

PRELIMINARY DRAINAGE STUDY
FOR
PRESCOTT COMMERCIAL CENTER
Town of Yucca Valley, California
County of San Bernardino

Job No. PDB026000
February 19, 2013

Prepared by:

N|V|5

NOLTE VERTICAL FIVE

42-829 Cook Street, Suite 104
Palm Desert, California 92211
Phone 760.341.3101
Fax 760.341.5999

Prepared for:

Force-Gottlieb, LLC

439 North Bedford Drive
Beverly Hills, CA 90210
Project Number: PDB026000

PREPARED UNDER THE SUPERVISION OF:
NOLTE VERTICAL FIVE



STEPHEN F. CREVOISERAT, P.E., R.C.E. 78576

2/21/13

DATE

TABLE OF CONTENTS

I.	INTRODUCTION	
	A. Purpose of Study	5
	B. Scope	5
II.	SITE AREA	
	A. Area Characteristics	5
	B. Soils Group.....	5
	C. Land Use	6
	D. Flood Insurance Rate Maps (FIRM).....	6
	E. Drainage Master Plan	6
III.	HYDROLOGIC METHODOLOGY	
	A. Rational Method.....	6
	B. Synthetic Unit Hydrograph Method.....	6
	C. Storm Frequency	6
IV.	HYDROLOGIC AND HYDRAULIC RESULTS	
	A. Rational Method – Offsite Basins and Pre and Post Onsite Conditions.....	7
	B. Synthetic Unit Hydrograph Method.....	7
	C. Mitigation of Nuisance Water	8
V.	SUMMARY	
	A. Recommendations	8
	B. Conclusions	9
	C. References	9

APPENDICES

Appendix I

Figures

1. Vicinity Map
2. Flood Insurance Rate Map (FIRM)
3. Hydrologic Soils Map
4. Master Plan of Drainage – Town of Yucca Valley
5. 100 Year, 1 Hour Isohyetal Map
6. 100 Year, 6 Hour Isohyetal Map
7. 100 Year, 24 Hour Isohyetal Map

Appendix II

CivilD Rational Method – Existing Offsite and Onsite (10-yr and 100-yr)
Analyzes

CivilD Synthetic Unit Hydrograph Method – (Pre and Post- Development)

Appendix III

Maps

- Offsite Hydrology Map
- Onsite Hydrology Map – Unit Hydrograph
- Onsite Hydrology Map – Rational Method

LIST OF FIGURES

Figure 1 Vicinity Map..... APPENDIX I

Figure 2 Flood Insurance Rate Map (FIRM) APPENDIX I

Figure 3 Hydrologic Soils Map APPENDIX I

Figure 4 Master Plan of Drainage Map APPENDIX I

Figure 5 100 Year, 1 Hour Isohyetal Map APPENDIX I

Figure 6 100 Year, 6 Hour Isohyetal Map APPENDIX I

Figure 7 100 Year, 24 Hour Isohyetal Map APPENDIX I

LIST OF TABLES

Table 1 Existing Offsite and Onsite Peak Flow Rates7

Table 2 Pre- and Post- Onsite Development Peak Volume Results.....8

I. INTRODUCTION

A. Purpose of Study

This Preliminary Study shall provide the offsite and onsite hydrologic and hydraulic analyzes in according to the San Bernardino County drainage requirements. The proposed site consists of an area of approximately 2.50 acres of commercial development. The commercial development shall be constructed in up to three phases. Offsite streets that surround the development shall be improved to continue and perpetuate offsite runoff to its natural drainage pattern. Palisades Drive shall be half improved in accordance to the standards of street design per Town of Yucca Valley standard drawing. Sidewalk, curb/gutter and commercial driveways are proposed for this development. Twenty-nine Palms Highway 62 roadway improvements shall be installed per Town and CalTrans requirements.

Hydrologic and hydraulic calculations were performed using methodologies defined in the *San Bernardino County Flood Control District Hydrology Manual* (August 1986).

B. Scope

This Preliminary Study involves the hydrologic analyses of approximately 45.11 acres of offsite watershed that will impact Prescott Street adjacent to the proposed project site.

This site is currently bounded by existing residential lots and Palisades Drive to the south, Prescott Avenue to the west, Twentynine Palms Highway (State Route 62) to the north and an existing medical complex to the east.

Pre-development peak runoff values for the 100-year, 1 hour storm frequency have been determined for the offsite and future project site using the Rational Method. Pre-development and post-development peak flow rates for the 100-year, 24 hour storm frequency have been determined for the project site using the Unit Hydrograph Method.

II. SITE AREA

A. Area Characteristics

The Prescott Commercial Center is located on the southeast corner of the intersection at Prescott Avenue and Twenty-nine Palms Highway (Hwy) 62, in a portion of the northeast quarter of Section 31, Township 1 North, Range 6 East, San Bernardino Meridian, San Bernardino County, California.

B. Soils Group

According to Plate C-3 of the San Bernardino County Flood Control District (SBCFCD) Hydrology Manual (copy enclosed in Appendix I), the entire onsite watershed is within a

Soil Type “B” and has been used for the hydrologic parameters of the Rational Method and Unit Hydrograph Analysis. The offsite watershed has been determined to be Soil Type “B”.

C. Land Use

Land Use Zoning classification for this study is a Commercial Development.

D. Flood Insurance Rate Maps (FIRM)

The site is located in Zone X of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), San Bernardino County, California and incorporated areas panel 8120 of 9400 with map number 06071C8120H dated August 28, 2008. A Zone X is designation as areas determined to be outside of the 0.2% annual chance floodplain. The FIRM map for this project is located in Appendix I.

E. Drainage Master Plan

There are no proposed master plans of drainage facilities on or adjacent to the proposed site development per the Yucca Valley Master Plan of Drainage (YVMPD). A copy of the YVMPD “Yucca Valley Master & Proposed Drainage Facilities Figure 2” exhibit is included in Appendix I.

III. HYDROLOGIC METHODOLOGY

A. Rational Method

The materials included with this study are presented to satisfy the requirements set forth in the *San Bernardino County Flood Control District (SBCFCD) Hydrology Manual*. All pre- and post-development, watershed basin runoff values were generated by the use the Rational Method. Applicable input and output files for this method can be found in the Appendix II of this report.

B. Synthetic Unit Hydrograph Method

The Synthetic Unit Hydrograph method was used to generate peak 100-year, 24 hour flow values (worst case scenario). The Synthetic Unit Hydrograph results are used to determine the total volume of watershed runoff for both the pre- and post-development conditions. The rainfall intensity figures that were used to compute the Unit Hydrograph Method are located in Appendix I of this report.

C. Storm Frequency

Per *San Bernardino County* criteria, the 100-year, 1-, 6-, 24- hour storm frequency was used to calculate peak flows using the Rational and/or Unit Hydrograph Method. The

hydrologic frequency obtained from the San Bernardino County Isoheytal Maps are 1.28 (offsite/onsite), 2.20 (offsite/onsite) and 4.20 (offsite/onsite), respectively. Per *San Bernardino County* criteria, the 100-year, 24 hour frequency storm was used to calculate both peak flow rates and the total runoff volume using the Unit Hydrograph Method.

IV. HYDROLOGIC AND HYDRAULIC RESULTS

A. Rational Method – Offsite Basins and Pre- and Post Onsite Conditions

Table 1 below illustrates the 100-year, 24 hour peak discharge values at the most downstream point for the offsite and 100-year, 1 hour pre-development and post-development conditions. Detailed hydrologic calculations can be found in Appendix II of this report.

An offsite basin of approximately 45.11 acres impacts the project site along the westerly boundary of the development. These values are also located in the Table 1 below and a detailed analysis is provided in Appendix II of this report.

The proposed onsite runoff value for Prescott Commercial Center is provided in the Table 1 below. These values will be used to determine onsite retention sizing to help convey excessive onsite storm water runoff generated for the proposed commercial center.

**TABLE 1
EXISTING OFFSITE AND ONSITE PEAK FLOW RATES**

Rational Method (1 hr) Basin (Offsites)	Area (acres)	100-year (cfs) 1 hour Peak Flow
¹ OFFSITE-EX	45.11	105.38
ONSITE-EX	3.32	7.37
Total	48.43	
Unit Hydrograph (24 hr) Basin (Onsite)	Area (acres)	100-year (cfs), 24 hour Peak Flow
² ONSITE-EX	2.50	6.80
² ONSITE-PR	2.50	7.16
Total	2.50	

¹OFFSITE-EX basins includes southerly basins and existing commercial to the west of the proposed development.

²Onsite basins – Proposed and Existing conditions.

B. Synthetic Unit Hydrograph Method - Pre and Post Onsite Development

The results of the Unit Hydrograph for both onsite peak flow rates and total volume for pre-development and post-development can be found in the Table 2 below. A detailed hydrologic calculation can be found in the Appendix II of this report.

**TABLE 2
PRE AND POST ONSITE DEVELOPMENT PEAK VOLUME RESULTS**

Basin (Condition)	Unit Hydrograph Total Volume (ac-ft)		Incremental Increase (ac-ft)
	Computed Volume (ac-ft)	Condition	
ONSITE (EX ¹)	0.6499	Pre-Development	0.1284
ONSITE (PR ²)	0.7783	Post-Development	
Basin	Incremental Increase (ac-ft)	Additional 20% of the Incremental Increase (ac-ft)	Total Storage (ac-ft)
ONSITE	0.1284	0.0256	0.1541 ³

¹Abbreviation for EX is defined as Existing Condition.

²Abbreviation for PR is defined as Proposed Condition.

³Total Storage is computed by Incremental Increase plus 20% of the Incremental Increase.

C. Mitigation of Nuisance Water

Nuisance (onsite) flows shall be conveyed through valley and/or ribbon gutters, and L-type curb and gutter, drainage easements (if any), and storm drain systems to be discharged onto the proposed/future onsite retention basin(s). Nuisance flows generated by offsite irrigation, etc. shall be conveyed onto L-type curb and gutter along the exterior streets and captured by catch basins at the intersection of Prescott Avenue and Twentynine Palms Highway. A dry well will be attached to the catch basin located on Prescott to further contain nuisance flow.

V. SUMMARY

A. Recommendations

The following recommendations have been provided to facilitate safety, both public and private, for the proposed commercial development.

1. Proposed finished floors elevations for the commercial development shall be determined by the Final Drainage Study for the onsite conditions. Note, offsite street improvements and commercial driveways shall be constructed according to the offsite plans.
2. A Final Drainage study shall address any modification or changes for the offsite and onsite drainage conditions. This Preliminary Study only address the existing offsite and onsite watershed basin(s) and concentrated flows on the exterior streets.

3. Construct offsite local street improvements and commercial driveways as shown on the offsite street improvement plans.
4. Entrances along Prescott Avenue and Palisades Street shall be elevated to prevent stormwater from entering the site. Offsite flows shall flow around the site and shall be released at pre-development locations.

B. Conclusions

Development of the Prescott Commercial will be accomplished in a manner that will maintain historical downstream flow patterns. The commercial development should not adversely impact surrounding or downstream properties and the effects of post-development incremental increase flows shall be discussed in the Final Drainage Study for the onsite development. A portion of the nuisance flows generated from the offsite shall be mitigated by the proposed dry well on Prescott Avenue.

C. References

1. *CivilDesign Engineering Software, Rational Method Hydrology System Model*, © 1989-2001, Version 6.4.
2. *CivilDesign Engineering Software, Unit Hydrograph System Model*, © 1989-2002, Version 6.1.
3. County of San Bernardino, *Hydrology Manual*, ©August 1986.
4. Bentley Systems, Inc., *FlowMaster* © 2009, Version 7
5. *TerraServer USA Topographic Maps*, Internet program

APPENDICES

Appendix I

1. VICINITY MAP
2. FLOOD INSURANCE RATE MAP (FIRM)
3. HYDROLOGIC SOILS MAP
4. MASTER PLAN OF DRAINAGE
5. 100 YEAR, 1 HOUR ISOHYETAL MAP
6. 100 YEAR, 6 HOUR ISOHYETAL MAP
7. 100 YEAR, 24 HOUR ISOHYETAL MAP

Appendix II

- CIVILD RATIONAL METHOD OFFSITE AND ONSITE ANALYSIS
- CIVILD UNIT HYDROGRAPH METHOD – PRE AND POST- DEVELOPMENT

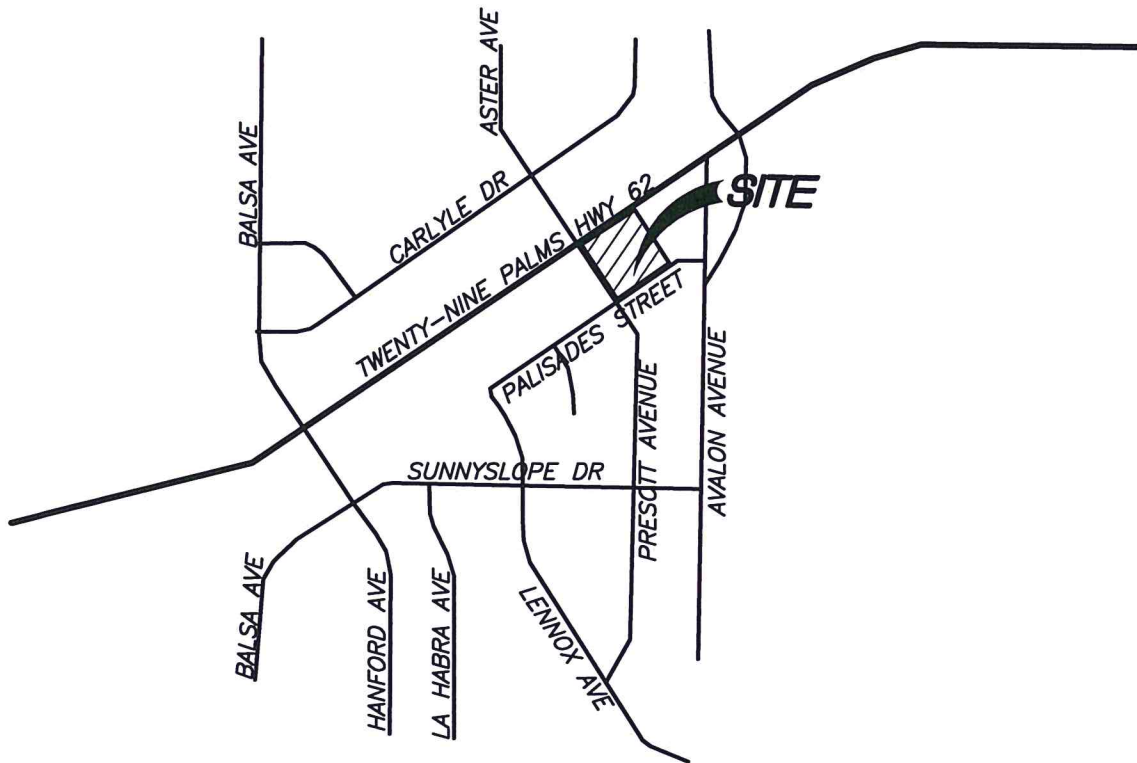
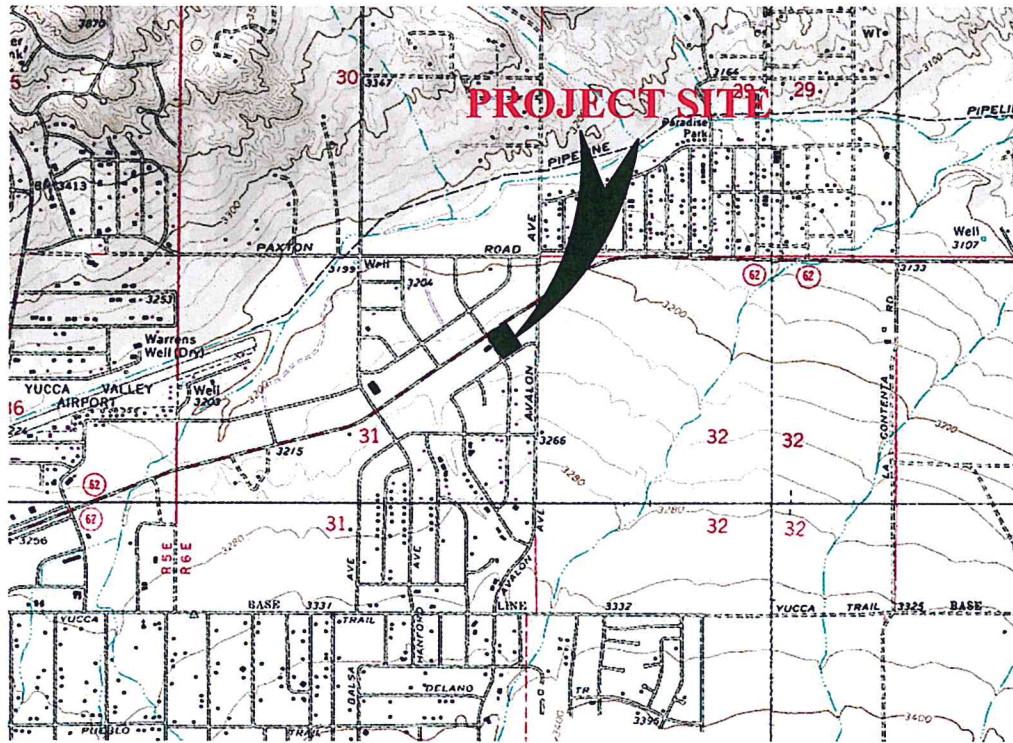
Appendix III

