PRELIMINARY HYDROLOGY REPORT
for
C & S Coffee Shop Expansion
APN: 0586-351-16

PREP DATE: JANUARY 29, 2026

SITE: 55795 29 Palm Hwy.
Yucca Valley, CA 92284
APN: 0586-351-16

PREPARED FOR: **Benji Reyes**

PREPARED BY: ***Futrono Engineering Inc.***
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Introduction

Benny Reyes has retained Futrono Engineering Inc. to prepare a Hydrology Analysis for an undeveloped lot east of an existing C & S Coffee Shop at 55795 29 Palm Hwy. (APN: 0586-351-16).
The owner merged the undeveloped lot with the lot with the existing C & S Coffee Shop. The new undeveloped area will expand the C & S Coffee Shop. The owner will build a 1,120 sqft of covered patio, a 3,164 sq-ft of rotisserie chicken bar, a freshly baked bread bar, a fruit juice bar, an ice cream bar, also a new kitchen, a new storage room, two handicapped bathrooms. Finally, the project will create four new parking lots (2 lots will be ADA compliance) on the back part of the lot.

Purpose

This Hydrology Report aims to determine the stormwater runoff for the pre-developed and developed conditions and show the increased peak runoff due to the developed condition. The San Bernardino Hydrology Manual shows the intensity values of the 10-year and 100-year storm durations we use to calculate the runoff peak and the Unit Hydrographs for existing and developed conditions.

This property is in a FEMA flood zone (See map in the Reference Materials chapter).

Criteria

The criteria utilized for hydrology analysis is the San Bernardino County Hydrology Manual. The software, CivilD, was used to calculate storm water runoff rates for the pre-developed and developed condition.
10% increased Intensities values from NOAA were used.
Post development flow rate for 10 and 100 yr storm may not exceed 90% of existing conditions for 10 and 100 yr storm.

NOTE: Intensities values from NOAA were INCREASED IN 10% of their values.

Site Location

The project site is located on 55795 29 Palm Hwy, city of Yucca Valley, County of San Bernardino, CA 92284. The area consists of 0.16 Ac. Currently there is a vacant lot.
The soil in the study is type B.

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Results

Summary of the flows obtained from the rational method for the pre-developed and developed condition, 10 and 100 year storm.

Pre-developed				Developed			
Node	10 year storm [cfs]	100 year storm [cfs]		Node	10 year storm [cfs]	100 year storm [cfs]	
20	0.54	1.16		**40**	0.89	1.89	

Pre-developed			Developed			Difference		
10 year [cfs]	**100 year [cfs]**		10 year [cfs]	100 year [cfs]		10 year [cfs]	100 year [cfs]	
0.54	1.16		0.90	1.89		0.36	0.73	

The difference between the pre-developed and the developed conditions for 10-and 100-year storms is minimal. Also, two 3' diameter and 65 feet long will intercept at least 918.9 cf of the flows before they exit the site.

Summary of the volumes obtained from the unit hydrograph for the pre-developed and developed condition 100-year storm 24 hour storm.

	Volume [Ac-ft]	Volume [cf]
UH Pre-developed	0.0390	1698.8
UH Developed	0.0596	2596.2

UH Pre-developed	UH Developed	Difference
Volume [cf]	Volume [cf]	Volume [cf]
1698.8	2596.2	**897.4**

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Volume Calculation

UNIT HYDROGRAPH 24 HOUR		
	Ac-ft	cf
predeveloped	0.0390	1698.8
developed	0.0596	2596.2
Difference	0.0206	897.3
Pipe Diameter	3	feet
Area pipe	7.068375	sq-ft
Length of the pipe	127.0	feet
Use 2 - 3' x 65'		

The two CMP perforated 3-foot-diameter, 65-foot-long pipe will retain 918.9 cf of rain flow to mitigate the 897.3 cf increase from the developed condition.

See details in the Developed Condition Exhibit

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Hydrology Reference Material

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Soil type

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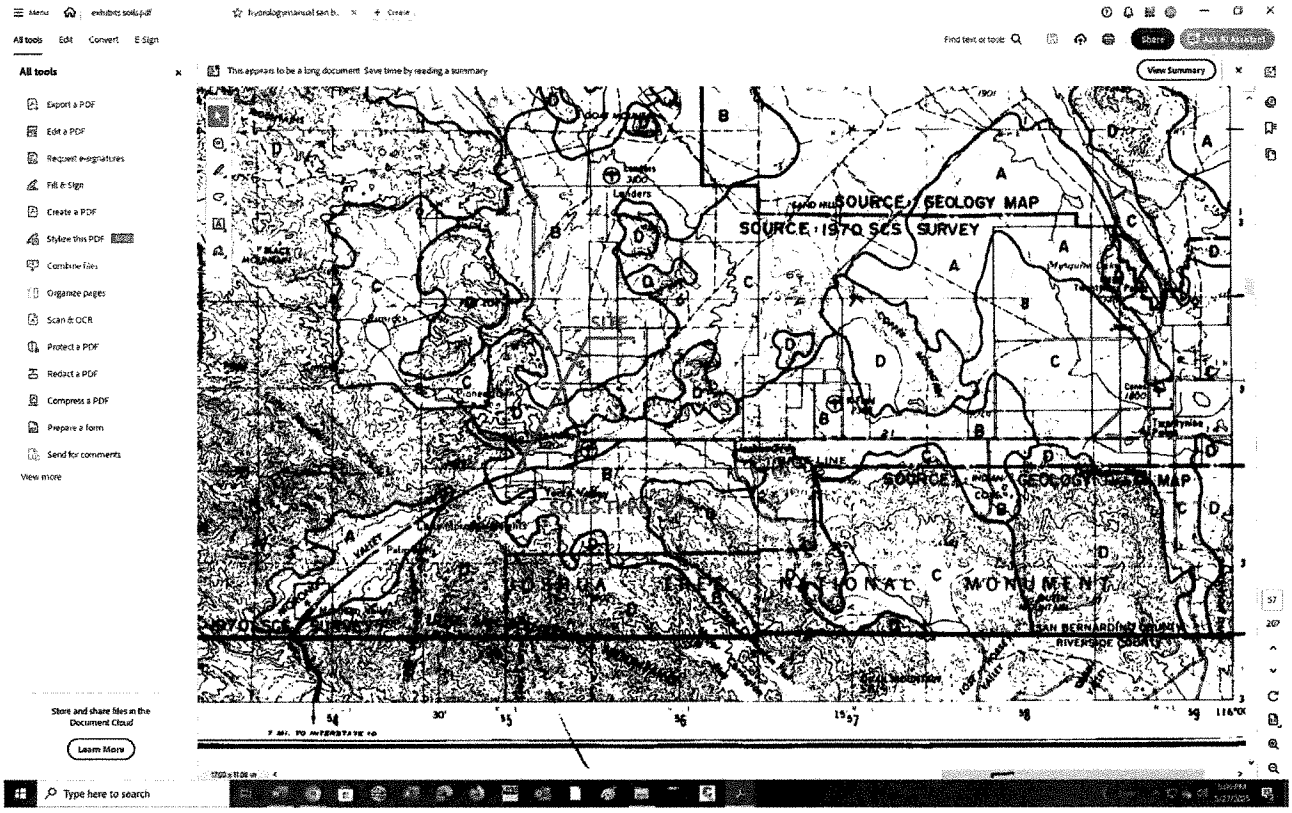

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Intensities

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NOTE: Intensities values from NOAA were INCREASED IN 10% of their values.

1/25/25, 2:48 PM PF Map: Contiguous US

NOAA's National Weather Service
Hydrometeorological Design Studies Center
Precipitation Frequency Data Server (PFDS)

www.nws.noaa.gov

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Documents

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Regional Precipitation

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USA.gov

NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA

Data description

Data type: Precipitation depth Units: English Time series type: Partial duration

Select location

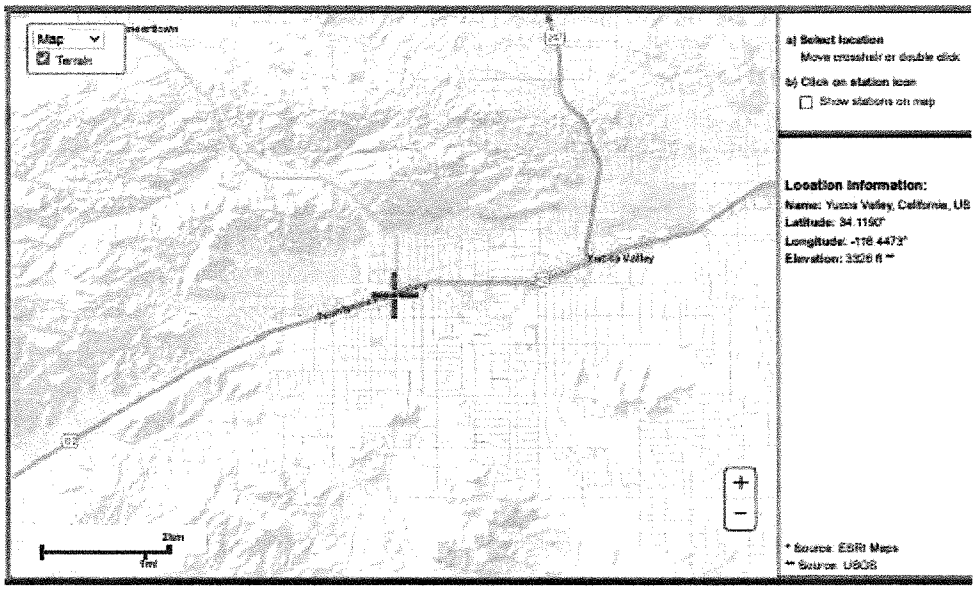
1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude: Longitude: Submit

b) By station (list of CA stations): Select station

c) By address: 55705 Twentynine Palms Hwy, Yucca ...

2) Use map:



POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

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

https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=ca

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NOTE: Intensities values from NOAA were INCREASED IN 10% of their values.

