Appendix F Hydrology and Water Quality

This page intentionally left blank.

PRELIMINARY

DRAINAGE STUDY

Arrowhead Springs Specific Plan

CITY OF SAN BERNARDINO, CA

March, 2005

PREPARED FOR

American Development Group
24600 Arrowhead Springs Road
San Bernardino, Ca 92414
(909) 875-1400

PREPARED BY:

TRANSTECH
624 Canyon Road
Walnut, CA 91789
Phone: (760) 310-8012

TABLE OF CONTENTS

	Page No.
Introduction	1
Project Summary	1
Existing Conditions and Background	1
Project Description	2
Discussion	2
Hydrology Methodology	3
Determination of Runoff Coefficient	3
Determination of Average Area Point Precipitation, Low Loss Fraction, and Maximum Loss Rate	3
Determination of Area	3
Conclusion	3

LIST OF TABLES

TABLE-1	Unit Hydrograph Peak Flow summary	4

LIST OF FIGURES

Figure 1	Vicinity Map	5
Figure 2	Vicinity Map/Mapping Vision	6
Figure 3	Soils Group, Southwest-B Area	7
Figure 4	Valley Area Isohyetals, 100 Year 1 HR	8
Figure 5	Valley Area Isohyetals, 100 Year 6 HR	9
Figure 6	Valley Area Isohyetals, 100 Year 24 HR	10

APPENDICES

Appendix-1	Watershed Information Form-Waterman Canyon and related graphs and worksheets	11-22
Appendix-2	Watershed Information Form-East Twin Creek and related graphs and worksheets	23-34
Appendix-3	General Tables and Graphs from san Bernardino Flood Manual as used for preparation of Watershed Information Forms.	35-41
Appendix-4	HYDROLOGY MAP	42
Appendix-5	Unit Hydrograph Analysis Graph	43-115

INTERODUCTION

The purpose of this drainage study is to determine the proposed condition hydrology for the **Arrowhead Springs**, a proposed 765(approx.) lot **single family housing** and **Golf Course** subdivision on vacant land between Waterman Canyon and East Twin Creek, **North of 40th Street and East of HWY 18 to Big Bear/ Arrowhead Lake in the city of San Bernardino, State of California,** and to estimate the potential hydrological impact of the Arrowhead Springs development on the East Twin Creek and Waterman Canyon watercourses in San Bernardino County, CA.
The Study methodology for hydrology is included and the resulting calculations for proposed condition storm flows are provided.

PROJECT SUMMARY

The undeveloped 100-year storm event run off is calculated to be **17,695** CFS including off site storm run off associated with this site under moisture condition of AMC-II.
Upon completion of **Arrowhead Springs**, for 100-year storm event, the total storm water flow from the project is estimated to be **18,167 CFS.** This amount includes off site storm for 100-year storm event under AMC-III moisture condition.
Table-1 presents the summary results of hydrology analysis for this area as it is contributing flow to East Twin Creek and Waterman Canyon for purpose of estimating the potential hydrological impact of this development on the above referenced watercourses.

EXISTING CONDITIONS AND BACKGROUND

Arrowhead Springs is planned for a vacant irregular shaped property bounded on west by State HWY 18, vacant land, and State Forest Land, on south by 40th Street, on east by East Twin Creek, existing Historic Hotel/Spa Resort, and Arrowhead Springs Village and vacant lands, and on north by Lake Arrowhead, Big Bear, Crestline, and vacant lands. The East Twin Creek, Strawberry Creek, and the West Twin Creek that flows through Waterman Canyon compose the major waterways. Arrowhead Springs is divided into these three basins that converge southerly of the property near 40th Street in the City of San Bernardino.
Flows continue southerly across 40th Street through the County of San Bernardino Flood Control District percolation Waterman Canyon basins. Drainage from these areas continues southerly along improved drainage channels, ultimately discharging into the Santa Ana River.

Portions of the property lying adjacent to West Twin Creek and East Twin Creek are subject to 100-year flood plain inundations. However, the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) depicts the flood plain boundaries for the area at north and south of this project, a specific 100-year floodplain elevation has not been determined for this region. This indicates, through final hydrology and storm drain design for this tract the design and construction of the proposed storm structures should consider the pad elevations to be above the flood HGL and to satisfy City, County, and FEMA regulations. The development of the project will require some revisions to be done on FEMA maps, FIRM and FIS.

PROJECT DESCRIPTION

This portion of the Arrowhead Springs Property consists of three proposed parcels (4, 5, & 6), some existing development and undeveloped vacant lands. The proposed parcels 4, 5, and 6 with total of **319** acres development consisting of a **765** (approx.) lots single-family residential subdivision and a Golf Course. There are other commercial and residential developments around these parcels as per general plan for the area and all are considered in preparation of the above preliminary hydrology report.

DISCUSSION

Arrowhead springs will be developed in compliance with all applicable ordinances as required by the local and state agencies. The Golf Course will be graded and improved accordingly. A public street system improved with curbs and gutters and asphalt paving to City standards will provide access to the residential lots, each graded to drain in a positive manner.

The existing 100-year flood plain boundaries meander along the water- courses with varying widths as slope and channel characteristics change. Project development along these areas will be limited to golf course, open space or other passive type uses. The proposed structural/habitable development areas of the project are significantly above any flood plain areas associated with these watercourses.

To protect the development and down stream properties from flood hazard, the drainage system for Arrowhead Springs is designed to transport storm water runoff from each of the sub basins through the site to points where it will be discharged back into the natural water courses. The storm water runoff will generally be carried in the natural drainage courses occurring onsite and within underground pipe systems. Energy dissipaters will be provided at storm drain discharge points as necessary to control erosion. Grading and improvement plans prepared for each final map in the Specific Plan area will include drainage facilities engineered in accordance with the design standards of the City of San Bernardino. Appropriate hydrology and hydraulic calculations will be provided for the City Engineer's review and approval.

The development and implementation of the Arrowhead Springs Specific Plan will require storm water management measures to reduce the discharge of pollutants and protect and enhance the water quality in a manner pursuant to and consistent with the Clean Water Act. The Arrowhead Springs project will incorporate Best Management Practices (BMPs) into the design development of the storm drainage and water quality management systems. Construction requirements for the Arrowhead Springs development will include:

- Submittal of a Notice of Intent (NOI) to the State Water Resources Control Board
- Preparation of a Storm Water Pollution and Prevention Plan (SWPPP)
- Preparation of a Storm Water Quality Management Plan (SWQMP)

HYDROLOGY METHODOLOGY

The preliminary hydrology analyses for the project are attached in this study. The Modified Unit Hydrograph method hydrology of the San Bernardino County Hydrology Manual, August 1986 edition is used. A 100-year storm event (Q100) is used for developed (proposed) condition hydrology under AMC-III of moisture condition. Or undeveloped condition a 100-year storm event (Q100) is used with AMC-II moisture condition. At the time of final hydrology and hydraulic analysis for this development, it will be considered all local, state, and federal regulations if any different than above.

DETERMINATION OF RUNOFF COEFICIENT

Runoff coefficients are dependent on the proposed land use of the basin. Coefficients for this project are those of the San Bernardino County Hydrology Manual.

DETERMINATION OF AVERAGE AREA POINT PRECIPITATION, LOW LOSS FRACTION FACTOR, AND MAXIMUM LOSS RATE

Average area point precipitation, "I", in inches is determined using Isohytals maps of Valley Area as per Figures B-4, B-5, and B-6 for 100-year 1-hour, 100-year 6-hour, and 100-year 24-hour of San Bernardino Flood Manual and method presented as modified hydrograph method in the above Manual. The Hydrologic Soils Group Map for Southwest-B area of San Bernardino County Flood Manual and Arrowhead springs Property Maximum Proposed Land use map prepared by American Development, Inc. are used for determination of average low loss fraction and average maximum loss rate using area area-average weighting method as presented in san Bernardino Flood Manual.

DETERMINATION OF AREA

USGS map is used as base of topo for preparation of this study. The catchment's area boundary for each watercourse is determined based on the valleys and ridges shown on USGS map and the slope of the land as it contributes run-off to East Twin Creek and Waterman Canyon.

CONCLUSION

To allow for grading of building sites and the construction of streets and the installation of utilities and to protect downstream properties, storm water flows must necessarily be controlled in a system of storm drains consisting of both natural channels and man made facilities of the type normally associated with land development. Provided these measures in compliance with City and County of san Bernardino requirements and consistent with accepted engineering and construction practices are taken, Arrowhead Springs can be developed and it and downstream properties kept reasonably free of flood hazard and storm water pollution.

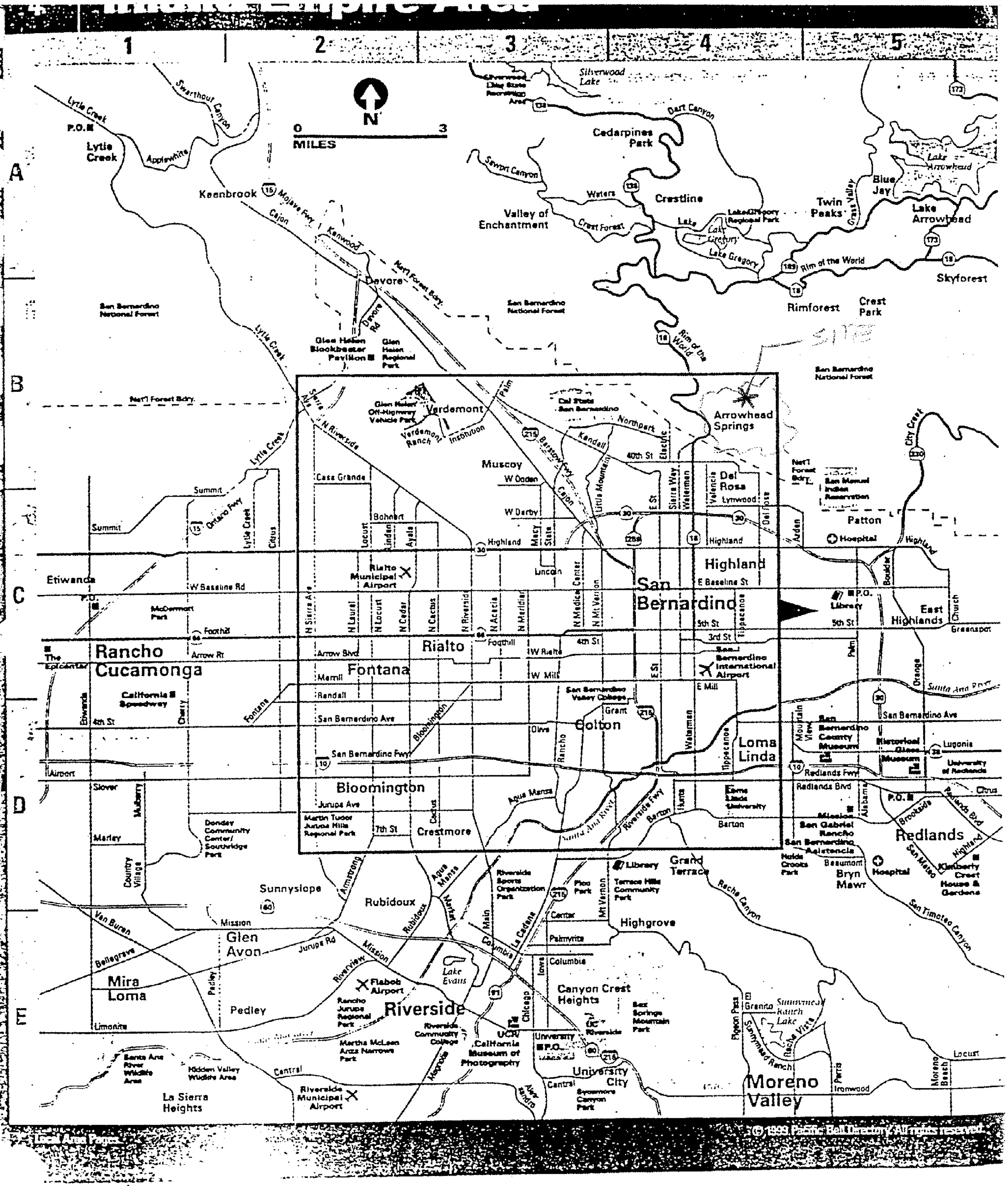
RESULTS

The results of the Unit Hydrograph Analysis are presented in Table-1.

Table-1 Unit Hydrograph Peak Flow Summary

Hydrograph No.	Watershed	Area (Acres)	Peak Flow (cfs)
AS-1	Waterman Canyon Arrowhead Springs, Developed Condition	3394	6450
AS-2	Waterman Canyon Arrowhead Springs, Un-developed Condition	3394	6288
AS-3	East Twin Creek Arrowhead Springs, Developed Condition	5929	11717
AS-4	East Twin Creek Arrowhead Springs, Un-developed Condition	5929	11407

NOTE:
Developed Peak Flows are based on AMC-III moisture condition
Undeveloped Peak Flows are based on AMC-II moisture condition



VICINITY MAP

F-7

FIG-1

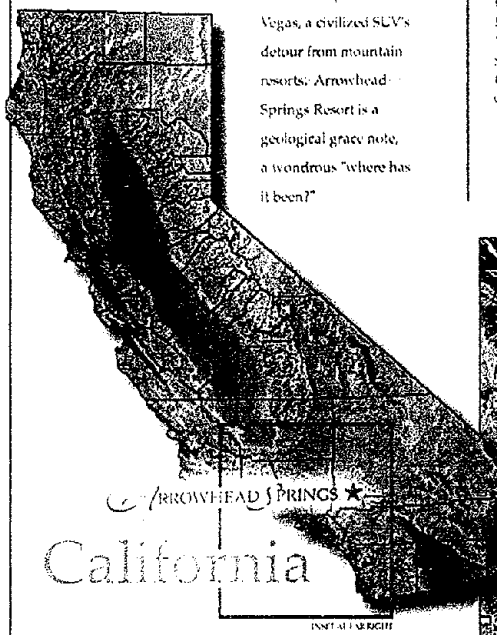
The oasis has never been more accessible. Sixty minutes from Los Angeles, ninety minutes from San Diego. A mere limo drive from Beverly Hills, a Ferrari's hop from Las Vegas, a civilized SUV's detour from mountain resorts. Arrowhead Springs Resort is a geological grace note, a wondrous "where has it been?"

Arrowhead Springs is located in the heart of Southern California known as the "Inland Empire," within a two-hour drive of over 20 million residents. Situated on 2,000 acres at a temperate elevation of 2,000 feet and surrounded on three sides by the San Bernardino National Forest, the site is on a major access route to the popular mountain resorts of Lake Arrowhead, Big Bear and Crestline.