- MAPS

APPENDIX I

Figures

- 1. VICINITY MAP**
- 2. FLOOD INSURANCE RATE MAP (FIRM)**
- 3. HYDROLOGIC SOILS MAP**
- 4. MASTER PLAN OF DRAINAGE**
- 5. 100 YEAR, 1 HOUR ISOHYETAL MAP**
- 6. 100 YEAR, 6 HOUR ISOHYETAL MAP**
- 7. 100 YEAR, 24 HOUR ISOHYETAL MAP**



VICINITY MAP
NO SCALE

N | V | 5

NOLTE VERTICAL FIVE

42-829 COOK STREET, SUITE 104
760.341.3101 TEL. 760.341.5999 FAX

PALM DESERT, CA 92211
WWW.NOLTE.COM

FIGURE 1
VICINITY MAP

PREPARED BY: JMA

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 8120H

FIRM
FLOOD INSURANCE RATE MAP

SAN BERNARDINO COUNTY,
CALIFORNIA
AND INCORPORATED AREAS
PANEL 8120 OF 9400
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

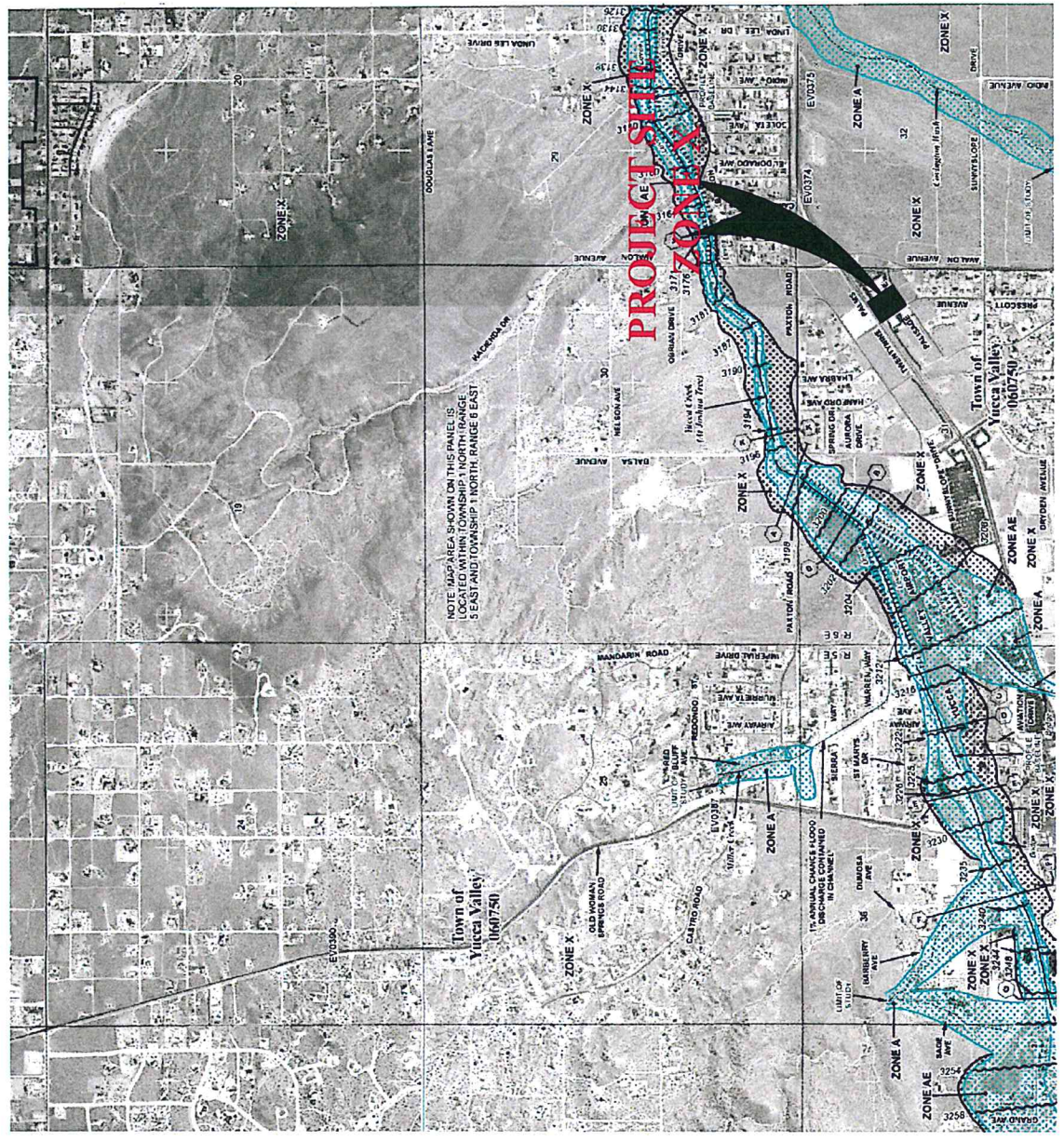
CONTAINS	COMMUNITY	NUMBER	PANEL	SUFFIX
	SAN BERNARDINO COUNTY	08120	8120	H
	YUCCA VALLEY TOWN CF	060750	8120	H

Notice to User: The Map Number shown below should be used when placing map orders, the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
06071C8120H
MAP REVISED
AUGUST 28, 2008

Federal Emergency Management Agency

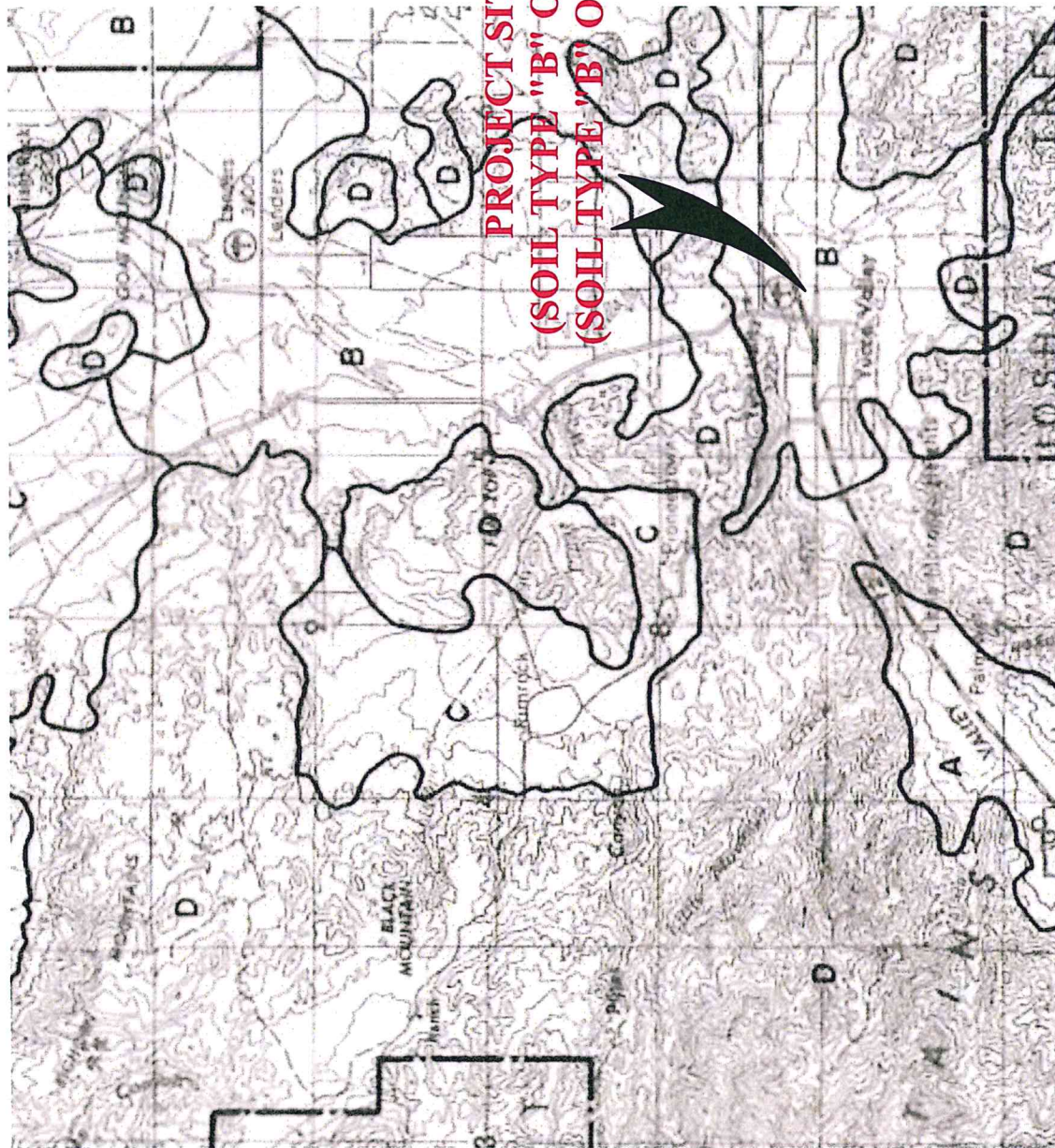


N|V|5

NOLTE VERTICAL FIVE
PALM DESERT, CA 92211
42-829 COOK STREET, SUITE 104
760.341.3101 TEL. 760.341.5999 FAX
WWW.NV5.COM

FIGURE 2
FLOOD INSURANCE RATE MAP
(FIRM)

PREPARED BY: JMA



**PROJECT SITE
(SOIL TYPE "B" ONSITE)
(SOIL TYPE "B" OFFSITE)**

COMPOSITE SOIL DETERMINATION
 *ONSITE - 100% SOIL TYPE "B"
 *OFFSITE - 100% SOIL TYPE "B"

*REFERENCED FROM PLATE C-1 OF THE SBFO FLOOD CONTROL DISTRICT HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
 FOR
 SOUTHCENTRAL AREA

PLATE C-3

NV5

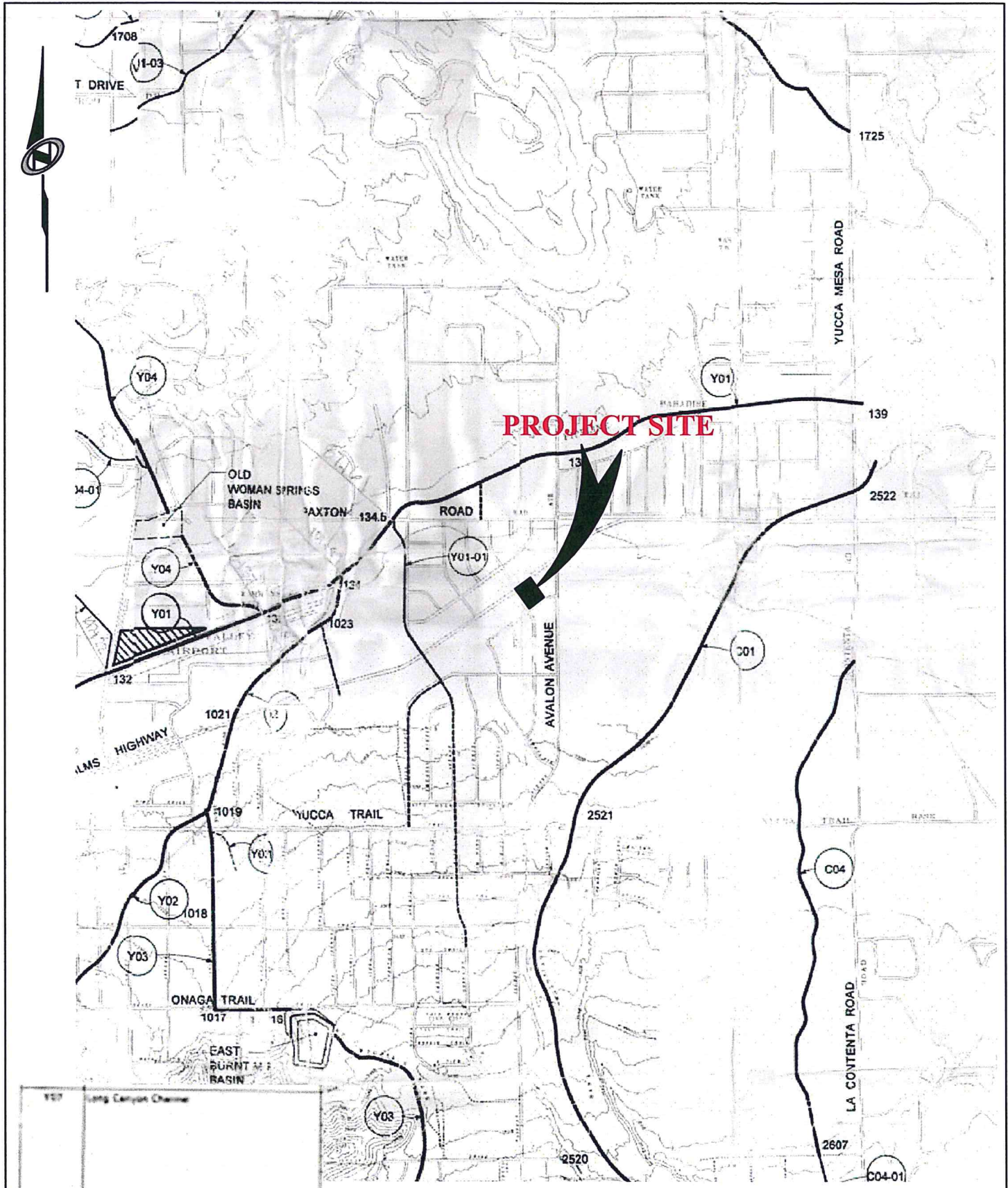
NOLTE VERTICAL FIVE
 42-829 COOK STREET, SITE 104
 PALM DESERT, CA 92211
 760.341.3101 TEL. 760.341.5989 FAX
 WWW.NOLTE.COM

FIGURE 3
HYDROLOGIC SOILS MAP
SOUTHCENTRAL AREA

PREPARED BY: JMA

LEGEND
 SOIL GROUP BOUNDARY
 A
 SOIL GROUP DESIGNATION
 BOUNDARY OF INDICATED SOURCE





PROJECT SITE

107	Long Canyon Channel
107-01	Sage Avenue Drain
107-01	Extension of 107-01
108	Long Canyon Channel Tributaries
109	Residential Channel

N | V | 5

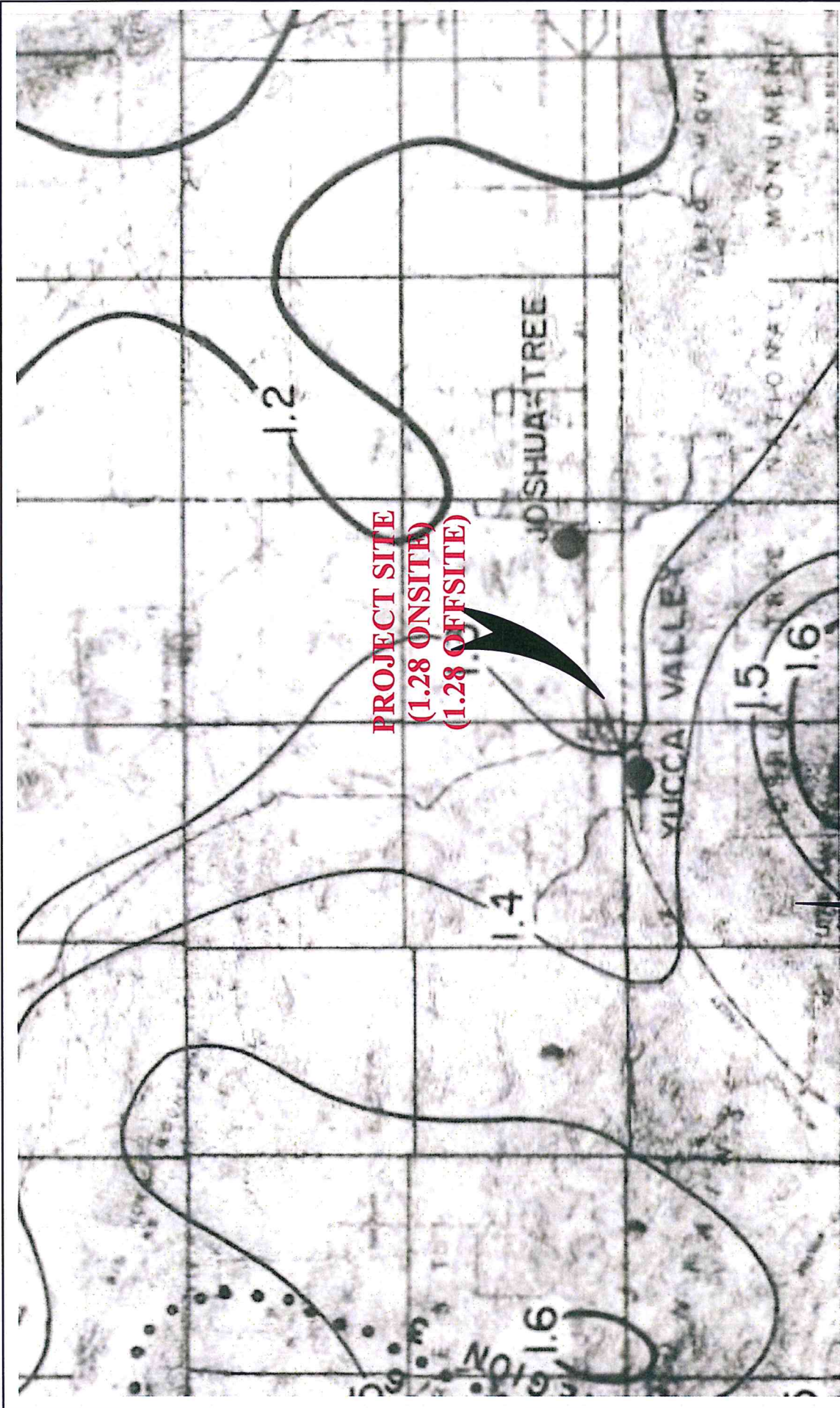
NOLTE VERTICAL FIVE

42-829 COOK STREET, SUITE 104 PALM DESERT, CA 92211
 760.341.3101 TEL. 760.341.5999 FAX WWW.NOLTE.COM

FIGURE 4

**YUCCA VALLEY MASTER PLAN
OF DRAINAGE MAP**

PREPARED BY: JMA



PROJECT SITE
(1.28 ONSITE)
(1.28 OFFSITE)

INFORMATION PRESENT ON THIS EXHIBIT HAS BEEN REFERENCED FROM WARNER
 ENGINEERING PRELIMINARY STUDY FOR TRACT NO. 17862 JULY 2006.



SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT	
DESERT AREA	
ISOHYETALS	
Y ₁₀₀ -100 YEAR 1 HOUR	
BASED ON USDC, NOAA ATLAS 2, 1973	
APPROVED BY	<i>[Signature]</i>
DATE	1992
SCALE	1" = 1/8 MI.
FILE NO	WFO-1
DWG NO	10 of 12
WATER RESOURCES DIVISION	

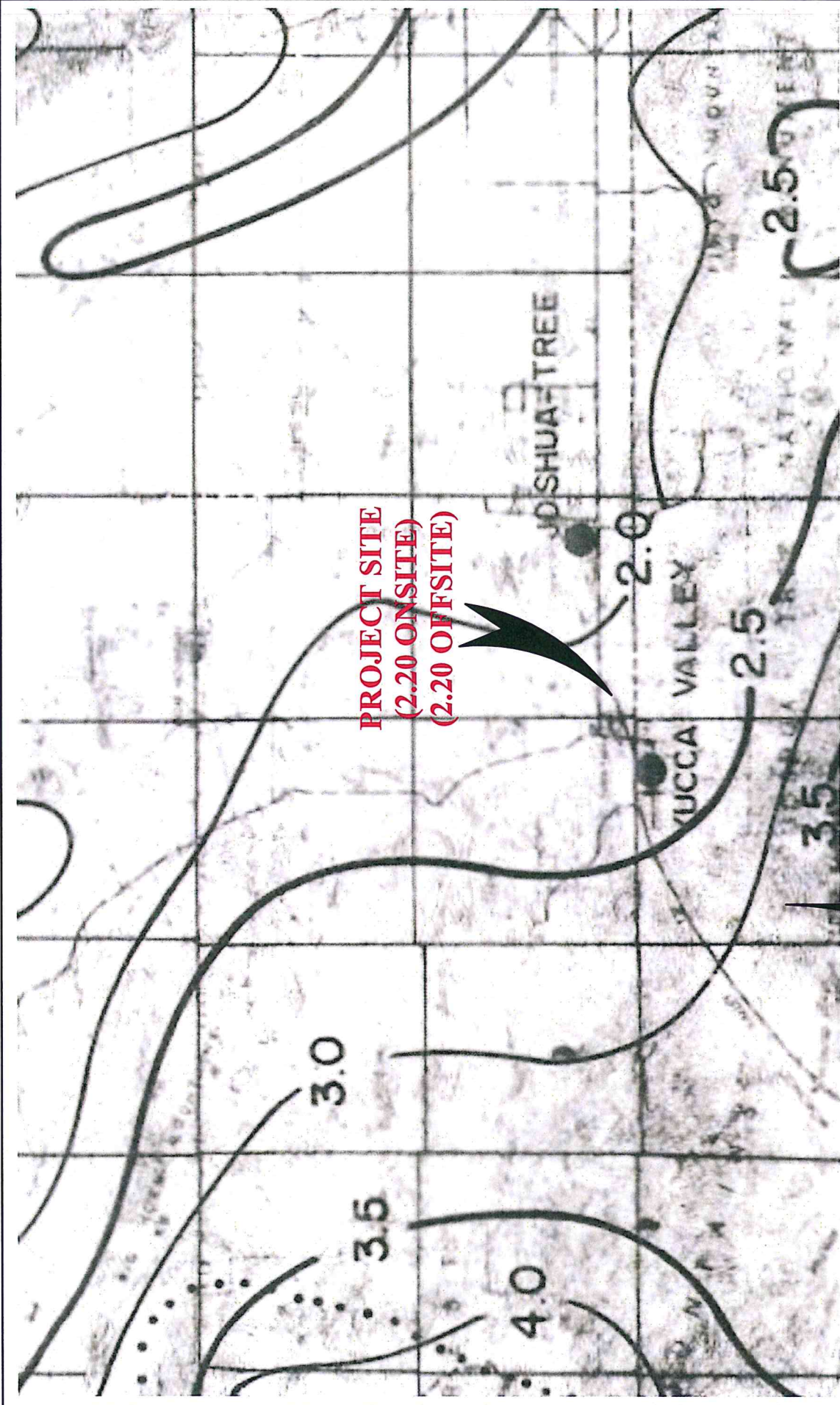
LEGEND:
 1.2 ISOLINES PRECIPITATION (INCHES)

N|V|5

NOLTE VERTICAL FIVE
 PALM DESERT, CA 92211
 42-829 COOK STREET, SITE 104
 760.341.5101 TEL. 760.341.5999 FAX
 WWW.NOLTE.COM

FIGURE 5
100 YEAR, 1 HOUR ISOHYETAL MAP

PREPARED BY: JMA



**PROJECT SITE
(2.20 ONSITE)
(2.20 OFFSITE)**

INFORMATION PRESENT ON THIS EXHIBIT HAS BEEN REFERENCED FROM WARNER ENGINEERING PRELIMINARY STUDY FOR TRACT NO. 17862 JULY 2006.

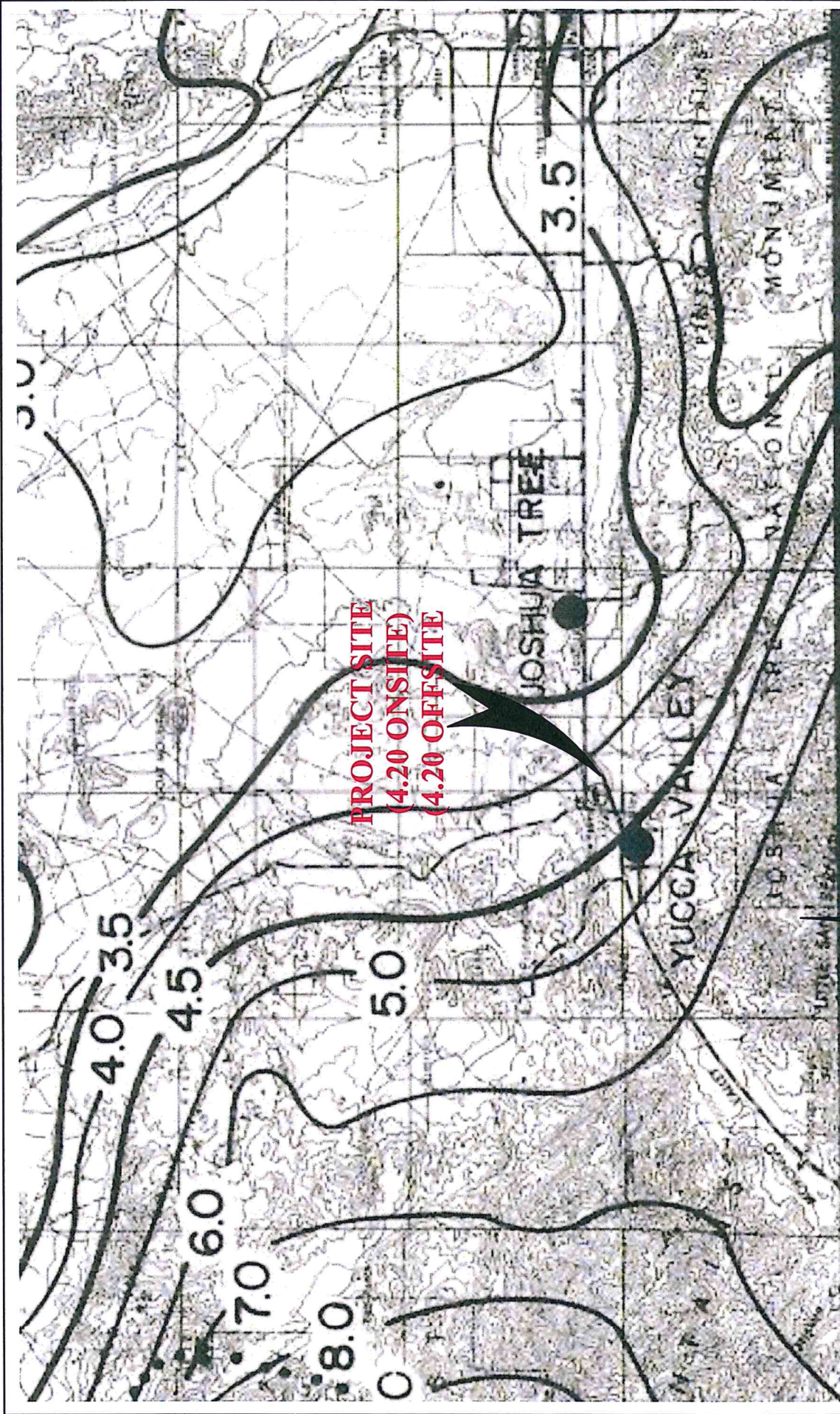


SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT	
DESERT AREA	
ISOHYETALS	
X:3 - 100 YEAR 6 HOUR	
BASED ON USAC, NOAA ATLAS 2, 1973	
APPROVED BY:	<i>[Signature]</i>
DATE	FILE NO. DRAWING NO.
1982	7-816 WHD-1 11 of 12
	METEC RESOURCE DIVISION

LEGEND:
2.0 ISOLINES PRECIPITATION (INCHES)

NV15
NOLTE VERTICAL FIVE
 PALM DESERT, CA 92211
 WWW.NOLTE.COM
 42-829 COOK STREET, SUITE 104
 760.341.3101 TEL. 760.341.5998 FAX

FIGURE 6
100 YEAR, 6 HOUR ISOHYETAL MAP
 PREPARED BY: JMA



INFORMATION PRESENT ON THIS EXHIBIT HAS BEEN REFERENCED FROM WARNER
ENGINEERING PRELIMINARY STUDY FOR TRACT NO. 17862 JULY 2006.



SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT	
DESERT AREA	
ISOHYETS X ₁ - 100 YEAR 24 HOUR BASED ON USDC, NOAA ATLAS 2, 1973	
APPROVED BY	<i>[Signature]</i>
DATE	FILE NO
1982	WD-1
	12 of 12

LEGEND
3.5 ISOLINES PRECIPITATION (INCHES)

NV5
NOLTE VERTICAL FIVE
 PALM DESERT, CA 92211
 42-829 COOK STREET, SUITE 104
 WWW.NOLTE.COM
 760.341.5101 TEL. 760.341.5999 FAX

FIGURE 7
100 YEAR, 24 HOUR ISOHYETAL MAP

PREPARED BY: JMA

APPENDIX II

- **CIVILDESIGN RATIONAL METHOD
OFFSITE AND ONSITE ANALYSIS**
- **CIVILDESIGN UNIT HYDROGRAPH
METHOD (PRE AND POST-
DEVELOPMENT)**

- **CIVILDESIGN RATIONAL METHOD
OFFSITE AND ONSITE ANALYSIS**

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 02/08/13

PRESCOTT COMMERCIAL CENTER - JOB NO. PDB024100
EXISTING OFFSITE AND ONSITE CONDITIONS - RATIONAL METHOD
10-YEAR STORM EVENT, 1 HOUR RAINFALL
BY JMA 2-08-13

Program License Serial Number 6192

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.910 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

+++++
Process from Point/Station 100.000 to Point/Station 105.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(2 dwl/acre)
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) = 0.7000 Max loss rate(Fm)= 0.514(In/Hr)
Initial subarea data:
Initial area flow distance = 503.710(Ft.)
Top (of initial area) elevation = 3301.000(Ft.)
Bottom (of initial area) elevation = 3290.000(Ft.)
Difference in elevation = 11.000(Ft.)
Slope = 0.02184 s(%)= 2.18
TC = k(0.438)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.337 min.
Rainfall intensity = 2.921(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.742
Subarea runoff = 5.114(CFS)
Total initial stream area = 2.360(Ac.)
Pervious area fraction = 0.700
Initial area Fm value = 0.514(In/Hr)

+++++
Process from Point/Station 105.000 to Point/Station 110.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 0.429(Ft.), Average velocity = 2.885(Ft/s)
***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.90
2	20.00	0.00
3	30.00	0.40
4	50.00	0.00
5	60.00	0.90

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 28.692(CFS)
 ' ' flow top width = 44.307(Ft.)
 ' ' velocity = 2.885(Ft/s)
 ' ' area = 9.947(Sq.Ft)
 ' ' Froude number = 1.073

Upstream point elevation = 3290.000(Ft.)
 Downstream point elevation = 3271.000(Ft.)
 Flow length = 1099.380(Ft.)
 Travel time = 6.35 min.
 Time of concentration = 17.69 min.
 Depth of flow = 0.429(Ft.)
 Average velocity = 2.885(Ft/s)
 Total irregular channel flow = 28.692(CFS)
 Irregular channel normal depth above invert elev. = 0.429(Ft.)
 Average velocity of channel(s) = 2.885(Ft/s)

Adding area flow to channel
 RESIDENTIAL(2 dwl/acre)
 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) = 0.7000 Max loss rate(Fm) = 0.514(In/Hr)
 Rainfall intensity = 2.140(In/Hr) for a 10.0 year storm
 Effective runoff coefficient used for area, (total area with modified
 rational method)(Q=KCIA) is C = 0.684
 Subarea runoff = 47.098(CFS) for 33.320(Ac.)
 Total runoff = 52.212(CFS)
 Effective area this stream = 35.68(Ac.)
 Total Study Area (Main Stream No. 1) = 35.68(Ac.)
 Area averaged Fm value = 0.514(In/Hr)
 Depth of flow = 0.532(Ft.), Average velocity = 3.557(Ft/s)

 Process from Point/Station 110.000 to Point/Station 115.000
 **** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
 Depth of flow = 0.409(Ft.), Average velocity = 6.532(Ft/s)
 ***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.90
2	20.00	0.00
3	30.00	0.40
4	50.00	0.00
5	60.00	0.90

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 59.207(CFS)
 ' ' flow top width = 43.638(Ft.)

' ' velocity= 6.532(Ft/s)
' ' area = 9.064(Sq.Ft)
' ' Froude number = 2.526

Upstream point elevation = 3271.000(Ft.)
Downstream point elevation = 3230.000(Ft.)
Flow length = 417.120(Ft.)
Travel time = 1.06 min.
Time of concentration = 18.75 min.
Depth of flow = 0.409(Ft.)
Average velocity = 6.532(Ft/s)
Total irregular channel flow = 59.207(CFS)
Irregular channel normal depth above invert elev. = 0.409(Ft.)
Average velocity of channel(s) = 6.532(Ft/s)

Adding area flow to channel

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)
Rainfall intensity = 2.054(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.715
Subarea runoff = 14.056(CFS) for 9.430(Ac.)
Total runoff = 66.267(CFS)
Effective area this stream = 45.11(Ac.)
Total Study Area (Main Stream No. 1) = 45.11(Ac.)
Area averaged Fm value = 0.422(In/Hr)
Depth of flow = 0.425(Ft.), Average velocity = 6.801(Ft/s)

+++++
Process from Point/Station 110.000 to Point/Station 115.000
**** SUBAREA FLOW ADDITION ****

UNDEVELOPED (average 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) = 69.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.548(In/Hr)
Time of concentration = 18.75 min.
Rainfall intensity = 2.054(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.711
Subarea runoff = 4.500(CFS) for 3.320(Ac.)
Total runoff = 70.768(CFS)
Effective area this stream = 48.43(Ac.)
Total Study Area (Main Stream No. 1) = 48.43(Ac.)
Area averaged Fm value = 0.430(In/Hr)

+++++
Process from Point/Station 110.000 to Point/Station 115.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1

Stream flow area = 48.430(Ac.)
Runoff from this stream = 70.768(CFS)
Time of concentration = 18.75 min.

