3.82	3.87	13.811	O	|	|	|	5.04
23.833	3.79	3.84	13.811	O	|	|	|	5.04
23.917	3.77	3.82	13.810	O	|	|	|	5.04
24.000	3.74	3.79	13.810	O	|	|	|	5.04
24.083	3.59	3.74	13.809	O	|	|	|	5.03
24.167	3.06	3.57	13.807	O	|	|	|	5.03
24.250	2.21	3.18	13.802	O	|	|	|	5.03
24.333	1.49	2.63	13.795	O	|	|	|	5.02
24.417	1.10	2.08	13.787	O	|	|	|	5.02
24.500	0.87	1.63	13.781	O	|	|	|	5.01
24.583	0.71	1.29	13.777	O	|	|	|	5.01
24.667	0.58	1.02	13.773	O	|	|	|	5.01
24.750	0.48	0.82	13.770	O	|	|	|	5.01
24.833	0.40	0.66	13.768	O	|	|	|	5.01
24.917	0.33	0.54	13.767	O	|	|	|	5.00
25.000	0.27	0.44	13.765	O	|	|	|	5.00
25.083	0.23	0.36	13.764	O	|	|	|	5.00
25.167	0.19	0.30	13.764	O	|	|	|	5.00
25.250	0.15	0.25	13.763	O	|	|	|	5.00
25.333	0.12	0.20	13.762	O	|	|	|	5.00
25.417	0.10	0.17	13.762	O	|	|	|	5.00
25.500	0.08	0.13	13.761	O	|	|	|	5.00
25.583	0.06	0.11	13.761	O	|	|	|	5.00
25.667	0.05	0.08	13.761	O	|	|	|	5.00
25.750	0.03	0.07	13.760	O	|	|	|	5.00
25.833	0.02	0.05	13.760	O	|	|	|	5.00
25.917	0.01	0.03	13.760	O	|	|	|	5.00
26.000	0.00	0.03	13.760	O	|	|	|	5.00

Remaining water in basin = 13.76 (Ac.Ft)

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

Number of intervals = 312
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 30.211 (CFS)
Total volume = 5.461 (Ac.Ft)