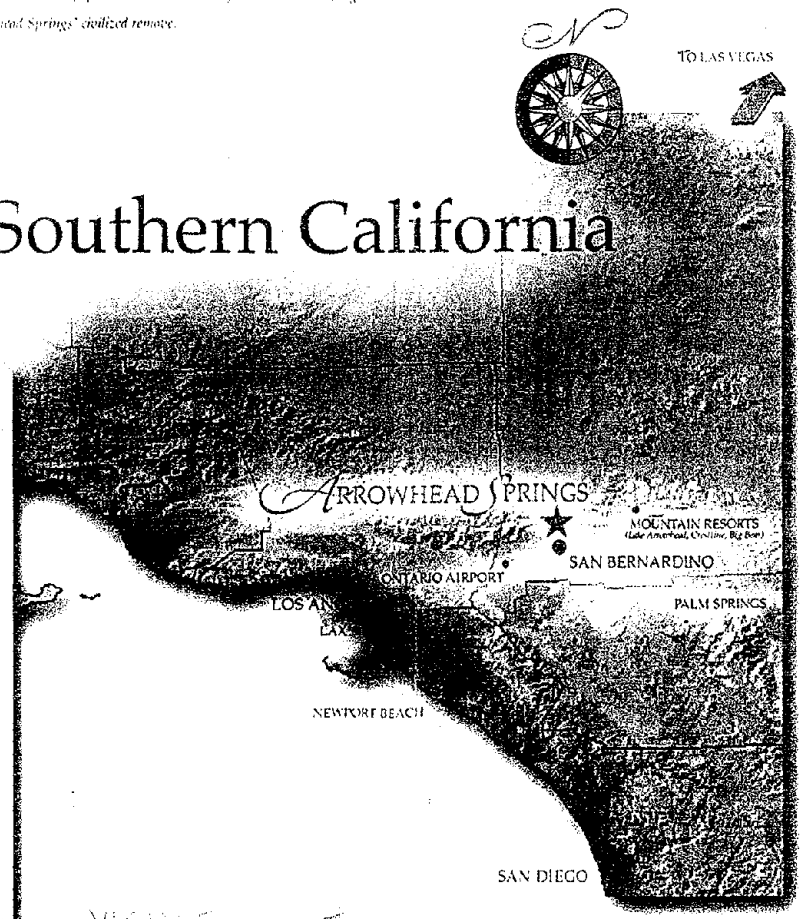
A spectacular valley view to the south across the Inland Empire enhances the uniqueness of Arrowhead Springs' civilized remove.

DISTANCES FROM ARROWHEAD SPRINGS:

[illegible]	60 miles	1 hour
[illegible]	75 miles	90 minutes
[illegible]	18 miles	30 minutes
[illegible]	50 miles	1 hour
[illegible]	37 miles	1 hour
[illegible]	107 miles	90 minutes
[illegible]	225 miles	3 hours, 30 minutes
[illegible]	24 miles	30 minutes



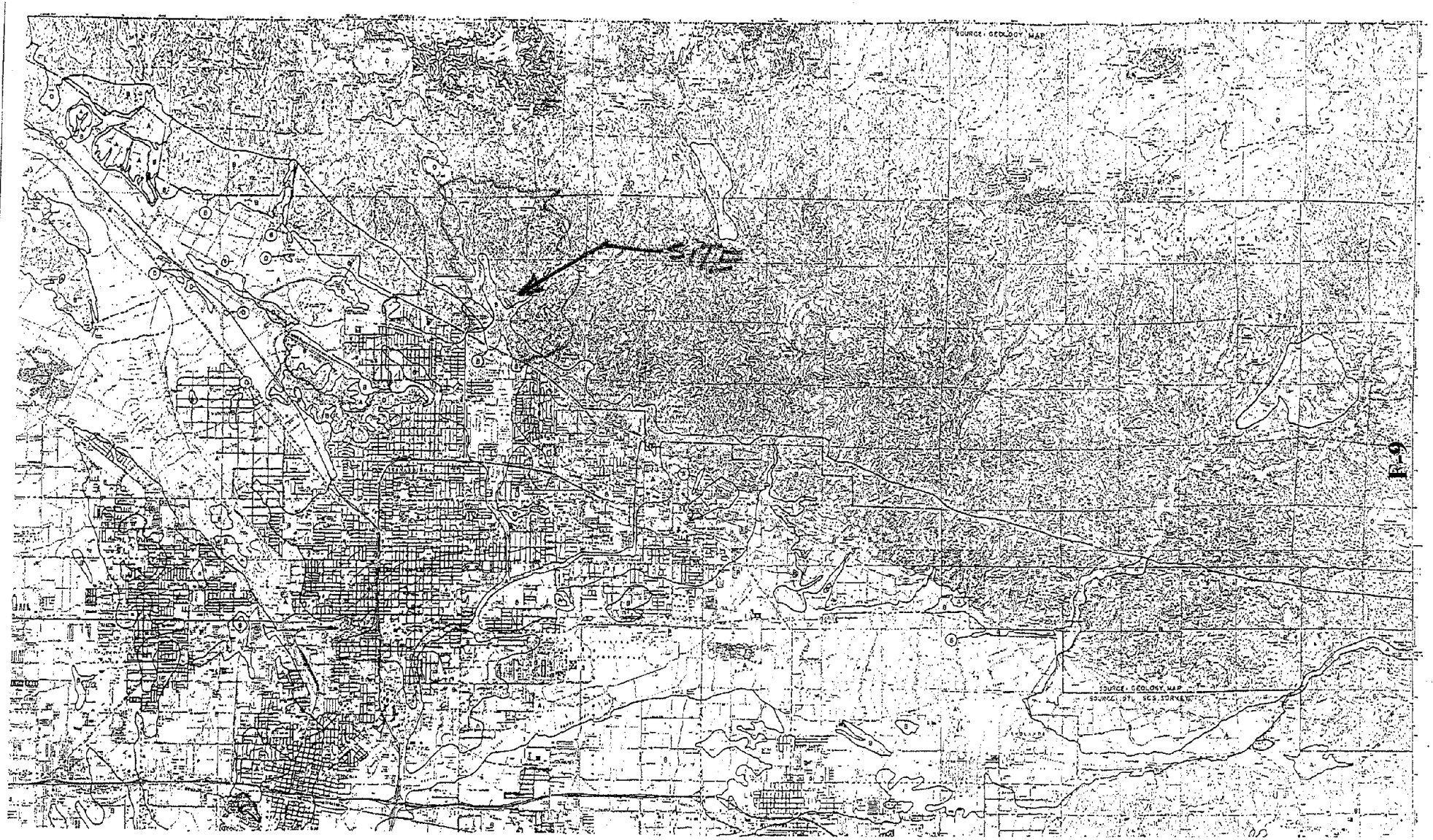
ARROWHEAD SPRINGS

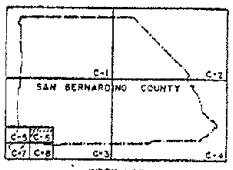


VICINITY

SATELLITE MAP OF ARROWHEAD SPRINGS (Not Intended for Navigation)

Figure 2





INDEX MAP

LEGEND

SOIL GROUP BOUNDARY

A SOIL GROUP DESIGNATION

BOUNDARY OF INDICATED SOURCE

SCALE 1:40,000

SCALE REDUCED BY 1/2

Fig-3

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHWEST-B AREA

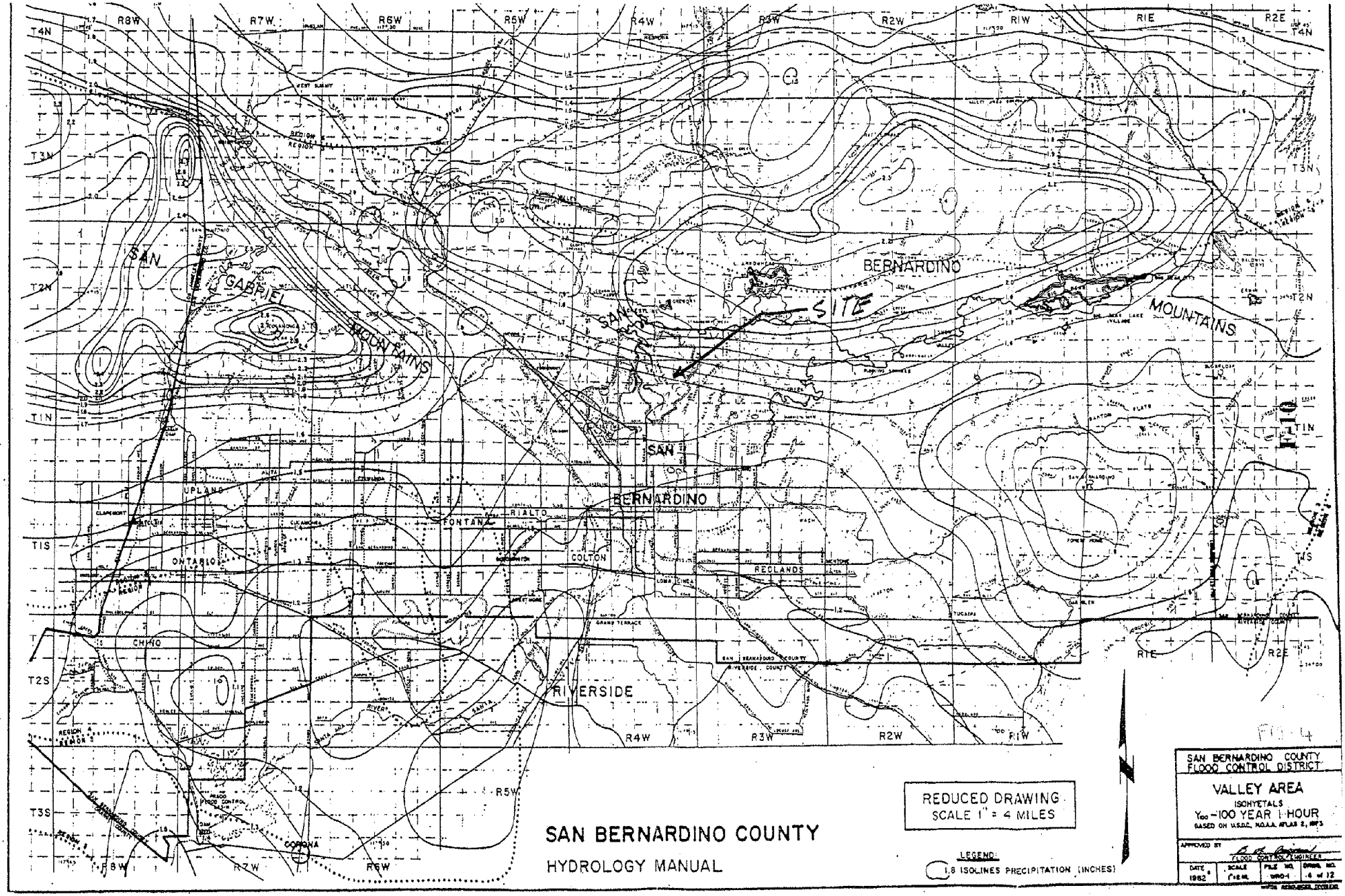
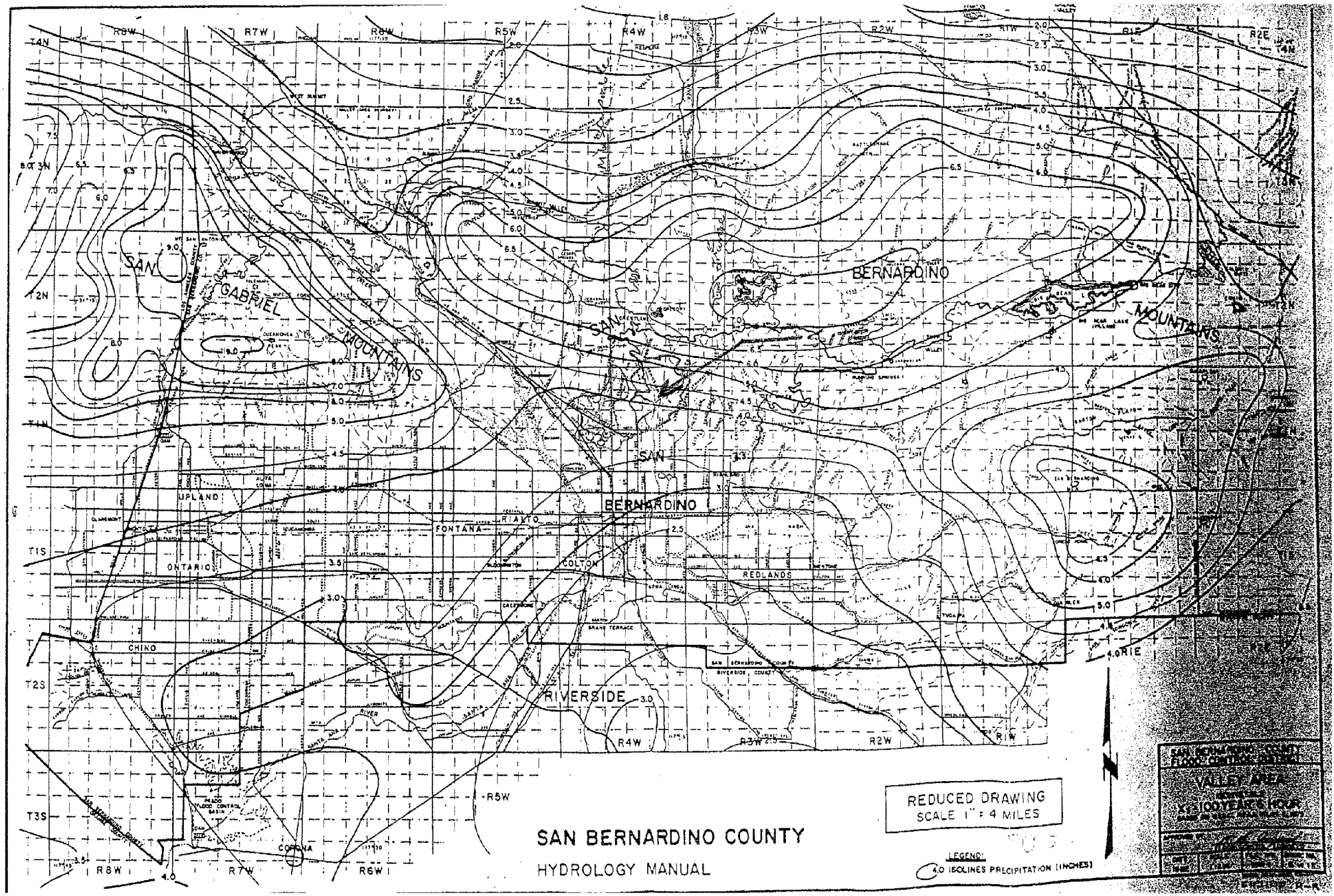

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
LEGEND:
1.8 ISOLINES PRECIPITATION (INCHES)
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT
VALLEY AREA
ISOHYETALS
Y100 - 100 YEAR 1 HOUR
BASED ON U.S.D.C., N.O.A.A. ATLAS 2, NWS
SITE
SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
SAN BERNARDINO
UPLAND
ONTARIO
CHINO
FONTANA
RIALTO
COLTON
REDLANDS
RIVERSIDE
CORONA
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
T4N
T3N
T2N
T1N
T1S
T2S
T3S

FIGURE B-4


SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
LEGEND:
4.0 ISOLINES PRECIPITATION (INCHES)
VALLEY AREA
X = 100 YEAR 6 HOUR
SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
SAN BERNARDINO
RIVERSIDE
UPLAND
ONTARIO
CHINO
CORONA
FONTANA
RIALTO
COLTON
REDLANDS
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
T4N
T3N
T2N
T1N
T1S
T2S
T3S