Rainfall intensity = 2.054 (In/Hr)
Area averaged loss rate (Fm) = 0.4304 (In/Hr)
Area averaged Pervious ratio (Ap) = 0.6037

Summary of stream data:

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

1	70.77	48.430	18.75	0.430	2.054
---	-------	--------	-------	-------	-------

Qmax(1) =
1.000 * 1.000 * 70.768) + = 70.768

Total of 1 streams to confluence:
Flow rates before confluence point:
70.768

Maximum flow rates at confluence using above data:
70.768

Area of streams before confluence:
48.430

Effective area values after confluence:
48.430

Results of confluence:

Total flow rate = 70.768 (CFS)
Time of concentration = 18.754 min.
Effective stream area after confluence = 48.430 (Ac.)
Study area average Pervious fraction (Ap) = 0.604
Study area average soil loss rate (Fm) = 0.430 (In/Hr)
Study area total (this main stream) = 48.43 (Ac.)
End of computations, Total Study Area = 48.43 (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) = 0.604
Area averaged SCS curve number = 56.9

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 02/08/13

PRESCOTT COMMERCIAL CENTER - JOB NO. PDB024100
EXISTING OFFSITE AND ONSITE CONDITIONS - RATIONAL METHOD
100-YEAR STORM EVENT, 1-HOUR RAINFALL
BY JMA 2-08-13

Program License Serial Number 6192

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.280 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 2

+++++
Process from Point/Station 100.000 to Point/Station 105.000
**** INITIAL AREA EVALUATION ****

RESIDENTIAL(2 dwl/acre)
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) = 0.7000 Max loss rate(Fm)= 0.514(In/Hr)
Initial subarea data:
Initial area flow distance = 503.710(Ft.)
Top (of initial area) elevation = 3301.000(Ft.)
Bottom (of initial area) elevation = 3290.000(Ft.)
Difference in elevation = 11.000(Ft.)
Slope = 0.02184 s(%)= 2.18
TC = k(0.438)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.337 min.
Rainfall intensity = 4.109(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.787
Subarea runoff = 7.637(CFS)
Total initial stream area = 2.360(Ac.)
Pervious area fraction = 0.700
Initial area Fm value = 0.514(In/Hr)

+++++
Process from Point/Station 105.000 to Point/Station 110.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 0.507(Ft.), Average velocity = 3.402(Ft/s)
***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.90
2	20.00	0.00
3	30.00	0.40
4	50.00	0.00
5	60.00	0.90

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 45.861(CFS)
' ' flow top width = 46.891(Ft.)
' ' velocity= 3.402(Ft/s)
' ' area = 13.482(Sq.Ft)
' ' Froude number = 1.118

Upstream point elevation = 3290.000(Ft.)
Downstream point elevation = 3271.000(Ft.)
Flow length = 1099.380(Ft.)
Travel time = 5.39 min.
Time of concentration = 16.72 min.
Depth of flow = 0.507(Ft.)
Average velocity = 3.402(Ft/s)
Total irregular channel flow = 45.861(CFS)
Irregular channel normal depth above invert elev. = 0.507(Ft.)
Average velocity of channel(s) = 3.402(Ft/s)
Adding area flow to channel

RESIDENTIAL(2 dwl/acre)
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) = 0.7000 Max loss rate(Fm)= 0.514(In/Hr)
Rainfall intensity = 3.130(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.752
Subarea runoff = 76.385(CFS) for 33.320(Ac.)
Total runoff = 84.022(CFS)
Effective area this stream = 35.68(Ac.)
Total Study Area (Main Stream No. 1) = 35.68(Ac.)
Area averaged Fm value = 0.514(In/Hr)
Depth of flow = 0.642(Ft.), Average velocity = 4.178(Ft/s)

++++
Process from Point/Station 110.000 to Point/Station 115.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 0.000(CFS)
Depth of flow = 0.481(Ft.), Average velocity = 7.717(Ft/s)
***** Irregular Channel Data *****

Information entered for subchannel number 1 :

Point number	'X' coordinate	'Y' coordinate
1	0.00	0.90
2	20.00	0.00
3	30.00	0.40
4	50.00	0.00
5	60.00	0.90

Manning's 'N' friction factor = 0.025

Sub-Channel flow = 94.730(CFS)
' ' flow top width = 46.026(Ft.)

' ' velocity= 7.717(Ft/s)
' ' area = 12.276(Sq.Ft)
' ' Froude number = 2.633

Upstream point elevation = 3271.000(Ft.)
Downstream point elevation = 3230.000(Ft.)
Flow length = 417.120(Ft.)
Travel time = 0.90 min.
Time of concentration = 17.62 min.
Depth of flow = 0.481(Ft.)
Average velocity = 7.717(Ft/s)
Total irregular channel flow = 94.730(CFS)
Irregular channel normal depth above invert elev. = 0.481(Ft.)
Average velocity of channel(s) = 7.717(Ft/s)
Adding area flow to channel

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)
Rainfall intensity = 3.017(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.774
Subarea runoff = 21.361(CFS) for 9.430(Ac.)
Total runoff = 105.383(CFS)
Effective area this stream = 45.11(Ac.)
Total Study Area (Main Stream No. 1) = 45.11(Ac.)
Area averaged Fm value = 0.422(In/Hr)
Depth of flow = 0.500(Ft.), Average velocity = 8.009(Ft/s)

+++++
Process from Point/Station 110.000 to Point/Station 115.000
**** SUBAREA FLOW ADDITION ****

UNDEVELOPED (average 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) = 69.00
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.548(In/Hr)
Time of concentration = 17.62 min.
Rainfall intensity = 3.017(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.772
Subarea runoff = 7.379(CFS) for 3.320(Ac.)
Total runoff = 112.762(CFS)
Effective area this stream = 48.43(Ac.)
Total Study Area (Main Stream No. 1) = 48.43(Ac.)
Area averaged Fm value = 0.430(In/Hr)

+++++
Process from Point/Station 110.000 to Point/Station 115.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1

Stream flow area = 48.430(Ac.)
Runoff from this stream = 112.762(CFS)
Time of concentration = 17.62 min.

Rainfall intensity = 3.017 (In/Hr)
Area averaged loss rate (Fm) = 0.4304 (In/Hr)
Area averaged Pervious ratio (Ap) = 0.6037
Summary of stream data:

Stream No.	Flow rate (CFS)	Area (Ac.)	TC (min)	Fm (In/Hr)	Rainfall Intensity (In/Hr)
1	112.76	48.430	17.62	0.430	3.017

Qmax(1) = 1.000 * 1.000 * 112.762) + = 112.762

Total of 1 streams to confluence:
Flow rates before confluence point:
112.762
Maximum flow rates at confluence using above data:
112.762
Area of streams before confluence:
48.430
Effective area values after confluence:
48.430

Results of confluence:
Total flow rate = 112.762 (CFS)
Time of concentration = 17.624 min.
Effective stream area after confluence = 48.430 (Ac.)
Study area average Pervious fraction (Ap) = 0.604
Study area average soil loss rate (Fm) = 0.430 (In/Hr)
Study area total (this main stream) = 48.43 (Ac.)
End of computations, Total Study Area = 48.43 (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) = 0.604
Area averaged SCS curve number = 56.9

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 02/11/13

PRESCOTT COMMERCIAL CENTER - JOB NO. PDB024100
POST-DEVELOPMENT ONSITE CONDITION - RATIONAL METHOD
10-YEAR STORM EVENT, 1 HOUR RAINFALL
BY JMA 2-11-13

Program License Serial Number 6192

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

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.910 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

+++++
Process from Point/Station 1.000 to Point/Station 2.000
**** 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 = 389.130 (Ft.)
Top (of initial area) elevation = 30.050 (Ft.)
Bottom (of initial area) elevation = 27.450 (Ft.)
Difference in elevation = 2.600 (Ft.)
Slope = 0.00668 s(%) = 0.67
TC = $k(0.304)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 8.994 min.
Rainfall intensity = 2.842 (In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff = 1.570 (CFS)
Total initial stream area = 0.630 (Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.073 (In/Hr)

+++++
Process from Point/Station 3.000 to Point/Station 2.000
**** 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 = 8.99 min.
Rainfall intensity = 2.842 (In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.877
Subarea runoff = 0.149 (CFS) for 0.060 (Ac.)

Total runoff = 1.719(CFS)
 Effective area this stream = 0.69(Ac.)
 Total Study Area (Main Stream No. 1) = 0.69(Ac.)
 Area averaged Fm value = 0.073(In/Hr)

++++
 Process from Point/Station 2.000 to Point/Station 2.000
 **** CONFLUENCE OF MINOR STREAMS ****

 Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 0.690(Ac.)
 Runoff from this stream = 1.719(CFS)
 Time of concentration = 8.99 min.
 Rainfall intensity = 2.842(In/Hr)
 Area averaged loss rate (Fm) = 0.0734(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	1.72	0.690	8.99	0.073	2.842

Qmax(1) = 1.000 * 1.000 * 1.719) + = 1.719

Total of 1 streams to confluence:
 Flow rates before confluence point:
 1.719
 Maximum flow rates at confluence using above data:
 1.719
 Area of streams before confluence:
 0.690
 Effective area values after confluence:
 0.690
 Results of confluence:
 Total flow rate = 1.719(CFS)
 Time of concentration = 8.994 min.
 Effective stream area after confluence = 0.690(Ac.)
 Study area average Pervious fraction(Ap) = 0.100
 Study area average soil loss rate(Fm) = 0.073(In/Hr)
 Study area total (this main stream) = 0.69(Ac.)

++++
 Process from Point/Station 4.000 to Point/Station 5.000
 **** 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 = 8.99 min.
 Rainfall intensity = 2.842(In/Hr) for a 10.0 year storm
 Effective runoff coefficient used for area, (total area with modified rational method)(Q=K CIA) is C = 0.877
 Subarea runoff = 2.666(CFS) for 1.070(Ac.)
 Total runoff = 4.385(CFS)
 Effective area this stream = 1.76(Ac.)
 Total Study Area (Main Stream No. 1) = 1.76(Ac.)
 Area averaged Fm value = 0.073(In/Hr)

++++
 Process from Point/Station 6.000 to Point/Station 7.000
 **** 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 = 8.99 min.
Rainfall intensity = 2.842(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.877
Subarea runoff = 0.797(CFS) for 0.320(Ac.)
Total runoff = 5.182(CFS)
Effective area this stream = 2.08(Ac.)
Total Study Area (Main Stream No. 1) = 2.08(Ac.)
Area averaged Fm value = 0.073(In/Hr)

+++++
Process from Point/Station 8.000 to Point/Station 9.000
**** 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 = 8.99 min.
Rainfall intensity = 2.842(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area, (total area with modified
rational method) (Q=KCIA) is C = 0.877
Subarea runoff = 0.997(CFS) for 0.400(Ac.)
Total runoff = 6.179(CFS)
Effective area this stream = 2.48(Ac.)
Total Study Area (Main Stream No. 1) = 2.48(Ac.)
Area averaged Fm value = 0.073(In/Hr)
End of computations, Total Study Area = 2.48 (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 = 56.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 02/11/13

PRESCOTT COMMERCIAL CENTER - JOB NO. PDB024100
POST-DEVELOPMENT ONSITE CONDITION - RATIONAL METHOD
100-YEAR STORM EVENT, 1 HOUR RAINFALL
BY JMA 02-11-13

Program License Serial Number 6192

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

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.280 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

Process from Point/Station 1.000 to Point/Station 2.000
**** 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 = 389.130(Ft.)
Top (of initial area) elevation = 30.050(Ft.)
Bottom (of initial area) elevation = 27.450(Ft.)
Difference in elevation = 2.600(Ft.)
Slope = 0.00668 s(%)= 0.67
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.994 min.
Rainfall intensity = 3.997(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883
Subarea runoff = 2.225(CFS)
Total initial stream area = 0.630(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.073(In/Hr)

Process from Point/Station 3.000 to Point/Station 2.000
**** 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 = 8.99 min.
Rainfall intensity = 3.997(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 = 0.212(CFS) for 0.060(Ac.)

Total runoff = 2.437 (CFS)
 Effective area this stream = 0.69 (Ac.)
 Total Study Area (Main Stream No. 1) = 0.69 (Ac.)
 Area averaged Fm value = 0.073 (In/Hr)

 Process from Point/Station 2.000 to Point/Station 2.000
 **** CONFLUENCE OF MINOR STREAMS ****

 Along Main Stream number: 1 in normal stream number 1
 Stream flow area = 0.690 (Ac.)
 Runoff from this stream = 2.437 (CFS)
 Time of concentration = 8.99 min.
 Rainfall intensity = 3.997 (In/Hr)
 Area averaged loss rate (Fm) = 0.0734 (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	2.44	0.690	8.99	0.073	3.997

Qmax(1) = 1.000 * 1.000 * 2.437 + = 2.437

Total of 1 streams to confluence:
 Flow rates before confluence point:
 2.437
 Maximum flow rates at confluence using above data:
 2.437
 Area of streams before confluence:
 0.690
 Effective area values after confluence:
 0.690
 Results of confluence:
 Total flow rate = 2.437 (CFS)
 Time of concentration = 8.994 min.
 Effective stream area after confluence = 0.690 (Ac.)
 Study area average Pervious fraction (Ap) = 0.100
 Study area average soil loss rate (Fm) = 0.073 (In/Hr)
 Study area total (this main stream) = 0.69 (Ac.)

 Process from Point/Station 4.000 to Point/Station 5.000
 **** 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 = 8.99 min.
 Rainfall intensity = 3.997 (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 = 3.778 (CFS) for 1.070 (Ac.)
 Total runoff = 6.215 (CFS)
 Effective area this stream = 1.76 (Ac.)
 Total Study Area (Main Stream No. 1) = 1.76 (Ac.)
 Area averaged Fm value = 0.073 (In/Hr)

 Process from Point/Station 6.000 to Point/Station 7.000
 **** 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 = 8.99 min.
Rainfall intensity = 3.997(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 = 1.130(CFS) for 0.320(Ac.)
Total runoff = 7.345(CFS)
Effective area this stream = 2.08(Ac.)
Total Study Area (Main Stream No. 1) = 2.08(Ac.)
Area averaged Fm value = 0.073(In/Hr)

+++++
Process from Point/Station 8.000 to Point/Station 9.000
**** 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 = 8.99 min.
Rainfall intensity = 3.997(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 = 1.413(CFS) for 0.400(Ac.)
Total runoff = 8.758(CFS)
Effective area this stream = 2.48(Ac.)
Total Study Area (Main Stream No. 1) = 2.48(Ac.)
Area averaged Fm value = 0.073(In/Hr)
End of computations, Total Study Area = 2.48 (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 = 56.0

- **CIVILDESIGN UNIT HYDROGRAPH METHOD (PRE AND POST-DEVELOPMENT)**

Unit Hydrograph Analysis

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

Study date 02/08/13

+++++

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

Program License Serial Number 6192

PRESCOTT COMMERCIAL CENTER - UNIT HYDROGRAPH - JOB NO. PDB024100
EXISTING ONSITE CONDITION
100-YEAR STORM EVENT, 24 HOUR RAINFALL
BY JMA 2-08-13

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		
2.50	1	1.28

Rainfall data for year 100		
2.50	6	2.20

Rainfall data for year 100		
2.50	24	4.20

+++++

***** 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)
86.0	86.0	2.50	1.000	0.265	0.850	0.225

Area-averaged adjusted loss rate Fm (In/Hr) = 0.225

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

Area	Area	SCS CN	SCS CN	S	Pervious
------	------	--------	--------	---	----------

(Ac.)	Fract	(AMC2)	(AMC2)		Yield Fr
2.13	0.850	86.0	86.0	1.63	0.650
0.38	0.150	98.0	98.0	0.20	0.944

Area-averaged catchment yield fraction, Y = 0.694

Area-averaged low loss fraction, Yb = 0.306

Direct entry of lag time by user

+++++

Watershed area = 2.50 (Ac.)

Catchment Lag time = 0.176 hours

Unit interval = 5.000 minutes

Unit interval percentage of lag time = 47.2947

Hydrograph baseflow = 0.00 (CFS)

Average maximum watershed loss rate (Fm) = 0.225 (In/Hr)

Average low loss rate fraction (Yb) = 0.306 (decimal)

DESERT S-Graph Selected

Computed peak 5-minute rainfall = 0.607 (In)

Computed peak 30-minute rainfall = 1.040 (In)

Specified peak 1-hour rainfall = 1.280 (In)

Computed peak 3-hour rainfall = 1.784 (In)

Specified peak 6-hour rainfall = 2.200 (In)

Specified peak 24-hour rainfall = 4.200 (In)

Rainfall depth area reduction factors:

Using a total area of 2.50 (Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.607 (In)

30-minute factor = 1.000 Adjusted rainfall = 1.040 (In)

1-hour factor = 1.000 Adjusted rainfall = 1.280 (In)

3-hour factor = 1.000 Adjusted rainfall = 1.784 (In)

6-hour factor = 1.000 Adjusted rainfall = 2.200 (In)

24-hour factor = 1.000 Adjusted rainfall = 4.200 (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 = 30.23 (CFS))

1	3.615	1.093
2	27.310	7.164
3	57.978	9.272
4	71.859	4.197
5	79.915	2.436
6	85.235	1.609
7	89.088	1.165
8	91.795	0.819
9	93.919	0.642
10	95.532	0.488
11	96.777	0.376
12	97.664	0.268
13	98.216	0.167
14	98.762	0.165
15	99.324	0.170
16	99.707	0.116
17	100.000	0.089

Peak Unit Adjusted mass rainfall Unit rainfall

Number	(In)	(In)
1	0.6073	0.6073

2	0.7477	0.1404
3	0.8444	0.0967
4	0.9205	0.0761
5	0.9842	0.0637
6	1.0396	0.0553
7	1.0888	0.0492
8	1.1333	0.0445
9	1.1740	0.0408
10	1.2117	0.0377
11	1.2469	0.0351
12	1.2798	0.0330
13	1.3112	0.0314
14	1.3409	0.0297
15	1.3692	0.0283
16	1.3962	0.0270
17	1.4220	0.0258
18	1.4468	0.0248
19	1.4706	0.0238
20	1.4936	0.0230
21	1.5158	0.0222
22	1.5373	0.0215
23	1.5581	0.0208
24	1.5783	0.0202
25	1.5979	0.0196
26	1.6169	0.0191
27	1.6355	0.0186
28	1.6536	0.0181
29	1.6712	0.0176
30	1.6884	0.0172
31	1.7052	0.0168
32	1.7217	0.0164
33	1.7378	0.0161
34	1.7535	0.0158
35	1.7690	0.0154
36	1.7841	0.0151
37	1.7990	0.0148
38	1.8135	0.0146
39	1.8278	0.0143
40	1.8419	0.0140
41	1.8557	0.0138
42	1.8692	0.0136
43	1.8826	0.0133
44	1.8957	0.0131
45	1.9086	0.0129
46	1.9213	0.0127
47	1.9339	0.0125
48	1.9462	0.0123
49	1.9584	0.0122
50	1.9704	0.0120
51	1.9822	0.0118
52	1.9939	0.0117
53	2.0054	0.0115
54	2.0168	0.0114
55	2.0280	0.0112
56	2.0390	0.0111
57	2.0500	0.0109
58	2.0608	0.0108
59	2.0715	0.0107
60	2.0820	0.0106
61	2.0924	0.0104
62	2.1028	0.0103
63	2.1130	0.0102
64	2.1230	0.0101