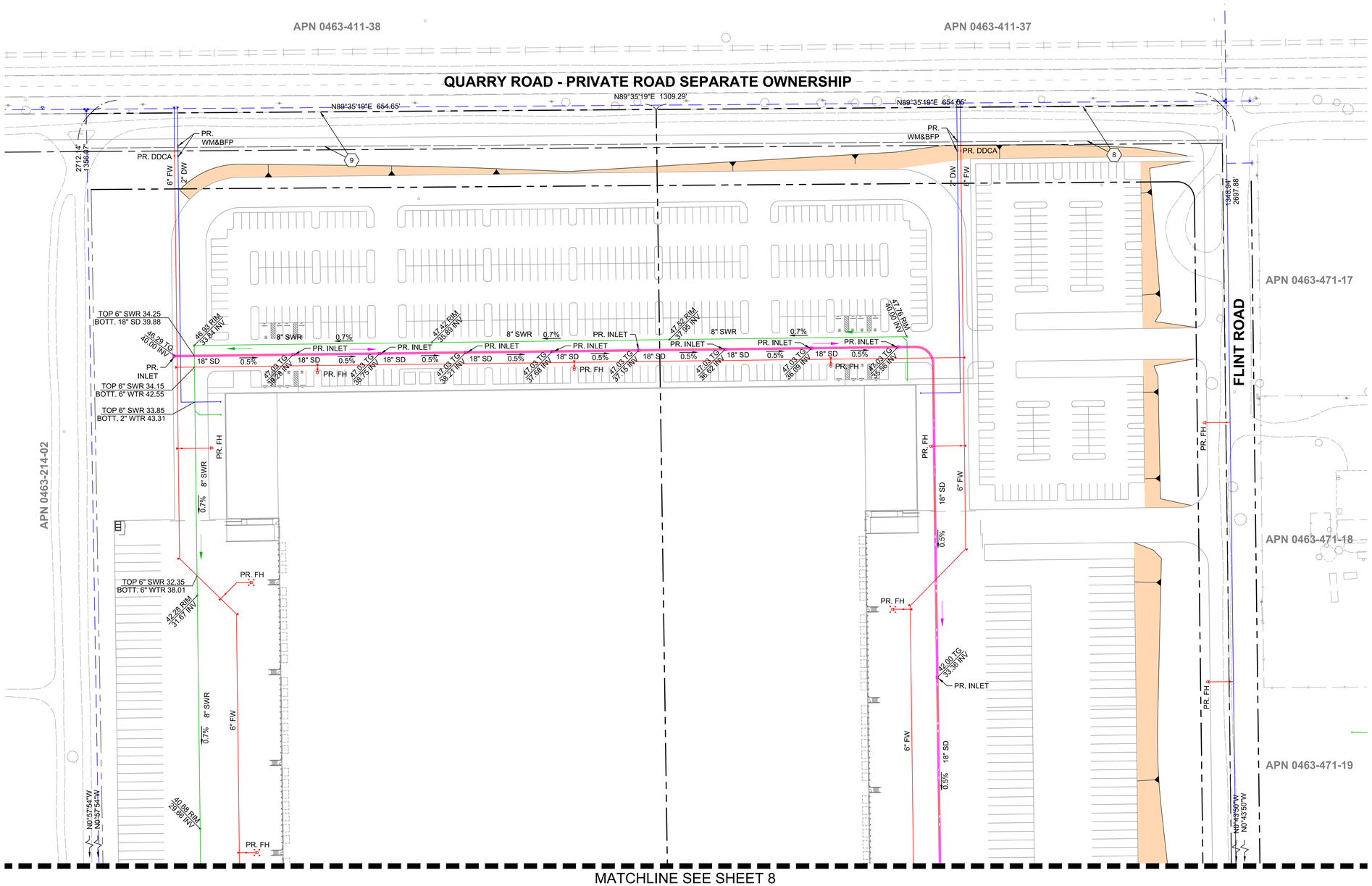
Status of hydrographs being held in storage

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

****

APPENDIX F

-Utility Plans



ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
CB	CATCH BASIN
EG	EXISTING GROUND
EL.	ELEVATION
ELEC.	ELECTRIC
EX.	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOW LINE
FH	FIRE HYDRANT
FS	FINISH SURFACE
FUT.	FUTURE
GB	GRADE BREAK
GUY	GUY ANCHOR
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
P/L	PROPERTY LINE
PE	PAD ELEVATION
PP	POWER POLE
PS	PIPE SLOPE
PR.	PROPOSED
R/W	RIGHT OF WAY
ST.	STREET
SWR	SEWER
TG	TOP OF GRATE
TYP	TYPICAL
WTR	WATER

EASEMENTS

(8) A 40' WIDE EASEMENT FOR PIPE LINES, UTILITIES, ACCESS RIGHTS AND INCIDENTAL PURPOSES, RECORDED JUNE 3, 1987 AS INSTRUMENT NO. 87-187992 OF OFFICIAL RECORDS.

(9) A 40' WIDE EASEMENT FOR PIPE LINES, UTILITIES, ACCESS RIGHTS AND INCIDENTAL PURPOSES, RECORDED JUNE 3, 1987 AS INSTRUMENT NO. 87-187992 OF OFFICIAL RECORDS.

UTILITY LEGEND

- PROPOSED FIRE WATER SERVICE/MAIN
- PROPOSED DOMESTIC WATER SERVICE/MAIN
- PROPOSED SEWER SERVICE/MAIN
- PROPOSED STORM DRAIN
- PROPOSED SEWER PIPE FLOW DIRECTION
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

LEGEND

- PROPOSED SLOPE 2:1 MAX.
- PROPOSED AC PAVEMENT
- PROPOSED PCC PAVEMENT
- PROPOSED STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE FLOW DIRECTION

NOT FOR CONSTRUCTION

N

60 0 60 120
scale 1"= 60' feet

CONTOUR INTERVALS = 2'

ENGINEER

DAVID EVANS AND ASSOCIATES INC.