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	0.089 (0.074-0.109)	0.132 (0.109-0.161)	0.195 (0.161-0.238)	0.253 (0.207-0.312)	0.343 (0.271-0.437)	0.422 (0.327-0.549)	0.512 (0.387-0.683)	0.616 (0.453-0.846)	0.779 (0.550-1.11)	1.03 (0.703-1.53)
10-min	0.128 (0.106-0.156)	0.188 (0.156-0.230)	0.279 (0.230-0.342)	0.362 (0.296-0.447)	0.491 (0.389-0.626)	0.604 (0.469-0.787)	0.733 (0.555-0.979)	0.883 (0.650-1.21)	1.12 (0.788-1.60)	1.48 (1.01-2.19)
15-min	0.155 (0.126-0.189)	0.228 (0.189-0.278)	0.337 (0.278-0.413)	0.438 (0.358-0.540)	0.594 (0.470-0.757)	0.731 (0.567-0.952)	0.887 (0.671-1.18)	1.07 (0.786-1.47)	1.35 (0.953-1.93)	1.79 (1.22-2.64)
30-min	0.235 (0.195-0.287)	0.347 (0.287-0.423)	0.513 (0.424-0.629)	0.666 (0.545-0.822)	0.904 (0.715-1.15)	1.11 (0.862-1.45)	1.35 (1.02-1.80)	1.62 (1.20-2.23)	2.05 (1.45-2.94)	2.72 (1.86-4.02)
60-min	0.330 (0.273-0.402)	0.487 (0.403-0.594)	0.720 (0.594-0.881)	0.934 (0.765-1.15)	1.27 (1.00-1.62)	1.56 (1.21-2.03)	1.89 (1.43-2.53)	2.28 (1.68-3.13)	2.88 (2.03-4.12)	3.81 (2.60-5.64)
2-hr	0.460 (0.381-0.561)	0.650 (0.538-0.793)	0.924 (0.763-1.13)	1.17 (0.958-1.44)	1.54 (1.22-1.97)	1.86 (1.44-2.42)	2.21 (1.67-2.95)	2.60 (1.92-3.57)	3.20 (2.26-4.58)	3.85 (2.63-5.70)
3-hr	0.550 (0.455-0.670)	0.764 (0.632-0.933)	1.07 (0.885-1.31)	1.34 (1.10-1.66)	1.75 (1.39-2.23)	2.09 (1.62-2.72)	2.47 (1.87-3.29)	2.89 (2.12-3.96)	3.51 (2.48-5.02)	4.04 (2.76-5.98)
6-hr	0.725 (0.600-0.884)	0.996 (0.824-1.22)	1.38 (1.14-1.69)	1.71 (1.40-2.11)	2.20 (1.74-2.81)	2.60 (2.02-3.39)	3.04 (2.30-4.06)	3.52 (2.59-4.83)	4.22 (2.98-6.04)	4.81 (3.28-7.12)
12-hr	0.906 (0.751-1.10)	1.25 (1.04-1.53)	1.74 (1.43-2.12)	2.16 (1.76-2.66)	2.77 (2.19-3.53)	3.27 (2.54-4.26)	3.82 (2.89-5.10)	4.42 (3.25-6.06)	5.29 (3.73-7.56)	6.02 (4.10-8.91)
24-hr	1.14 (1.01-1.31)	1.59 (1.41-1.83)	2.23 (1.97-2.58)	2.79 (2.44-3.26)	3.62 (3.07-4.36)	4.30 (3.57-5.29)	5.05 (4.09-6.35)	5.87 (4.63-7.59)	7.08 (5.36-9.53)	8.10 (5.93-11.3)
2-day	1.26 (1.11-1.45)	1.79 (1.58-2.06)	2.55 (2.25-2.95)	3.22 (2.82-3.75)	4.21 (3.57-5.07)	5.05 (4.19-6.20)	5.96 (4.83-7.49)	6.96 (5.49-9.01)	8.46 (6.41-11.4)	9.72 (7.12-13.5)
3-day	1.37 (1.21-1.58)	1.97 (1.74-2.27)	2.83 (2.50-3.26)	3.60 (3.15-4.20)	4.74 (4.02-5.71)	5.70 (4.74-7.01)	6.76 (5.48-8.51)	7.94 (6.26-10.3)	9.68 (7.34-13.0)	11.2 (8.18-15.6)
4-day	1.43 (1.26-1.64)	2.07 (1.83-2.39)	3.00 (2.64-3.47)	3.82 (3.34-4.45)	5.05 (4.28-6.08)	6.09 (5.06-7.48)	7.23 (5.87-9.10)	8.51 (6.72-11.0)	10.4 (7.89-14.0)	12.0 (8.81-16.8)
7-day	1.58 (1.40-1.82)	2.33 (2.06-2.69)	3.40 (3.00-3.94)	4.36 (3.82-5.08)	5.80 (4.91-6.98)	7.01 (5.82-8.62)	8.35 (6.77-10.5)	9.86 (7.78-12.7)	12.1 (9.16-16.3)	14.0 (10.3-19.5)
10-day	1.70 (1.50-1.96)	2.52 (2.23-2.91)	3.70 (3.26-4.27)	4.74 (4.15-5.53)	6.31 (5.34-7.59)	7.63 (6.34-9.38)	9.10 (7.38-11.4)	10.7 (8.47-13.9)	13.2 (9.99-17.8)	15.3 (11.2-21.3)
20-day	1.94 (1.72-2.23)	2.88 (2.55-3.32)	4.21 (3.72-4.87)	5.39 (4.72-6.28)	7.14 (6.05-8.60)	8.62 (7.16-10.6)	10.2 (8.30-12.9)	12.1 (9.51-15.6)	14.8 (11.2-19.9)	17.1 (12.5-23.8)
30-day	2.18 (1.93-2.51)	3.24 (2.86-3.73)	4.72 (4.17-5.46)	6.02 (5.27-7.02)	7.94 (6.73-9.56)	9.56 (7.94-11.7)	11.3 (9.19-14.3)	13.3 (10.5-17.2)	16.2 (12.3-21.9)	18.7 (13.7-26.1)
45-day	2.55 (2.26-2.93)	3.74 (3.31-4.31)	5.40 (4.77-6.24)	6.85 (6.00-7.98)	8.96 (7.60-10.8)	10.7 (8.90-13.2)	12.6 (10.3-15.9)	14.8 (11.7-19.1)	18.0 (13.6-24.2)	20.7 (15.1-28.8)
60-day	2.91 (2.58-3.35)	4.23 (3.74-4.88)	6.05 (5.34-7.00)	7.63 (6.68-8.90)	9.93 (8.42-12.0)	11.8 (9.82-14.5)	13.9 (11.3-17.5)	16.2 (12.8-20.9)	19.6 (14.8-26.4)	22.4 (16.4-31.3)

[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.

https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=ca

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FEMA map

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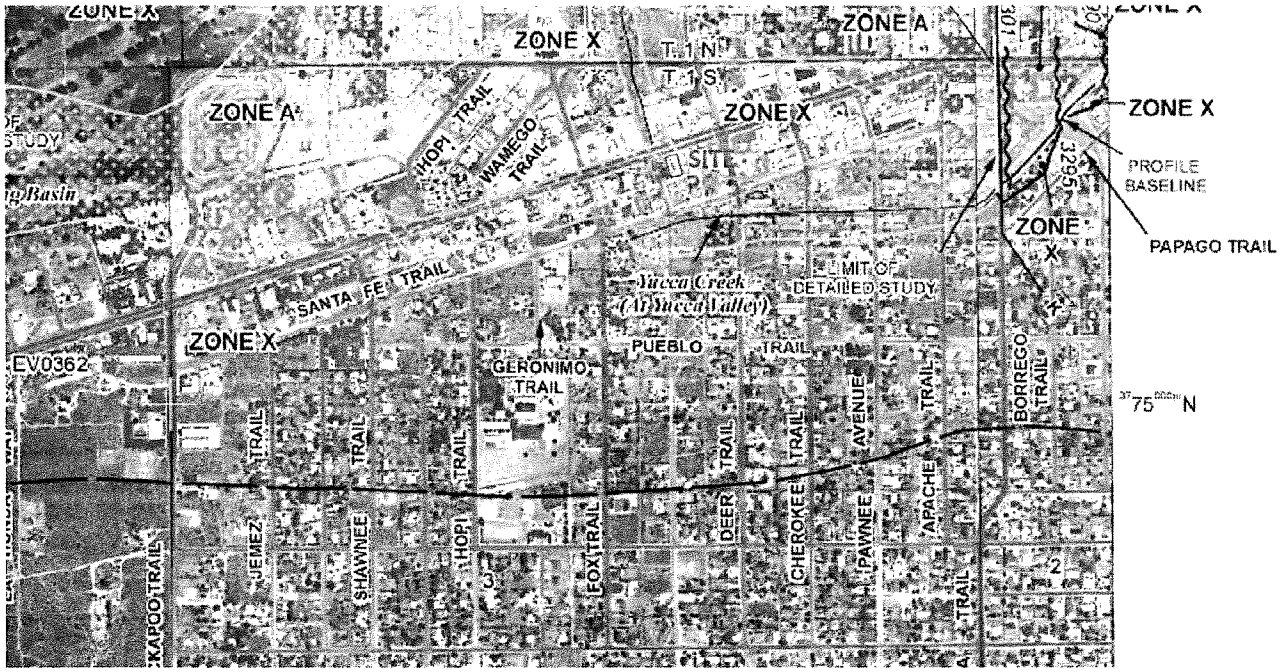

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Rational method

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Pre-developed Condition: 10, and 100 year storm

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San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1
Rational Hydrology Study Date: 01/29/26

55975 29palm,Yucca Valley
10 YEAR STORM
pre developed condition
1 HOUR DURATION

Program License Serial Number 6561

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 1.023 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

++
Process from Point/Station 10.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 78.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.404(In/Hr)
Initial subarea data:
Initial area flow distance = 138.000(Ft.)
Top (of initial area) elevation = 3526.000(Ft.)
Bottom (of initial area) elevation = 3523.000(Ft.)
Difference in elevation = 3.000(Ft.)
Slope = 0.02174 s(%)= 2.17
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.103 min.
Rainfall intensity = 4.154(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.813
Subarea runoff = 0.540(CFS)
Total initial stream area = 0.160(Ac.)
Pervious area fraction = 1.000

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```
Initial area Fm value =    0.404(In/Hr)
End of computations, Total Study Area =           0.16 (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 =  78.0
```


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          San Bernardino County Rational Hydrology Program

               (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2019 Version 9.1
      Rational Hydrology Study        Date: 01/29/26
-------------------------------------------------------------------------
55975 29palm,Yucca Valley
10 YEAR STORM
pre developed condition
1 HOUR DURATION
-------------------------------------------------------------------------


Program License Serial Number 6561

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

-------------------------------------------------------------------------
Rational hydrology study storm event year is    10.0
Computed rainfall intensity:
Storm year =    10.00   1 hour rainfall =     1.023 (In.)
Slope used for rainfall intensity curve b =  0.7000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       20.000
**** INITIAL AREA EVALUATION ****
_________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Initial subarea data:
Initial area flow distance =   138.000(Ft.)
Top (of initial area) elevation =  3526.000(Ft.)
Bottom (of initial area) elevation =  3523.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.02174  s(%)=       2.17
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.103 min.
Rainfall intensity =      4.154(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.813
Subarea runoff =      0.540(CFS)
Total initial stream area =        0.160(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.404(In/Hr)
End of computations, Total Study Area =            0.16 (Ac.)
```


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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 = 78.0

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            San Bernardino County Rational Hydrology Program

                (Hydrology Manual Date - August 1986)

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      Rational Hydrology Study        Date: 01/29/26
--------------------------------------------------------------------------
55975 29palm,Yucca Valley
100 YEAR STORM
pre developed condition
1 HOUR DURATION
--------------------------------------------------------------------------

Program License Serial Number 6561

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

--------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
   10 Year storm 1 hour rainfall  =      1.023(In.)
  100 Year storm 1 hour rainfall  =      2.079(In.)
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     2.079 (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 ****

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Initial subarea data:
Initial area fl   ow distance =   138.000(Ft.)
Top (of initial area) elevation =  3526.000(Ft.)
Bottom (of initial area) elevation =  3523.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.02174  s(%)=       2.17
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.103 min.
Rainfall intensity =      8.443(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.857
Subarea runoff =      1.158(CFS)
Total initial stream area =        0.160(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.404(In/Hr)
End of computations, Total Study Area =            0.16 (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 =  78.0
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Developed Condition: 10, and 100 year storm

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          San Bernardino County Rational Hydrology Program

              (Hydrology Manual Date - August 1986)    FILE 29PADT

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2019 Version 9.1
      Rational Hydrology Study        Date: 01/22/26
--------------------------------------------------------------------------
55975 29palm, Yucca Valley
10 YEAR STORM
Developed condition

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


Program License Serial Number 6561

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

--------------------------------------------------------------------------
Rational hydrology study storm event year is    10.0
Computed rainfall intensity:
Storm year =    10.00   1 hour rainfall =     1.023 (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 = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =    54.000(Ft.)
Top (of initial area) elevation =  3334.000(Ft.)
Bottom (of initial area) elevation =  3333.000(Ft.)
Difference in elevation =     1.000(Ft.)
Slope =    0.01852  s(%)=       1.85
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    3.329 min.
Rainfall intensity =      7.744(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.891
Subarea runoff =      0.138(CFS)
```


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```
Total initial stream area =        0.020(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       25.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  3330.000(Ft.)
Downstream point/station elevation =  3326.000(Ft.)
Pipe length  =     8.00(Ft.)   Manning's N = 0.010
No. of pipes = 1  Required pipe flow  =     0.138(CFS)
Nearest computed pipe diameter  =      3.00(In.)
Calculated individual pipe flow  =     0.138(CFS)
Normal flow depth in pipe =    0.84(In.)
Flow top width inside pipe =    2.69(In.)
Critical Depth =    2.64(In.)
Pipe flow velocity =     12.34(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     3.34 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       25.000 to Point/Station       30.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.271(Ft.), Average velocity =   1.727(Ft/s)
     ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
     1              0.00               1.00
     2              2.00               0.00
     3              3.00               1.00
Manning's 'N' friction factor =   0.025
------------------------------------------------------------------
Sub-Channel flow  =      0.190(CFS)
  '     '   flow top width =      0.812(Ft.)
  '     '    velocity=    1.727(Ft/s)
  '     '   area =      0.110(Sq.Ft)
  '     '   Froude number =     0.828

Upstream point elevation =  3326.000(Ft.)
Downstream point elevation =  3324.500(Ft.)
Flow length =    95.000(Ft.)
Travel time  =    0.92 min.
Time of concentration =    4.26 min.
Depth of flow =   0.271(Ft.)
Average velocity =   1.727(Ft/s)
Total irregular channel flow =     0.190(CFS)
```


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```
Irregular channel normal depth above invert elev. =    0.271(Ft.)
Average velocity of channel(s) =   1.727(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Rainfall intensity =      6.520(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 =      0.061(CFS) for    0.015(Ac.)
Total runoff =      0.199(CFS)
Effective area this stream =        0.04(Ac.)
Total Study Area (Main Stream No. 1) =        0.04(Ac.)
Area averaged Fm value =    0.215(In/Hr)
Depth of flow =   0.275(Ft.), Average velocity =   1.747(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       30.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Time of concentration =     4.26 min.
Rainfall intensity =      6.520(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.885
Subarea runoff =      0.580(CFS) for    0.100(Ac.)
Total runoff =      0.779(CFS)
Effective area this stream =        0.14(Ac.)
Total Study Area (Main Stream No. 1) =        0.14(Ac.)
Area averaged Fm value =    0.110(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.420(Ft.), Average velocity =   2.998(Ft/s)
     ******* Irregular Channel Data ***********
------------------------------------------------------------------------
Information entered for subchannel number 1 :
```


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```
Point number      'X' coordinate     'Y' coordinate
     1              0.00               1.00
     2              2.00               0.00
     3              3.00               1.00
Manning's 'N' friction factor =   0.025
-----------------------------------------------------------------
Sub-Channel flow  =      0.793(CFS)
  '     '   flow top width =      1.260(Ft.)
  '     '    velocity=    2.998(Ft/s)
  '     '   area =      0.265(Sq.Ft)
  '     '   Froude number =     1.153

Upstream point elevation =  3324.500(Ft.)
Downstream point elevation =  3323.600(Ft.)
Flow length =    34.000(Ft.)
Travel time  =    0.19 min.
Time of concentration =    4.45 min.
Depth of flow =   0.420(Ft.)
Average velocity =   2.998(Ft/s)
Total irregular channel flow =     0.793(CFS)
Irregular channel normal depth above invert elev. =   0.420(Ft.)
Average velocity of channel(s) =   2.998(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Rainfall intensity =      6.325(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.883
Subarea runoff =      0.003(CFS) for    0.005(Ac.)
Total runoff =      0.782(CFS)
Effective area this stream =        0.14(Ac.)
Total Study Area (Main Stream No. 1) =        0.14(Ac.)
Area averaged Fm value =    0.121(In/Hr)
Depth of flow =   0.418(Ft.), Average velocity =   2.987(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****

-----------------------------------------------------------------
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
```