65	2.1330	0.0100
66	2.1429	0.0099
67	2.1526	0.0098
68	2.1623	0.0097
69	2.1719	0.0096
70	2.1813	0.0095
71	2.1907	0.0094
72	2.2000	0.0093
73	2.2142	0.0142
74	2.2283	0.0141
75	2.2423	0.0140
76	2.2562	0.0139
77	2.2700	0.0138
78	2.2837	0.0137
79	2.2973	0.0136
80	2.3108	0.0135
81	2.3242	0.0134
82	2.3376	0.0133
83	2.3508	0.0133
84	2.3640	0.0132
85	2.3771	0.0131
86	2.3901	0.0130
87	2.4030	0.0129
88	2.4159	0.0128
89	2.4286	0.0128
90	2.4413	0.0127
91	2.4539	0.0126
92	2.4665	0.0125
93	2.4789	0.0125
94	2.4913	0.0124
95	2.5037	0.0123
96	2.5159	0.0123
97	2.5281	0.0122
98	2.5402	0.0121
99	2.5523	0.0121
100	2.5643	0.0120
101	2.5762	0.0119
102	2.5881	0.0119
103	2.5999	0.0118
104	2.6116	0.0117
105	2.6233	0.0117
106	2.6349	0.0116
107	2.6465	0.0116
108	2.6580	0.0115
109	2.6695	0.0115
110	2.6809	0.0114
111	2.6922	0.0113
112	2.7035	0.0113
113	2.7147	0.0112
114	2.7259	0.0112
115	2.7370	0.0111
116	2.7481	0.0111
117	2.7591	0.0110
118	2.7701	0.0110
119	2.7810	0.0109
120	2.7919	0.0109
121	2.8027	0.0108
122	2.8135	0.0108
123	2.8242	0.0107
124	2.8349	0.0107
125	2.8456	0.0106
126	2.8562	0.0106
127	2.8667	0.0106

128	2.8772	0.0105
129	2.8877	0.0105
130	2.8981	0.0104
131	2.9085	0.0104
132	2.9188	0.0103
133	2.9291	0.0103
134	2.9394	0.0103
135	2.9496	0.0102
136	2.9597	0.0102
137	2.9699	0.0101
138	2.9800	0.0101
139	2.9900	0.0101
140	3.0000	0.0100
141	3.0100	0.0100
142	3.0200	0.0099
143	3.0299	0.0099
144	3.0397	0.0099
145	3.0495	0.0098
146	3.0593	0.0098
147	3.0691	0.0098
148	3.0788	0.0097
149	3.0885	0.0097
150	3.0982	0.0097
151	3.1078	0.0096
152	3.1174	0.0096
153	3.1269	0.0095
154	3.1364	0.0095
155	3.1459	0.0095
156	3.1554	0.0095
157	3.1648	0.0094
158	3.1742	0.0094
159	3.1835	0.0094
160	3.1928	0.0093
161	3.2021	0.0093
162	3.2114	0.0093
163	3.2206	0.0092
164	3.2298	0.0092
165	3.2390	0.0092
166	3.2481	0.0091
167	3.2573	0.0091
168	3.2663	0.0091
169	3.2754	0.0091
170	3.2844	0.0090
171	3.2934	0.0090
172	3.3024	0.0090
173	3.3113	0.0089
174	3.3202	0.0089
175	3.3291	0.0089
176	3.3380	0.0089
177	3.3468	0.0088
178	3.3556	0.0088
179	3.3644	0.0088
180	3.3732	0.0088
181	3.3819	0.0087
182	3.3906	0.0087
183	3.3993	0.0087
184	3.4079	0.0087
185	3.4165	0.0086
186	3.4251	0.0086
187	3.4337	0.0086
188	3.4423	0.0086
189	3.4508	0.0085
190	3.4593	0.0085

191	3.4678	0.0085
192	3.4762	0.0085
193	3.4847	0.0084
194	3.4931	0.0084
195	3.5015	0.0084
196	3.5098	0.0084
197	3.5182	0.0083
198	3.5265	0.0083
199	3.5348	0.0083
200	3.5431	0.0083
201	3.5513	0.0083
202	3.5596	0.0082
203	3.5678	0.0082
204	3.5760	0.0082
205	3.5841	0.0082
206	3.5923	0.0081
207	3.6004	0.0081
208	3.6085	0.0081
209	3.6166	0.0081
210	3.6246	0.0081
211	3.6327	0.0080
212	3.6407	0.0080
213	3.6487	0.0080
214	3.6567	0.0080
215	3.6646	0.0080
216	3.6726	0.0079
217	3.6805	0.0079
218	3.6884	0.0079
219	3.6963	0.0079
220	3.7041	0.0079
221	3.7120	0.0078
222	3.7198	0.0078
223	3.7276	0.0078
224	3.7354	0.0078
225	3.7432	0.0078
226	3.7509	0.0078
227	3.7587	0.0077
228	3.7664	0.0077
229	3.7741	0.0077
230	3.7817	0.0077
231	3.7894	0.0077
232	3.7971	0.0076
233	3.8047	0.0076
234	3.8123	0.0076
235	3.8199	0.0076
236	3.8274	0.0076
237	3.8350	0.0076
238	3.8425	0.0075
239	3.8501	0.0075
240	3.8576	0.0075
241	3.8651	0.0075
242	3.8725	0.0075
243	3.8800	0.0075
244	3.8874	0.0074
245	3.8949	0.0074
246	3.9023	0.0074
247	3.9097	0.0074
248	3.9170	0.0074
249	3.9244	0.0074
250	3.9317	0.0073
251	3.9391	0.0073
252	3.9464	0.0073
253	3.9537	0.0073

254	3.9609	0.0073
255	3.9682	0.0073
256	3.9755	0.0073
257	3.9827	0.0072
258	3.9899	0.0072
259	3.9971	0.0072
260	4.0043	0.0072
261	4.0115	0.0072
262	4.0187	0.0072
263	4.0258	0.0071
264	4.0329	0.0071
265	4.0401	0.0071
266	4.0472	0.0071
267	4.0543	0.0071
268	4.0613	0.0071
269	4.0684	0.0071
270	4.0754	0.0070
271	4.0825	0.0070
272	4.0895	0.0070
273	4.0965	0.0070
274	4.1035	0.0070
275	4.1105	0.0070
276	4.1174	0.0070
277	4.1244	0.0070
278	4.1313	0.0069
279	4.1382	0.0069
280	4.1452	0.0069
281	4.1521	0.0069
282	4.1589	0.0069
283	4.1658	0.0069
284	4.1727	0.0069
285	4.1795	0.0068
286	4.1864	0.0068
287	4.1932	0.0068
288	4.2000	0.0068

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0068	0.0021	0.0047
2	0.0068	0.0021	0.0047
3	0.0068	0.0021	0.0047
4	0.0069	0.0021	0.0048
5	0.0069	0.0021	0.0048
6	0.0069	0.0021	0.0048
7	0.0069	0.0021	0.0048
8	0.0069	0.0021	0.0048
9	0.0070	0.0021	0.0048
10	0.0070	0.0021	0.0048
11	0.0070	0.0021	0.0049
12	0.0070	0.0022	0.0049
13	0.0070	0.0022	0.0049
14	0.0071	0.0022	0.0049
15	0.0071	0.0022	0.0049
16	0.0071	0.0022	0.0049
17	0.0071	0.0022	0.0049
18	0.0071	0.0022	0.0050
19	0.0072	0.0022	0.0050
20	0.0072	0.0022	0.0050
21	0.0072	0.0022	0.0050
22	0.0072	0.0022	0.0050
23	0.0073	0.0022	0.0050

24	0.0073	0.0022	0.0051
25	0.0073	0.0022	0.0051
26	0.0073	0.0022	0.0051
27	0.0074	0.0023	0.0051
28	0.0074	0.0023	0.0051
29	0.0074	0.0023	0.0051
30	0.0074	0.0023	0.0051
31	0.0075	0.0023	0.0052
32	0.0075	0.0023	0.0052
33	0.0075	0.0023	0.0052
34	0.0075	0.0023	0.0052
35	0.0076	0.0023	0.0052
36	0.0076	0.0023	0.0053
37	0.0076	0.0023	0.0053
38	0.0076	0.0023	0.0053
39	0.0077	0.0023	0.0053
40	0.0077	0.0024	0.0053
41	0.0077	0.0024	0.0054
42	0.0077	0.0024	0.0054
43	0.0078	0.0024	0.0054
44	0.0078	0.0024	0.0054
45	0.0078	0.0024	0.0054
46	0.0078	0.0024	0.0054
47	0.0079	0.0024	0.0055
48	0.0079	0.0024	0.0055
49	0.0079	0.0024	0.0055
50	0.0080	0.0024	0.0055
51	0.0080	0.0025	0.0055
52	0.0080	0.0025	0.0056
53	0.0081	0.0025	0.0056
54	0.0081	0.0025	0.0056
55	0.0081	0.0025	0.0056
56	0.0081	0.0025	0.0057
57	0.0082	0.0025	0.0057
58	0.0082	0.0025	0.0057
59	0.0083	0.0025	0.0057
60	0.0083	0.0025	0.0057
61	0.0083	0.0025	0.0058
62	0.0083	0.0026	0.0058
63	0.0084	0.0026	0.0058
64	0.0084	0.0026	0.0058
65	0.0085	0.0026	0.0059
66	0.0085	0.0026	0.0059
67	0.0085	0.0026	0.0059
68	0.0086	0.0026	0.0059
69	0.0086	0.0026	0.0060
70	0.0086	0.0026	0.0060
71	0.0087	0.0027	0.0060
72	0.0087	0.0027	0.0060
73	0.0088	0.0027	0.0061
74	0.0088	0.0027	0.0061
75	0.0088	0.0027	0.0061
76	0.0089	0.0027	0.0061
77	0.0089	0.0027	0.0062
78	0.0089	0.0027	0.0062
79	0.0090	0.0028	0.0062
80	0.0090	0.0028	0.0063
81	0.0091	0.0028	0.0063
82	0.0091	0.0028	0.0063
83	0.0092	0.0028	0.0064
84	0.0092	0.0028	0.0064
85	0.0093	0.0028	0.0064
86	0.0093	0.0028	0.0064

87	0.0094	0.0029	0.0065
88	0.0094	0.0029	0.0065
89	0.0095	0.0029	0.0066
90	0.0095	0.0029	0.0066
91	0.0095	0.0029	0.0066
92	0.0096	0.0029	0.0066
93	0.0097	0.0030	0.0067
94	0.0097	0.0030	0.0067
95	0.0098	0.0030	0.0068
96	0.0098	0.0030	0.0068
97	0.0099	0.0030	0.0068
98	0.0099	0.0030	0.0069
99	0.0100	0.0031	0.0069
100	0.0100	0.0031	0.0069
101	0.0101	0.0031	0.0070
102	0.0101	0.0031	0.0070
103	0.0102	0.0031	0.0071
104	0.0103	0.0031	0.0071
105	0.0103	0.0032	0.0072
106	0.0104	0.0032	0.0072
107	0.0105	0.0032	0.0073
108	0.0105	0.0032	0.0073
109	0.0106	0.0032	0.0074
110	0.0106	0.0033	0.0074
111	0.0107	0.0033	0.0074
112	0.0108	0.0033	0.0075
113	0.0109	0.0033	0.0075
114	0.0109	0.0033	0.0076
115	0.0110	0.0034	0.0076
116	0.0111	0.0034	0.0077
117	0.0112	0.0034	0.0078
118	0.0112	0.0034	0.0078
119	0.0113	0.0035	0.0079
120	0.0114	0.0035	0.0079
121	0.0115	0.0035	0.0080
122	0.0116	0.0035	0.0080
123	0.0117	0.0036	0.0081
124	0.0117	0.0036	0.0081
125	0.0119	0.0036	0.0082
126	0.0119	0.0037	0.0083
127	0.0121	0.0037	0.0084
128	0.0121	0.0037	0.0084
129	0.0123	0.0038	0.0085
130	0.0123	0.0038	0.0086
131	0.0125	0.0038	0.0087
132	0.0125	0.0038	0.0087
133	0.0127	0.0039	0.0088
134	0.0128	0.0039	0.0089
135	0.0129	0.0040	0.0090
136	0.0130	0.0040	0.0090
137	0.0132	0.0040	0.0091
138	0.0133	0.0041	0.0092
139	0.0134	0.0041	0.0093
140	0.0135	0.0041	0.0094
141	0.0137	0.0042	0.0095
142	0.0138	0.0042	0.0096
143	0.0140	0.0043	0.0097
144	0.0141	0.0043	0.0098
145	0.0093	0.0028	0.0064
146	0.0094	0.0029	0.0065
147	0.0096	0.0029	0.0066
148	0.0097	0.0030	0.0067
149	0.0099	0.0030	0.0068

150	0.0100	0.0031	0.0069
151	0.0102	0.0031	0.0071
152	0.0103	0.0032	0.0072
153	0.0106	0.0032	0.0073
154	0.0107	0.0033	0.0074
155	0.0109	0.0034	0.0076
156	0.0111	0.0034	0.0077
157	0.0114	0.0035	0.0079
158	0.0115	0.0035	0.0080
159	0.0118	0.0036	0.0082
160	0.0120	0.0037	0.0083
161	0.0123	0.0038	0.0086
162	0.0125	0.0038	0.0087
163	0.0129	0.0040	0.0090
164	0.0131	0.0040	0.0091
165	0.0136	0.0042	0.0094
166	0.0138	0.0042	0.0096
167	0.0143	0.0044	0.0099
168	0.0146	0.0045	0.0101
169	0.0151	0.0046	0.0105
170	0.0154	0.0047	0.0107
171	0.0161	0.0049	0.0112
172	0.0164	0.0050	0.0114
173	0.0172	0.0053	0.0119
174	0.0176	0.0054	0.0122
175	0.0186	0.0057	0.0129
176	0.0191	0.0058	0.0132
177	0.0202	0.0062	0.0140
178	0.0208	0.0064	0.0144
179	0.0222	0.0068	0.0154
180	0.0230	0.0070	0.0159
181	0.0248	0.0076	0.0172
182	0.0258	0.0079	0.0179
183	0.0283	0.0087	0.0196
184	0.0297	0.0091	0.0206
185	0.0330	0.0101	0.0229
186	0.0351	0.0108	0.0244
187	0.0408	0.0125	0.0283
188	0.0445	0.0136	0.0309
189	0.0553	0.0169	0.0384
190	0.0637	0.0188	0.0450
191	0.0967	0.0188	0.0779
192	0.1404	0.0188	0.1216
193	0.6073	0.0188	0.5885
194	0.0761	0.0188	0.0573
195	0.0492	0.0151	0.0341
196	0.0377	0.0115	0.0262
197	0.0314	0.0096	0.0218
198	0.0270	0.0083	0.0187
199	0.0238	0.0073	0.0165
200	0.0215	0.0066	0.0149
201	0.0196	0.0060	0.0136
202	0.0181	0.0055	0.0125
203	0.0168	0.0052	0.0117
204	0.0158	0.0048	0.0109
205	0.0148	0.0045	0.0103
206	0.0140	0.0043	0.0097
207	0.0133	0.0041	0.0093
208	0.0127	0.0039	0.0088
209	0.0122	0.0037	0.0084
210	0.0117	0.0036	0.0081
211	0.0112	0.0034	0.0078
212	0.0108	0.0033	0.0075

213	0.0104	0.0032	0.0072
214	0.0101	0.0031	0.0070
215	0.0098	0.0030	0.0068
216	0.0095	0.0029	0.0066
217	0.0142	0.0043	0.0099
218	0.0139	0.0043	0.0096
219	0.0136	0.0042	0.0094
220	0.0133	0.0041	0.0093
221	0.0131	0.0040	0.0091
222	0.0128	0.0039	0.0089
223	0.0126	0.0039	0.0088
224	0.0124	0.0038	0.0086
225	0.0122	0.0037	0.0085
226	0.0120	0.0037	0.0083
227	0.0118	0.0036	0.0082
228	0.0116	0.0036	0.0081
229	0.0115	0.0035	0.0079
230	0.0113	0.0035	0.0078
231	0.0111	0.0034	0.0077
232	0.0110	0.0034	0.0076
233	0.0108	0.0033	0.0075
234	0.0107	0.0033	0.0074
235	0.0106	0.0032	0.0073
236	0.0104	0.0032	0.0072
237	0.0103	0.0032	0.0071
238	0.0102	0.0031	0.0071
239	0.0101	0.0031	0.0070
240	0.0099	0.0030	0.0069
241	0.0098	0.0030	0.0068
242	0.0097	0.0030	0.0067
243	0.0096	0.0029	0.0067
244	0.0095	0.0029	0.0066
245	0.0094	0.0029	0.0065
246	0.0093	0.0029	0.0065
247	0.0092	0.0028	0.0064
248	0.0091	0.0028	0.0063
249	0.0091	0.0028	0.0063
250	0.0090	0.0027	0.0062
251	0.0089	0.0027	0.0062
252	0.0088	0.0027	0.0061
253	0.0087	0.0027	0.0061
254	0.0087	0.0026	0.0060
255	0.0086	0.0026	0.0060
256	0.0085	0.0026	0.0059
257	0.0084	0.0026	0.0059
258	0.0084	0.0026	0.0058
259	0.0083	0.0025	0.0058
260	0.0082	0.0025	0.0057
261	0.0082	0.0025	0.0057
262	0.0081	0.0025	0.0056
263	0.0080	0.0025	0.0056
264	0.0080	0.0024	0.0055
265	0.0079	0.0024	0.0055
266	0.0079	0.0024	0.0055
267	0.0078	0.0024	0.0054
268	0.0078	0.0024	0.0054
269	0.0077	0.0024	0.0053
270	0.0076	0.0023	0.0053
271	0.0076	0.0023	0.0053
272	0.0075	0.0023	0.0052
273	0.0075	0.0023	0.0052
274	0.0074	0.0023	0.0052
275	0.0074	0.0023	0.0051