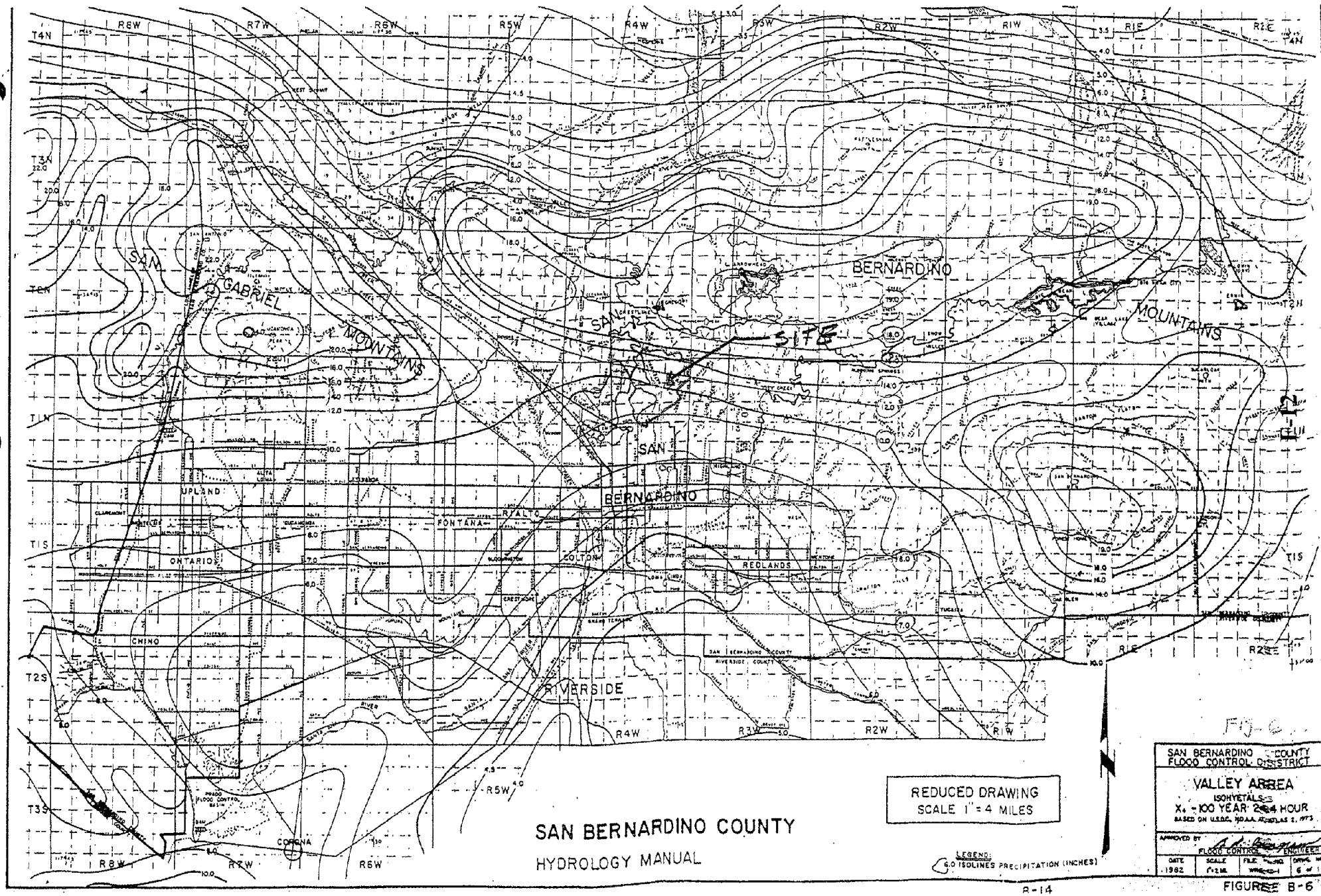

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL
REDUCED DRAWING
SCALE 1" = 4 MILES
LEGEND:
6.0 ISOLINES PRECIPITATION (INCHES)
SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT
VALLEY AREA
ISOHYETALS
X4 - 100 YEAR 24-4 HOUR
BASED ON U.S.D.C. N.O.A.A. ATLAS 2, 1973
APPROVED BY
FLOOD CONTROL ENGINEER
DATE
1982
SCALE
1"=2 MI.
FILE NO.
DRWG. NO.
6 of 12
SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
SITE
SAN BERNARDINO
UPLAND
FONTANA
RIALTO
ONTARIO
COLTON
REDLANDS
CHINO
RIVERSIDE
CORONA
T4N
T3N
T2N
T1N
T1S
T2S
T3S
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E

FIGURE B-6

APPENDIX-1

FILE: AS-1

WATERMAN CYN.

PROJECT: ARROWHEAD SPRG. DATE: 2-23-05

Undev.

ENGINEER:

1.	Enter the design storm return frequency **(years)**	100
2.	Enter catchment lag **(hours)**	0.49
3.	Enter the catchment area **(acres)**	3,394
4.	Enter baseflow **(cfs/square mile)**	0
5.	Enter S-Graph proportions **(decimal)**	
	Valley: Developed	
	Foothill	100%
	Mountain	
	Valley: Undeveloped	
	Desert	
6.	Enter maximum loss rate, F_m **(inch/hour)***	0.333
7.	Enter low loss fraction, $\bar{Y}$ **(decimal)**	0.111
8.	Enter watershed area-averaged 5-minute point rainfall **(inches)***	0.58"
	Enter watershed area-averaged 30-minute point rainfall **(inches)***	1.25"
	Enter watershed area-averaged 1-hour point rainfall **(inches)***	1.74"
	Enter watershed area-averaged 3-hour point rainfall **(inches)***	3.4"
	Enter watershed area-averaged 6-hour point rainfall **(inches)***	5.36"
	Enter watershed area-averaged 24-hour point rainfall **(inches)***	14.50"
9.	Enter 24-hour storm unit interval **(minutes)**	5 MIN.

*Note: enter values unadjusted by depth-area factors

F_m - AMC III = 0.138

AN BERNARDINO COUNTY
YDROLOGY MANUAL

WATERSHED
INFORMATION FORM

AS-1

Figure E-7

FILE A3-2

Waterman Cyn. - DEV.

PROJECT: ARROWHEAD SPRINGS DATE: 2-28-05

ENGINEER: _____

1. Enter the design storm return frequency **(years)** 100yr. AMC III
2. Enter catchment lag **(hours)** 0.49
3. Enter the catchment area **(acres)** 3,394
4. Enter baseflow **(cfs/square mile)** 0
5. Enter S-Graph proportions **(decimal)**

Valley: Developed	
Foothill	100%
Mountain	
Valley: Undeveloped	
Desert	

6. Enter maximum loss rate, F_m **(inch/hour)** 0.138
7. Enter low loss fraction, $\bar{Y}$ **(decimal)** 0.115
8. Enter watershed area-averaged 5-minute point rainfall **(inches)*** 0.58"

   Enter watershed area-averaged 30-minute point rainfall **(inches)*** 1.25"

   Enter watershed area-averaged 1-hour point rainfall **(inches)*** 1.74"

   Enter watershed area-averaged 3-hour point rainfall **(inches)*** 3.4"

   Enter watershed area-averaged 6-hour point rainfall **(inches)*** 5.36"

   Enter watershed area-averaged 24-hour point rainfall **(inches)*** 14.5"
9. Enter 24-hour storm unit interval **(minutes)** 5 min.

*Note: enter values unadjusted by depth-area factors

N BERNARDINO COUNTY
DROLOGY MANUAL

WATERSHED INFORMATION FORM

F-15

A3-2

Figure E-7

AVERAGE AREA POINT PRECIPITATION
ARROWHEAD SPRING PROJECT
WATERMAN CYCN. UNDEV.

100-YR- 1 HR

ISO-INCH.		AREA-AC.	WEIGHTING
2.02		205.20	414.50
1.95		555.90	1084.01
1.85		684.70	1266.70
1.75		556.80	974.40
1.65		579.50	956.18
1.55		363.20	562.96
1.47		448.70	659.59
	TOTAL	3394.00	5918.33

I= 1.74 INCHES; 100 YR

100-YR- 6 HR

ISO-INCH.		AREA-AC.	WEIGHTING
6.51		31.30	203.76
6.25		844.00	5275.00
5.50		1202.00	6611.00
4.75		906.50	4305.88
4.50		328.60	1478.70
3.90		81.60	318.24
	TOTAL	3394.00	18192.58

I= 5.36 INCHES; 100 YR

100-YR-24 HR

ISO-INCH.		AREA-AC.	WEIGHTING
18.10		48.50	877.85
17.00		1315.50	22363.50
15.00		647.50	9712.50
13.00		723.50	9405.50
11.00		445.00	4895.00
9.10		214.00	1947.40
	TOTAL	3394.00	49201.75

I= 14.50 INCHES; 100 YR

AREA AVERAGE MAX. LOSS RATE-Fm; WATERMAN CYN.
Arrowhead Spring Developed Condition-TOTAL Watershed

Land Use	Area Ac.	Fractional Area	Soil Group	Fp	Ap	Fm	Fm*Frac. Area
OPEN SPACE	3049.00	0.898	D	0.13	1.00	0.13	0.117
OPEN SPACE	1.36	0.000	B	0.30	1.00	0.30	0.000
18-HOLE GOLF COURSE	106.89	0.031	B	0.40	1.00	0.40	0.013
18-HOLE GOLF COURSE	87.96	0.026	D	0.17	1.00	0.17	0.004
RL-N	50.00	0.015	D	0.21	0.60	0.13	0.002
RM-N	21.03	0.006	D	0.21	0.20	0.04	0.000
RM-N	7.97	0.002	B	0.42	0.20	0.08	0.000
RL-S	1.30	0.000	B	0.42	0.60	0.25	0.000
RL-S	7.50	0.002	D	0.21	0.60	0.13	0.000
RM-S	22.00	0.006	B	0.42	0.20	0.08	0.001
RM-S-HILL-TOP	8.12	0.002	B	0.42	0.20	0.08	0.000
CORPORATE OFFICE	2.76	0.001	B	0.42	0.10	0.04	0.000
CORPORATE OFFICE	7.47	0.002	D	0.21	0.10	0.02	0.000
VILLAGE SHOPPING	3.60	0.001	B	0.42	0.10	0.04	0.000
VILLAGE SHOPPING	1.84	0.001	D	0.21	0.10	0.02	0.000
REST/C	5.00	0.001	D	0.21	0.10	0.02	0.000
MWD	10.20	0.003	D	0.21	0.10	0.02	0.000
TOTAL	**3394.00**	1.000					**0.138**

*NOTE: FOR DEVELOPED CONDITION ASSUMED AMC-III

AREA AVERAGE LOW LOSS FRACTION-Y; WATRMAN CYN.
Arrowhead Spring Developed Condition-Total Watershed

P24= 14.5 inch

Land Use	Area Ac.	Fractional Area	Soil Group	CN	S	Y	Y*Frac. Area
OPEN SPACE	3049.00	0.898	D	83	2.05	0.89	0.801
OPEN SPACE	1.36	0.0004	B	66	5.15	0.82	0.000
18-HOLE GOLF COURSE	106.89	0.031	B	58	7.24	0.77	0.024
18-HOLE GOLF COURSE	87.96	0.026	D	79	2.66	0.88	0.023
RL-N	50.00	0.015	D	75	3.33	0.86	0.013
RM-N	21.03	0.006	D	75	3.33	0.86	0.005
RM-N	7.97	0.002	B	56	7.86	0.75	0.002
RL-S	1.30	0.000	B	56	7.86	0.75	0.000
RL-S	7.50	0.002	D	75	3.33	0.86	0.002
RM-S	22.00	0.006	B	56	7.86	0.75	0.005
RM-S-HILL-TOP	8.12	0.002	B	56	7.86	0.75	0.002
CORPORATE OFFICE	2.76	0.001	B	56	7.86	0.75	0.001
CORPORATE OFFICE	7.47	0.002	D	75	3.33	0.86	0.002
VILLAGE SHOPPING	3.60	0.001	B	56	7.86	0.75	0.001
VILLAGE SHOPPING	1.84	0.001	D	75	3.33	0.86	0.000
REST/C	5.00	0.001	D	75	3.33	0.86	0.001
MWD	10.20	0.003	D	75	3.33	0.86	0.003
TOTAL	**3394.00**	1.000					**0.885**

$\bar{Y}$= 0.115

AREA AVERAGE MAX. LOSS RATE-Fm; WATERMAN CYN.
Arrowhead Spring Undeveloped Condition-TOTAL Watershed

Land Use	Area Ac.	Fractional Area	Soil Group	Fp	Ap	Fm	Fm*Frac. Area
OPEN SPACE	3250.20	0.955	D	0.13	1.00	0.13	0.124
OPEN SPACE	154.00	0.045	B	0.30	1.00	0.30	0.014
TOTAL	**3404.20**						**0.138**

*NOTE: FOR UNDEVELOPED CONDITION ASSUMED AMC-III

AREA AVERAGE MAX. LOSS RATE-Fm; WATERMAN CYN.
Arrowhead Spring Undeveloped Condition-TOTAL Watershed

Land Use	Area Ac.	Fractional Area	Soil Group	Fp	Ap	Fm	Fm*Frac. Area
OPEN SPACE	3240.00	0.955	D	0.32	1.00	0.32	0.305
OPEN SPACE	154.00	0.045	B	0.61	1.00	0.61	0.028
TOTAL	**3394.00**						**0.333**

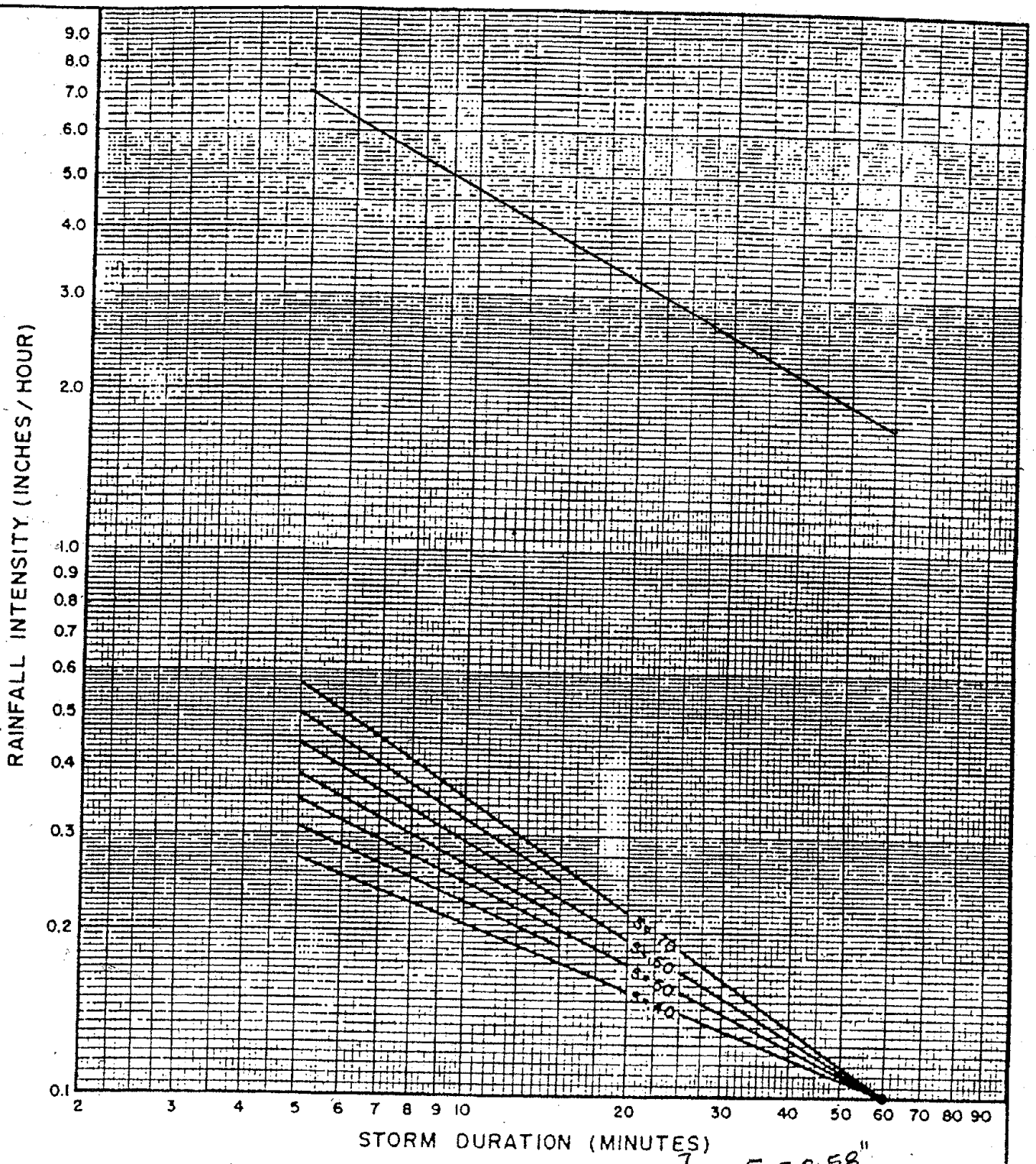
*NOTE: FOR UNDEVELOPED CONDITION ASSUMED AMC-II