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```
Time of concentration =      4.45 min.
Rainfall intensity =       6.325(In/Hr) for a     10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.878
Subarea runoff =       0.107(CFS) for     0.020(Ac.)
Total runoff =       0.888(CFS)
Effective area this stream =         0.16(Ac.)
Total Study Area (Main Stream No. 1) =         0.16(Ac.)
Area averaged Fm value =     0.156(In/Hr)
End of computations, Total Study Area =             0.16 (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) = 0.325
Area averaged SCS curve number =  61.5
```


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```
          San Bernardino County Rational Hydrology Program

              (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2019 Version 9.1
      Rational Hydrology Study        Date: 01/19/26
--------------------------------------------------------------------------
55975 29palm, Yucca Valley
100 year storm
Developed condition
1 hour duration
--------------------------------------------------------------------------


Program License Serial Number 6561

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

--------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     2.080 (In.)
Slope used for rainfall intensity curve b =  0.7000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       20.000
**** INITIAL AREA EVALUATION ****
--------------------------------------------------------------------------
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =    54.000(Ft.)
Top (of initial area) elevation =  3334.000(Ft.)
Bottom (of initial area) elevation =  3333.000(Ft.)
Difference in elevation =     1.000(Ft.)
Slope =    0.01852  s(%)=       1.85
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    3.329 min.
Rainfall intensity =     15.745(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.896
```


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```
Subarea runoff =      0.282(CFS)
Total initial stream area =        0.020(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       25.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  3330.000(Ft.)
Downstream point/station elevation =  3326.000(Ft.)
Pipe length  =     8.00(Ft.)   Manning's N = 0.010
No. of pipes = 1  Required pipe flow  =     0.282(CFS)
Nearest computed pipe diameter  =      3.00(In.)
Calculated individual pipe flow  =     0.282(CFS)
Normal flow depth in pipe =    1.22(In.)
Flow top width inside pipe =    2.95(In.)
Critical depth could not be calculated.
Pipe flow velocity =     15.04(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     3.34 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       25.000 to Point/Station       30.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.354(Ft.), Average velocity =   2.065(Ft/s)
     ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
     1              0.00              1.00
     2              2.00              0.00
     3              3.00              1.00
Manning's 'N' friction factor =   0.025
------------------------------------------------------------------
Sub-Channel flow  =      0.388(CFS)
  '     '   flow top width =      1.062(Ft.)
  '     '    velocity=    2.065(Ft/s)
  '     '   area =      0.188(Sq.Ft)
  '     '   Froude number =     0.865

Upstream point elevation =  3326.000(Ft.)
Downstream point elevation =  3324.500(Ft.)
Flow length =    95.000(Ft.)
Travel time  =    0.77 min.
Time of concentration =    4.10 min.
Depth of flow =   0.354(Ft.)
Average velocity =   2.065(Ft/s)
```


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```
Total irregular channel flow =     0.388(CFS)
Irregular channel normal depth above invert elev. =   0.354(Ft.)
Average velocity of channel(s) =   2.065(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Rainfall intensity =     13.598(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 =      0.139(CFS) for    0.015(Ac.)
Total runoff =      0.422(CFS)
Effective area this stream =        0.04(Ac.)
Total Study Area (Main Stream No. 1) =        0.04(Ac.)
Area averaged Fm value =    0.215(In/Hr)
Depth of flow =   0.365(Ft.), Average velocity =   2.109(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       30.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Time of concentration =     4.10 min.
Rainfall intensity =     13.598(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 =      1.217(CFS) for    0.100(Ac.)
Total runoff =      1.639(CFS)
Effective area this stream =        0.14(Ac.)
Total Study Area (Main Stream No. 1) =        0.14(Ac.)
Area averaged Fm value =    0.110(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       40.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel =      0.000(CFS)
Depth of flow =   0.555(Ft.), Average velocity =   3.611(Ft/s)
     ******* Irregular Channel Data ***********
--------------------------------------------------------------------
```


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```
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
     1              0.00               1.00
     2              2.00               0.00
     3              3.00               1.00
Manning's 'N' friction factor =   0.025
-----------------------------------------------------------------
Sub-Channel flow  =      1.669(CFS)
  '     '   flow top width =      1.665(Ft.)
  '     '    velocity=    3.611(Ft/s)
  '     '   area =      0.462(Sq.Ft)
  '     '   Froude number =     1.208

Upstream point elevation =  3324.500(Ft.)
Downstream point elevation =  3323.600(Ft.)
Flow length =    34.000(Ft.)
Travel time  =    0.16 min.
Time of concentration =    4.26 min.
Depth of flow =   0.555(Ft.)
Average velocity =   3.611(Ft/s)
Total irregular channel flow =     1.669(CFS)
Irregular channel normal depth above invert elev. =   0.555(Ft.)
Average velocity of channel(s) =   3.611(Ft/s)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Rainfall intensity =     13.246(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.892
Subarea runoff =      0.015(CFS) for    0.005(Ac.)
Total runoff =      1.654(CFS)
Effective area this stream =        0.14(Ac.)
Total Study Area (Main Stream No. 1) =        0.14(Ac.)
Area averaged Fm value =    0.121(In/Hr)
Depth of flow =   0.553(Ft.), Average velocity =   3.602(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       40.000
**** SUBAREA FLOW ADDITION ****
-----------------------------------------------------------------
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 78.00
```


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```
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.404(In/Hr)
Time of concentration =     4.26 min.
Rainfall intensity =     13.246(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 =      0.231(CFS) for    0.020(Ac.)
Total runoff =      1.885(CFS)
Effective area this stream =        0.16(Ac.)
Total Study Area (Main Stream No. 1) =        0.16(Ac.)
Area averaged Fm value =    0.156(In/Hr)
End of computations, Total Study Area =            0.16 (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) = 0.325
Area averaged SCS curve number =  61.5
```


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Unit Hydrograph

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Pre-developed condition

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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 01/29/26

++

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

Program License Serial Number 6561

55975 29 Palm, Yucca Valley
100 year storm
predeveloped condition
24 hours duration

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
0.16	1	2.08
Rainfall data for year 100		
0.16	6	3.34
Rainfall data for year 100		
0.16	24	5.55

++

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

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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	0.16	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
0.16	1.000	67.0	67.0	4.93	0.396

Area-averaged catchment yield fraction, Y = 0.396
Area-averaged low loss fraction, Yb = 0.604
Direct entry of lag time by user
++
Watershed area = 0.16(Ac.)
Catchment Lag time = 0.112 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 74.4048
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.578(In/Hr)
Average low loss rate fraction (Yb) = 0.604 (decimal)
MOUNTAIN S-Graph Selected
Computed peak 5-minute rainfall = 0.987(In)
Computed peak 30-minute rainfall = 1.689(In)
Specified peak 1-hour rainfall = 2.079(In)
Computed peak 3-hour rainfall = 2.782(In)
Specified peak 6-hour rainfall = 3.344(In)
Specified peak 24-hour rainfall = 5.555(In)

Rainfall depth area reduction factors:
Using a total area of 0.16(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.986(In)
30-minute factor = 1.000 Adjusted rainfall = 1.689(In)
1-hour factor = 1.000 Adjusted rainfall = 2.079(In)
3-hour factor = 1.000 Adjusted rainfall = 2.782(In)
6-hour factor = 1.000 Adjusted rainfall = 3.344(In)
24-hour factor = 1.000 Adjusted rainfall = 5.555(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 = 1.93 (CFS))		
1	15.274	0.296
2	52.296	0.716
3	67.129	0.287

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4	75.612	0.164
5	81.222	0.109
6	85.135	0.076
7	88.222	0.060
8	90.730	0.049
9	92.838	0.041
10	94.612	0.034
11	96.062	0.028
12	97.402	0.026
13	98.741	0.026
14	100.000	0.024

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.9865	0.9865
2	1.2145	0.2280
3	1.3716	0.1571
4	1.4953	0.1236
5	1.5988	0.1035
6	1.6887	0.0899
7	1.7686	0.0799
8	1.8409	0.0723
9	1.9071	0.0662
10	1.9683	0.0612
11	2.0254	0.0571
12	2.0790	0.0536
13	2.1236	0.0446
14	2.1658	0.0422
15	2.2058	0.0400
16	2.2438	0.0381
17	2.2802	0.0364
18	2.3151	0.0348
19	2.3485	0.0334
20	2.3807	0.0322
21	2.4117	0.0310
22	2.4416	0.0299
23	2.4706	0.0290
24	2.4986	0.0280
25	2.5258	0.0272
26	2.5523	0.0264
27	2.5779	0.0257
28	2.6029	0.0250
29	2.6273	0.0243
30	2.6510	0.0237
31	2.6742	0.0232
32	2.6968	0.0226
33	2.7189	0.0221
34	2.7405	0.0216
35	2.7617	0.0212
36	2.7824	0.0207
37	2.8027	0.0203
38	2.8226	0.0199
39	2.8421	0.0195
40	2.8612	0.0192

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41	2.8800	0.0188
42	2.8985	0.0185
43	2.9166	0.0181
44	2.9345	0.0178
45	2.9520	0.0175
46	2.9693	0.0173
47	2.9863	0.0170
48	3.0030	0.0167
49	3.0195	0.0165
50	3.0357	0.0162
51	3.0517	0.0160
52	3.0674	0.0158
53	3.0830	0.0155
54	3.0983	0.0153
55	3.1134	0.0151
56	3.1283	0.0149
57	3.1431	0.0147
58	3.1576	0.0145
59	3.1719	0.0144
60	3.1861	0.0142
61	3.2001	0.0140
62	3.2140	0.0138
63	3.2276	0.0137
64	3.2411	0.0135
65	3.2545	0.0134
66	3.2677	0.0132
67	3.2808	0.0131
68	3.2937	0.0129
69	3.3065	0.0128
70	3.3191	0.0126
71	3.3316	0.0125
72	3.3440	0.0124
73	3.3609	0.0169
74	3.3777	0.0168
75	3.3944	0.0166
76	3.4109	0.0165
77	3.4272	0.0164
78	3.4434	0.0162
79	3.4595	0.0161
80	3.4755	0.0160
81	3.4913	0.0158
82	3.5071	0.0157
83	3.5227	0.0156
84	3.5381	0.0155
85	3.5535	0.0154
86	3.5688	0.0152
87	3.5839	0.0151
88	3.5989	0.0150
89	3.6138	0.0149
90	3.6287	0.0148
91	3.6434	0.0147
92	3.6580	0.0146
93	3.6725	0.0145
94	3.6869	0.0144

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95	3.7012	0.0143
96	3.7154	0.0142
97	3.7295	0.0141
98	3.7436	0.0140
99	3.7575	0.0139
100	3.7714	0.0139
101	3.7851	0.0138
102	3.7988	0.0137
103	3.8124	0.0136
104	3.8259	0.0135
105	3.8393	0.0134
106	3.8527	0.0133
107	3.8659	0.0133
108	3.8791	0.0132
109	3.8922	0.0131
110	3.9053	0.0130
111	3.9182	0.0130
112	3.9311	0.0129
113	3.9439	0.0128
114	3.9567	0.0127
115	3.9693	0.0127
116	3.9820	0.0126
117	3.9945	0.0125
118	4.0070	0.0125
119	4.0193	0.0124
120	4.0317	0.0123
121	4.0439	0.0123
122	4.0562	0.0122
123	4.0683	0.0121
124	4.0804	0.0121
125	4.0924	0.0120
126	4.1043	0.0120
127	4.1162	0.0119
128	4.1281	0.0118
129	4.1399	0.0118
130	4.1516	0.0117
131	4.1632	0.0117
132	4.1748	0.0116
133	4.1864	0.0116
134	4.1979	0.0115
135	4.2093	0.0114
136	4.2207	0.0114
137	4.2321	0.0113
138	4.2433	0.0113
139	4.2546	0.0112
140	4.2658	0.0112
141	4.2769	0.0111
142	4.2880	0.0111
143	4.2990	0.0110
144	4.3100	0.0110
145	4.3209	0.0109
146	4.3318	0.0109
147	4.3426	0.0108
148	4.3534	0.0108