276	0.0073	0.0022	0.0051
277	0.0073	0.0022	0.0051
278	0.0073	0.0022	0.0050
279	0.0072	0.0022	0.0050
280	0.0072	0.0022	0.0050
281	0.0071	0.0022	0.0049
282	0.0071	0.0022	0.0049
283	0.0070	0.0022	0.0049
284	0.0070	0.0021	0.0049
285	0.0070	0.0021	0.0048
286	0.0069	0.0021	0.0048
287	0.0069	0.0021	0.0048
288	0.0068	0.0021	0.0047

Total soil rain loss = 1.08(In)
Total effective rainfall = 3.12(In)
Peak flow rate in flood hydrograph = 6.80(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.01	Q				
0+10	0.0003	0.04	Q				
0+15	0.0009	0.08	Q				
0+20	0.0016	0.10	Q				
0+25	0.0024	0.11	Q				
0+30	0.0032	0.12	Q				
0+35	0.0041	0.13	Q				
0+40	0.0050	0.13	Q				
0+45	0.0060	0.14	Q				
0+50	0.0069	0.14	Q				
0+55	0.0079	0.14	Q				
1+ 0	0.0089	0.14	Q				
1+ 5	0.0099	0.14	Q				
1+10	0.0109	0.15	Q				
1+15	0.0119	0.15	Q				
1+20	0.0129	0.15	Q				
1+25	0.0139	0.15	Q				
1+30	0.0149	0.15	Q				
1+35	0.0159	0.15	Q				
1+40	0.0170	0.15	QV				
1+45	0.0180	0.15	QV				
1+50	0.0190	0.15	QV				
1+55	0.0201	0.15	QV				
2+ 0	0.0211	0.15	QV				
2+ 5	0.0222	0.15	QV				
2+10	0.0232	0.15	QV				
2+15	0.0243	0.15	QV				
2+20	0.0253	0.15	QV				
2+25	0.0264	0.15	QV				
2+30	0.0274	0.15	QV				
2+35	0.0285	0.15	QV				
2+40	0.0296	0.16	QV				
2+45	0.0307	0.16	QV				
2+50	0.0317	0.16	QV				
2+55	0.0328	0.16	Q V				

3+ 0	0.0339	0.16	Q	V				
3+ 5	0.0350	0.16	Q	V				
3+10	0.0361	0.16	Q	V				
3+15	0.0372	0.16	Q	V				
3+20	0.0383	0.16	Q	V				
3+25	0.0394	0.16	Q	V				
3+30	0.0405	0.16	Q	V				
3+35	0.0416	0.16	Q	V				
3+40	0.0427	0.16	Q	V				
3+45	0.0438	0.16	Q	V				
3+50	0.0449	0.16	Q	V				
3+55	0.0461	0.16	Q	V				
4+ 0	0.0472	0.16	Q	V				
4+ 5	0.0483	0.16	Q	V				
4+10	0.0495	0.17	Q	V				
4+15	0.0506	0.17	Q	V				
4+20	0.0517	0.17	Q	V				
4+25	0.0529	0.17	Q	V				
4+30	0.0540	0.17	Q	V				
4+35	0.0552	0.17	Q	V				
4+40	0.0564	0.17	Q	V				
4+45	0.0575	0.17	Q	V				
4+50	0.0587	0.17	Q	V				
4+55	0.0599	0.17	Q	V				
5+ 0	0.0611	0.17	Q	V				
5+ 5	0.0623	0.17	Q	V				
5+10	0.0634	0.17	Q	V				
5+15	0.0646	0.17	Q	V				
5+20	0.0658	0.17	Q	V				
5+25	0.0670	0.18	Q	V				
5+30	0.0683	0.18	Q	V				
5+35	0.0695	0.18	Q	V				
5+40	0.0707	0.18	Q	V				
5+45	0.0719	0.18	Q	V				
5+50	0.0732	0.18	Q	V				
5+55	0.0744	0.18	Q	V				
6+ 0	0.0756	0.18	Q	V				
6+ 5	0.0769	0.18	Q	V				
6+10	0.0781	0.18	Q	V				
6+15	0.0794	0.18	Q	V				
6+20	0.0806	0.18	Q	V				
6+25	0.0819	0.18	Q	V				
6+30	0.0832	0.19	Q	V				
6+35	0.0845	0.19	Q	V				
6+40	0.0858	0.19	Q	V				
6+45	0.0870	0.19	Q	V				
6+50	0.0883	0.19	Q	V				
6+55	0.0897	0.19	Q	V				
7+ 0	0.0910	0.19	Q	V				
7+ 5	0.0923	0.19	Q	V				
7+10	0.0936	0.19	Q	V				
7+15	0.0949	0.19	Q	V				
7+20	0.0963	0.19	Q	V				
7+25	0.0976	0.19	Q	V				
7+30	0.0990	0.20	Q	V				
7+35	0.1003	0.20	Q	V				
7+40	0.1017	0.20	Q	V				
7+45	0.1031	0.20	Q	V				
7+50	0.1044	0.20	Q	V				
7+55	0.1058	0.20	Q	V				
8+ 0	0.1072	0.20	Q	V				
8+ 5	0.1086	0.20	Q	V				
8+10	0.1100	0.20	Q	V				

8+15	0.1114	0.21	Q	V				
8+20	0.1129	0.21	Q	V				
8+25	0.1143	0.21	Q	V				
8+30	0.1157	0.21	Q	V				
8+35	0.1172	0.21	Q	V				
8+40	0.1186	0.21	Q	V				
8+45	0.1201	0.21	Q	V				
8+50	0.1216	0.21	Q	V				
8+55	0.1230	0.22	Q	V				
9+ 0	0.1245	0.22	Q	V				
9+ 5	0.1260	0.22	Q	V				
9+10	0.1275	0.22	Q	V				
9+15	0.1291	0.22	Q	V				
9+20	0.1306	0.22	Q	V				
9+25	0.1321	0.22	Q	V				
9+30	0.1337	0.22	Q	V				
9+35	0.1352	0.23	Q	V				
9+40	0.1368	0.23	Q	V				
9+45	0.1384	0.23	Q	V				
9+50	0.1400	0.23	Q	V				
9+55	0.1416	0.23	Q	V				
10+ 0	0.1432	0.23	Q	V				
10+ 5	0.1448	0.24	Q	V				
10+10	0.1464	0.24	Q	V				
10+15	0.1481	0.24	Q	V				
10+20	0.1498	0.24	Q	V				
10+25	0.1514	0.24	Q	V				
10+30	0.1531	0.24	Q	V				
10+35	0.1548	0.25	Q	V				
10+40	0.1565	0.25	Q	V				
10+45	0.1582	0.25	IQ	V				
10+50	0.1600	0.25	IQ	V				
10+55	0.1617	0.25	IQ	V				
11+ 0	0.1635	0.26	IQ	V				
11+ 5	0.1653	0.26	IQ	V				
11+10	0.1671	0.26	IQ	V				
11+15	0.1689	0.26	IQ	V				
11+20	0.1707	0.27	IQ	V				
11+25	0.1726	0.27	IQ	V				
11+30	0.1744	0.27	IQ	V				
11+35	0.1763	0.27	IQ	V				
11+40	0.1782	0.28	IQ	V				
11+45	0.1801	0.28	IQ	V				
11+50	0.1821	0.28	IQ	V				
11+55	0.1840	0.28	IQ	V				
12+ 0	0.1860	0.29	IQ	V				
12+ 5	0.1880	0.29	IQ	V				
12+10	0.1898	0.26	IQ	V				
12+15	0.1914	0.23	Q	V				
12+20	0.1929	0.22	Q	V				
12+25	0.1944	0.22	Q	V				
12+30	0.1959	0.22	Q	V				
12+35	0.1974	0.21	Q	V				
12+40	0.1989	0.21	Q	V				
12+45	0.2004	0.22	Q	V				
12+50	0.2019	0.22	Q	V				
12+55	0.2034	0.22	Q	V				
13+ 0	0.2049	0.22	Q	V				
13+ 5	0.2065	0.23	Q	V				
13+10	0.2081	0.23	Q	V				
13+15	0.2097	0.23	Q	V				
13+20	0.2113	0.24	Q	V				
13+25	0.2130	0.24	Q	V				

13+30	0.2147	0.25	Q		V				
13+35	0.2164	0.25	Q		V				
13+40	0.2182	0.26	Q		V				
13+45	0.2200	0.26	Q		V				
13+50	0.2219	0.27	Q		V				
13+55	0.2238	0.28	Q		V				
14+ 0	0.2258	0.28	Q		V				
14+ 5	0.2278	0.29	Q		V				
14+10	0.2298	0.30	Q		V				
14+15	0.2319	0.31	Q		V				
14+20	0.2341	0.32	Q		V				
14+25	0.2364	0.33	Q		V				
14+30	0.2387	0.34	Q		V				
14+35	0.2411	0.35	Q		V				
14+40	0.2436	0.36	Q		V				
14+45	0.2462	0.37	Q		V				
14+50	0.2488	0.39	Q		V				
14+55	0.2516	0.41	Q		V				
15+ 0	0.2545	0.42	Q		V				
15+ 5	0.2576	0.44	Q		V				
15+10	0.2608	0.47	Q		V				
15+15	0.2642	0.49	Q		V				
15+20	0.2678	0.52	Q		V				
15+25	0.2717	0.56	Q		V				
15+30	0.2758	0.60	Q		V				
15+35	0.2803	0.65	Q		V				
15+40	0.2852	0.71	Q		V				
15+45	0.2906	0.79	Q		V				
15+50	0.2968	0.90	Q		V				
15+55	0.3043	1.09	Q		V				
16+ 0	0.3145	1.48	Q		V				
16+ 5	0.3329	2.67	Q		V				
16+10	0.3743	6.02			V				
16+15	0.4212	6.80			V				
16+20	0.4477	3.84			V				
16+25	0.4655	2.60	Q		V				
16+30	0.4789	1.94	Q		V				
16+35	0.4894	1.54	Q		V				
16+40	0.4979	1.23	Q		V				
16+45	0.5050	1.03	Q		V				
16+50	0.5110	0.87	Q		V				
16+55	0.5162	0.75	Q		V				
17+ 0	0.5205	0.63	Q		V				
17+ 5	0.5242	0.54	Q		V				
17+10	0.5277	0.50	Q		V				
17+15	0.5309	0.47	Q		V				
17+20	0.5337	0.41	Q		V				
17+25	0.5362	0.37	Q		V				
17+30	0.5383	0.30	Q		V				
17+35	0.5402	0.28	Q		V				
17+40	0.5420	0.26	Q		V				
17+45	0.5438	0.25	Q		V				
17+50	0.5454	0.24	Q		V				
17+55	0.5470	0.23	Q		V				
18+ 0	0.5486	0.22	Q		V				
18+ 5	0.5501	0.22	Q		V				
18+10	0.5517	0.24	Q		V				
18+15	0.5535	0.26	Q		V				
18+20	0.5554	0.27	Q		V				
18+25	0.5573	0.27	Q		V				
18+30	0.5591	0.27	Q		V				
18+35	0.5610	0.27	Q		V				
18+40	0.5628	0.27	Q		V				

18+45	0.5647	0.26	IQ				V	
18+50	0.5665	0.26	IQ				V	
18+55	0.5682	0.26	IQ				V	
19+ 0	0.5700	0.25	IQ				V	
19+ 5	0.5717	0.25	IQ				V	
19+10	0.5734	0.25	Q				V	
19+15	0.5751	0.24	Q				V	
19+20	0.5768	0.24	Q				V	
19+25	0.5784	0.24	Q				V	
19+30	0.5800	0.23	Q				V	
19+35	0.5816	0.23	Q				V	
19+40	0.5832	0.23	Q				V	
19+45	0.5847	0.23	Q				V	
19+50	0.5863	0.22	Q				V	
19+55	0.5878	0.22	Q				V	
20+ 0	0.5893	0.22	Q				V	
20+ 5	0.5907	0.21	Q				V	
20+10	0.5922	0.21	Q				V	
20+15	0.5936	0.21	Q				V	
20+20	0.5951	0.21	Q				V	
20+25	0.5965	0.20	Q				V	
20+30	0.5979	0.20	Q				V	
20+35	0.5992	0.20	Q				V	
20+40	0.6006	0.20	Q				V	
20+45	0.6020	0.20	Q				V	
20+50	0.6033	0.19	Q				V	
20+55	0.6046	0.19	Q				V	
21+ 0	0.6059	0.19	Q				V	
21+ 5	0.6072	0.19	Q				V	
21+10	0.6085	0.19	Q				V	
21+15	0.6098	0.19	Q				V	
21+20	0.6111	0.18	Q				V	
21+25	0.6123	0.18	Q				V	
21+30	0.6135	0.18	Q				V	
21+35	0.6148	0.18	Q				V	
21+40	0.6160	0.18	Q				V	
21+45	0.6172	0.18	Q				V	
21+50	0.6184	0.17	Q				V	
21+55	0.6196	0.17	Q				V	
22+ 0	0.6208	0.17	Q				V	
22+ 5	0.6220	0.17	Q				V	
22+10	0.6231	0.17	Q				V	
22+15	0.6243	0.17	Q				V	
22+20	0.6254	0.17	Q				V	
22+25	0.6266	0.17	Q				V	
22+30	0.6277	0.16	Q				V	
22+35	0.6288	0.16	Q				V	
22+40	0.6299	0.16	Q				V	
22+45	0.6310	0.16	Q				V	
22+50	0.6321	0.16	Q				V	
22+55	0.6332	0.16	Q				V	
23+ 0	0.6343	0.16	Q				V	
23+ 5	0.6354	0.16	Q				V	
23+10	0.6364	0.16	Q				V	
23+15	0.6375	0.15	Q				V	
23+20	0.6386	0.15	Q				V	
23+25	0.6396	0.15	Q				V	
23+30	0.6407	0.15	Q				V	
23+35	0.6417	0.15	Q				V	
23+40	0.6427	0.15	Q				V	
23+45	0.6437	0.15	Q				V	
23+50	0.6448	0.15	Q				V	
23+55	0.6458	0.15	Q				V	

24+ 0	0.6468	0.15	Q				V
24+ 5	0.6477	0.14	Q				V
24+10	0.6485	0.11	Q				V
24+15	0.6489	0.06	Q				V
24+20	0.6492	0.04	Q				V
24+25	0.6494	0.03	Q				V
24+30	0.6495	0.02	Q				V
24+35	0.6496	0.02	Q				V
24+40	0.6497	0.01	Q				V
24+45	0.6498	0.01	Q				V
24+50	0.6498	0.01	Q				V
24+55	0.6498	0.00	Q				V
25+ 0	0.6499	0.00	Q				V
25+ 5	0.6499	0.00	Q				V
25+10	0.6499	0.00	Q				V
25+15	0.6499	0.00	Q				V
25+20	0.6499	0.00	Q				V

Unit Hydrograph Analysis

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

Study date 02/08/13

+++++

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

Program License Serial Number 6192

PRESCOTT COMMERCIAL CENTER - UNIT HYDROGRAPH - JOB NO. PDB024100
PROPOSED ONSITE CONDITION
100-YEAR STORM EVENT, 24 HOUR RAINFALL
BY JMA 2-08-13

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		
2.50	1	1.28

Rainfall data for year 100
2.50 6 2.20

Rainfall data for year 100
2.50 24 4.20

+++++

***** 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)
56.0	56.0	2.50	1.000	0.734	0.100	0.073

Area-averaged adjusted loss rate Fm (In/Hr) = 0.073

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

Area	Area	SCS CN	SCS CN	S	Pervious
------	------	--------	--------	---	----------

(Ac.)	Fract	(AMC2)	(AMC2)	Yield Fr	
0.25	0.100	56.0	56.0	7.86	0.157
2.25	0.900	98.0	98.0	0.20	0.944

Area-averaged catchment yield fraction, Y = 0.865

Area-averaged low loss fraction, Yb = 0.135

Direct entry of lag time by user

+++++

Watershed area = 2.50(Ac.)