AREA AVERAGE LOW LOSS FRACTION-Y; WATRMAN CYN.
Arrowhead Spring Undeveloped Condition-Total Watershed

P24= 14.5 inch

Land Use	Area Ac.	Fractional Area	Soil Group	CN	S	Y	Y*Frac. Area
OPEN SPACE	3240.00	0.955	D	83	2.05	0.89	0.852
OPENN SPACE	154.00	0.045	B	66	5.15	0.82	0.037
TOTAL	**3394.00**						**0.889**

$\bar{Y}$= **0.111**



DESIGN STORM FREQUENCY = 100 YEARS 5 MIN. = $\frac{7}{60} \times 5 = 0.58''$

ONE HOUR POINT RAINFALL = 1.74 INCHES 30 MIN. = $\frac{2.5}{60} \times 30 = 1.25''$

LOG-LOG SLOPE = 0.6

PROJECT LOCATION = ARROWHEAD SPRING; WATERMAN CYN. CA

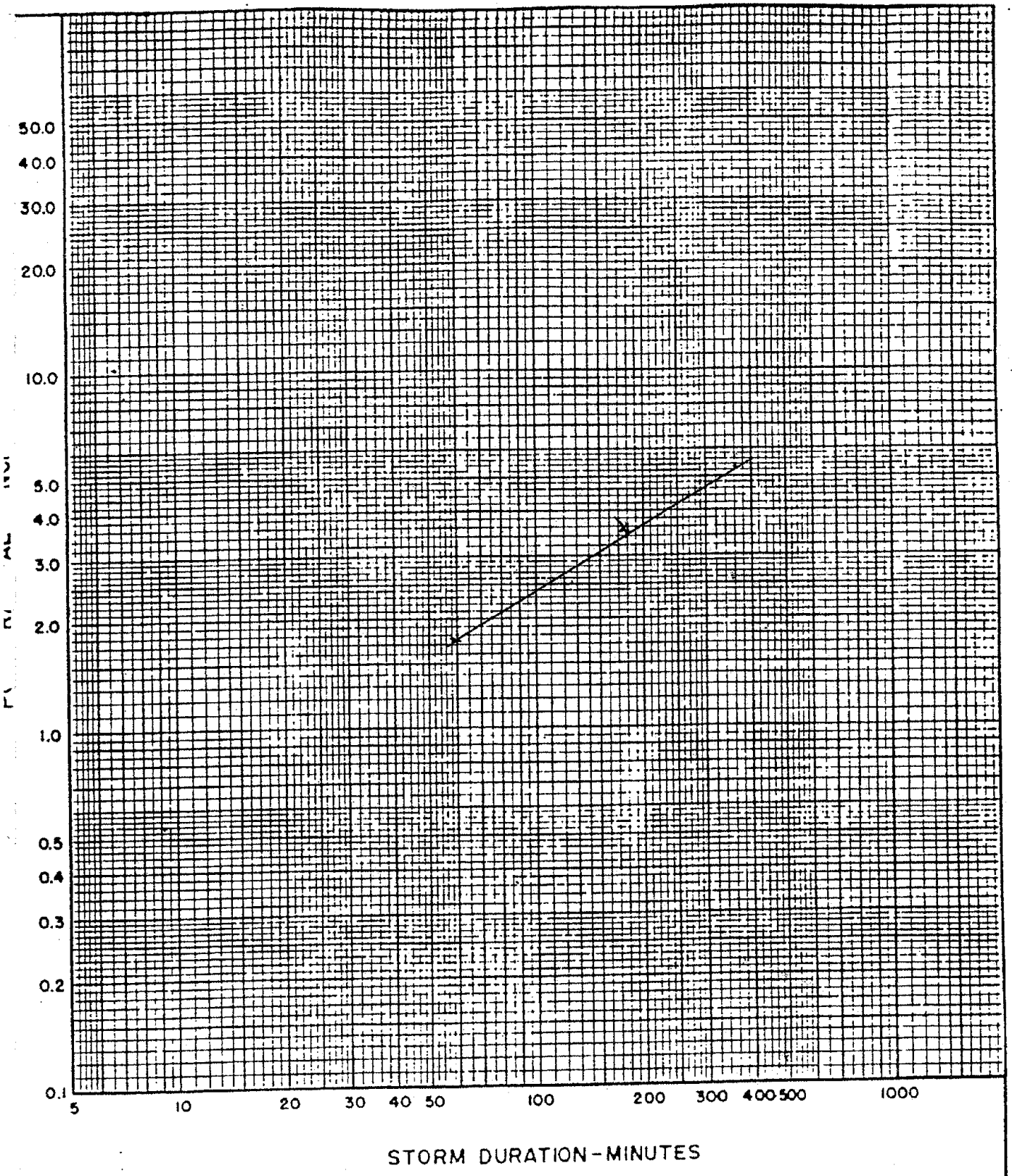
undev.

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

INTENSITY - DURATION CURVES

CALCULATION SHEET



PROJECT LOCATION ARROWHEAD SPRINGS; WATERMAN CYN.

NOTES 1-HR = 1.74"

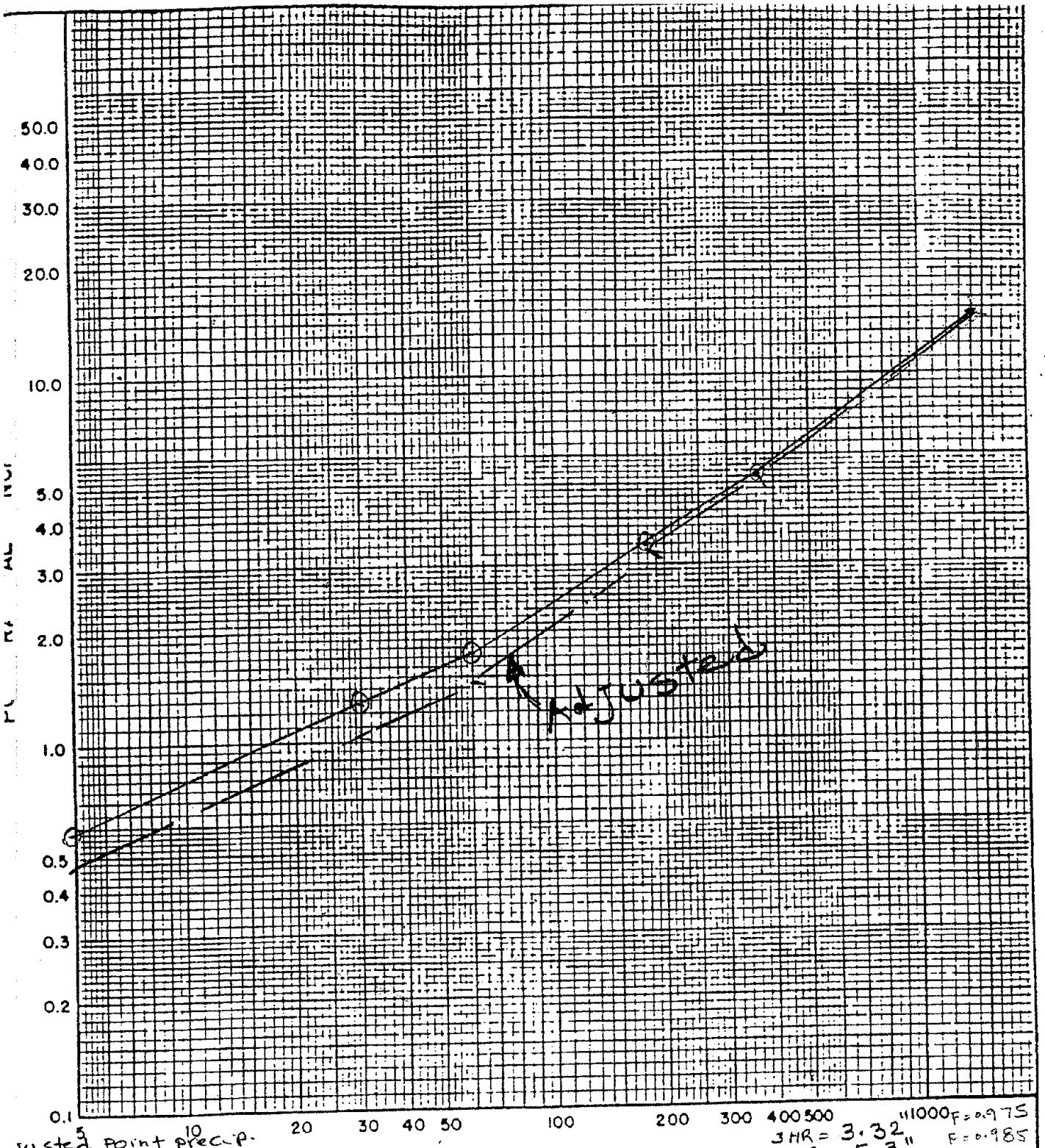
6 HR = 5.36" ; 3 HR EST = 3.4"

under

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

AREA - AVERAGED
MASS RAINFALL
F-23 PLOTTING SHEET



Adjusted Point precip.
IN. = 0.48"
, MIN. = 1.03"
HR. = 1.44" } F=0.825

3 HR = 3.32" F=0.975
6 HR = 5.3" F=0.985
24 HR = 14.38" F=0.992

PROJECT LOCATION ARROWHEAD SPRINGS, CA; Waterman Cyn.

NOTES 100 yr.

Point Precip; 3,394 AC. (5.3 S.M.)

Undev.

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

F-24

AREA - AVERAGED MASS RAINFALL PLOTTING SHEET

APPENDIX-2

FILE H-3

EAST TWIN CREEK

PROJECT: ARROWHEAD SPRG. undev. DATE: 2-23-05

ENGINEER:

1.	Enter the design storm return frequency **(years)**	100
2.	Enter catchment lag **(hours)**	0.46
3.	Enter the catchment area **(acres)**	5,929
4.	Enter baseflow **(cfs/square mile)**	0
5.	Enter S-Graph proportions **(decimal)**	
	Valley: Developed	
	Foothill	100%
	Mountain	
	Valley: Undeveloped	
	Desert	
6.	Enter maximum loss rate, F_m **(inch/hour)***	0.328
7.	Enter low loss fraction, $\bar{Y}$ **(decimal)**	0.109
8.	Enter watershed area-averaged 5-minute point rainfall **(inches)***	0.625"
	Enter watershed area-averaged 30-minute point rainfall **(inches)***	1.33"
	Enter watershed area-averaged 1-hour point rainfall **(inches)***	1.78
	Enter watershed area-averaged 3-hour point rainfall **(inches)***	3.5"
	Enter watershed area-averaged 6-hour point rainfall **(inches)***	5.40
	Enter watershed area-averaged 24-hour point rainfall **(inches)***	14.70
9.	Enter 24-hour storm unit interval **(minutes)**	5.0 MIN

*Note: enter values unadjusted by depth-area factors

F_m - AMC III = 0.135

AN BERNARDINO COUNTY
HYDROLOGY MANUAL

WATERSHED
INFORMATION FORM

Figure E-7

FILE. H2-7

EAST TWIN CREEK - DEV.

PROJECT: ARROWHEAD SPRINGS DATE: 2-28-05

ENGINEER: _____

1. Enter the design storm return frequency **(years)** 100YR-AMC III
2. Enter catchment lag **(hours)** 0.46
3. Enter the catchment area **(acres)** 5,929
4. Enter baseflow **(cfs/square mile)** ~~0~~
5. Enter S-Graph proportions **(decimal)**

Valley: Developed	
Foothill	100%
Mountain	
Valley: Undeveloped	
Desert	

6. Enter maximum loss rate, F_m **(inch/hour)** 0.132
7. Enter low loss fraction, $\bar{Y}$ **(decimal)** 0.110
8. Enter watershed area-averaged 5-minute point rainfall **(inches)*** 0.625"

   Enter watershed area-averaged 30-minute point rainfall **(inches)*** 1.33"

   Enter watershed area-averaged 1-hour point rainfall **(inches)*** 1.78"

   Enter watershed area-averaged 3-hour point rainfall **(inches)*** 3.5"

   Enter watershed area-averaged 6-hour point rainfall **(inches)*** 5.4"

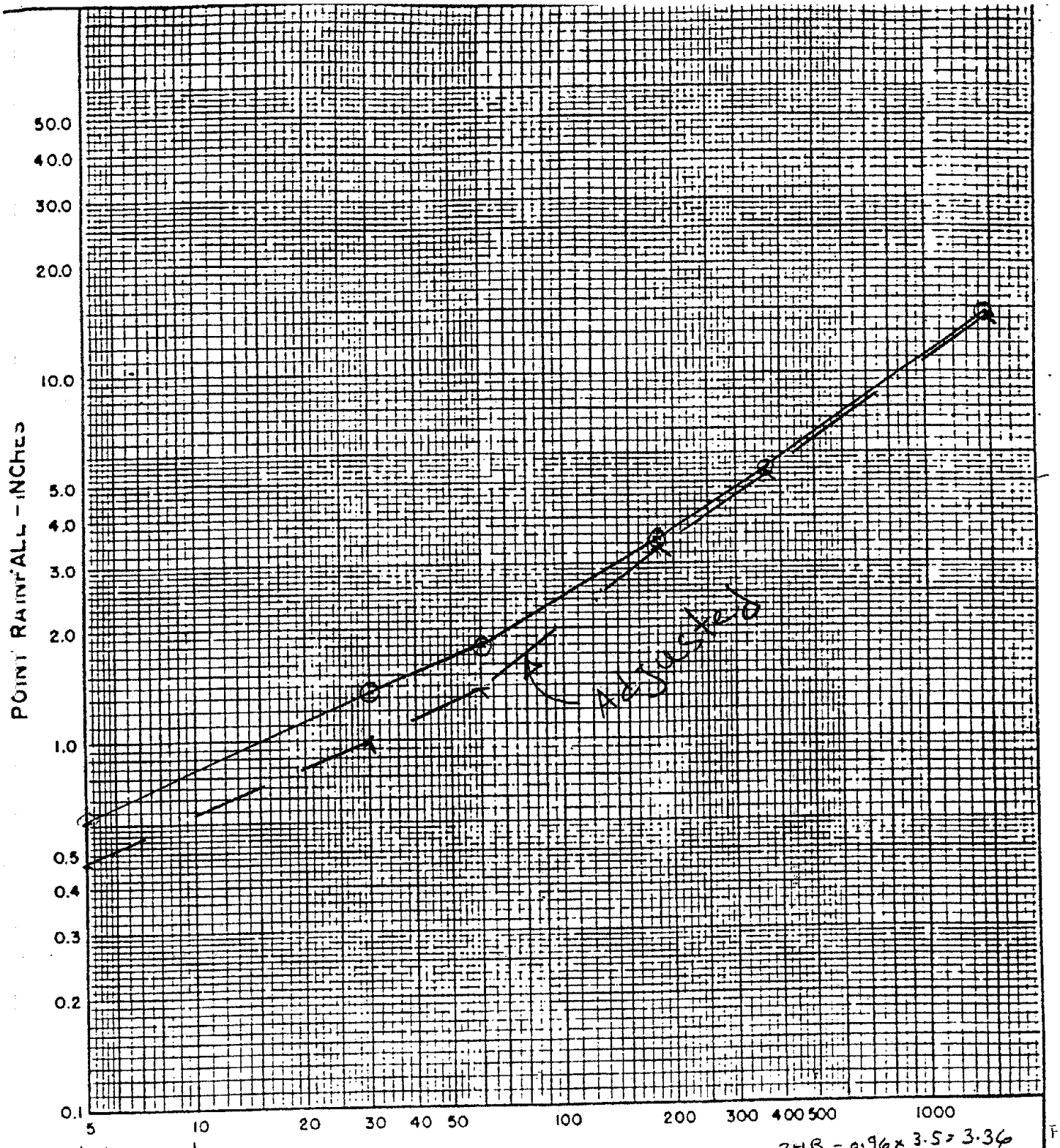
   Enter watershed area-averaged 24-hour point rainfall **(inches)*** 14.7"
9. Enter 24-hour storm unit interval **(minutes)** 5 MIN.