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149	4.3642	0.0107
150	4.3749	0.0107
151	4.3855	0.0107
152	4.3961	0.0106
153	4.4067	0.0106
154	4.4172	0.0105
155	4.4277	0.0105
156	4.4381	0.0104
157	4.4485	0.0104
158	4.4589	0.0104
159	4.4692	0.0103
160	4.4795	0.0103
161	4.4897	0.0102
162	4.4999	0.0102
163	4.5100	0.0101
164	4.5202	0.0101
165	4.5302	0.0101
166	4.5403	0.0100
167	4.5503	0.0100
168	4.5602	0.0100
169	4.5701	0.0099
170	4.5800	0.0099
171	4.5899	0.0098
172	4.5997	0.0098
173	4.6094	0.0098
174	4.6192	0.0097
175	4.6289	0.0097
176	4.6385	0.0097
177	4.6482	0.0096
178	4.6578	0.0096
179	4.6673	0.0096
180	4.6769	0.0095
181	4.6864	0.0095
182	4.6958	0.0095
183	4.7052	0.0094
184	4.7146	0.0094
185	4.7240	0.0094
186	4.7333	0.0093
187	4.7426	0.0093
188	4.7519	0.0093
189	4.7612	0.0092
190	4.7704	0.0092
191	4.7795	0.0092
192	4.7887	0.0091
193	4.7978	0.0091
194	4.8069	0.0091
195	4.8159	0.0091
196	4.8250	0.0090
197	4.8340	0.0090
198	4.8429	0.0090
199	4.8519	0.0089
200	4.8608	0.0089
201	4.8697	0.0089
202	4.8785	0.0089

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203	4.8874	0.0088
204	4.8962	0.0088
205	4.9049	0.0088
206	4.9137	0.0087
207	4.9224	0.0087
208	4.9311	0.0087
209	4.9398	0.0087
210	4.9484	0.0086
211	4.9570	0.0086
212	4.9656	0.0086
213	4.9742	0.0086
214	4.9827	0.0085
215	4.9912	0.0085
216	4.9997	0.0085
217	5.0082	0.0085
218	5.0166	0.0084
219	5.0250	0.0084
220	5.0334	0.0084
221	5.0418	0.0084
222	5.0501	0.0083
223	5.0584	0.0083
224	5.0667	0.0083
225	5.0750	0.0083
226	5.0832	0.0082
227	5.0914	0.0082
228	5.0996	0.0082
229	5.1078	0.0082
230	5.1160	0.0082
231	5.1241	0.0081
232	5.1322	0.0081
233	5.1403	0.0081
234	5.1484	0.0081
235	5.1564	0.0080
236	5.1644	0.0080
237	5.1724	0.0080
238	5.1804	0.0080
239	5.1884	0.0080
240	5.1963	0.0079
241	5.2042	0.0079
242	5.2121	0.0079
243	5.2200	0.0079
244	5.2279	0.0079
245	5.2357	0.0078
246	5.2435	0.0078
247	5.2513	0.0078
248	5.2591	0.0078
249	5.2668	0.0078
250	5.2746	0.0077
251	5.2823	0.0077
252	5.2900	0.0077
253	5.2976	0.0077
254	5.3053	0.0077
255	5.3129	0.0076
256	5.3206	0.0076

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257	5.3282	0.0076
258	5.3357	0.0076
259	5.3433	0.0076
260	5.3508	0.0075
261	5.3584	0.0075
262	5.3659	0.0075
263	5.3734	0.0075
264	5.3808	0.0075
265	5.3883	0.0075
266	5.3957	0.0074
267	5.4031	0.0074
268	5.4105	0.0074
269	5.4179	0.0074
270	5.4253	0.0074
271	5.4326	0.0073
272	5.4400	0.0073
273	5.4473	0.0073
274	5.4546	0.0073
275	5.4619	0.0073
276	5.4691	0.0073
277	5.4764	0.0072
278	5.4836	0.0072
279	5.4908	0.0072
280	5.4980	0.0072
281	5.5052	0.0072
282	5.5123	0.0072
283	5.5195	0.0071
284	5.5266	0.0071
285	5.5337	0.0071
286	5.5408	0.0071
287	5.5479	0.0071
288	5.5550	0.0071

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0071	0.0043	0.0028
2	0.0071	0.0043	0.0028
3	0.0071	0.0043	0.0028
4	0.0071	0.0043	0.0028
5	0.0072	0.0043	0.0028
6	0.0072	0.0043	0.0028
7	0.0072	0.0044	0.0029
8	0.0072	0.0044	0.0029
9	0.0073	0.0044	0.0029
10	0.0073	0.0044	0.0029
11	0.0073	0.0044	0.0029
12	0.0073	0.0044	0.0029
13	0.0074	0.0044	0.0029
14	0.0074	0.0045	0.0029
15	0.0074	0.0045	0.0029
16	0.0074	0.0045	0.0029
17	0.0075	0.0045	0.0030

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18	0.0075	0.0045	0.0030
19	0.0075	0.0045	0.0030
20	0.0075	0.0046	0.0030
21	0.0076	0.0046	0.0030
22	0.0076	0.0046	0.0030
23	0.0076	0.0046	0.0030
24	0.0077	0.0046	0.0030
25	0.0077	0.0046	0.0030
26	0.0077	0.0047	0.0031
27	0.0078	0.0047	0.0031
28	0.0078	0.0047	0.0031
29	0.0078	0.0047	0.0031
30	0.0078	0.0047	0.0031
31	0.0079	0.0048	0.0031
32	0.0079	0.0048	0.0031
33	0.0079	0.0048	0.0031
34	0.0080	0.0048	0.0032
35	0.0080	0.0048	0.0032
36	0.0080	0.0048	0.0032
37	0.0081	0.0049	0.0032
38	0.0081	0.0049	0.0032
39	0.0081	0.0049	0.0032
40	0.0082	0.0049	0.0032
41	0.0082	0.0050	0.0032
42	0.0082	0.0050	0.0033
43	0.0083	0.0050	0.0033
44	0.0083	0.0050	0.0033
45	0.0083	0.0050	0.0033
46	0.0084	0.0051	0.0033
47	0.0084	0.0051	0.0033
48	0.0084	0.0051	0.0033
49	0.0085	0.0051	0.0034
50	0.0085	0.0051	0.0034
51	0.0086	0.0052	0.0034
52	0.0086	0.0052	0.0034
53	0.0086	0.0052	0.0034
54	0.0087	0.0052	0.0034
55	0.0087	0.0053	0.0035
56	0.0087	0.0053	0.0035
57	0.0088	0.0053	0.0035
58	0.0088	0.0053	0.0035
59	0.0089	0.0054	0.0035
60	0.0089	0.0054	0.0035
61	0.0090	0.0054	0.0036
62	0.0090	0.0054	0.0036
63	0.0091	0.0055	0.0036
64	0.0091	0.0055	0.0036
65	0.0091	0.0055	0.0036
66	0.0092	0.0055	0.0036
67	0.0092	0.0056	0.0037
68	0.0093	0.0056	0.0037
69	0.0093	0.0056	0.0037
70	0.0094	0.0057	0.0037
71	0.0094	0.0057	0.0037

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72	0.0095	0.0057	0.0037
73	0.0095	0.0058	0.0038
74	0.0096	0.0058	0.0038
75	0.0096	0.0058	0.0038
76	0.0097	0.0058	0.0038
77	0.0097	0.0059	0.0039
78	0.0098	0.0059	0.0039
79	0.0098	0.0059	0.0039
80	0.0099	0.0060	0.0039
81	0.0100	0.0060	0.0039
82	0.0100	0.0060	0.0040
83	0.0101	0.0061	0.0040
84	0.0101	0.0061	0.0040
85	0.0102	0.0062	0.0040
86	0.0102	0.0062	0.0041
87	0.0103	0.0062	0.0041
88	0.0104	0.0063	0.0041
89	0.0104	0.0063	0.0041
90	0.0105	0.0063	0.0041
91	0.0106	0.0064	0.0042
92	0.0106	0.0064	0.0042
93	0.0107	0.0065	0.0042
94	0.0107	0.0065	0.0043
95	0.0108	0.0065	0.0043
96	0.0109	0.0066	0.0043
97	0.0110	0.0066	0.0043
98	0.0110	0.0067	0.0044
99	0.0111	0.0067	0.0044
100	0.0112	0.0068	0.0044
101	0.0113	0.0068	0.0045
102	0.0113	0.0068	0.0045
103	0.0114	0.0069	0.0045
104	0.0115	0.0069	0.0046
105	0.0116	0.0070	0.0046
106	0.0117	0.0070	0.0046
107	0.0118	0.0071	0.0047
108	0.0118	0.0072	0.0047
109	0.0120	0.0072	0.0047
110	0.0120	0.0073	0.0048
111	0.0121	0.0073	0.0048
112	0.0122	0.0074	0.0048
113	0.0123	0.0074	0.0049
114	0.0124	0.0075	0.0049
115	0.0125	0.0076	0.0050
116	0.0126	0.0076	0.0050
117	0.0127	0.0077	0.0050
118	0.0128	0.0077	0.0051
119	0.0130	0.0078	0.0051
120	0.0130	0.0079	0.0052
121	0.0132	0.0080	0.0052
122	0.0133	0.0080	0.0053
123	0.0134	0.0081	0.0053
124	0.0135	0.0082	0.0053
125	0.0137	0.0083	0.0054

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126	0.0138	0.0083	0.0054
127	0.0139	0.0084	0.0055
128	0.0140	0.0085	0.0056
129	0.0142	0.0086	0.0056
130	0.0143	0.0086	0.0057
131	0.0145	0.0088	0.0057
132	0.0146	0.0088	0.0058
133	0.0148	0.0089	0.0059
134	0.0149	0.0090	0.0059
135	0.0151	0.0091	0.0060
136	0.0152	0.0092	0.0060
137	0.0155	0.0094	0.0061
138	0.0156	0.0094	0.0062
139	0.0158	0.0096	0.0063
140	0.0160	0.0096	0.0063
141	0.0162	0.0098	0.0064
142	0.0164	0.0099	0.0065
143	0.0166	0.0101	0.0066
144	0.0168	0.0101	0.0066
145	0.0124	0.0075	0.0049
146	0.0125	0.0076	0.0050
147	0.0128	0.0077	0.0051
148	0.0129	0.0078	0.0051
149	0.0132	0.0080	0.0052
150	0.0134	0.0081	0.0053
151	0.0137	0.0083	0.0054
152	0.0138	0.0084	0.0055
153	0.0142	0.0086	0.0056
154	0.0144	0.0087	0.0057
155	0.0147	0.0089	0.0058
156	0.0149	0.0090	0.0059
157	0.0153	0.0093	0.0061
158	0.0155	0.0094	0.0062
159	0.0160	0.0097	0.0063
160	0.0162	0.0098	0.0064
161	0.0167	0.0101	0.0066
162	0.0170	0.0103	0.0067
163	0.0175	0.0106	0.0069
164	0.0178	0.0108	0.0071
165	0.0185	0.0112	0.0073
166	0.0188	0.0114	0.0074
167	0.0195	0.0118	0.0077
168	0.0199	0.0120	0.0079
169	0.0207	0.0125	0.0082
170	0.0212	0.0128	0.0084
171	0.0221	0.0134	0.0088
172	0.0226	0.0137	0.0090
173	0.0237	0.0143	0.0094
174	0.0243	0.0147	0.0096
175	0.0257	0.0155	0.0102
176	0.0264	0.0160	0.0105
177	0.0280	0.0169	0.0111
178	0.0290	0.0175	0.0115
179	0.0310	0.0187	0.0123

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180	0.0322	0.0194	0.0127
181	0.0348	0.0210	0.0138
182	0.0364	0.0220	0.0144
183	0.0400	0.0242	0.0158
184	0.0422	0.0255	0.0167
185	0.0536	0.0324	0.0212
186	0.0571	0.0345	0.0226
187	0.0662	0.0400	0.0262
188	0.0723	0.0437	0.0286
189	0.0899	0.0482	0.0417
190	0.1035	0.0482	0.0553
191	0.1571	0.0482	0.1089
192	0.2280	0.0482	0.1798
193	0.9865	0.0482	0.9383
194	0.1236	0.0482	0.0754
195	0.0799	0.0482	0.0317
196	0.0612	0.0370	0.0242
197	0.0446	0.0269	0.0177
198	0.0381	0.0230	0.0151
199	0.0334	0.0202	0.0132
200	0.0299	0.0181	0.0119
201	0.0272	0.0164	0.0108
202	0.0250	0.0151	0.0099
203	0.0232	0.0140	0.0092
204	0.0216	0.0131	0.0086
205	0.0203	0.0123	0.0080
206	0.0192	0.0116	0.0076
207	0.0181	0.0110	0.0072
208	0.0173	0.0104	0.0068
209	0.0165	0.0099	0.0065
210	0.0158	0.0095	0.0062
211	0.0151	0.0091	0.0060
212	0.0145	0.0088	0.0058
213	0.0140	0.0085	0.0055
214	0.0135	0.0082	0.0053
215	0.0131	0.0079	0.0052
216	0.0126	0.0076	0.0050
217	0.0169	0.0102	0.0067
218	0.0165	0.0100	0.0065
219	0.0161	0.0097	0.0064
220	0.0157	0.0095	0.0062
221	0.0154	0.0093	0.0061
222	0.0150	0.0091	0.0059
223	0.0147	0.0089	0.0058
224	0.0144	0.0087	0.0057
225	0.0141	0.0085	0.0056
226	0.0139	0.0084	0.0055
227	0.0136	0.0082	0.0054
228	0.0133	0.0081	0.0053
229	0.0131	0.0079	0.0052
230	0.0129	0.0078	0.0051
231	0.0127	0.0077	0.0050
232	0.0125	0.0075	0.0049
233	0.0123	0.0074	0.0049