Catchment Lag time = 0.176 hours

Unit interval = 5.000 minutes

Unit interval percentage of lag time = 47.2947

Hydrograph baseflow = 0.00(CFS)

Average maximum watershed loss rate(Fm) = 0.073(In/Hr)

Average low loss rate fraction (Yb) = 0.135 (decimal)

DESERT S-Graph Selected

Computed peak 5-minute rainfall = 0.607(In)

Computed peak 30-minute rainfall = 1.040(In)

Specified peak 1-hour rainfall = 1.280(In)

Computed peak 3-hour rainfall = 1.784(In)

Specified peak 6-hour rainfall = 2.200(In)

Specified peak 24-hour rainfall = 4.200(In)

Rainfall depth area reduction factors:

Using a total area of 2.50(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.607(In)

30-minute factor = 1.000 Adjusted rainfall = 1.040(In)

1-hour factor = 1.000 Adjusted rainfall = 1.280(In)

3-hour factor = 1.000 Adjusted rainfall = 1.784(In)

6-hour factor = 1.000 Adjusted rainfall = 2.200(In)

24-hour factor = 1.000 Adjusted rainfall = 4.200(In)

Unit Hydrograph

Interval 'S' Graph Unit Hydrograph
Number Mean values ((CFS))

(K = 30.23 (CFS))

1	3.615	1.093
2	27.310	7.164
3	57.978	9.272
4	71.859	4.197
5	79.915	2.436
6	85.235	1.609
7	89.088	1.165
8	91.795	0.819
9	93.919	0.642
10	95.532	0.488
11	96.777	0.376
12	97.664	0.268
13	98.216	0.167
14	98.762	0.165
15	99.324	0.170
16	99.707	0.116
17	100.000	0.089

Peak Unit Number	Adjusted mass rainfall (In)	Unit rainfall (In)
1	0.6073	0.6073

2	0.7477	0.1404
3	0.8444	0.0967
4	0.9205	0.0761
5	0.9842	0.0637
6	1.0396	0.0553
7	1.0888	0.0492
8	1.1333	0.0445
9	1.1740	0.0408
10	1.2117	0.0377
11	1.2469	0.0351
12	1.2798	0.0330
13	1.3112	0.0314
14	1.3409	0.0297
15	1.3692	0.0283
16	1.3962	0.0270
17	1.4220	0.0258
18	1.4468	0.0248
19	1.4706	0.0238
20	1.4936	0.0230
21	1.5158	0.0222
22	1.5373	0.0215
23	1.5581	0.0208
24	1.5783	0.0202
25	1.5979	0.0196
26	1.6169	0.0191
27	1.6355	0.0186
28	1.6536	0.0181
29	1.6712	0.0176
30	1.6884	0.0172
31	1.7052	0.0168
32	1.7217	0.0164
33	1.7378	0.0161
34	1.7535	0.0158
35	1.7690	0.0154
36	1.7841	0.0151
37	1.7990	0.0148
38	1.8135	0.0146
39	1.8278	0.0143
40	1.8419	0.0140
41	1.8557	0.0138
42	1.8692	0.0136
43	1.8826	0.0133
44	1.8957	0.0131
45	1.9086	0.0129
46	1.9213	0.0127
47	1.9339	0.0125
48	1.9462	0.0123
49	1.9584	0.0122
50	1.9704	0.0120
51	1.9822	0.0118
52	1.9939	0.0117
53	2.0054	0.0115
54	2.0168	0.0114
55	2.0280	0.0112
56	2.0390	0.0111
57	2.0500	0.0109
58	2.0608	0.0108
59	2.0715	0.0107
60	2.0820	0.0106
61	2.0924	0.0104
62	2.1028	0.0103
63	2.1130	0.0102
64	2.1230	0.0101

65	2.1330	0.0100
66	2.1429	0.0099
67	2.1526	0.0098
68	2.1623	0.0097
69	2.1719	0.0096
70	2.1813	0.0095
71	2.1907	0.0094
72	2.2000	0.0093
73	2.2142	0.0142
74	2.2283	0.0141
75	2.2423	0.0140
76	2.2562	0.0139
77	2.2700	0.0138
78	2.2837	0.0137
79	2.2973	0.0136
80	2.3108	0.0135
81	2.3242	0.0134
82	2.3376	0.0133
83	2.3508	0.0133
84	2.3640	0.0132
85	2.3771	0.0131
86	2.3901	0.0130
87	2.4030	0.0129
88	2.4159	0.0128
89	2.4286	0.0128
90	2.4413	0.0127
91	2.4539	0.0126
92	2.4665	0.0125
93	2.4789	0.0125
94	2.4913	0.0124
95	2.5037	0.0123
96	2.5159	0.0123
97	2.5281	0.0122
98	2.5402	0.0121
99	2.5523	0.0121
100	2.5643	0.0120
101	2.5762	0.0119
102	2.5881	0.0119
103	2.5999	0.0118
104	2.6116	0.0117
105	2.6233	0.0117
106	2.6349	0.0116
107	2.6465	0.0116
108	2.6580	0.0115
109	2.6695	0.0115
110	2.6809	0.0114
111	2.6922	0.0113
112	2.7035	0.0113
113	2.7147	0.0112
114	2.7259	0.0112
115	2.7370	0.0111
116	2.7481	0.0111
117	2.7591	0.0110
118	2.7701	0.0110
119	2.7810	0.0109
120	2.7919	0.0109
121	2.8027	0.0108
122	2.8135	0.0108
123	2.8242	0.0107
124	2.8349	0.0107
125	2.8456	0.0106
126	2.8562	0.0106
127	2.8667	0.0106

128	2.8772	0.0105
129	2.8877	0.0105
130	2.8981	0.0104
131	2.9085	0.0104
132	2.9188	0.0103
133	2.9291	0.0103
134	2.9394	0.0103
135	2.9496	0.0102
136	2.9597	0.0102
137	2.9699	0.0101
138	2.9800	0.0101
139	2.9900	0.0101
140	3.0000	0.0100
141	3.0100	0.0100
142	3.0200	0.0099
143	3.0299	0.0099
144	3.0397	0.0099
145	3.0495	0.0098
146	3.0593	0.0098
147	3.0691	0.0098
148	3.0788	0.0097
149	3.0885	0.0097
150	3.0982	0.0097
151	3.1078	0.0096
152	3.1174	0.0096
153	3.1269	0.0095
154	3.1364	0.0095
155	3.1459	0.0095
156	3.1554	0.0095
157	3.1648	0.0094
158	3.1742	0.0094
159	3.1835	0.0094
160	3.1928	0.0093
161	3.2021	0.0093
162	3.2114	0.0093
163	3.2206	0.0092
164	3.2298	0.0092
165	3.2390	0.0092
166	3.2481	0.0091
167	3.2573	0.0091
168	3.2663	0.0091
169	3.2754	0.0091
170	3.2844	0.0090
171	3.2934	0.0090
172	3.3024	0.0090
173	3.3113	0.0089
174	3.3202	0.0089
175	3.3291	0.0089
176	3.3380	0.0089
177	3.3468	0.0088
178	3.3556	0.0088
179	3.3644	0.0088
180	3.3732	0.0088
181	3.3819	0.0087
182	3.3906	0.0087
183	3.3993	0.0087
184	3.4079	0.0087
185	3.4165	0.0086
186	3.4251	0.0086
187	3.4337	0.0086
188	3.4423	0.0086
189	3.4508	0.0085
190	3.4593	0.0085

191	3.4678	0.0085
192	3.4762	0.0085
193	3.4847	0.0084
194	3.4931	0.0084
195	3.5015	0.0084
196	3.5098	0.0084
197	3.5182	0.0083
198	3.5265	0.0083
199	3.5348	0.0083
200	3.5431	0.0083
201	3.5513	0.0083
202	3.5596	0.0082
203	3.5678	0.0082
204	3.5760	0.0082
205	3.5841	0.0082
206	3.5923	0.0081
207	3.6004	0.0081
208	3.6085	0.0081
209	3.6166	0.0081
210	3.6246	0.0081
211	3.6327	0.0080
212	3.6407	0.0080
213	3.6487	0.0080
214	3.6567	0.0080
215	3.6646	0.0080
216	3.6726	0.0079
217	3.6805	0.0079
218	3.6884	0.0079
219	3.6963	0.0079
220	3.7041	0.0079
221	3.7120	0.0078
222	3.7198	0.0078
223	3.7276	0.0078
224	3.7354	0.0078
225	3.7432	0.0078
226	3.7509	0.0078
227	3.7587	0.0077
228	3.7664	0.0077
229	3.7741	0.0077
230	3.7817	0.0077
231	3.7894	0.0077
232	3.7971	0.0076
233	3.8047	0.0076
234	3.8123	0.0076
235	3.8199	0.0076
236	3.8274	0.0076
237	3.8350	0.0076
238	3.8425	0.0075
239	3.8501	0.0075
240	3.8576	0.0075
241	3.8651	0.0075
242	3.8725	0.0075
243	3.8800	0.0075
244	3.8874	0.0074
245	3.8949	0.0074
246	3.9023	0.0074
247	3.9097	0.0074
248	3.9170	0.0074
249	3.9244	0.0074
250	3.9317	0.0073
251	3.9391	0.0073
252	3.9464	0.0073
253	3.9537	0.0073

254	3.9609	0.0073
255	3.9682	0.0073
256	3.9755	0.0073
257	3.9827	0.0072
258	3.9899	0.0072
259	3.9971	0.0072
260	4.0043	0.0072
261	4.0115	0.0072
262	4.0187	0.0072
263	4.0258	0.0071
264	4.0329	0.0071
265	4.0401	0.0071
266	4.0472	0.0071
267	4.0543	0.0071
268	4.0613	0.0071
269	4.0684	0.0071
270	4.0754	0.0070
271	4.0825	0.0070
272	4.0895	0.0070
273	4.0965	0.0070
274	4.1035	0.0070
275	4.1105	0.0070
276	4.1174	0.0070
277	4.1244	0.0070
278	4.1313	0.0069
279	4.1382	0.0069
280	4.1452	0.0069
281	4.1521	0.0069
282	4.1589	0.0069
283	4.1658	0.0069
284	4.1727	0.0069
285	4.1795	0.0068
286	4.1864	0.0068
287	4.1932	0.0068
288	4.2000	0.0068

Unit Period (number)	Unit Rainfall (In)	Unit Soil-Loss (In)	Effective Rainfall (In)
1	0.0068	0.0009	0.0059
2	0.0068	0.0009	0.0059
3	0.0068	0.0009	0.0059
4	0.0069	0.0009	0.0059
5	0.0069	0.0009	0.0060
6	0.0069	0.0009	0.0060
7	0.0069	0.0009	0.0060
8	0.0069	0.0009	0.0060
9	0.0070	0.0009	0.0060
10	0.0070	0.0009	0.0060
11	0.0070	0.0009	0.0061
12	0.0070	0.0009	0.0061
13	0.0070	0.0009	0.0061
14	0.0071	0.0010	0.0061
15	0.0071	0.0010	0.0061
16	0.0071	0.0010	0.0061
17	0.0071	0.0010	0.0062
18	0.0071	0.0010	0.0062
19	0.0072	0.0010	0.0062
20	0.0072	0.0010	0.0062
21	0.0072	0.0010	0.0062
22	0.0072	0.0010	0.0063
23	0.0073	0.0010	0.0063

24	0.0073	0.0010	0.0063
25	0.0073	0.0010	0.0063
26	0.0073	0.0010	0.0063
27	0.0074	0.0010	0.0064
28	0.0074	0.0010	0.0064
29	0.0074	0.0010	0.0064
30	0.0074	0.0010	0.0064
31	0.0075	0.0010	0.0065
32	0.0075	0.0010	0.0065
33	0.0075	0.0010	0.0065
34	0.0075	0.0010	0.0065
35	0.0076	0.0010	0.0065
36	0.0076	0.0010	0.0066
37	0.0076	0.0010	0.0066
38	0.0076	0.0010	0.0066
39	0.0077	0.0010	0.0066
40	0.0077	0.0010	0.0066
41	0.0077	0.0010	0.0067
42	0.0077	0.0010	0.0067
43	0.0078	0.0010	0.0067
44	0.0078	0.0010	0.0067
45	0.0078	0.0011	0.0068
46	0.0078	0.0011	0.0068
47	0.0079	0.0011	0.0068
48	0.0079	0.0011	0.0068
49	0.0079	0.0011	0.0069
50	0.0080	0.0011	0.0069
51	0.0080	0.0011	0.0069
52	0.0080	0.0011	0.0069
53	0.0081	0.0011	0.0070
54	0.0081	0.0011	0.0070
55	0.0081	0.0011	0.0070
56	0.0081	0.0011	0.0070
57	0.0082	0.0011	0.0071
58	0.0082	0.0011	0.0071
59	0.0083	0.0011	0.0071
60	0.0083	0.0011	0.0072
61	0.0083	0.0011	0.0072
62	0.0083	0.0011	0.0072
63	0.0084	0.0011	0.0073
64	0.0084	0.0011	0.0073
65	0.0085	0.0011	0.0073
66	0.0085	0.0011	0.0073
67	0.0085	0.0011	0.0074
68	0.0086	0.0012	0.0074
69	0.0086	0.0012	0.0074
70	0.0086	0.0012	0.0075
71	0.0087	0.0012	0.0075
72	0.0087	0.0012	0.0075
73	0.0088	0.0012	0.0076
74	0.0088	0.0012	0.0076
75	0.0088	0.0012	0.0076
76	0.0089	0.0012	0.0077
77	0.0089	0.0012	0.0077
78	0.0089	0.0012	0.0077
79	0.0090	0.0012	0.0078
80	0.0090	0.0012	0.0078
81	0.0091	0.0012	0.0079
82	0.0091	0.0012	0.0079
83	0.0092	0.0012	0.0079
84	0.0092	0.0012	0.0080
85	0.0093	0.0012	0.0080
86	0.0093	0.0013	0.0080

87	0.0094	0.0013	0.0081
88	0.0094	0.0013	0.0081
89	0.0095	0.0013	0.0082
90	0.0095	0.0013	0.0082
91	0.0095	0.0013	0.0083
92	0.0096	0.0013	0.0083
93	0.0097	0.0013	0.0084
94	0.0097	0.0013	0.0084
95	0.0098	0.0013	0.0084
96	0.0098	0.0013	0.0085
97	0.0099	0.0013	0.0085
98	0.0099	0.0013	0.0086
99	0.0100	0.0013	0.0086
100	0.0100	0.0013	0.0087
101	0.0101	0.0014	0.0087
102	0.0101	0.0014	0.0088
103	0.0102	0.0014	0.0088
104	0.0103	0.0014	0.0089
105	0.0103	0.0014	0.0089
106	0.0104	0.0014	0.0090
107	0.0105	0.0014	0.0091
108	0.0105	0.0014	0.0091
109	0.0106	0.0014	0.0092
110	0.0106	0.0014	0.0092
111	0.0107	0.0014	0.0093
112	0.0108	0.0015	0.0093
113	0.0109	0.0015	0.0094
114	0.0109	0.0015	0.0095
115	0.0110	0.0015	0.0095
116	0.0111	0.0015	0.0096
117	0.0112	0.0015	0.0097
118	0.0112	0.0015	0.0097
119	0.0113	0.0015	0.0098
120	0.0114	0.0015	0.0099
121	0.0115	0.0016	0.0100
122	0.0116	0.0016	0.0100
123	0.0117	0.0016	0.0101
124	0.0117	0.0016	0.0102
125	0.0119	0.0016	0.0103
126	0.0119	0.0016	0.0103
127	0.0121	0.0016	0.0104
128	0.0121	0.0016	0.0105
129	0.0123	0.0017	0.0106
130	0.0123	0.0017	0.0107
131	0.0125	0.0017	0.0108
132	0.0125	0.0017	0.0109
133	0.0127	0.0017	0.0110
134	0.0128	0.0017	0.0110
135	0.0129	0.0017	0.0112
136	0.0130	0.0018	0.0113
137	0.0132	0.0018	0.0114
138	0.0133	0.0018	0.0115
139	0.0134	0.0018	0.0116
140	0.0135	0.0018	0.0117
141	0.0137	0.0018	0.0119
142	0.0138	0.0019	0.0119
143	0.0140	0.0019	0.0121
144	0.0141	0.0019	0.0122
145	0.0093	0.0013	0.0080
146	0.0094	0.0013	0.0081
147	0.0096	0.0013	0.0083
148	0.0097	0.0013	0.0084
149	0.0099	0.0013	0.0085

150	0.0100	0.0013	0.0086
151	0.0102	0.0014	0.0088
152	0.0103	0.0014	0.0089
153	0.0106	0.0014	0.0091
154	0.0107	0.0014	0.0092
155	0.0109	0.0015	0.0095
156	0.0111	0.0015	0.0096
157	0.0114	0.0015	0.0098
158	0.0115	0.0016	0.0100
159	0.0118	0.0016	0.0102
160	0.0120	0.0016	0.0104
161	0.0123	0.0017	0.0107
162	0.0125	0.0017	0.0108
163	0.0129	0.0017	0.0112
164	0.0131	0.0018	0.0114
165	0.0136	0.0018	0.0117
166	0.0138	0.0019	0.0119
167	0.0143	0.0019	0.0124
168	0.0146	0.0020	0.0126
169	0.0151	0.0020	0.0131
170	0.0154	0.0021	0.0134
171	0.0161	0.0022	0.0139
172	0.0164	0.0022	0.0142
173	0.0172	0.0023	0.0149
174	0.0176	0.0024	0.0153
175	0.0186	0.0025	0.0161
176	0.0191	0.0026	0.0165
177	0.0202	0.0027	0.0175
178	0.0208	0.0028	0.0180
179	0.0222	0.0030	0.0192
180	0.0230	0.0031	0.0199
181	0.0248	0.0033	0.0214
182	0.0258	0.0035	0.0223
183	0.0283	0.0038	0.0245
184	0.0297	0.0040	0.0257
185	0.0330	0.0044	0.0285
186	0.0351	0.0047	0.0304
187	0.0408	0.0055	0.0353
188	0.0445	0.0060	0.0385
189	0.0553	0.0061	0.0492
190	0.0637	0.0061	0.0576
191	0.0967	0.0061	0.0906
192	0.1404	0.0061	0.1343
193	0.6073	0.0061	0.6012
194	0.0761	0.0061	0.0700
195	0.0492	0.0061	0.0431
196	0.0377	0.0051	0.0326
197	0.0314	0.0042	0.0271
198	0.0270	0.0036	0.0233
199	0.0238	0.0032	0.0206
200	0.0215	0.0029	0.0186
201	0.0196	0.0026	0.0170
202	0.0181	0.0024	0.0156
203	0.0168	0.0023	0.0146
204	0.0158	0.0021	0.0136
205	0.0148	0.0020	0.0128
206	0.0140	0.0019	0.0122
207	0.0133	0.0018	0.0115
208	0.0127	0.0017	0.0110
209	0.0122	0.0016	0.0105
210	0.0117	0.0016	0.0101
211	0.0112	0.0015	0.0097
212	0.0108	0.0015	0.0093