*Note: enter values unadjusted by depth-area factors

AN BERNARDINO COUNTY
HYDROLOGY MANUAL

WATERSHED
INFORMATION FORM

Figure E-7



PROJECT LOCATION ARROW HEAD SPRING, EAST TWIN CREEK

NOTES 100yr.

POINT PRECIP. 5,929 AC.

und.

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

F-28

AREA - AVERAGED MASS RAINFALL PLOTTING SHEET

AVERAGE AREA POINT PRECIPITATION
ARROWHEAD SPRING PROJECT
EAST TWIN CREEK UNDEV.

100-YR- 1 HR

ISO-INCH.		AREA-AC.	WEIGHTING
2.04		1035.00	2111.40
1.95		852.50	1662.38
1.85		852.50	1577.13
1.75		1308.50	2289.88
1.65		669.00	1103.85
1.55		522.50	809.88
1.47		689.00	1012.83
	TOTAL	5929.00	10567.33

I= 1.78 INCHES; 100 YR

100-YR- 6 HR

ISO-INCH.		AREA-AC.	WEIGHTING
6.65		921.00	6124.65
6.25		896.40	5602.50
5.50		1500.50	8252.75
4.75		1605.60	7626.60
4.50		819.90	3689.55
3.90		185.60	723.84
	TOTAL	5929.00	32019.89

I= 5.40 INCHES; 100 YR

100-YR-24 HR

ISO-INCH.		AREA-AC.	WEIGHTING
18.40		1084.00	19945.60
17.00		1244.00	21148.00
15.00		1238.00	18570.00
13.00		1082.00	14066.00
11.00		918.00	10098.00
9.10		363.00	3303.30
	TOTAL	5929.00	87130.90

I= 14.70 INCHES; 100 YR

AREA AVERAGE MAX. LOSS RATE-Fm; EAST TWIN CREEK
Arrowhead Spring Developed Condition-TOTAL Watershed

Land Use	Area Ac.	Fractional Area	Soil Group	Fp	Ap	Fm	Fm*Frac. Area
OPEN SPACE	5619.78	0.948	D	0.13	1.00	0.13	0.123
OPEN SPACE	142.11	0.024	B	0.30	1.00	0.30	0.007
CORPORATE OFFICE/C	3.77	0.001	D	0.21	0.10	0.02	0.000
INTERNATIONAL HOTEL/C	17.00	0.003	D	0.21	0.10	0.02	0.000
HISTORIC HOTEL/C	25.00	0.004	D	0.21	0.10	0.02	0.000
COMMERCIAL GEN.	0.70	0.000	D	0.21	0.10	0.02	0.000
GOLF COURSE	4.15	0.001	B	0.40	1.00	0.40	0.000
SPA CLUB/C	22.00	0.004	D	0.21	0.10	0.02	0.000
RESIDENTIAL MED/12/AC	12.14	0.002	B	0.42	0.20	0.08	0.000
RESIDENTIAL MED/12/AC	47.04	0.008	D	0.21	0.20	0.04	0.000
VILLAGE SHOPPING/C	8.50	0.001	B	0.42	0.10	0.04	0.000
VILLAGE SHOPPING/C	26.81	0.005	D	0.21	0.10	0.02	0.000
TOTAL	**5929.00**	1.000					**0.132**

*NOTE: FOR DEVELOPED CONDITION ASSUMED AMC-III

AREA AVERAGE LOW LOSS FRACTION-Y; EAST TWIN CREEK
Arrowhead Spring Developed Condition-Total Watershed

P24= 14.7 inch

Land Use	Area Ac.	Fractional Area	Soil Group	CN	S	Y	Y*Frac. Area
OPEN SPACE	5619.78	0.948	D	83	2.05	0.89	0.847
OPEN SPACE	142.11	0.024	B	66	5.15	0.82	0.020
CORPORATE OFFICE/C	3.77	0.001	D	75	3.33	0.86	0.001
INTERNATIONAL HOTEL/C	17.00	0.003	D	75	3.33	0.86	0.002
HISTORIC HOTEL/C	25.00	0.004	D	75	3.33	0.86	0.004
COMMERCIAL GEN.	0.70	0.000	D	75	3.33	0.86	0.000
GOLF COURSE	4.15	0.001	B	58	7.24	0.77	0.001
SPA CLUB/C	22.00	0.004	D	75	3.33	0.86	0.003
RESIDENTIAL MED/12/AC	12.14	0.002	B	56	7.86	0.75	0.002
RESIDENTIAL MED/12/AC	47.04	0.008	D	75	3.33	0.86	0.007
VILLAGE SHOPPING/C	8.50	0.001	B	56	7.86	0.75	0.001
VILLAGE SHOPPING/C	26.81	0.005	D	75	3.33	0.86	0.004
TOTAL	**5929.00**	1.000					**0.890**

$\bar{Y}$= **0.110**

AREA AVERAGE LOW LOSS FRACTION-Y; EAST TWIN CREEK
Arrowhead Spring Undeveloped Condition-Total Watershed

P24= 14.7 inch

Land Use	Area Ac.	Fractional Area	Soil Group	CN	S	Y	Y*Frac. Area
OPEN SPACE	5762.10	0.972	D	83	2.05	0.89	0.868
OPENN SPACE	166.90	0.028	B	66	5.15	0.82	0.023
TOTAL	**5929.00**						**0.891**

$\bar{Y}$= **0.109**

AREA AVERAGE MAX. LOSS RATE-Fm; EAST TWIN CREEK
Arrowhead Spring Undeveloped Condition-TOTAL Watershed

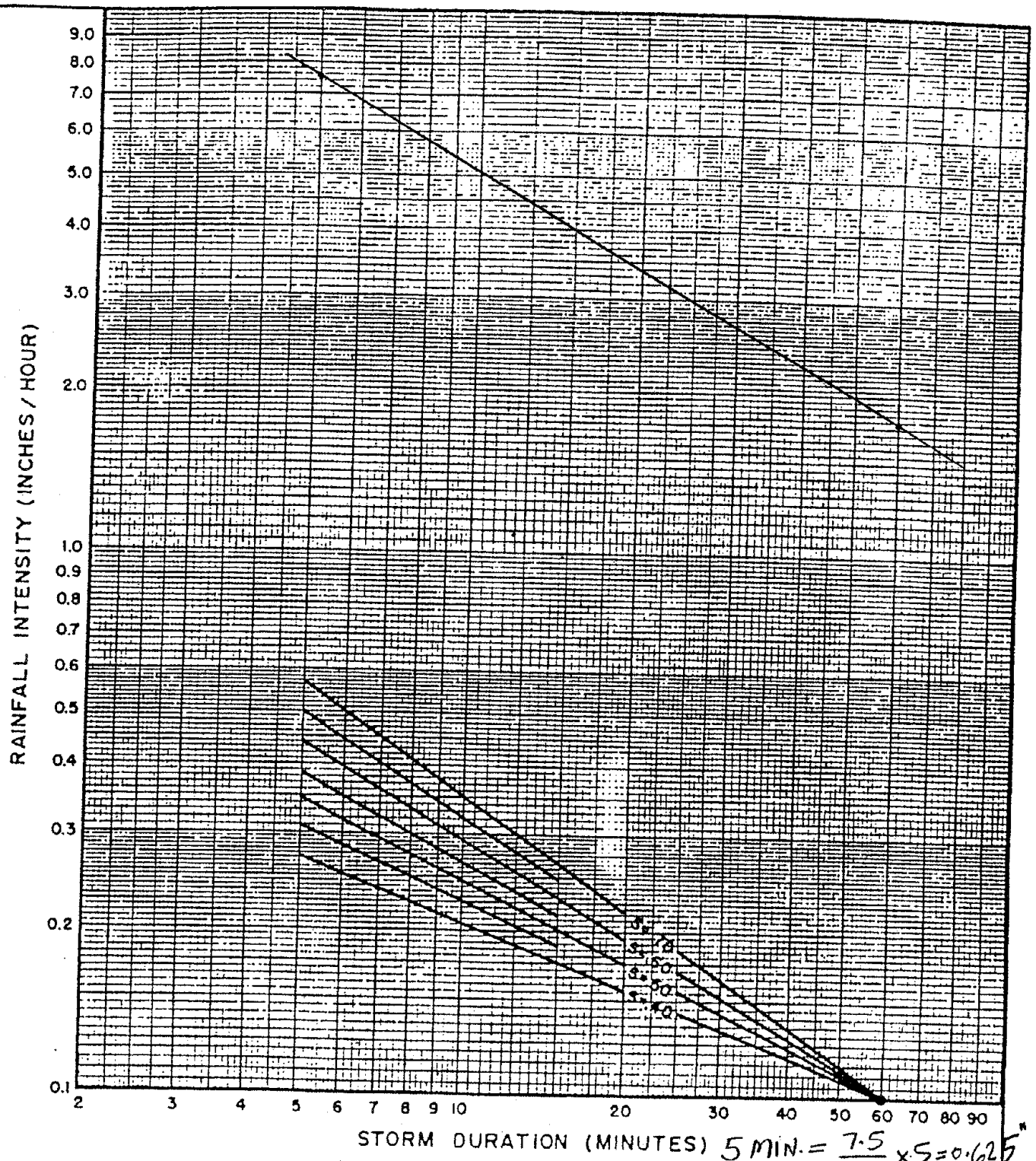
Land Use	Area Ac.	Fractional Area	Soil Group	Fp	Ap	Fm	Fm*Frac. Area
OPEN SPACE	5762.10	0.972	D	0.13	1.00	0.13	0.126
OPEN SPACE	166.90	0.028	B	0.30	1.00	0.30	0.008
TOTAL	**5929.00**						**0.135**

*NOTE: FOR UNDEVELOPED CONDITION ASSUMED AMC-III

AREA AVERAGE MAX. LOSS RATE-Fm; EAST TWIN CREEK
Arrowhead Spring Undeveloped Condition-TOTAL Watershed

Land Use	Area Ac.	Fractional Area	Soil Group	Fp	Ap	Fm	Fm*Frac. Area
OPEN SPACE	5762.10	0.972	D	0.32	1.00	0.32	0.311
OPEN SPACE	166.90	0.028	B	0.61	1.00	0.61	0.017
TOTAL	**5929.00**						**0.328**

*NOTE: FOR UNDEVELOPED CONDITION ASSUMED AMC-II



5 MIN. = $\frac{7.5}{60} \times 5 = 0.625''$

30 MIN. = $\frac{2.66}{60} \times 30 = 1.33''$

DESIGN STORM FREQUENCY = 100 YEARS

ONE HOUR POINT RAINFALL = 1.78 INCHES

LOG-LOG SLOPE = 0.6

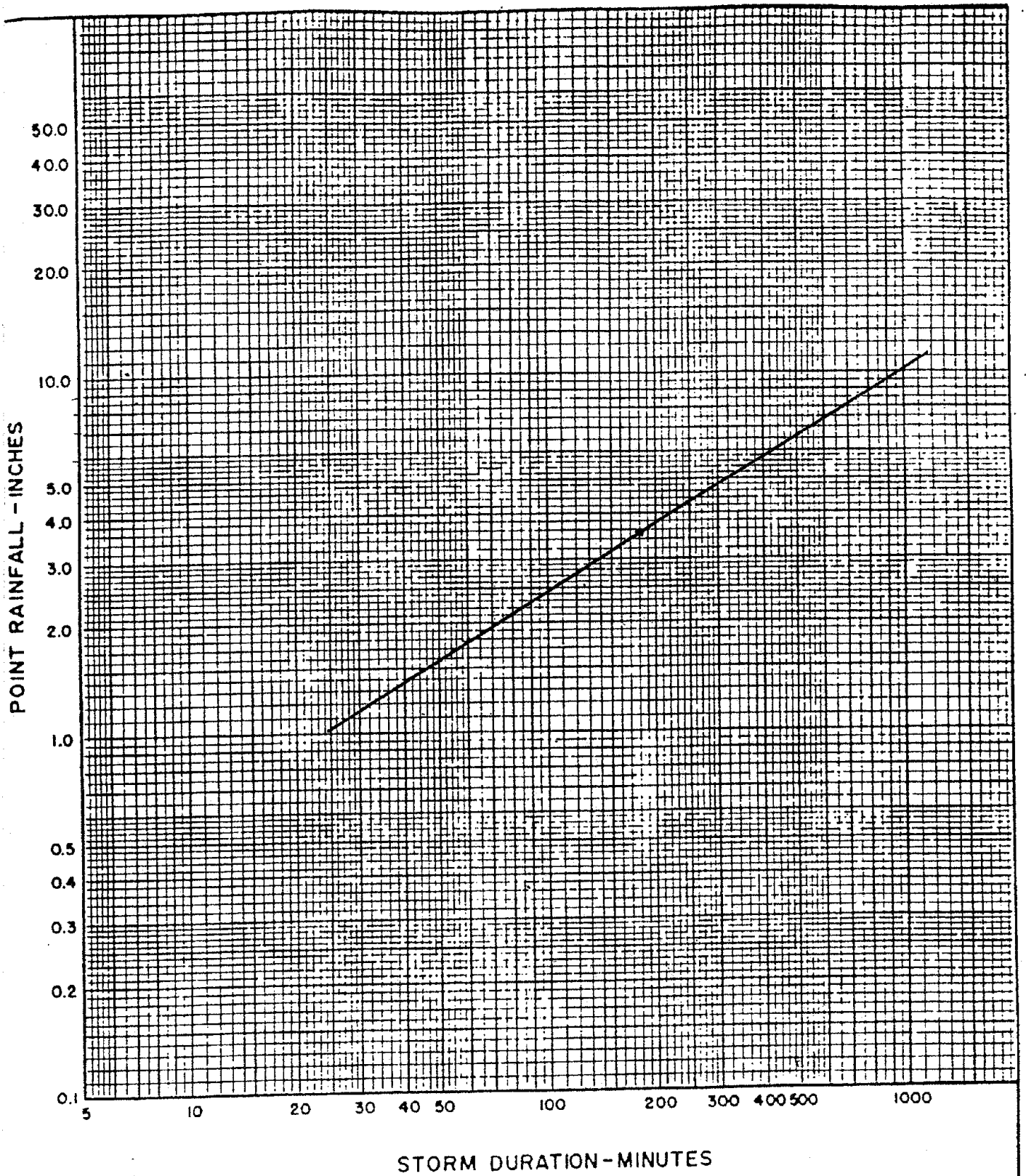
PROJECT LOCATION = ARROWHEAD SPRINGS, CA.
EAST TWIN CREEK

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

INTENSITY - DURATION CURVES

F-35 CALCULATION SHEET



PROJECT LOCATION ARROWHEAD SPRINGS, EAST TWIN CREEK

NOTES 100 yr., 1-HR = 1.78"

6 HR = 5.4", 3HR = 3.5" EST.

Und.