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234	0.0121	0.0073	0.0048
235	0.0119	0.0072	0.0047
236	0.0117	0.0071	0.0046
237	0.0116	0.0070	0.0046
238	0.0114	0.0069	0.0045
239	0.0112	0.0068	0.0044
240	0.0111	0.0067	0.0044
241	0.0109	0.0066	0.0043
242	0.0108	0.0065	0.0043
243	0.0107	0.0064	0.0042
244	0.0105	0.0064	0.0042
245	0.0104	0.0063	0.0041
246	0.0103	0.0062	0.0041
247	0.0101	0.0061	0.0040
248	0.0100	0.0061	0.0040
249	0.0099	0.0060	0.0039
250	0.0098	0.0059	0.0039
251	0.0097	0.0059	0.0038
252	0.0096	0.0058	0.0038
253	0.0095	0.0057	0.0038
254	0.0094	0.0057	0.0037
255	0.0093	0.0056	0.0037
256	0.0092	0.0056	0.0036
257	0.0091	0.0055	0.0036
258	0.0090	0.0055	0.0036
259	0.0089	0.0054	0.0035
260	0.0089	0.0053	0.0035
261	0.0088	0.0053	0.0035
262	0.0087	0.0053	0.0034
263	0.0086	0.0052	0.0034
264	0.0085	0.0052	0.0034
265	0.0085	0.0051	0.0034
266	0.0084	0.0051	0.0033
267	0.0083	0.0050	0.0033
268	0.0082	0.0050	0.0033
269	0.0082	0.0049	0.0032
270	0.0081	0.0049	0.0032
271	0.0080	0.0049	0.0032
272	0.0080	0.0048	0.0032
273	0.0079	0.0048	0.0031
274	0.0079	0.0047	0.0031
275	0.0078	0.0047	0.0031
276	0.0077	0.0047	0.0031
277	0.0077	0.0046	0.0030
278	0.0076	0.0046	0.0030
279	0.0076	0.0046	0.0030
280	0.0075	0.0045	0.0030
281	0.0075	0.0045	0.0030
282	0.0074	0.0045	0.0029
283	0.0073	0.0044	0.0029
284	0.0073	0.0044	0.0029
285	0.0072	0.0044	0.0029
286	0.0072	0.0043	0.0028
287	0.0071	0.0043	0.0028

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288 0.0071 0.0043 0.0028

Total soil rain loss = 2.62(In)
Total effective rainfall = 2.93(In)
Peak flow rate in flood hydrograph = 0.78(CFS)

++

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0000	0.00	Q				
0+15	0.0001	0.00	Q				
0+20	0.0001	0.00	Q				
0+25	0.0001	0.00	Q				
0+30	0.0001	0.00	Q				
0+35	0.0002	0.00	Q				
0+40	0.0002	0.00	Q				
0+45	0.0002	0.01	Q				
0+50	0.0003	0.01	Q				
0+55	0.0003	0.01	Q				
1+ 0	0.0004	0.01	Q				
1+ 5	0.0004	0.01	Q				
1+10	0.0004	0.01	Q				
1+15	0.0005	0.01	Q				
1+20	0.0005	0.01	Q				
1+25	0.0005	0.01	Q				
1+30	0.0006	0.01	Q				
1+35	0.0006	0.01	Q				
1+40	0.0007	0.01	Q				
1+45	0.0007	0.01	Q				
1+50	0.0007	0.01	Q				
1+55	0.0008	0.01	Q				
2+ 0	0.0008	0.01	Q				
2+ 5	0.0009	0.01	Q				
2+10	0.0009	0.01	Q				
2+15	0.0009	0.01	Q				
2+20	0.0010	0.01	QV				
2+25	0.0010	0.01	QV				
2+30	0.0011	0.01	QV				
2+35	0.0011	0.01	QV				
2+40	0.0012	0.01	QV				
2+45	0.0012	0.01	QV				
2+50	0.0012	0.01	QV				
2+55	0.0013	0.01	QV				
3+ 0	0.0013	0.01	QV				
3+ 5	0.0014	0.01	QV				
3+10	0.0014	0.01	QV				

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3+15	0.0014	0.01	QV				
3+20	0.0015	0.01	QV				
3+25	0.0015	0.01	QV				
3+30	0.0016	0.01	QV				
3+35	0.0016	0.01	QV				
3+40	0.0017	0.01	QV				
3+45	0.0017	0.01	QV				
3+50	0.0017	0.01	QV				
3+55	0.0018	0.01	QV				
4+ 0	0.0018	0.01	QV				
4+ 5	0.0019	0.01	QV				
4+10	0.0019	0.01	QV				
4+15	0.0020	0.01	Q V				
4+20	0.0020	0.01	Q V				
4+25	0.0021	0.01	Q V				
4+30	0.0021	0.01	Q V				
4+35	0.0021	0.01	Q V				
4+40	0.0022	0.01	Q V				
4+45	0.0022	0.01	Q V				
4+50	0.0023	0.01	Q V				
4+55	0.0023	0.01	Q V				
5+ 0	0.0024	0.01	Q V				
5+ 5	0.0024	0.01	Q V				
5+10	0.0025	0.01	Q V				
5+15	0.0025	0.01	Q V				
5+20	0.0026	0.01	Q V				
5+25	0.0026	0.01	Q V				
5+30	0.0027	0.01	Q V				
5+35	0.0027	0.01	Q V				
5+40	0.0028	0.01	Q V				
5+45	0.0028	0.01	Q V				
5+50	0.0029	0.01	Q V				
5+55	0.0029	0.01	Q V				
6+ 0	0.0030	0.01	Q V				
6+ 5	0.0030	0.01	Q V				
6+10	0.0031	0.01	Q V				
6+15	0.0031	0.01	Q V				
6+20	0.0032	0.01	Q V				
6+25	0.0032	0.01	Q V				
6+30	0.0033	0.01	Q V				
6+35	0.0033	0.01	Q V				
6+40	0.0034	0.01	Q V				
6+45	0.0034	0.01	Q V				
6+50	0.0035	0.01	Q V				
6+55	0.0035	0.01	Q V				
7+ 0	0.0036	0.01	Q V				
7+ 5	0.0036	0.01	Q V				
7+10	0.0037	0.01	Q V				
7+15	0.0037	0.01	Q V				
7+20	0.0038	0.01	Q V				
7+25	0.0038	0.01	Q V				
7+30	0.0039	0.01	Q V				
7+35	0.0039	0.01	Q V				
7+40	0.0040	0.01	Q V				

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7+45	0.0041	0.01	Q	V				
7+50	0.0041	0.01	Q	V				
7+55	0.0042	0.01	Q	V				
8+ 0	0.0042	0.01	Q	V				
8+ 5	0.0043	0.01	Q	V				
8+10	0.0043	0.01	Q	V				
8+15	0.0044	0.01	Q	V				
8+20	0.0045	0.01	Q	V				
8+25	0.0045	0.01	Q	V				
8+30	0.0046	0.01	Q	V				
8+35	0.0046	0.01	Q	V				
8+40	0.0047	0.01	Q	V				
8+45	0.0047	0.01	Q	V				
8+50	0.0048	0.01	Q	V				
8+55	0.0049	0.01	Q	V				
9+ 0	0.0049	0.01	Q	V				
9+ 5	0.0050	0.01	Q	V				
9+10	0.0051	0.01	Q	V				
9+15	0.0051	0.01	Q	V				
9+20	0.0052	0.01	Q	V				
9+25	0.0052	0.01	Q	V				
9+30	0.0053	0.01	Q	V				
9+35	0.0054	0.01	Q	V				
9+40	0.0054	0.01	Q	V				
9+45	0.0055	0.01	Q	V				
9+50	0.0056	0.01	Q	V				
9+55	0.0056	0.01	Q	V				
10+ 0	0.0057	0.01	Q	V				
10+ 5	0.0058	0.01	Q	V				
10+10	0.0058	0.01	Q	V				
10+15	0.0059	0.01	Q	V				
10+20	0.0060	0.01	Q	V				
10+25	0.0061	0.01	Q	V				
10+30	0.0061	0.01	Q	V				
10+35	0.0062	0.01	Q	V				
10+40	0.0063	0.01	Q	V				
10+45	0.0063	0.01	Q	V				
10+50	0.0064	0.01	Q	V				
10+55	0.0065	0.01	Q	V				
11+ 0	0.0066	0.01	Q	V				
11+ 5	0.0066	0.01	Q	V				
11+10	0.0067	0.01	Q	V				
11+15	0.0068	0.01	Q	V				
11+20	0.0069	0.01	Q	V				
11+25	0.0070	0.01	Q	V				
11+30	0.0070	0.01	Q	V				
11+35	0.0071	0.01	Q	V				
11+40	0.0072	0.01	Q	V				
11+45	0.0073	0.01	Q	V				
11+50	0.0074	0.01	Q	V				
11+55	0.0074	0.01	Q	V				
12+ 0	0.0075	0.01	Q	V				
12+ 5	0.0076	0.01	Q	V				
12+10	0.0077	0.01	Q	V				

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12+15	0.0078	0.01	Q	V				
12+20	0.0078	0.01	Q	V				
12+25	0.0079	0.01	Q	V				
12+30	0.0080	0.01	Q	V				
12+35	0.0080	0.01	Q	V				
12+40	0.0081	0.01	Q	V				
12+45	0.0082	0.01	Q	V				
12+50	0.0083	0.01	Q	V				
12+55	0.0083	0.01	Q	V				
13+ 0	0.0084	0.01	Q	V				
13+ 5	0.0085	0.01	Q	V				
13+10	0.0086	0.01	Q	V				
13+15	0.0087	0.01	Q	V				
13+20	0.0087	0.01	Q	V				
13+25	0.0088	0.01	Q	V				
13+30	0.0089	0.01	Q	V				
13+35	0.0090	0.01	Q	V				
13+40	0.0091	0.01	Q	V				
13+45	0.0092	0.01	Q	V				
13+50	0.0093	0.01	Q	V				
13+55	0.0094	0.01	Q	V				
14+ 0	0.0095	0.01	Q	V				
14+ 5	0.0096	0.01	Q	V				
14+10	0.0097	0.02	Q	V				
14+15	0.0098	0.02	Q	V				
14+20	0.0099	0.02	Q	V				
14+25	0.0100	0.02	Q	V				
14+30	0.0101	0.02	Q	V				
14+35	0.0102	0.02	Q	V				
14+40	0.0104	0.02	Q	V				
14+45	0.0105	0.02	Q	V				
14+50	0.0106	0.02	Q	V				
14+55	0.0108	0.02	Q	V				
15+ 0	0.0109	0.02	Q	V				
15+ 5	0.0111	0.02	Q	V				
15+10	0.0113	0.02	Q	V				
15+15	0.0114	0.03	Q	V				
15+20	0.0116	0.03	Q	V				
15+25	0.0118	0.03	Q	V				
15+30	0.0121	0.04	Q	V				
15+35	0.0124	0.04	Q	V				
15+40	0.0127	0.04	Q	V				
15+45	0.0130	0.05	Q	V				
15+50	0.0135	0.07	Q	V				
15+55	0.0141	0.10	Q	V				
16+ 0	0.0153	0.16	Q	V				
16+ 5	0.0184	0.46	Q	V				
16+10	0.0238	0.78	Q	V				
16+15	0.0265	0.39	Q	V				
16+20	0.0281	0.24	Q	V				
16+25	0.0293	0.17	Q	V				
16+30	0.0302	0.13	Q	V				
16+35	0.0310	0.11	Q	V				
16+40	0.0316	0.09	Q	V				