18484 Outer Highway 18 N Suite 225
Apple Valley California 92307
Phone: 760.524.9100
SSchubert@deainc.com

DATE: 10/27/2022

QUARRY ROAD INDUSTRIAL COMPLEX
APN: 0436-214-06 - 09

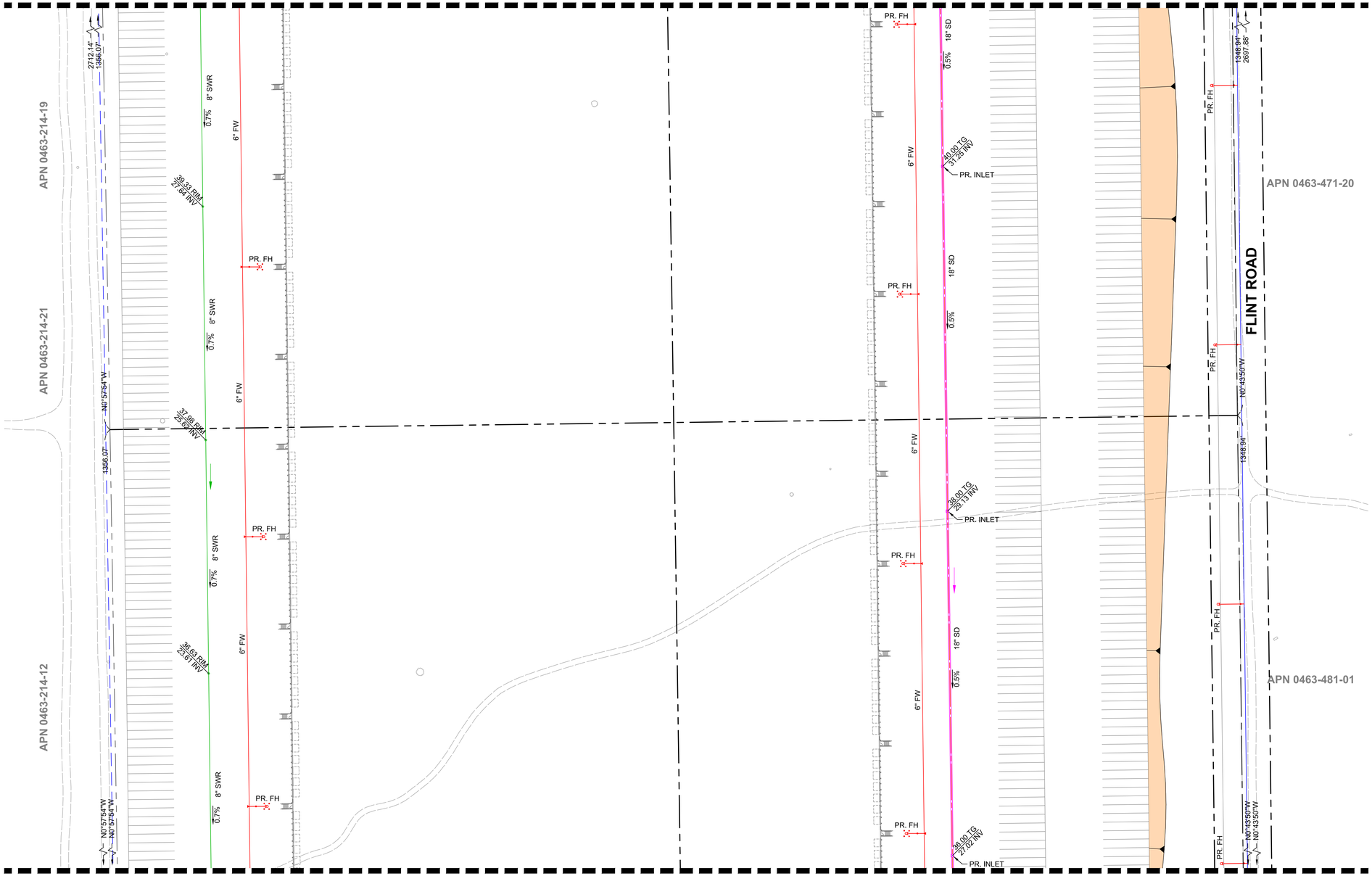
SITE PLAN REVIEW
CONCEPTUAL WET
UTILITY PLAN