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

F-36

AREA - AVERAGED MASS RAINFALL PLOTTING SHEET

APPENDIX-3

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

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

SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

CURVE NUMBERS FOR PERVIOUS AREAS

Figure C-3 (1 of 2)

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

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

Notes:

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

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

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

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

ACTUAL IMPERVIOUS COVER

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

Notes:

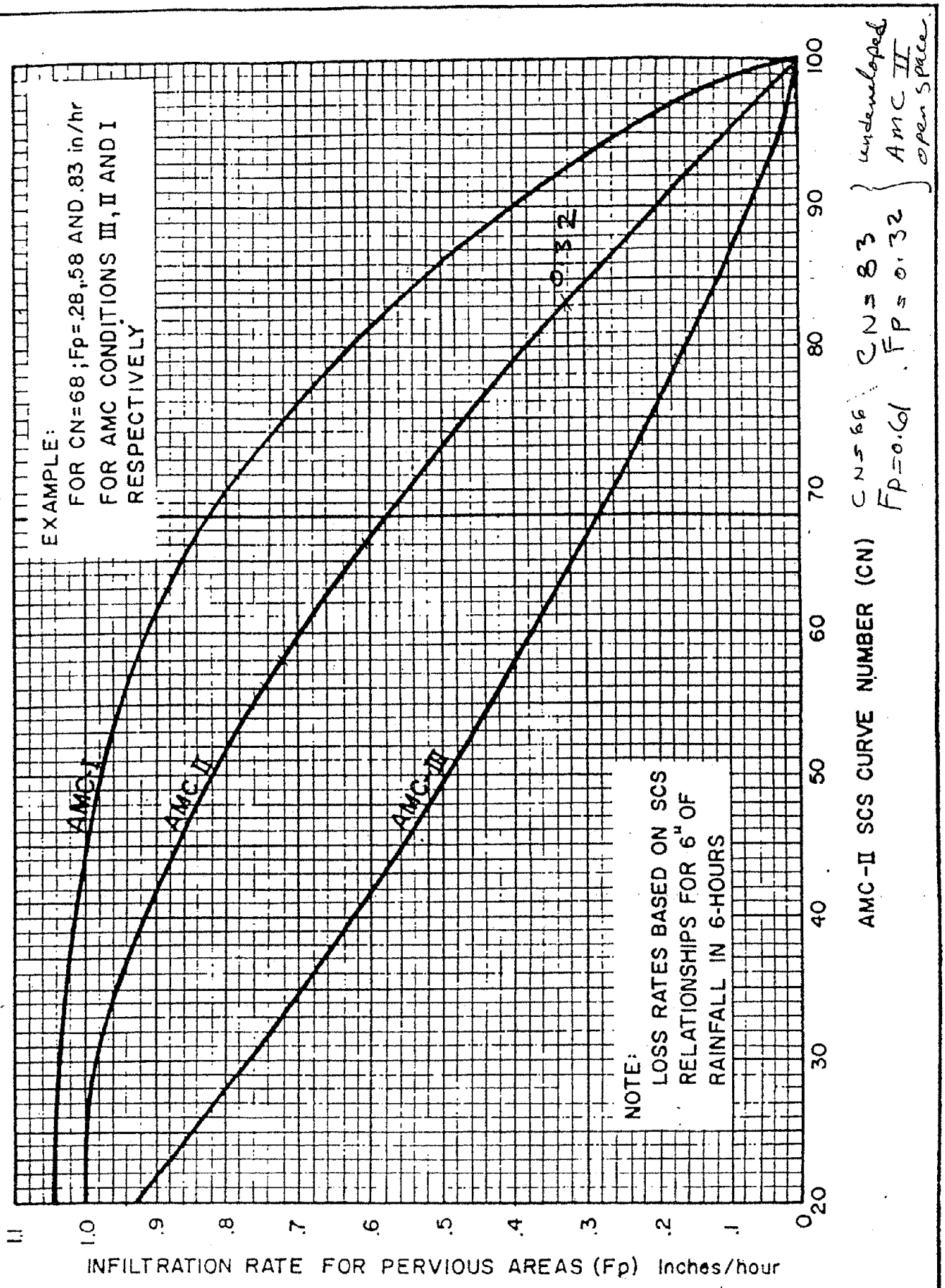
1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

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

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

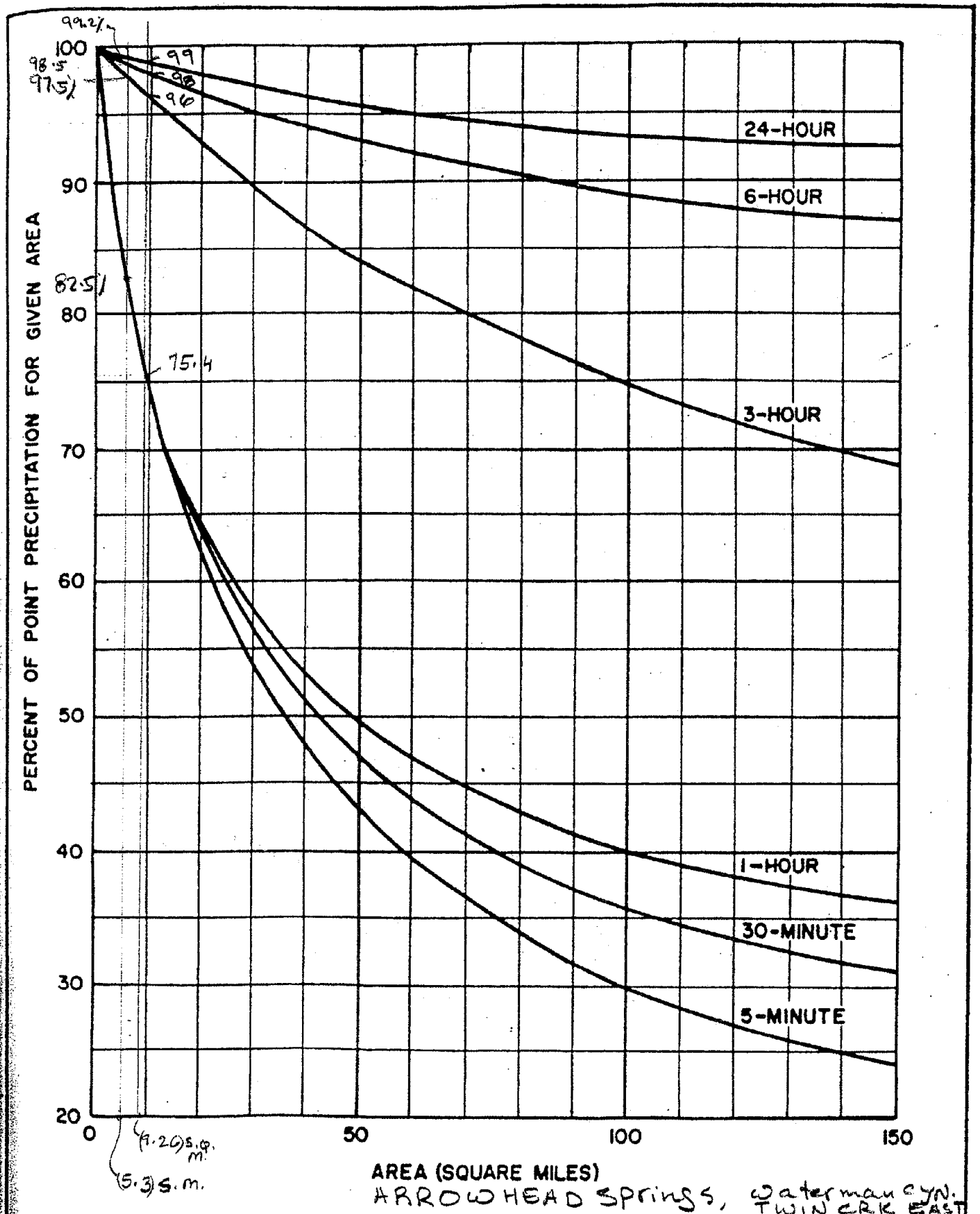
ACTUAL IMPERVIOUS COVER FOR DEVELOPED AREAS

Figure



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

INFILTRATION RATE FOR PERVIOUS AREAS VERSUS SCS CURVE NUMBERS



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

F-42

DESIGN STORM
DEPTH AREA
CURVES

$\bar{n}$ = 0.015

1. Drainage area has fairly uniform, gentle slopes
2. Most watercourses either improved or along paved streets
3. Groundcover consists of some grasses - large % of area impervious
4. Main water course improved channel or conduit

$\bar{n}$ = 0.020

1. Drainage area has some graded and non-uniform, gentle slopes
2. Over half of the area watercourses are improved or paved streets
3. Groundcover consists of equal amount of grasses and impervious area
4. Main watercourse is partly improved channel or conduit and partly greenbelt (see n = 0.025)

$\bar{n}$ = 0.025

1. Drainage area is generally rolling with gentle side slopes
2. Some drainage improvements in the area - streets and canals
3. Groundcover consists mostly of scattered brush and grass and small % impervious
4. Main watercourse is straight channels which are turfed or with stony beds and weeds on earth bank (greenbelt type)

$\bar{n}$ = 0.030

1. Drainage area is generally rolling with rounded ridges and moderate side slopes
2. No drainage improvements exist in the area
3. Groundcover includes scattered brush and grasses
4. Watercourses meander in fairly straight, unimproved channels with some boulders and lodged debris

$\bar{n}$ = 0.040

1. Drainage area is composed of steep upper canyons with moderate slopes in lower canyons
2. No drainage improvements exist in the area
3. Groundcover is mixed brush and trees with grasses in lower canyons
4. Watercourses have moderate bends and are moderately impeded by boulders and debris with meandering courses

$\bar{n}$ = 0.050

1. Drainage area is quite rugged with sharp ridges and steep canyons
2. No drainage improvements exist in the area
3. Groundcover, excluding small areas of rock outcrops, includes many trees and considerable underbrush
4. Watercourses meander around sharp bends, over large boulders and considerable debris obstruction

$\bar{n}$ = 0.200

1. Drainage area has comparatively uniform slopes
2. No drainage improvements exist in the area
3. Groundcover consists of cultivated crops or substantial growths of grass and fairly dense small shrubs, cacti, or similar vegetation
4. Surface characteristics are such that channelization does not occur

TABLE C.2. Fm (in/hr) VALUES
FOR TYPICAL COVER TYPES

COVER TYPE	SOIL GROUP				
	A_p(1)	A	B	C	D
NATURAL:					
Barren	1.0	0.41	0.27	0.18	0.14
Row Crops (good)	1.0	0.59	0.41	0.29	0.22
Grass (fair)	1.0	0.82	0.56	0.40	0.31
Orchards (fair)	1.0	0.88	0.62	0.43	0.34
Woodland (fair)	1.0	0.95	0.69	0.50	0.40
URBAN:					
Residential (1 DU/AC)	0.80	0.78	0.60	0.45	0.37
Residential (2 DU/AC)	0.70	0.68	0.53	0.39	0.32
Residential (4 DU/AC)	0.60	0.58	0.45	0.34	0.28
Residential (10 DU/AC)	0.40	0.39	0.30	0.22	0.18
Condominium	0.35	0.34	0.26	0.20	0.16
Mobile Home Park	0.25	0.24	0.19	0.14	0.12
Apartments	0.20	0.19	0.15	0.11	0.09
Commercial/Industrial	0.10	0.10	0.08	0.06	0.05

NOTES:

(1) Recommended a_p values from Figure C-4

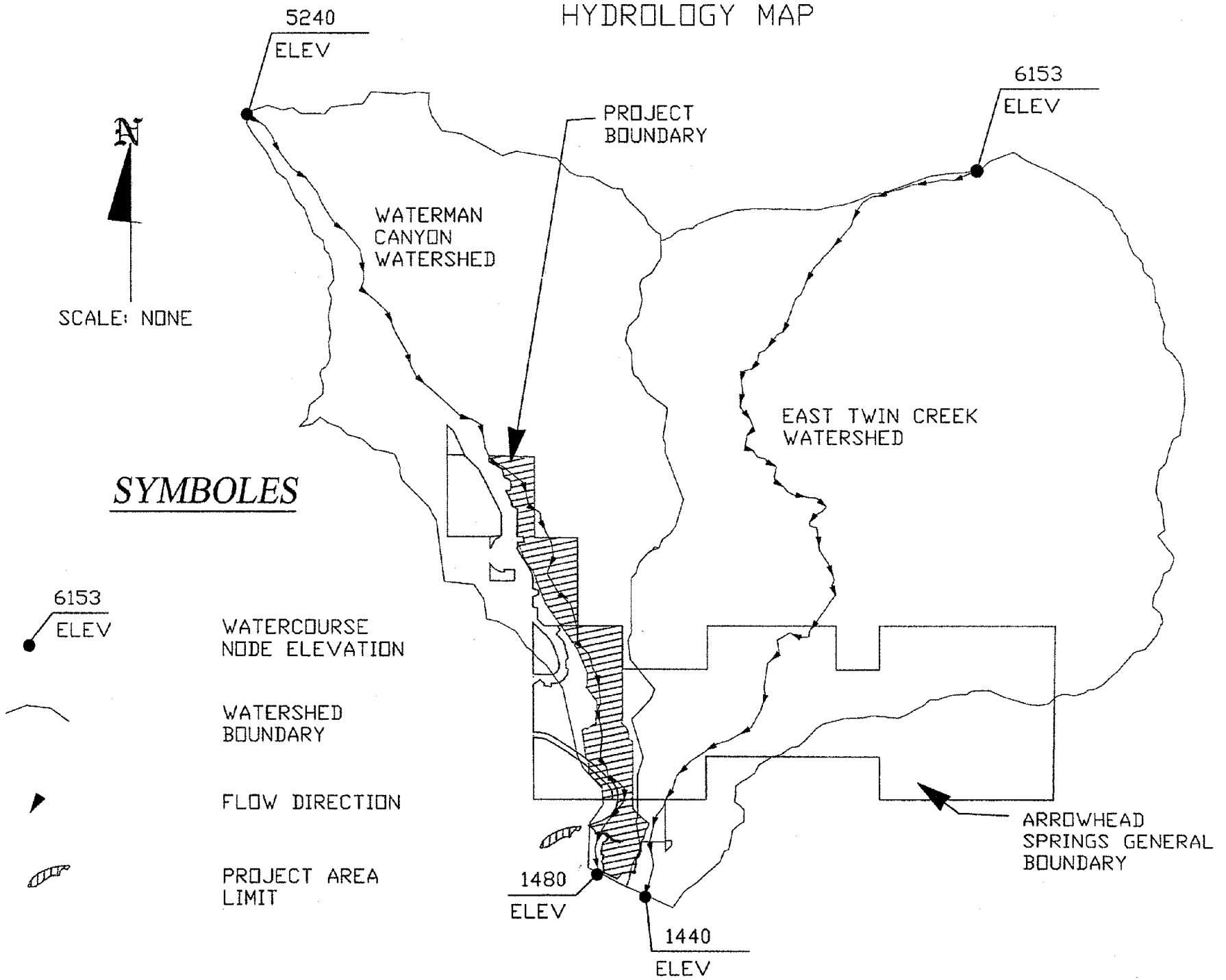
(2) AMC II assumed for all Fm values

(3) CN values obtained from Figure C-3

(4) DU/AC=dwelling unit per acre

APPENDIX-4

ARROWHEAD SPRINGS HYDROLOGY MAP



APPENDIX-5

```
****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2002 Advanced Engineering Software (aes)
            Ver. 8.0  Release Date: 01/01/2002  License ID 1542

                          Analysis prepared by:

                        TRANSTECH ENGINEERS, INC.
                           624 Brea Canyon Road
                            Walnut, CA 91789


 ************************** DESCRIPTION OF STUDY **************************
* WATERMAN CANYON                                                         *
* UNDEVELOPED CONDITION                                                   *
*                                                                         *
 ***************************************************************************

  FILE NAME: AS-1.DAT
  TIME/DATE OF STUDY: 12:03 03/04/2005
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =    1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

        WATERSHED AREA =     3394.000 ACRES
        BASEFLOW =    0.000 CFS/SQUARE-MILE
        *USER ENTERED "LAG" TIME =     0.490 HOURS
         CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
         THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
         MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
        FOOTHILL S-GRAPH SELECTED
        MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.333
        LOW LOSS FRACTION = 0.111
        *HYDROGRAPH MODEL #1 SPECIFIED*

        SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.58
        SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.25
        SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.74
        SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  3.40
        SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  5.36
        SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 14.50

        *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
          5-MINUTE FACTOR = 0.825
         30-MINUTE FACTOR = 0.825
          1-HOUR FACTOR = 0.825
          3-HOUR FACTOR = 0.975
          6-HOUR FACTOR = 0.985
         24-HOUR FACTOR = 0.992

        UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  17.007


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                1.112                456.415
        2                3.972               1174.010
        3                8.270               1764.123
        4               14.027               2362.960
        5               23.093               3721.370
        6               40.739               7243.110
        7               56.602               6511.134
        8               64.590               3278.796
```

9	70.054	2242.409
10	74.597	1864.988
11	78.312	1524.745
12	81.413	1272.823
13	84.114	1108.722
14	86.481	971.371
15	88.450	808.551
16	90.133	690.703
17	91.679	634.514
18	93.009	545.824
19	94.182	481.546
20	95.115	383.101
21	95.981	355.334
22	96.569	241.444
23	97.118	225.182
24	97.667	225.232
25	98.032	149.899
26	98.122	37.194
27	98.210	36.157
28	98.298	36.060
29	98.387	36.251
30	98.474	35.919
31	98.562	36.201
32	98.650	36.016
33	98.738	36.107
34	98.826	36.110
35	98.914	36.107
36	99.002	36.110
37	99.090	36.107
38	99.178	36.107
39	99.266	36.107
40	99.354	36.107
41	99.442	36.107
42	99.530	36.107
43	99.618	36.107
44	99.706	36.107
45	99.794	36.107
46	99.882	36.107
47	99.970	36.107
48	100.000	12.470

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0361	0.0040	0.0321
2	0.0362	0.0040	0.0321
3	0.0362	0.0040	0.0322
4	0.0363	0.0040	0.0322
5	0.0363	0.0040	0.0323
6	0.0364	0.0040	0.0323
7	0.0364	0.0040	0.0324
8	0.0365	0.0040	0.0324
9	0.0366	0.0041	0.0325
10	0.0366	0.0041	0.0325
11	0.0367	0.0041	0.0326
12	0.0367	0.0041	0.0326
13	0.0368	0.0041	0.0327
14	0.0368	0.0041	0.0327
15	0.0369	0.0041	0.0328
16	0.0369	0.0041	0.0328
17	0.0370	0.0041	0.0329
18	0.0370	0.0041	0.0329
19	0.0371	0.0041	0.0330
20	0.0372	0.0041	0.0330
21	0.0372	0.0041	0.0331
22	0.0373	0.0041	0.0331
23	0.0374	0.0041	0.0332
24	0.0374	0.0042	0.0333
25	0.0375	0.0042	0.0333
26	0.0375	0.0042	0.0334
27	0.0376	0.0042	0.0334
28	0.0377	0.0042	0.0335
29	0.0377	0.0042	0.0336
30	0.0378	0.0042	0.0336
31	0.0379	0.0042	0.0337
32	0.0379	0.0042	0.0337
33	0.0380	0.0042	0.0338
34	0.0380	0.0042	0.0338
35	0.0381	0.0042	0.0339
36	0.0382	0.0042	0.0339
37	0.0383	0.0042	0.0340
38	0.0383	0.0043	0.0341
39	0.0384	0.0043	0.0341
40	0.0385	0.0043	0.0342
41	0.0385	0.0043	0.0343
42	0.0386	0.0043	0.0343
43	0.0387	0.0043	0.0344
44	0.0387	0.0043	0.0344
45	0.0388	0.0043	0.0345
46	0.0389	0.0043	0.0346
47	0.0390	0.0043	0.0347
48	0.0390	0.0043	0.0347
49	0.0391	0.0043	0.0348
50	0.0392	0.0043	0.0348
51	0.0393	0.0044	0.0349

52	0.0393	0.0044	0.0350
53	0.0394	0.0044	0.0351
54	0.0395	0.0044	0.0351
55	0.0396	0.0044	0.0352
56	0.0396	0.0044	0.0352
57	0.0398	0.0044	0.0353
58	0.0398	0.0044	0.0354
59	0.0399	0.0044	0.0355
60	0.0400	0.0044	0.0355
61	0.0401	0.0044	0.0356
62	0.0401	0.0045	0.0357
63	0.0403	0.0045	0.0358
64	0.0403	0.0045	0.0358
65	0.0404	0.0045	0.0359
66	0.0405	0.0045	0.0360
67	0.0406	0.0045	0.0361
68	0.0407	0.0045	0.0362
69	0.0408	0.0045	0.0363
70	0.0408	0.0045	0.0363
71	0.0410	0.0045	0.0364
72	0.0410	0.0046	0.0365
73	0.0412	0.0046	0.0366
74	0.0412	0.0046	0.0367
75	0.0414	0.0046	0.0368
76	0.0414	0.0046	0.0368
77	0.0416	0.0046	0.0369
78	0.0416	0.0046	0.0370
79	0.0418	0.0046	0.0371
80	0.0418	0.0046	0.0372
81	0.0420	0.0047	0.0373
82	0.0420	0.0047	0.0374
83	0.0422	0.0047	0.0375
84	0.0422	0.0047	0.0376
85	0.0424	0.0047	0.0377
86	0.0425	0.0047	0.0377
87	0.0426	0.0047	0.0379
88	0.0427	0.0047	0.0379
89	0.0428	0.0048	0.0381
90	0.0429	0.0048	0.0381
91	0.0431	0.0048	0.0383
92	0.0431	0.0048	0.0384
93	0.0433	0.0048	0.0385
94	0.0434	0.0048	0.0386
95	0.0435	0.0048	0.0387
96	0.0436	0.0048	0.0388
97	0.0438	0.0049	0.0389
98	0.0439	0.0049	0.0390
99	0.0441	0.0049	0.0392
100	0.0441	0.0049	0.0392
101	0.0443	0.0049	0.0394
102	0.0444	0.0049	0.0395
103	0.0446	0.0049	0.0396
104	0.0447	0.0050	0.0397
105	0.0449	0.0050	0.0399
106	0.0450	0.0050	0.0400
107	0.0452	0.0050	0.0401
108	0.0453	0.0050	0.0402

109	0.0455	0.0050	0.0404
110	0.0456	0.0051	0.0405
111	0.0458	0.0051	0.0407
112	0.0459	0.0051	0.0408
113	0.0461	0.0051	0.0410
114	0.0462	0.0051	0.0411
115	0.0464	0.0052	0.0412
116	0.0465	0.0052	0.0413
117	0.0467	0.0052	0.0415
118	0.0468	0.0052	0.0416
119	0.0471	0.0052	0.0419
120	0.0472	0.0052	0.0420
121	0.0474	0.0053	0.0422
122	0.0476	0.0053	0.0423
123	0.0478	0.0053	0.0425
124	0.0479	0.0053	0.0426
125	0.0482	0.0054	0.0429
126	0.0483	0.0054	0.0430
127	0.0486	0.0054	0.0432
128	0.0487	0.0054	0.0433
129	0.0490	0.0054	0.0436
130	0.0492	0.0055	0.0437
131	0.0495	0.0055	0.0440
132	0.0496	0.0055	0.0441
133	0.0499	0.0055	0.0444
134	0.0501	0.0056	0.0445
135	0.0504	0.0056	0.0448
136	0.0505	0.0056	0.0449
137	0.0509	0.0056	0.0452
138	0.0511	0.0057	0.0454
139	0.0514	0.0057	0.0457
140	0.0516	0.0057	0.0459
141	0.0519	0.0058	0.0462
142	0.0521	0.0058	0.0463
143	0.0525	0.0058	0.0467
144	0.0527	0.0059	0.0469
145	0.0493	0.0055	0.0439
146	0.0496	0.0055	0.0441
147	0.0500	0.0056	0.0445
148	0.0503	0.0056	0.0447
149	0.0508	0.0056	0.0452
150	0.0510	0.0057	0.0454
151	0.0516	0.0057	0.0459
152	0.0519	0.0058	0.0461
153	0.0524	0.0058	0.0466
154	0.0527	0.0059	0.0469
155	0.0533	0.0059	0.0474
156	0.0536	0.0060	0.0477
157	0.0543	0.0060	0.0483
158	0.0546	0.0061	0.0486
159	0.0553	0.0061	0.0492
160	0.0557	0.0062	0.0495
161	0.0564	0.0063	0.0502
162	0.0568	0.0063	0.0505
163	0.0577	0.0064	0.0513
164	0.0581	0.0064	0.0517
165	0.0590	0.0065	0.0525

166	0.0595	0.0066	0.0529
167	0.0605	0.0067	0.0538
168	0.0610	0.0068	0.0542
169	0.0704	0.0078	0.0626
170	0.0709	0.0079	0.0630
171	0.0719	0.0080	0.0639
172	0.0724	0.0080	0.0644
173	0.0736	0.0082	0.0654
174	0.0742	0.0082	0.0659
175	0.0755	0.0084	0.0671
176	0.0762	0.0085	0.0677
177	0.0777	0.0086	0.0690
178	0.0785	0.0087	0.0698
179	0.0802	0.0089	0.0713
180	0.0812	0.0090	0.0722
181	0.0833	0.0092	0.0741
182	0.0845	0.0094	0.0751
183	0.0871	0.0097	0.0775
184	0.0886	0.0098	0.0788
185	0.0584	0.0065	0.0519
186	0.0613	0.0068	0.0545
187	0.0684	0.0076	0.0608
188	0.0731	0.0081	0.0650
189	0.0775	0.0086	0.0689
190	0.0870	0.0097	0.0773
191	0.1221	0.0136	0.1086
192	0.1656	0.0184	0.1472
193	0.4785	0.0277	0.4507
194	0.1005	0.0112	0.0893
195	0.0787	0.0087	0.0699
196	0.0645	0.0072	0.0573
197	0.0903	0.0100	0.0802
198	0.0857	0.0095	0.0762
199	0.0822	0.0091	0.0731
200	0.0793	0.0088	0.0705
201	0.0769	0.0085	0.0684
202	0.0748	0.0083	0.0665
203	0.0730	0.0081	0.0649
204	0.0714	0.0079	0.0634
205	0.0615	0.0068	0.0547
206	0.0600	0.0067	0.0533
207	0.0585	0.0065	0.0520
208	0.0572	0.0064	0.0509
209	0.0561	0.0062	0.0498
210	0.0550	0.0061	0.0489
211	0.0540	0.0060	0.0480
212	0.0530	0.0059	0.0471
213	0.0521	0.0058	0.0463
214	0.0513	0.0057	0.0456
215	0.0505	0.0056	0.0449
216	0.0498	0.0055	0.0443
217	0.0529	0.0059	0.0470
218	0.0523	0.0058	0.0465
219	0.0518	0.0057	0.0460
220	0.0512	0.0057	0.0455
221	0.0507	0.0056	0.0451
222	0.0502	0.0056	0.0447

223	0.0498	0.0055	0.0442
224	0.0493	0.0055	0.0438
225	0.0489	0.0054	0.0435
226	0.0485	0.0054	0.0431
227	0.0481	0.0053	0.0427
228	0.0477	0.0053	0.0424
229	0.0473	0.0053	0.0421
230	0.0470	0.0052	0.0418
231	0.0466	0.0052	0.0414
232	0.0463	0.0051	0.0412
233	0.0460	0.0051	0.0409
234	0.0457	0.0051	0.0406
235	0.0454	0.0050	0.0403
236	0.0451	0.0050	0.0401
237	0.0448	0.0050	0.0398
238	0.0445	0.0049	0.0396
239	0.0442	0.0049	0.0393
240	0.0440	0.0049	0.0391
241	0.0437	0.0049	0.0389
242	0.0435	0.0048	0.0386
243	0.0432	0.0048	0.0384
244	0.0430	0.0048	0.0382
245	0.0428	0.0047	0.0380
246	0.0425	0.0047	0.0378
247	0.0423	0.0047	0.0376
248	0.0421	0.0047	0.0374
249	0.0419	0.0046	0.0372
250	0.0417	0.0046	0.0371
251	0.0415	0.0046	0.0369
252	0.0413	0.0046	0.0367
253	0.0411	0.0046	0.0365
254	0.0409	0.0045	0.0364
255	0.0407	0.0045	0.0362
256	0.0405	0.0045	0.0360
257	0.0404	0.0045	0.0359
258	0.0402	0.0045	0.0357
259	0.0400	0.0044	0.0356
260	0.0399	0.0044	0.0354
261	0.0397	0.0044	0.0353
262	0.0395	0.0044	0.0352
263	0.0394	0.0044	0.0350
264	0.0392	0.0044	0.0349
265	0.0391	0.0043	0.0347
266	0.0389	0.0043	0.0346
267	0.0388	0.0043	0.0345
268	0.0386	0.0043	0.0344
269	0.0385	0.0043	0.0342
270	0.0384	0.0043	0.0341
271	0.0382	0.0042	0.0340
272	0.0381	0.0042	0.0339
273	0.0380	0.0042	0.0337
274	0.0378	0.0042	0.0336
275	0.0377	0.0042	0.0335
276	0.0376	0.0042	0.0334
277	0.0374	0.0042	0.0333
278	0.0373	0.0041	0.0332
279	0.0372	0.0041	0.0331