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16+45	0.0321	0.08	Q			V	
16+50	0.0326	0.07	Q			V	
16+55	0.0330	0.06	Q			V	
17+ 0	0.0334	0.05	Q			V	
17+ 5	0.0337	0.05	Q			V	
17+10	0.0340	0.04	Q			V	
17+15	0.0341	0.02	Q			V	
17+20	0.0342	0.02	Q			V	
17+25	0.0344	0.02	Q			V	
17+30	0.0345	0.01	Q			V	
17+35	0.0345	0.01	Q			V	
17+40	0.0346	0.01	Q			V	
17+45	0.0347	0.01	Q			V	
17+50	0.0348	0.01	Q			V	
17+55	0.0349	0.01	Q			V	
18+ 0	0.0350	0.01	Q			V	
18+ 5	0.0350	0.01	Q			V	
18+10	0.0351	0.01	Q			V	
18+15	0.0352	0.01	Q			V	
18+20	0.0353	0.01	Q			V	
18+25	0.0354	0.01	Q			V	
18+30	0.0354	0.01	Q			V	
18+35	0.0355	0.01	Q			V	
18+40	0.0356	0.01	Q			V	
18+45	0.0357	0.01	Q			V	
18+50	0.0357	0.01	Q			V	
18+55	0.0358	0.01	Q			V	
19+ 0	0.0359	0.01	Q			V	
19+ 5	0.0360	0.01	Q			V	
19+10	0.0360	0.01	Q			V	
19+15	0.0361	0.01	Q			V	
19+20	0.0362	0.01	Q			V	
19+25	0.0362	0.01	Q			V	
19+30	0.0363	0.01	Q			V	
19+35	0.0364	0.01	Q			V	
19+40	0.0364	0.01	Q			V	
19+45	0.0365	0.01	Q			V	
19+50	0.0366	0.01	Q			V	
19+55	0.0366	0.01	Q			V	
20+ 0	0.0367	0.01	Q			V	
20+ 5	0.0368	0.01	Q			V	
20+10	0.0368	0.01	Q			V	
20+15	0.0369	0.01	Q			V	
20+20	0.0369	0.01	Q			V	
20+25	0.0370	0.01	Q			V	
20+30	0.0370	0.01	Q			V	
20+35	0.0371	0.01	Q			V	
20+40	0.0372	0.01	Q			V	
20+45	0.0372	0.01	Q			V	
20+50	0.0373	0.01	Q			V	
20+55	0.0373	0.01	Q			V	
21+ 0	0.0374	0.01	Q			V	
21+ 5	0.0374	0.01	Q			V	
21+10	0.0375	0.01	Q			V	

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21+15	0.0375	0.01	Q				V
21+20	0.0376	0.01	Q				V
21+25	0.0376	0.01	Q				V
21+30	0.0377	0.01	Q				V
21+35	0.0377	0.01	Q				V
21+40	0.0378	0.01	Q				V
21+45	0.0378	0.01	Q				V
21+50	0.0379	0.01	Q				V
21+55	0.0379	0.01	Q				V
22+ 0	0.0380	0.01	Q				V
22+ 5	0.0380	0.01	Q				V
22+10	0.0380	0.01	Q				V
22+15	0.0381	0.01	Q				V
22+20	0.0381	0.01	Q				V
22+25	0.0382	0.01	Q				V
22+30	0.0382	0.01	Q				V
22+35	0.0383	0.01	Q				V
22+40	0.0383	0.01	Q				V
22+45	0.0383	0.01	Q				V
22+50	0.0384	0.01	Q				V
22+55	0.0384	0.01	Q				V
23+ 0	0.0385	0.01	Q				V
23+ 5	0.0385	0.01	Q				V
23+10	0.0386	0.01	Q				V
23+15	0.0386	0.01	Q				V
23+20	0.0386	0.01	Q				V
23+25	0.0387	0.01	Q				V
23+30	0.0387	0.01	Q				V
23+35	0.0388	0.01	Q				V
23+40	0.0388	0.01	Q				V
23+45	0.0388	0.01	Q				V
23+50	0.0389	0.01	Q				V
23+55	0.0389	0.01	Q				V
24+ 0	0.0390	0.01	Q				V

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Developed Condition: 100 year storm

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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

Study date 01/29/26

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

Program License Serial Number 6561

55975 29 Palm, Yucca Valley
100 year storm
Developed condition
24 hour duration

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

Sub-Area (Ac.)	Duration (hours)	Isohyetal (In)
Rainfall data for year 100		
0.16	1	2.08
Rainfall data for year 100		
0.16	6	3.34
Rainfall data for year 100		
0.16	24	5.55

++

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

SCS curve	SCS curve	Area	Area	Fp(Fig C6)	Ap	Fm

No.(AMCII)	NO.(AMC 2)	(Ac.)	Fraction	(In/Hr)	(dec.)	(In/Hr)
61.5	61.5	0.16	1.000	0.659	0.325	0.214

Area-averaged adjusted loss rate Fm (In/Hr) = 0.214

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

Area (Ac.)	Area Fract	SCS CN (AMC2)	SCS CN (AMC2)	S	Pervious Yield Fr
0.05	0.325	61.5	61.5	6.26	0.316
0.11	0.675	98.0	98.0	0.20	0.957

Area-averaged catchment yield fraction, Y = 0.749
Area-averaged low loss fraction, Yb = 0.251
Direct entry of lag time by user
++
Watershed area = 0.16(Ac.)
Catchment Lag time = 0.061 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 135.9434
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.214(In/Hr)
Average low loss rate fraction (Yb) = 0.251 (decimal)
MOUNTAIN S-Graph Selected
Computed peak 5-minute rainfall = 0.987(In)
Computed peak 30-minute rainfall = 1.689(In)
Specified peak 1-hour rainfall = 2.079(In)
Computed peak 3-hour rainfall = 2.782(In)
Specified peak 6-hour rainfall = 3.344(In)
Specified peak 24-hour rainfall = 5.555(In)

Rainfall depth area reduction factors:
Using a total area of 0.16(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.986(In)
30-minute factor = 1.000 Adjusted rainfall = 1.689(In)
1-hour factor = 1.000 Adjusted rainfall = 2.079(In)
3-hour factor = 1.000 Adjusted rainfall = 2.782(In)
6-hour factor = 1.000 Adjusted rainfall = 3.344(In)
24-hour factor = 1.000 Adjusted rainfall = 5.555(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 = 1.93 (CFS))	
1	31.279	0.605
2	69.107	0.732
3	81.373	0.237
4	87.863	0.126
5	92.252	0.085

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6	95.416	0.061
7	97.905	0.048
8	100.000	0.041

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.9865	0.9865
2	1.2145	0.2280
3	1.3716	0.1571
4	1.4953	0.1236
5	1.5988	0.1035
6	1.6887	0.0899
7	1.7686	0.0799
8	1.8409	0.0723
9	1.9071	0.0662
10	1.9683	0.0612
11	2.0254	0.0571
12	2.0790	0.0536
13	2.1236	0.0446
14	2.1658	0.0422
15	2.2058	0.0400
16	2.2438	0.0381
17	2.2802	0.0364
18	2.3151	0.0348
19	2.3485	0.0334
20	2.3807	0.0322
21	2.4117	0.0310
22	2.4416	0.0299
23	2.4706	0.0290
24	2.4986	0.0280
25	2.5258	0.0272
26	2.5523	0.0264
27	2.5779	0.0257
28	2.6029	0.0250
29	2.6273	0.0243
30	2.6510	0.0237
31	2.6742	0.0232
32	2.6968	0.0226
33	2.7189	0.0221
34	2.7405	0.0216
35	2.7617	0.0212
36	2.7824	0.0207
37	2.8027	0.0203
38	2.8226	0.0199
39	2.8421	0.0195
40	2.8612	0.0192
41	2.8800	0.0188
42	2.8985	0.0185
43	2.9166	0.0181
44	2.9345	0.0178
45	2.9520	0.0175
46	2.9693	0.0173
47	2.9863	0.0170
48	3.0030	0.0167
49	3.0195	0.0165

50	3.0357	0.0162
51	3.0517	0.0160
52	3.0674	0.0158
53	3.0830	0.0155
54	3.0983	0.0153
55	3.1134	0.0151
56	3.1283	0.0149
57	3.1431	0.0147
58	3.1576	0.0145
59	3.1719	0.0144
60	3.1861	0.0142
61	3.2001	0.0140
62	3.2140	0.0138
63	3.2276	0.0137
64	3.2411	0.0135
65	3.2545	0.0134
66	3.2677	0.0132
67	3.2808	0.0131
68	3.2937	0.0129
69	3.3065	0.0128
70	3.3191	0.0126
71	3.3316	0.0125
72	3.3440	0.0124
73	3.3609	0.0169
74	3.3777	0.0168
75	3.3944	0.0166
76	3.4109	0.0165
77	3.4272	0.0164
78	3.4434	0.0162
79	3.4595	0.0161
80	3.4755	0.0160
81	3.4913	0.0158
82	3.5071	0.0157
83	3.5227	0.0156
84	3.5381	0.0155
85	3.5535	0.0154
86	3.5688	0.0152
87	3.5839	0.0151
88	3.5989	0.0150
89	3.6138	0.0149
90	3.6287	0.0148
91	3.6434	0.0147
92	3.6580	0.0146
93	3.6725	0.0145
94	3.6869	0.0144
95	3.7012	0.0143
96	3.7154	0.0142
97	3.7295	0.0141
98	3.7436	0.0140
99	3.7575	0.0139
100	3.7714	0.0139
101	3.7851	0.0138
102	3.7988	0.0137
103	3.8124	0.0136
104	3.8259	0.0135

105	3.8393	0.0134
106	3.8527	0.0133
107	3.8659	0.0133
108	3.8791	0.0132
109	3.8922	0.0131
110	3.9053	0.0130
111	3.9182	0.0130
112	3.9311	0.0129
113	3.9439	0.0128
114	3.9567	0.0127
115	3.9693	0.0127
116	3.9820	0.0126
117	3.9945	0.0125
118	4.0070	0.0125
119	4.0193	0.0124
120	4.0317	0.0123
121	4.0439	0.0123
122	4.0562	0.0122
123	4.0683	0.0121
124	4.0804	0.0121
125	4.0924	0.0120
126	4.1043	0.0120
127	4.1162	0.0119
128	4.1281	0.0118
129	4.1399	0.0118
130	4.1516	0.0117
131	4.1632	0.0117
132	4.1748	0.0116
133	4.1864	0.0116
134	4.1979	0.0115
135	4.2093	0.0114
136	4.2207	0.0114
137	4.2321	0.0113
138	4.2433	0.0113
139	4.2546	0.0112
140	4.2658	0.0112
141	4.2769	0.0111
142	4.2880	0.0111
143	4.2990	0.0110
144	4.3100	0.0110
145	4.3209	0.0109
146	4.3318	0.0109
147	4.3426	0.0108
148	4.3534	0.0108
149	4.3642	0.0107
150	4.3749	0.0107
151	4.3855	0.0107
152	4.3961	0.0106
153	4.4067	0.0106
154	4.4172	0.0105
155	4.4277	0.0105
156	4.4381	0.0104
157	4.4485	0.0104
158	4.4589	0.0104
159	4.4692	0.0103

160	4.4795	0.0103
161	4.4897	0.0102
162	4.4999	0.0102
163	4.5100	0.0101
164	4.5202	0.0101
165	4.5302	0.0101
166	4.5403	0.0100
167	4.5503	0.0100
168	4.5602	0.0100
169	4.5701	0.0099
170	4.5800	0.0099
171	4.5899	0.0098
172	4.5997	0.0098
173	4.6094	0.0098
174	4.6192	0.0097
175	4.6289	0.0097
176	4.6385	0.0097
177	4.6482	0.0096
178	4.6578	0.0096
179	4.6673	0.0096
180	4.6769	0.0095
181	4.6864	0.0095
182	4.6958	0.0095
183	4.7052	0.0094
184	4.7146	0.0094
185	4.7240	0.0094
186	4.7333	0.0093
187	4.7426	0.0093
188	4.7519	0.0093
189	4.7612	0.0092
190	4.7704	0.0092
191	4.7795	0.0092
192	4.7887	0.0091
193	4.7978	0.0091
194	4.8069	0.0091
195	4.8159	0.0091
196	4.8250	0.0090
197	4.8340	0.0090
198	4.8429	0.0090
199	4.8519	0.0089
200	4.8608	0.0089
201	4.8697	0.0089
202	4.8785	0.0089
203	4.8874	0.0088
204	4.8962	0.0088
205	4.9049	0.0088
206	4.9137	0.0087
207	4.9224	0.0087
208	4.9311	0.0087
209	4.9398	0.0087
210	4.9484	0.0086
211	4.9570	0.0086
212	4.9656	0.0086
213	4.9742	0.0086
214	4.9827	0.0085

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215	4.9912	0.0085
216	4.9997	0.0085
217	5.0082	0.0085
218	5.0166	0.0084
219	5.0250	0.0084
220	5.0334	0.0084
221	5.0418	0.0084
222	5.0501	0.0083
223	5.0584	0.0083
224	5.0667	0.0083
225	5.0750	0.0083
226	5.0832	0.0082
227	5.0914	0.0082
228	5.0996	0.0082
229	5.1078	0.0082
230	5.1160	0.0082
231	5.1241	0.0081
232	5.1322	0.0081
233	5.1403	0.0081
234	5.1484	0.0081
235	5.1564	0.0080
236	5.1644	0.0080
237	5.1724	0.0080
238	5.1804	0.0080
239	5.1884	0.0080
240	5.1963	0.0079
241	5.2042	0.0079
242	5.2121	0.0079
243	5.2200	0.0079
244	5.2279	0.0079
245	5.2357	0.0078
246	5.2435	0.0078
247	5.2513	0.0078
248	5.2591	0.0078
249	5.2668	0.0078
250	5.2746	0.0077
251	5.2823	0.0077
252	5.2900	0.0077
253	5.2976	0.0077
254	5.3053	0.0077
255	5.3129	0.0076
256	5.3206	0.0076
257	5.3282	0.0076
258	5.3357	0.0076
259	5.3433	0.0076
260	5.3508	0.0075
261	5.3584	0.0075
262	5.3659	0.0075
263	5.3734	0.0075
264	5.3808	0.0075
265	5.3883	0.0075
266	5.3957	0.0074
267	5.4031	0.0074
268	5.4105	0.0074
269	5.4179	0.0074