FILE NO.

DRAWING NO.
SH. 7 OF 9

Plot Date: 11/2/2022 2:21 PM
Save Date: 11/2/2022 1:47 PM
By: Jose Aguilar
By: Jla
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MATCHLINE SEE SHEET 7



MATCHLINE SEE SHEET 9

ABBREVIATIONS

BFP	BACK FLOW PREVENTER
C/L	CENTERLINE
C&G	CURB AND GUTTER
CB	CATCH BASIN
EG	EXISTING GROUND
EL.	ELEVATION
ELEC.	ELECTRIC
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FF	FINISH FLOOR
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FH	FIRE HYDRANT
FS	FINISH SURFACE
FUT.	FUTURE
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GUY	GUY ANCHOR
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SITE PLAN REVIEW
CONCEPTUAL WET UTILITY PLAN

FILE NO.

DRAWING NO.

SH. 8 OF 9

Plot Date: 11/2/2022 2:24 PM
Save Date: 11/2/2022 1:48 PM
By: Jose Aguilar
By: jda
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MATCHLINE SEE SHEET 8

ABBREVIATIONS

BFP	BACK FLOW PREVENTER
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C&G	CURB AND GUTTER
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SWR	SEWER
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TYP	TYPICAL
WTR	WATER

APN 0463-214-13

APN 0463-481-03

APN 0463-481-05

APN 0463-213-11

35.26 RIM
21.59 INV

2712.14'
N35°49'07"E

6" FW

8" SWR
0.7%

PR. FH

34.17 RIM
19.97 INV

TOP 6" SWR 19.88
BOTT. 6" WTR 29.67

TOP 6" SWR 18.19
BOTT. 6" WTR 28.17

TOP 6" SWR 18.16
BOTT. 2" WTR 28.44

PR. DDCA

PR.
WM&BFP
6" FW
2" DW

(17.83) RIM
9.77 INV

PR. CB

7.1%

30.64 TG
25.00 INV

18" SD
12.6%

32.36 RIM
17.35 INV

2.6%

8" SWR

37.02 RIM
24.50 INV

1.0%

8" SWR

37.02 RIM
27.23 INV

1.0%

8" SWR

37.02 RIM
30.00 INV

PR.
INLET

18" SD
9.8%

35.52 TG
21.74 INV

PR. HEADWALL
SPLASH OUTLET
INV. OUT = 15.00

PR. HEADWALL
SPLASH OUTLET
INV. OUT = 15.00

6" FW

18" SD
0.5%

PR. FH

34.31 TG
24.88 INV

PR. INLET

18" SD
0.5%

6" FW

PR. FH

PR. FH

PR. FH

PR. FH

PR. FH

1348.94'
N0°43'50"W
2697.88'

1.5%

N0°57'54"W
N0°57'54"W

N0°43'50"W
N0°43'50"W

649.10'
N88°57'47"E

649.10'
N88°57'47"E
1298.20'

649.10'

(17.84) RIM
5.60 INV

SEE CORDOVA ROAD
INDUSTRIAL COMPLEX
CONCEPTUAL UTILITY
PLAN FOR CONTINUATION

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Plot Date: 11/2/2022 2:24 PM
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By: Jda
File: P:\VVVLI\00000001\0400\CAD\SHEETS\EC\Conceptual Utility\003-Quarry-Conceptual Utility-VVLI00000001.dwg