213	0.0104	0.0014	0.0090
214	0.0101	0.0014	0.0087
215	0.0098	0.0013	0.0084
216	0.0095	0.0013	0.0082
217	0.0142	0.0019	0.0123
218	0.0139	0.0019	0.0120
219	0.0136	0.0018	0.0118
220	0.0133	0.0018	0.0115
221	0.0131	0.0018	0.0113
222	0.0128	0.0017	0.0111
223	0.0126	0.0017	0.0109
224	0.0124	0.0017	0.0107
225	0.0122	0.0016	0.0105
226	0.0120	0.0016	0.0104
227	0.0118	0.0016	0.0102
228	0.0116	0.0016	0.0101
229	0.0115	0.0015	0.0099
230	0.0113	0.0015	0.0098
231	0.0111	0.0015	0.0096
232	0.0110	0.0015	0.0095
233	0.0108	0.0015	0.0094
234	0.0107	0.0014	0.0092
235	0.0106	0.0014	0.0091
236	0.0104	0.0014	0.0090
237	0.0103	0.0014	0.0089
238	0.0102	0.0014	0.0088
239	0.0101	0.0014	0.0087
240	0.0099	0.0013	0.0086
241	0.0098	0.0013	0.0085
242	0.0097	0.0013	0.0084
243	0.0096	0.0013	0.0083
244	0.0095	0.0013	0.0082
245	0.0094	0.0013	0.0081
246	0.0093	0.0013	0.0081
247	0.0092	0.0012	0.0080
248	0.0091	0.0012	0.0079
249	0.0091	0.0012	0.0078
250	0.0090	0.0012	0.0078
251	0.0089	0.0012	0.0077
252	0.0088	0.0012	0.0076
253	0.0087	0.0012	0.0076
254	0.0087	0.0012	0.0075
255	0.0086	0.0012	0.0074
256	0.0085	0.0011	0.0074
257	0.0084	0.0011	0.0073
258	0.0084	0.0011	0.0072
259	0.0083	0.0011	0.0072
260	0.0082	0.0011	0.0071
261	0.0082	0.0011	0.0071
262	0.0081	0.0011	0.0070
263	0.0080	0.0011	0.0070
264	0.0080	0.0011	0.0069
265	0.0079	0.0011	0.0069
266	0.0079	0.0011	0.0068
267	0.0078	0.0011	0.0068
268	0.0078	0.0010	0.0067
269	0.0077	0.0010	0.0067
270	0.0076	0.0010	0.0066
271	0.0076	0.0010	0.0066
272	0.0075	0.0010	0.0065
273	0.0075	0.0010	0.0065
274	0.0074	0.0010	0.0064
275	0.0074	0.0010	0.0064

276	0.0073	0.0010	0.0064
277	0.0073	0.0010	0.0063
278	0.0073	0.0010	0.0063
279	0.0072	0.0010	0.0062
280	0.0072	0.0010	0.0062
281	0.0071	0.0010	0.0062
282	0.0071	0.0010	0.0061
283	0.0070	0.0009	0.0061
284	0.0070	0.0009	0.0061
285	0.0070	0.0009	0.0060
286	0.0069	0.0009	0.0060
287	0.0069	0.0009	0.0059
288	0.0068	0.0009	0.0059

Total soil rain loss = 0.46(In)
Total effective rainfall = 3.74(In)
Peak flow rate in flood hydrograph = 7.16(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	0.01	Q				
0+10	0.0004	0.05	Q				
0+15	0.0011	0.10	Q				
0+20	0.0020	0.13	Q				
0+25	0.0030	0.14	Q				
0+30	0.0040	0.15	Q				
0+35	0.0051	0.16	Q				
0+40	0.0063	0.17	Q				
0+45	0.0074	0.17	Q				
0+50	0.0086	0.17	Q				
0+55	0.0098	0.18	Q				
1+ 0	0.0111	0.18	Q				
1+ 5	0.0123	0.18	Q				
1+10	0.0135	0.18	Q				
1+15	0.0148	0.18	Q				
1+20	0.0161	0.18	Q				
1+25	0.0173	0.18	Q				
1+30	0.0186	0.19	Q				
1+35	0.0199	0.19	QV				
1+40	0.0212	0.19	QV				
1+45	0.0225	0.19	QV				
1+50	0.0238	0.19	QV				
1+55	0.0250	0.19	QV				
2+ 0	0.0263	0.19	QV				
2+ 5	0.0277	0.19	QV				
2+10	0.0290	0.19	QV				
2+15	0.0303	0.19	QV				
2+20	0.0316	0.19	QV				
2+25	0.0329	0.19	QV				
2+30	0.0342	0.19	QV				
2+35	0.0356	0.19	QV				
2+40	0.0369	0.19	QV				
2+45	0.0382	0.19	QV				
2+50	0.0396	0.19	Q V				
2+55	0.0409	0.20	Q V				

3+ 0	0.0423	0.20	Q V				
3+ 5	0.0436	0.20	Q V				
3+10	0.0450	0.20	Q V				
3+15	0.0464	0.20	Q V				
3+20	0.0477	0.20	Q V				
3+25	0.0491	0.20	Q V				
3+30	0.0505	0.20	Q V				
3+35	0.0519	0.20	Q V				
3+40	0.0533	0.20	Q V				
3+45	0.0546	0.20	Q V				
3+50	0.0560	0.20	Q V				
3+55	0.0574	0.20	Q V				
4+ 0	0.0589	0.20	Q V				
4+ 5	0.0603	0.21	Q V				
4+10	0.0617	0.21	Q V				
4+15	0.0631	0.21	Q V				
4+20	0.0645	0.21	Q V				
4+25	0.0660	0.21	Q V				
4+30	0.0674	0.21	Q V				
4+35	0.0689	0.21	Q V				
4+40	0.0703	0.21	Q V				
4+45	0.0718	0.21	Q V				
4+50	0.0732	0.21	Q V				
4+55	0.0747	0.21	Q V				
5+ 0	0.0762	0.21	Q V				
5+ 5	0.0777	0.21	Q V				
5+10	0.0791	0.22	Q V				
5+15	0.0806	0.22	Q V				
5+20	0.0821	0.22	Q V				
5+25	0.0836	0.22	Q V				
5+30	0.0851	0.22	Q V				
5+35	0.0867	0.22	Q V				
5+40	0.0882	0.22	Q V				
5+45	0.0897	0.22	Q V				
5+50	0.0912	0.22	Q V				
5+55	0.0928	0.22	Q V				
6+ 0	0.0943	0.22	Q V				
6+ 5	0.0959	0.23	Q V				
6+10	0.0974	0.23	Q V				
6+15	0.0990	0.23	Q V				
6+20	0.1006	0.23	Q V				
6+25	0.1022	0.23	Q V				
6+30	0.1038	0.23	Q V				
6+35	0.1054	0.23	Q V				
6+40	0.1070	0.23	Q V				
6+45	0.1086	0.23	Q V				
6+50	0.1102	0.24	Q V				
6+55	0.1118	0.24	Q V				
7+ 0	0.1135	0.24	Q V				
7+ 5	0.1151	0.24	Q V				
7+10	0.1167	0.24	Q V				
7+15	0.1184	0.24	Q V				
7+20	0.1201	0.24	Q V				
7+25	0.1217	0.24	Q V				
7+30	0.1234	0.24	Q V				
7+35	0.1251	0.25	Q V				
7+40	0.1268	0.25	Q V				
7+45	0.1285	0.25	Q V				
7+50	0.1303	0.25	Q V				
7+55	0.1320	0.25	IQ V				
8+ 0	0.1337	0.25	IQ V				
8+ 5	0.1355	0.25	IQ V				
8+10	0.1372	0.25	IQ V				

8+15	0.1390	0.26	Q	V				
8+20	0.1408	0.26	Q	V				
8+25	0.1425	0.26	Q	V				
8+30	0.1443	0.26	Q	V				
8+35	0.1461	0.26	Q	V				
8+40	0.1480	0.26	Q	V				
8+45	0.1498	0.27	Q	V				
8+50	0.1516	0.27	Q	V				
8+55	0.1535	0.27	Q	V				
9+ 0	0.1553	0.27	Q	V				
9+ 5	0.1572	0.27	Q	V				
9+10	0.1591	0.27	Q	V				
9+15	0.1610	0.28	Q	V				
9+20	0.1629	0.28	Q	V				
9+25	0.1648	0.28	Q	V				
9+30	0.1667	0.28	Q	V				
9+35	0.1687	0.28	Q	V				
9+40	0.1706	0.28	Q	V				
9+45	0.1726	0.29	Q	V				
9+50	0.1746	0.29	Q	V				
9+55	0.1766	0.29	Q	V				
10+ 0	0.1786	0.29	Q	V				
10+ 5	0.1806	0.29	Q	V				
10+10	0.1827	0.30	Q	V				
10+15	0.1847	0.30	Q	V				
10+20	0.1868	0.30	Q	V				
10+25	0.1889	0.30	Q	V				
10+30	0.1910	0.31	Q	V				
10+35	0.1931	0.31	Q	V				
10+40	0.1952	0.31	Q	V				
10+45	0.1974	0.31	Q	V				
10+50	0.1995	0.31	Q	V				
10+55	0.2017	0.32	Q	V				
11+ 0	0.2039	0.32	Q	V				
11+ 5	0.2062	0.32	Q	V				
11+10	0.2084	0.33	Q	V				
11+15	0.2107	0.33	Q	V				
11+20	0.2129	0.33	Q	V				
11+25	0.2152	0.33	Q	V				
11+30	0.2176	0.34	Q	V				
11+35	0.2199	0.34	Q	V				
11+40	0.2223	0.34	Q	V				
11+45	0.2247	0.35	Q	V				
11+50	0.2271	0.35	Q	V				
11+55	0.2295	0.35	Q	V				
12+ 0	0.2320	0.36	Q	V				
12+ 5	0.2344	0.36	Q	V				
12+10	0.2367	0.33	Q	V				
12+15	0.2387	0.29	Q	V				
12+20	0.2407	0.28	Q	V				
12+25	0.2425	0.27	Q	V				
12+30	0.2444	0.27	Q	V				
12+35	0.2462	0.27	Q	V				
12+40	0.2481	0.27	Q	V				
12+45	0.2499	0.27	Q	V				
12+50	0.2518	0.27	Q	V				
12+55	0.2537	0.27	Q	V				
13+ 0	0.2556	0.28	Q	V				
13+ 5	0.2575	0.28	Q	V				
13+10	0.2595	0.29	Q	V				
13+15	0.2615	0.29	Q	V				
13+20	0.2636	0.30	Q	V				
13+25	0.2657	0.30	Q	V				

13+30	0.2678	0.31	Q		V				
13+35	0.2700	0.32	Q		V				
13+40	0.2722	0.32	Q		V				
13+45	0.2744	0.33	Q		V				
13+50	0.2768	0.34	Q		V				
13+55	0.2791	0.35	Q		V				
14+ 0	0.2816	0.35	Q		V				
14+ 5	0.2841	0.36	Q		V				
14+10	0.2867	0.37	Q		V				
14+15	0.2893	0.38	Q		V				
14+20	0.2920	0.40	Q		V				
14+25	0.2948	0.41	Q		V				
14+30	0.2977	0.42	Q		V				
14+35	0.3007	0.43	Q		V				
14+40	0.3038	0.45	Q		V				
14+45	0.3070	0.47	Q		V				
14+50	0.3104	0.49	Q		V				
14+55	0.3138	0.51	Q		V				
15+ 0	0.3175	0.53	Q		V				
15+ 5	0.3213	0.55	Q		V				
15+10	0.3253	0.58	Q		V				
15+15	0.3296	0.62	Q		V				
15+20	0.3340	0.65	Q		V				
15+25	0.3388	0.70	Q		V				
15+30	0.3440	0.75	Q		V				
15+35	0.3496	0.81	Q		V				
15+40	0.3557	0.89	Q		V				
15+45	0.3625	0.99	Q		V				
15+50	0.3703	1.14	Q		V				
15+55	0.3798	1.37	Q		V				
16+ 0	0.3922	1.80	Q		V				
16+ 5	0.4129	3.01	Q		V				
16+10	0.4567	6.37	Q		V				
16+15	0.5060	7.16	Q		V				
16+20	0.5348	4.17	Q		V				
16+25	0.5546	2.88	Q		V				
16+30	0.5696	2.18	Q		V				
16+35	0.5816	1.74	Q		V				
16+40	0.5913	1.41	Q		V				
16+45	0.5995	1.19	Q		V				
16+50	0.6065	1.02	Q		V				
16+55	0.6125	0.87	Q		V				
17+ 0	0.6177	0.75	Q		V				
17+ 5	0.6221	0.64	Q		V				
17+10	0.6262	0.60	Q		V				
17+15	0.6301	0.56	Q		V				
17+20	0.6335	0.49	Q		V				
17+25	0.6366	0.44	Q		V				
17+30	0.6391	0.37	Q		V				
17+35	0.6415	0.35	Q		V				
17+40	0.6438	0.33	Q		V				
17+45	0.6460	0.32	Q		V				
17+50	0.6480	0.30	Q		V				
17+55	0.6500	0.29	Q		V				
18+ 0	0.6520	0.28	Q		V				
18+ 5	0.6538	0.27	Q		V				
18+10	0.6559	0.30	Q		V				
18+15	0.6581	0.33	Q		V				
18+20	0.6604	0.34	Q		V				
18+25	0.6628	0.34	Q		V				
18+30	0.6651	0.34	Q		V				
18+35	0.6674	0.34	Q		V				
18+40	0.6697	0.33	Q		V				

18+45	0.6720	0.33	IQ				V	
18+50	0.6743	0.33	IQ				V	
18+55	0.6765	0.32	IQ				V	
19+ 0	0.6787	0.32	IQ				V	
19+ 5	0.6808	0.31	IQ				V	
19+10	0.6829	0.31	IQ				V	
19+15	0.6850	0.30	IQ				V	
19+20	0.6871	0.30	IQ				V	
19+25	0.6892	0.30	IQ				V	
19+30	0.6912	0.29	IQ				V	
19+35	0.6932	0.29	IQ				V	
19+40	0.6951	0.28	IQ				V	
19+45	0.6971	0.28	IQ				V	
19+50	0.6990	0.28	IQ				V	
19+55	0.7008	0.27	IQ				V	
20+ 0	0.7027	0.27	IQ				V	
20+ 5	0.7045	0.27	IQ				V	
20+10	0.7064	0.26	IQ				V	
20+15	0.7082	0.26	IQ				V	
20+20	0.7099	0.26	IQ				V	
20+25	0.7117	0.26	IQ				V	
20+30	0.7134	0.25	IQ				V	
20+35	0.7151	0.25	Q				V	
20+40	0.7168	0.25	Q				V	
20+45	0.7185	0.24	Q				V	
20+50	0.7202	0.24	Q				V	
20+55	0.7218	0.24	Q				V	
21+ 0	0.7235	0.24	Q				V	
21+ 5	0.7251	0.24	Q				V	
21+10	0.7267	0.23	Q				V	
21+15	0.7283	0.23	Q				V	
21+20	0.7299	0.23	Q				V	
21+25	0.7314	0.23	Q				V	
21+30	0.7330	0.22	Q				V	
21+35	0.7345	0.22	Q				V	
21+40	0.7360	0.22	Q				V	
21+45	0.7376	0.22	Q				V	
21+50	0.7390	0.22	Q				V	
21+55	0.7405	0.22	Q				V	
22+ 0	0.7420	0.21	Q				V	
22+ 5	0.7435	0.21	Q				V	
22+10	0.7449	0.21	Q				V	
22+15	0.7464	0.21	Q				V	
22+20	0.7478	0.21	Q				V	
22+25	0.7492	0.21	Q				V	
22+30	0.7506	0.20	Q				V	
22+35	0.7520	0.20	Q				V	
22+40	0.7534	0.20	Q				V	
22+45	0.7548	0.20	Q				V	
22+50	0.7562	0.20	Q				V	
22+55	0.7575	0.20	Q				V	
23+ 0	0.7589	0.20	Q				V	
23+ 5	0.7602	0.19	Q				V	
23+10	0.7615	0.19	Q				V	
23+15	0.7629	0.19	Q				V	
23+20	0.7642	0.19	Q				V	
23+25	0.7655	0.19	Q				V	
23+30	0.7668	0.19	Q				V	
23+35	0.7681	0.19	Q				V	
23+40	0.7694	0.19	Q				V	
23+45	0.7706	0.19	Q				V	
23+50	0.7719	0.18	Q				V	
23+55	0.7732	0.18	Q				V	

24+ 0	0.7744	0.18	Q				V
24+ 5	0.7756	0.17	Q				V
24+10	0.7765	0.13	Q				V
24+15	0.7771	0.08	Q				V
24+20	0.7774	0.05	Q				V
24+25	0.7777	0.04	Q				V
24+30	0.7778	0.03	Q				V
24+35	0.7780	0.02	Q				V
24+40	0.7781	0.01	Q				V
24+45	0.7782	0.01	Q				V
24+50	0.7782	0.01	Q				V
24+55	0.7783	0.01	Q				V
25+ 0	0.7783	0.00	Q				V
25+ 5	0.7783	0.00	Q				V
25+10	0.7783	0.00	Q				V
25+15	0.7783	0.00	Q				V
25+20	0.7783	0.00	Q				V

APPENDIX III

MAPS