270	5.4253	0.0074
271	5.4326	0.0073
272	5.4400	0.0073
273	5.4473	0.0073
274	5.4546	0.0073
275	5.4619	0.0073
276	5.4691	0.0073
277	5.4764	0.0072
278	5.4836	0.0072
279	5.4908	0.0072
280	5.4980	0.0072
281	5.5052	0.0072
282	5.5123	0.0072
283	5.5195	0.0071
284	5.5266	0.0071
285	5.5337	0.0071
286	5.5408	0.0071
287	5.5479	0.0071
288	5.5550	0.0071

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0071	0.0018	0.0053
2	0.0071	0.0018	0.0053
3	0.0071	0.0018	0.0053
4	0.0071	0.0018	0.0053
5	0.0072	0.0018	0.0054
6	0.0072	0.0018	0.0054
7	0.0072	0.0018	0.0054
8	0.0072	0.0018	0.0054
9	0.0073	0.0018	0.0054
10	0.0073	0.0018	0.0055
11	0.0073	0.0018	0.0055
12	0.0073	0.0018	0.0055
13	0.0074	0.0019	0.0055
14	0.0074	0.0019	0.0055
15	0.0074	0.0019	0.0056
16	0.0074	0.0019	0.0056
17	0.0075	0.0019	0.0056
18	0.0075	0.0019	0.0056
19	0.0075	0.0019	0.0056
20	0.0075	0.0019	0.0056
21	0.0076	0.0019	0.0057
22	0.0076	0.0019	0.0057
23	0.0076	0.0019	0.0057
24	0.0077	0.0019	0.0057
25	0.0077	0.0019	0.0058
26	0.0077	0.0019	0.0058
27	0.0078	0.0019	0.0058
28	0.0078	0.0020	0.0058
29	0.0078	0.0020	0.0058
30	0.0078	0.0020	0.0059
31	0.0079	0.0020	0.0059

32	0.0079	0.0020	0.0059
33	0.0079	0.0020	0.0059
34	0.0080	0.0020	0.0060
35	0.0080	0.0020	0.0060
36	0.0080	0.0020	0.0060
37	0.0081	0.0020	0.0060
38	0.0081	0.0020	0.0061
39	0.0081	0.0020	0.0061
40	0.0082	0.0020	0.0061
41	0.0082	0.0021	0.0061
42	0.0082	0.0021	0.0062
43	0.0083	0.0021	0.0062
44	0.0083	0.0021	0.0062
45	0.0083	0.0021	0.0062
46	0.0084	0.0021	0.0063
47	0.0084	0.0021	0.0063
48	0.0084	0.0021	0.0063
49	0.0085	0.0021	0.0064
50	0.0085	0.0021	0.0064
51	0.0086	0.0022	0.0064
52	0.0086	0.0022	0.0064
53	0.0086	0.0022	0.0065
54	0.0087	0.0022	0.0065
55	0.0087	0.0022	0.0065
56	0.0087	0.0022	0.0065
57	0.0088	0.0022	0.0066
58	0.0088	0.0022	0.0066
59	0.0089	0.0022	0.0067
60	0.0089	0.0022	0.0067
61	0.0090	0.0023	0.0067
62	0.0090	0.0023	0.0067
63	0.0091	0.0023	0.0068
64	0.0091	0.0023	0.0068
65	0.0091	0.0023	0.0068
66	0.0092	0.0023	0.0069
67	0.0092	0.0023	0.0069
68	0.0093	0.0023	0.0069
69	0.0093	0.0023	0.0070
70	0.0094	0.0024	0.0070
71	0.0094	0.0024	0.0071
72	0.0095	0.0024	0.0071
73	0.0095	0.0024	0.0071
74	0.0096	0.0024	0.0072
75	0.0096	0.0024	0.0072
76	0.0097	0.0024	0.0072
77	0.0097	0.0024	0.0073
78	0.0098	0.0025	0.0073
79	0.0098	0.0025	0.0074
80	0.0099	0.0025	0.0074
81	0.0100	0.0025	0.0075
82	0.0100	0.0025	0.0075
83	0.0101	0.0025	0.0075
84	0.0101	0.0025	0.0076
85	0.0102	0.0026	0.0076
86	0.0102	0.0026	0.0077

87	0.0103	0.0026	0.0077
88	0.0104	0.0026	0.0078
89	0.0104	0.0026	0.0078
90	0.0105	0.0026	0.0078
91	0.0106	0.0027	0.0079
92	0.0106	0.0027	0.0079
93	0.0107	0.0027	0.0080
94	0.0107	0.0027	0.0080
95	0.0108	0.0027	0.0081
96	0.0109	0.0027	0.0082
97	0.0110	0.0028	0.0082
98	0.0110	0.0028	0.0083
99	0.0111	0.0028	0.0083
100	0.0112	0.0028	0.0084
101	0.0113	0.0028	0.0084
102	0.0113	0.0028	0.0085
103	0.0114	0.0029	0.0086
104	0.0115	0.0029	0.0086
105	0.0116	0.0029	0.0087
106	0.0117	0.0029	0.0087
107	0.0118	0.0030	0.0088
108	0.0118	0.0030	0.0089
109	0.0120	0.0030	0.0090
110	0.0120	0.0030	0.0090
111	0.0121	0.0031	0.0091
112	0.0122	0.0031	0.0091
113	0.0123	0.0031	0.0092
114	0.0124	0.0031	0.0093
115	0.0125	0.0031	0.0094
116	0.0126	0.0032	0.0094
117	0.0127	0.0032	0.0095
118	0.0128	0.0032	0.0096
119	0.0130	0.0033	0.0097
120	0.0130	0.0033	0.0098
121	0.0132	0.0033	0.0099
122	0.0133	0.0033	0.0099
123	0.0134	0.0034	0.0101
124	0.0135	0.0034	0.0101
125	0.0137	0.0034	0.0102
126	0.0138	0.0035	0.0103
127	0.0139	0.0035	0.0104
128	0.0140	0.0035	0.0105
129	0.0142	0.0036	0.0106
130	0.0143	0.0036	0.0107
131	0.0145	0.0036	0.0109
132	0.0146	0.0037	0.0109
133	0.0148	0.0037	0.0111
134	0.0149	0.0037	0.0112
135	0.0151	0.0038	0.0113
136	0.0152	0.0038	0.0114
137	0.0155	0.0039	0.0116
138	0.0156	0.0039	0.0117
139	0.0158	0.0040	0.0119
140	0.0160	0.0040	0.0120
141	0.0162	0.0041	0.0121

142	0.0164	0.0041	0.0123
143	0.0166	0.0042	0.0125
144	0.0168	0.0042	0.0126
145	0.0124	0.0031	0.0093
146	0.0125	0.0031	0.0094
147	0.0128	0.0032	0.0096
148	0.0129	0.0032	0.0097
149	0.0132	0.0033	0.0099
150	0.0134	0.0034	0.0100
151	0.0137	0.0034	0.0102
152	0.0138	0.0035	0.0104
153	0.0142	0.0036	0.0106
154	0.0144	0.0036	0.0107
155	0.0147	0.0037	0.0110
156	0.0149	0.0037	0.0112
157	0.0153	0.0039	0.0115
158	0.0155	0.0039	0.0116
159	0.0160	0.0040	0.0120
160	0.0162	0.0041	0.0121
161	0.0167	0.0042	0.0125
162	0.0170	0.0043	0.0127
163	0.0175	0.0044	0.0131
164	0.0178	0.0045	0.0134
165	0.0185	0.0046	0.0138
166	0.0188	0.0047	0.0141
167	0.0195	0.0049	0.0146
168	0.0199	0.0050	0.0149
169	0.0207	0.0052	0.0155
170	0.0212	0.0053	0.0158
171	0.0221	0.0056	0.0165
172	0.0226	0.0057	0.0169
173	0.0237	0.0060	0.0178
174	0.0243	0.0061	0.0182
175	0.0257	0.0065	0.0192
176	0.0264	0.0066	0.0198
177	0.0280	0.0070	0.0210
178	0.0290	0.0073	0.0217
179	0.0310	0.0078	0.0232
180	0.0322	0.0081	0.0241
181	0.0348	0.0088	0.0261
182	0.0364	0.0091	0.0272
183	0.0400	0.0101	0.0299
184	0.0422	0.0106	0.0316
185	0.0536	0.0135	0.0401
186	0.0571	0.0143	0.0427
187	0.0662	0.0166	0.0496
188	0.0723	0.0178	0.0544
189	0.0899	0.0178	0.0720
190	0.1035	0.0178	0.0857
191	0.1571	0.0178	0.1393
192	0.2280	0.0178	0.2102
193	0.9865	0.0178	0.9687
194	0.1236	0.0178	0.1058
195	0.0799	0.0178	0.0621
196	0.0612	0.0154	0.0459

197	0.0446	0.0112	0.0334
198	0.0381	0.0096	0.0285
199	0.0334	0.0084	0.0250
200	0.0299	0.0075	0.0224
201	0.0272	0.0068	0.0204
202	0.0250	0.0063	0.0187
203	0.0232	0.0058	0.0173
204	0.0216	0.0054	0.0162
205	0.0203	0.0051	0.0152
206	0.0192	0.0048	0.0143
207	0.0181	0.0046	0.0136
208	0.0173	0.0043	0.0129
209	0.0165	0.0041	0.0123
210	0.0158	0.0040	0.0118
211	0.0151	0.0038	0.0113
212	0.0145	0.0037	0.0109
213	0.0140	0.0035	0.0105
214	0.0135	0.0034	0.0101
215	0.0131	0.0033	0.0098
216	0.0126	0.0032	0.0095
217	0.0169	0.0043	0.0127
218	0.0165	0.0041	0.0124
219	0.0161	0.0040	0.0121
220	0.0157	0.0040	0.0118
221	0.0154	0.0039	0.0115
222	0.0150	0.0038	0.0113
223	0.0147	0.0037	0.0110
224	0.0144	0.0036	0.0108
225	0.0141	0.0035	0.0106
226	0.0139	0.0035	0.0104
227	0.0136	0.0034	0.0102
228	0.0133	0.0034	0.0100
229	0.0131	0.0033	0.0098
230	0.0129	0.0032	0.0096
231	0.0127	0.0032	0.0095
232	0.0125	0.0031	0.0093
233	0.0123	0.0031	0.0092
234	0.0121	0.0030	0.0090
235	0.0119	0.0030	0.0089
236	0.0117	0.0029	0.0088
237	0.0116	0.0029	0.0086
238	0.0114	0.0029	0.0085
239	0.0112	0.0028	0.0084
240	0.0111	0.0028	0.0083
241	0.0109	0.0027	0.0082
242	0.0108	0.0027	0.0081
243	0.0107	0.0027	0.0080
244	0.0105	0.0026	0.0079
245	0.0104	0.0026	0.0078
246	0.0103	0.0026	0.0077
247	0.0101	0.0026	0.0076
248	0.0100	0.0025	0.0075
249	0.0099	0.0025	0.0074
250	0.0098	0.0025	0.0073
251	0.0097	0.0024	0.0073

252	0.0096	0.0024	0.0072
253	0.0095	0.0024	0.0071
254	0.0094	0.0024	0.0070
255	0.0093	0.0023	0.0070
256	0.0092	0.0023	0.0069
257	0.0091	0.0023	0.0068
258	0.0090	0.0023	0.0068
259	0.0089	0.0022	0.0067
260	0.0089	0.0022	0.0066
261	0.0088	0.0022	0.0066
262	0.0087	0.0022	0.0065
263	0.0086	0.0022	0.0064
264	0.0085	0.0021	0.0064
265	0.0085	0.0021	0.0063
266	0.0084	0.0021	0.0063
267	0.0083	0.0021	0.0062
268	0.0082	0.0021	0.0062
269	0.0082	0.0021	0.0061
270	0.0081	0.0020	0.0061
271	0.0080	0.0020	0.0060
272	0.0080	0.0020	0.0060
273	0.0079	0.0020	0.0059
274	0.0079	0.0020	0.0059
275	0.0078	0.0020	0.0058
276	0.0077	0.0019	0.0058
277	0.0077	0.0019	0.0057
278	0.0076	0.0019	0.0057
279	0.0076	0.0019	0.0057
280	0.0075	0.0019	0.0056
281	0.0075	0.0019	0.0056
282	0.0074	0.0019	0.0055
283	0.0073	0.0018	0.0055
284	0.0073	0.0018	0.0055
285	0.0072	0.0018	0.0054
286	0.0072	0.0018	0.0054
287	0.0071	0.0018	0.0054
288	0.0071	0.0018	0.0053

Total soil rain loss = 1.08(In)
Total effective rainfall = 4.48(In)
Peak flow rate in flood hydrograph = 0.86(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	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q	|	|	|	|
0+10	0.0001	0.01	Q	|	|	|	|
0+15	0.0001	0.01	Q	|	|	|	|

0+20	0.0002	0.01	Q				
0+25	0.0003	0.01	Q				
0+30	0.0003	0.01	Q				
0+35	0.0004	0.01	Q				
0+40	0.0005	0.01	Q				
0+45	0.0005	0.01	Q				
0+50	0.0006	0.01	Q				
0+55	0.0007	0.01	Q				
1+ 0	0.0008	0.01	Q				
1+ 5	0.0008	0.01	Q				
1+10	0.0009	0.01	Q				
1+15	0.0010	0.01	Q				
1+20	0.0011	0.01	Q				
1+25	0.0011	0.01	Q				
1+30	0.0012	0.01	Q				
1+35	0.0013	0.01	Q				
1+40	0.0013	0.01	Q				
1+45	0.0014	0.01	Q				
1+50	0.0015	0.01	QV				
1+55	0.0016	0.01	QV				
2+ 0	0.0017	0.01	QV				
2+ 5	0.0017	0.01	QV				
2+10	0.0018	0.01	QV				
2+15	0.0019	0.01	QV				
2+20	0.0020	0.01	QV				
2+25	0.0020	0.01	QV				
2+30	0.0021	0.01	QV				
2+35	0.0022	0.01	QV				
2+40	0.0023	0.01	QV				
2+45	0.0023	0.01	QV				
2+50	0.0024	0.01	QV				
2+55	0.0025	0.01	QV				
3+ 0	0.0026	0.01	QV				
3+ 5	0.0027	0.01	QV				
3+10	0.0027	0.01	QV				
3+15	0.0028	0.01	QV				
3+20	0.0029	0.01	QV				
3+25	0.0030	0.01	Q V				
3+30	0.0031	0.01	Q V				
3+35	0.0032	0.01	Q V				
3+40	0.0032	0.01	Q V				
3+45	0.0033	0.01	Q V				
3+50	0.0034	0.01	Q V				
3+55	0.0035	0.01	Q V				
4+ 0	0.0036	0.01	Q V				
4+ 5	0.0037	0.01	Q V				
4+10	0.0037	0.01	Q V				
4+15	0.0038	0.01	Q V				
4+20	0.0039	0.01	Q V				
4+25	0.0040	0.01	Q V				
4+30	0.0041	0.01	Q V				
4+35	0.0042	0.01	Q V				
4+40	0.0043	0.01	Q V				
4+45	0.0043	0.01	Q V				
4+50	0.0044	0.01	Q V				

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4+55	0.0045	0.01	Q	V				
5+ 0	0.0046	0.01	Q	V				
5+ 5	0.0047	0.01	Q	V				
5+10	0.0048	0.01	Q	V				
5+15	0.0049	0.01	Q	V				
5+20	0.0050	0.01	Q	V				
5+25	0.0051	0.01	Q	V				
5+30	0.0051	0.01	Q	V				
5+35	0.0052	0.01	Q	V				
5+40	0.0053	0.01	Q	V				
5+45	0.0054	0.01	Q	V				
5+50	0.0055	0.01	Q	V				
5+55	0.0056	0.01	Q	V				
6+ 0	0.0057	0.01	Q	V				
6+ 5	0.0058	0.01	Q	V				
6+10	0.0059	0.01	Q	V				
6+15	0.0060	0.01	Q	V				
6+20	0.0061	0.01	Q	V				
6+25	0.0062	0.01	Q	V				
6+30	0.0063	0.01	Q	V				
6+35	0.0064	0.01	Q	V				
6+40	0.0065	0.01	Q	V				
6+45	0.0066	0.01	Q	V				
6+50	0.0067	0.01	Q	V				
6+55	0.0068	0.01	Q	V				
7+ 0	0.0069	0.01	Q	V				
7+ 5	0.0070	0.01	Q	V				
7+10	0.0071	0.01	Q	V				
7+15	0.0072	0.01	Q	V				
7+20	0.0073	0.01	Q	V				
7+25	0.0074	0.01	Q	V				
7+30	0.0075	0.02	Q	V				
7+35	0.0076	0.02	Q	V				
7+40	0.0077	0.02	Q	V				
7+45	0.0078	0.02	Q	V				
7+50	0.0079	0.02	Q	V				
7+55	0.0080	0.02	Q	V				
8+ 0	0.0081	0.02	Q	V				
8+ 5	0.0082	0.02	Q	V				
8+10	0.0083	0.02	Q	V				
8+15	0.0084	0.02	Q	V				
8+20	0.0086	0.02	Q	V				
8+25	0.0087	0.02	Q	V				
8+30	0.0088	0.02	Q	V				
8+35	0.0089	0.02	Q	V				
8+40	0.0090	0.02	Q	V				
8+45	0.0091	0.02	Q	V				
8+50	0.0092	0.02	Q	V				
8+55	0.0093	0.02	Q	V				
9+ 0	0.0095	0.02	Q	V				
9+ 5	0.0096	0.02	Q	V				
9+10	0.0097	0.02	Q	V				
9+15	0.0098	0.02	Q	V				
9+20	0.0099	0.02	Q	V				
9+25	0.0101	0.02	Q	V				

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9+30	0.0102	0.02	Q	V				
9+35	0.0103	0.02	Q	V				
9+40	0.0104	0.02	Q	V				
9+45	0.0106	0.02	Q	V				
9+50	0.0107	0.02	Q	V				
9+55	0.0108	0.02	Q	V				
10+ 0	0.0109	0.02	Q	V				
10+ 5	0.0111	0.02	Q	V				
10+10	0.0112	0.02	Q	V				
10+15	0.0113	0.02	Q	V				
10+20	0.0115	0.02	Q	V				
10+25	0.0116	0.02	Q	V				
10+30	0.0117	0.02	Q	V				
10+35	0.0119	0.02	Q	V				
10+40	0.0120	0.02	Q	V				
10+45	0.0122	0.02	Q	V				
10+50	0.0123	0.02	Q	V				
10+55	0.0124	0.02	Q	V				
11+ 0	0.0126	0.02	Q	V				
11+ 5	0.0127	0.02	Q	V				
11+10	0.0129	0.02	Q	V				
11+15	0.0130	0.02	Q	V				
11+20	0.0132	0.02	Q	V				
11+25	0.0133	0.02	Q	V				
11+30	0.0135	0.02	Q	V				
11+35	0.0136	0.02	Q	V				
11+40	0.0138	0.02	Q	V				
11+45	0.0139	0.02	Q	V				
11+50	0.0141	0.02	Q	V				
11+55	0.0143	0.02	Q	V				
12+ 0	0.0144	0.02	Q	V				
12+ 5	0.0146	0.02	Q	V				
12+10	0.0147	0.02	Q	V				
12+15	0.0149	0.02	Q	V				
12+20	0.0150	0.02	Q	V				
12+25	0.0151	0.02	Q	V				
12+30	0.0153	0.02	Q	V				
12+35	0.0154	0.02	Q	V				
12+40	0.0155	0.02	Q	V				
12+45	0.0157	0.02	Q	V				
12+50	0.0158	0.02	Q	V				
12+55	0.0159	0.02	Q	V				
13+ 0	0.0161	0.02	Q	V				
13+ 5	0.0162	0.02	Q	V				
13+10	0.0164	0.02	Q	V				
13+15	0.0165	0.02	Q	V				
13+20	0.0167	0.02	Q	V				
13+25	0.0169	0.02	Q	V				
13+30	0.0170	0.02	Q	V				
13+35	0.0172	0.02	Q	V				
13+40	0.0174	0.03	Q	V				
13+45	0.0175	0.03	Q	V				
13+50	0.0177	0.03	Q	V				
13+55	0.0179	0.03	Q	V				
14+ 0	0.0181	0.03	Q	V				

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14+ 5	0.0183	0.03	Q	V				
14+10	0.0185	0.03	Q	V				
14+15	0.0187	0.03	Q	V				
14+20	0.0189	0.03	Q	V				
14+25	0.0192	0.03	Q	V				
14+30	0.0194	0.03	Q	V				
14+35	0.0196	0.04	Q	V				
14+40	0.0199	0.04	Q	V				
14+45	0.0201	0.04	Q	V				
14+50	0.0204	0.04	Q	V				
14+55	0.0207	0.04	Q	V				
15+ 0	0.0210	0.04	Q	V				
15+ 5	0.0213	0.05	Q	V				
15+10	0.0217	0.05	Q	V				
15+15	0.0220	0.05	Q	V				
15+20	0.0224	0.06	Q	V				
15+25	0.0228	0.06	Q	V				
15+30	0.0233	0.07	Q	V				
15+35	0.0239	0.08	Q	V				
15+40	0.0245	0.09	Q	V				
15+45	0.0253	0.11	Q	V				
15+50	0.0262	0.13	Q	V				
15+55	0.0274	0.18	Q	V				
16+ 0	0.0293	0.27	Q	V				
16+ 5	0.0348	0.80	Q	V				
16+10	0.0407	0.86	Q	V				
16+15	0.0434	0.39	Q	V				
16+20	0.0451	0.25	Q	V				
16+25	0.0464	0.19	Q	V				
16+30	0.0474	0.14	Q	V				
16+35	0.0482	0.12	Q	V				
16+40	0.0489	0.09	Q	V				
16+45	0.0492	0.05	Q	V				
16+50	0.0495	0.04	Q	V				
16+55	0.0498	0.04	Q	V				
17+ 0	0.0501	0.04	Q	V				
17+ 5	0.0503	0.03	Q	V				
17+10	0.0505	0.03	Q	V				
17+15	0.0507	0.03	Q	V				
17+20	0.0509	0.03	Q	V				
17+25	0.0511	0.03	Q	V				
17+30	0.0512	0.02	Q	V				
17+35	0.0514	0.02	Q	V				
17+40	0.0515	0.02	Q	V				
17+45	0.0517	0.02	Q	V				
17+50	0.0518	0.02	Q	V				
17+55	0.0520	0.02	Q	V				
18+ 0	0.0521	0.02	Q	V				
18+ 5	0.0523	0.02	Q	V				
18+10	0.0524	0.02	Q	V				
18+15	0.0526	0.02	Q	V				
18+20	0.0527	0.02	Q	V				
18+25	0.0529	0.02	Q	V				
18+30	0.0530	0.02	Q	V				
18+35	0.0532	0.02	Q	V				

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18+40	0.0533	0.02	Q				V	
18+45	0.0535	0.02	Q				V	
18+50	0.0536	0.02	Q				V	
18+55	0.0538	0.02	Q				V	
19+ 0	0.0539	0.02	Q				V	
19+ 5	0.0540	0.02	Q				V	
19+10	0.0542	0.02	Q				V	
19+15	0.0543	0.02	Q				V	
19+20	0.0544	0.02	Q				V	
19+25	0.0545	0.02	Q				V	
19+30	0.0547	0.02	Q				V	
19+35	0.0548	0.02	Q				V	
19+40	0.0549	0.02	Q				V	
19+45	0.0550	0.02	Q				V	
19+50	0.0551	0.02	Q				V	
19+55	0.0553	0.02	Q				V	
20+ 0	0.0554	0.02	Q				V	
20+ 5	0.0555	0.02	Q				V	
20+10	0.0556	0.02	Q				V	
20+15	0.0557	0.02	Q				V	
20+20	0.0558	0.02	Q				V	
20+25	0.0559	0.02	Q				V	
20+30	0.0560	0.02	Q				V	
20+35	0.0561	0.01	Q				V	
20+40	0.0562	0.01	Q				V	
20+45	0.0563	0.01	Q				V	
20+50	0.0564	0.01	Q				V	
20+55	0.0565	0.01	Q				V	
21+ 0	0.0566	0.01	Q				V	
21+ 5	0.0567	0.01	Q				V	
21+10	0.0568	0.01	Q				V	
21+15	0.0569	0.01	Q				V	
21+20	0.0570	0.01	Q				V	
21+25	0.0571	0.01	Q				V	
21+30	0.0572	0.01	Q				V	
21+35	0.0573	0.01	Q				V	
21+40	0.0574	0.01	Q				V	
21+45	0.0574	0.01	Q				V	
21+50	0.0575	0.01	Q				V	
21+55	0.0576	0.01	Q				V	
22+ 0	0.0577	0.01	Q				V	
22+ 5	0.0578	0.01	Q				V	
22+10	0.0579	0.01	Q				V	
22+15	0.0580	0.01	Q				V	
22+20	0.0580	0.01	Q				V	
22+25	0.0581	0.01	Q				V	
22+30	0.0582	0.01	Q				V	
22+35	0.0583	0.01	Q				V	
22+40	0.0584	0.01	Q				V	
22+45	0.0585	0.01	Q				V	
22+50	0.0585	0.01	Q				V	
22+55	0.0586	0.01	Q				V	
23+ 0	0.0587	0.01	Q				V	
23+ 5	0.0588	0.01	Q				V	
23+10	0.0588	0.01	Q				V	

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23+15	0.0589	0.01	Q	|	|	|	V|
23+20	0.0590	0.01	Q	|	|	|	V|
23+25	0.0591	0.01	Q	|	|	|	V|
23+30	0.0591	0.01	Q	|	|	|	V|
23+35	0.0592	0.01	Q	|	|	|	V|
23+40	0.0593	0.01	Q	|	|	|	V|
23+45	0.0594	0.01	Q	|	|	|	V|
23+50	0.0594	0.01	Q	|	|	|	V|
23+55	0.0595	0.01	Q	|	|	|	V|
24+ 0	0.0596	0.01	Q	|	|	|	V|

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Hydrology exhibits

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