280	0.0371	0.0041	0.0330
281	0.0370	0.0041	0.0329
282	0.0369	0.0041	0.0328
283	0.0367	0.0041	0.0327
284	0.0366	0.0041	0.0326
285	0.0365	0.0041	0.0325
286	0.0364	0.0040	0.0324
287	0.0363	0.0040	0.0323
288	0.0362	0.0040	0.0322

TOTAL STORM RAINFALL(INCHES) = 14.38
TOTAL SOIL-LOSS(INCHES) = 1.57
TOTAL EFFECTIVE RAINFALL(INCHES) = 12.81

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 444.4048
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3621.9980

24-HOUR STORM RUNOFF HYDROGRAPH

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 1575.0 3150.0 4725.0 6300.0
0.083	0.1010	14.66	Q . . . .
0.167	0.4617	52.38	Q . . . .
0.250	1.2131	109.10	Q . . . .
0.333	2.4881	185.13	VQ . . . .
0.417	4.5879	304.90	VQ . . . .
0.500	8.2926	537.93	V Q . . . .
0.583	13.4424	747.75	V Q . . . .
0.667	19.3247	854.11	V Q . . . .
0.750	25.7115	927.36	V Q . . . .
0.833	32.5201	988.61	V Q . . . .
0.917	39.6759	1039.02	V Q . . . .
1.000	47.1239	1081.44	V Q . . . .
1.083	54.8280	1118.64	V Q . . . .
1.167	62.7585	1151.51	V Q . . . .
1.250	70.8797	1179.20	V Q . . . .
1.333	79.1660	1203.17	V Q . . . .
1.417	87.6051	1225.36	V Q . . . .
1.500	96.1778	1244.76	.V Q . . . .
1.583	104.8701	1262.12	.V Q . . . .
1.667	113.6606	1276.37	.V Q . . . .
1.750	122.5431	1289.75	.V Q . . . .
1.833	131.4929	1299.51	.V Q . . . .
1.917	140.5065	1308.77	.V Q . . . .
2.000	149.5841	1318.07	.V Q . . . .
2.083	158.7092	1324.96	.V Q . . . .
2.167	167.8570	1328.26	.V Q . . . .
2.250	177.0274	1331.54	.V Q . . . .
2.333	186.2205	1334.84	. V Q . . . .
2.417	195.4365	1338.16	. V Q . . . .
2.500	204.6754	1341.49	. V Q . . . .
2.583	213.9374	1344.85	. V Q . . . .
2.667	223.2227	1348.22	. V Q . . . .
2.750	232.5313	1351.60	. V Q . . . .
2.833	241.8633	1355.02	. V Q . . . .
2.917	251.2190	1358.44	. V Q . . . .
3.000	260.5984	1361.89	. V Q . . . .
3.083	270.0016	1365.35	. V Q . . . .
3.167	279.4289	1368.84	. V Q . . . .
3.250	288.8803	1372.34	. V Q . . . .
3.333	298.3560	1375.87	. V Q . . . .
3.417	307.8560	1379.41	. V Q . . . .
3.500	317.3807	1382.98	. V Q . . . .
3.583	326.9301	1386.57	. V Q . . . .
3.667	336.5043	1390.18	. V Q . . . .
3.750	346.1035	1393.81	. V Q . . . .

```
3.833    355.7280    1397.46  .  V    Q .          .          .          .
```

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1575.0	3150.0	4725.0	6300.0
3.917	365.3777	1401.13	.	V Q .	.	.	.
4.000	375.0476	1404.08	.	V Q .	.	.	.
4.083	384.7351	1406.63	.	V Q .	.	.	.
4.167	394.4405	1409.22	.	V Q .	.	.	.
4.250	404.1638	1411.82	.	V Q .	.	.	.
4.333	413.9052	1414.46	.	V Q .	.	.	.
4.417	423.6649	1417.10	.	V Q .	.	.	.
4.500	433.4429	1419.78	.	V Q.	.	.	.
4.583	443.2395	1422.47	.	V Q.	.	.	.
4.667	453.0549	1425.19	.	V Q.	.	.	.
4.750	462.8892	1427.93	.	V Q.	.	.	.
4.833	472.7425	1430.71	.	V Q.	.	.	.
4.917	482.6151	1433.49	.	V Q.	.	.	.
5.000	492.5070	1436.32	.	V Q.	.	.	.
5.083	502.4186	1439.16	.	V Q.	.	.	.
5.167	512.3500	1442.04	.	V Q.	.	.	.
5.250	522.3013	1444.93	.	V Q.	.	.	.
5.333	532.2728	1447.86	.	V Q.	.	.	.
5.417	542.2645	1450.81	.	V Q.	.	.	.
5.500	552.2769	1453.79	.	V Q.	.	.	.
5.583	562.3099	1456.79	.	V Q.	.	.	.
5.667	572.3638	1459.84	.	V Q.	.	.	.
5.750	582.4389	1462.90	.	V Q.	.	.	.
5.833	592.5353	1466.00	.	V Q.	.	.	.
5.917	602.6533	1469.12	.	V Q.	.	.	.
6.000	612.7930	1472.29	.	V Q.	.	.	.
6.083	622.9547	1475.47	.	V Q.	.	.	.
6.167	633.1385	1478.71	.	V Q.	.	.	.
6.250	643.3448	1481.95	.	V Q.	.	.	.
6.333	653.5739	1485.25	.	V Q.	.	.	.
6.417	663.8257	1488.56	.	V Q.	.	.	.
6.500	674.1007	1491.93	.	V Q.	.	.	.
6.583	684.3990	1495.32	.	V Q.	.	.	.
6.667	694.7211	1498.75	.	V Q.	.	.	.
6.750	705.0669	1502.21	.	V Q.	.	.	.
6.833	715.4369	1505.72	.	V Q.	.	.	.
6.917	725.8312	1509.26	.	VQ.	.	.	.
7.000	736.2502	1512.84	.	VQ.	.	.	.
7.083	746.6941	1516.45	.	VQ.	.	.	.
7.167	757.1632	1520.12	.	VQ.	.	.	.
7.250	767.6578	1523.81	.	VQ.	.	.	.
7.333	778.1782	1527.56	.	VQ.	.	.	.
7.417	788.7245	1531.34	.	VQ.	.	.	.
7.500	799.2974	1535.18	.	VQ.	.	.	.
7.583	809.8969	1539.04	.	VQ.	.	.	.
7.667	820.5234	1542.97	.	Q.	.	.	.
7.750	831.1772	1546.93	.	Q.	.	.	.
7.833	841.8586	1550.95	.	Q.	.	.	.
7.917	852.5680	1555.00	.	Q.	.	.	.
8.000	863.3057	1559.12	.	Q.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1575.0	3150.0	4725.0	6300.0
8.083	874.0721	1563.27	.	Q.	.	.	.
8.167	884.8675	1567.50	.	Q.	.	.	.
8.250	895.6923	1571.75	.	Q.	.	.	.
8.333	906.5469	1576.09	.	Q	.	.	.
8.417	917.4315	1580.45	.	Q	.	.	.
8.500	928.3468	1584.90	.	Q	.	.	.
8.583	939.2930	1589.38	.	Q	.	.	.
8.667	950.2706	1593.95	.	Q	.	.	.
8.750	961.2798	1598.55	.	Q	.	.	.
8.833	972.3214	1603.24	.	Q	.	.	.
8.917	983.3955	1607.96	.	Q	.	.	.
9.000	994.5028	1612.78	.	Q	.	.	.
9.083	1005.6436	1617.63	.	QV	.	.	.
9.167	1016.8184	1622.59	.	QV	.	.	.
9.250	1028.0277	1627.58	.	QV	.	.	.
9.333	1039.2721	1632.68	.	QV	.	.	.
9.417	1050.5519	1637.82	.	QV	.	.	.
9.500	1061.8678	1643.07	.	QV	.	.	.
9.583	1073.2202	1648.37	.	QV	.	.	.
9.667	1084.6099	1653.78	.	QV	.	.	.
9.750	1096.0371	1659.24	.	Q V	.	.	.
9.833	1107.5028	1664.82	.	Q V	.	.	.
9.917	1119.0073	1670.45	.	Q V	.	.	.
10.000	1130.5515	1676.21	.	Q V	.	.	.
10.083	1142.1357	1682.02	.	Q V	.	.	.
10.167	1153.7609	1687.97	.	Q V	.	.	.
10.250	1165.4274	1693.97	.	Q V	.	.	.
10.333	1177.1361	1700.11	.	Q V	.	.	.
10.417	1188.8877	1706.32	.	Q V	.	.	.
10.500	1200.6830	1712.68	.	Q V	.	.	.
10.583	1212.5226	1719.10	.	Q V	.	.	.
10.667	1224.4075	1725.68	.	Q V	.	.	.
10.750	1236.3381	1732.34	.	Q V	.	.	.
10.833	1248.3158	1739.16	.	.Q V	.	.	.
10.917	1260.3411	1746.06	.	.Q V	.	.	.
11.000	1272.4150	1753.13	.	.Q V	.	.	.
11.083	1284.5383	1760.30	.	.Q V	.	.	.
11.167	1296.7122	1767.65	.	.Q V	.	.	.
11.250	1308.9374	1775.09	.	.Q V	.	.	.
11.333	1321.2151	1782.73	.	.Q V	.	.	.
11.417	1333.5463	1790.48	.	.Q V	.	.	.
11.500	1345.9321	1798.43	.	.Q V	.	.	.
11.583	1358.3737	1806.51	.	.Q V	.	.	.
11.667	1370.8723	1814.80	.	.Q V	.	.	.
11.750	1383.4290	1823.22	.	.Q V	.	.	.
11.833	1396.0452	1831.88	.	.Q V	.	.	.
11.917	1408.7220	1840.68	.	.Q V	.	.	.
12.000	1421.4613	1849.74	.	.Q V	.	.	.
12.083	1434.2534	1857.42	.	.Q V	.	.	.
12.167	1447.0839	1862.97	.	.Q V	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1575.0	3150.0	4725.0	6300.0
12.250	1459.9403	1866.76	.	.Q	V .	.	.
12.333	1472.8114	1868.87	.	.Q	V .	.	.
12.417	1485.6675	1866.70	.	.Q	V .	.	.
12.500	1498.4302	1853.14	.	.Q	V .	.	.
12.583	1511.1191	1842.44	.	.Q	V .	.	.
12.667	1523.8131	1843.16	.	.Q	V .	.	.
12.750	1536.5383	1847.70	.	.Q	V .	.	.
12.833	1549.3070	1854.00	.	.Q	V .	.	.
12.917	1562.1293	1861.79	.	.Q	V .	.	.
13.000	1575.0145	1870.94	.	.Q	V .	.	.
13.083	1587.9691	1881.00	.	.Q	V .	.	.
13.167	1601.0000	1892.09	.	. Q	V .	.	.
13.250	1614.1138	1904.12	.	. Q	V .	.	.
13.333	1627.3174	1917.16	.	. Q	V .	.	.
13.417	1640.6151	1930.84	.	. Q	V .	.	.
13.500	1654.0138	1945.49	.	. Q	V .	.	.
13.583	1667.5184	1960.87	.	. Q	V .	.	.
13.667	1681.1365	1977.33	.	. Q	V .	.	.
13.750	1694.8724	1994.47	.	. Q	V .	.	.
13.833	1708.7350	2012.85	.	. Q	V .	.	.
13.917	1722.7291	2031.94	.	. Q	V.	.	.
14.000	1736.8615	2052.02	.	. Q	V.	.	.
14.083	1751.1622	2076.47	.	. Q	V.	.	.
14.167	1765.6779	2107.67	.	. Q	V.	.	.
14.250	1780.4435	2143.96	.	. Q	V.	.	.
14.333	1795.4967	2185.73	.	. Q	V.	.	.
14.417	1810.9114	2238.21	.	. Q	V.	.	.
14.500	1826.8729	2317.61	.	. Q	V	.	.
14.583	1843.3462	2391.91	.	. Q	V	.	.
14.667	1860.1715	2443.04	.	. Q	V	.	.
14.750	1877.3024	2487.39	.	. Q	V	.	.
14.833	1894.7300	2530.50	.	. Q	V	.	.
14.917	1912.4465	2572.44	.	. Q	.V	.	.
15.000	1930.4531	2614.56	.	. Q	.V	.	.
15.083	1948.7542	2657.31	.	. Q	.V	.	.
15.167	1967.3610	2701.71	.	. Q	.V	.	.
15.250	1986.2826	2747.42	.	. Q	.V	.	.
15.333	2005.5376	2795.83	.	. Q	. V	.	.
15.417	2025.0532	2833.68	.	. Q	. V	.	.
15.500	2044.7137	2854.71	.	. Q	. V	.	.
15.583	2064.4402	2864.29	.	. Q	. V	.	.
15.667	2084.1731	2865.22	.	. Q	. V	.	.
15.750	2103.6985	2835.10	.	. Q	. V	.	.
15.833	2122.3884	2713.77	.	. Q	. V	.	.
15.917	2140.6101	2645.79	.	. Q	. V	.	.
16.000	2159.4392	2733.97	.	. Q	. V	.	.
16.083	2180.4004	3043.57	.	. Q.	V	.	.
16.167	2204.1855	3453.61	.	.Q	V	.	.
16.250	2230.7236	3853.33	.	.	Q	.	.
16.333	2260.6348	4343.09	.	.	V Q	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1575.0	3150.0	4725.0	6300.0
16.417	2295.7537	5099.27	.	.	.	V . Q	.
16.500	2339.0620	6288.36	.	.	.	V .	Q.
16.583	2378.9861	5796.97	.	.	.	V .	Q .
16.667	2409.6760	4456.17	.	.	.	V Q .	.
16.750	2436.7678	3933.72	.	.	.	Q V .	.
16.833	2462.8674	3789.66	.	.	.	Q V .	.
16.917	2488.2322	3682.97	.	.	.	Q V .	.
17.000	2512.6257	3541.94	.	.	.	Q V .	.
17.083	2536.1355	3413.63	.	.	.Q	V .	.
17.167	2558.8064	3291.80	.	.	Q	V .	.
17.250	2580.5627	3159.03	.	.	Q	V .	.
17.333	2601.4966	3039.58	.	.	Q.	V .	.
17.417	2621.7056	2934.36	.	.	Q .	V .	.
17.500	2640.9639	2796.30	.	.	Q .	V.	.
17.583	2659.3518	2669.94	.	.	Q .	V.	.
17.667	2676.9592	2556.59	.	.	Q .	V.	.
17.750	2694.0112	2475.95	.	.	Q .	V.	.
17.833	2710.3677	2374.97	.	.	Q .	V.	.
17.917	2726.2913	2312.12	.	.	Q .	V	.
18.000	2741.8079	2253.00	.	.	Q .	V	.
18.083	2756.7715	2172.72	.	.	Q .	V	.
18.167	2771.1555	2088.57	.	.	Q .	V	.
18.250	2785.2839	2051.45	.	.	Q .	V	.
18.333	2799.2148	2022.78	.	.	Q .	V	.
18.417	2812.9941	2000.76	.	.	Q .	.V	.
18.500	2826.7029	1990.52	.	.	Q .	.V	.
18.583	2840.3452	1980.85	.	.	Q .	.V	.
18.667	2853.8638	1962.90	.	.	Q .	.V	.
18.750	2867.2480	1943.39	.	.	Q .	.V	.
18.833	2880.5042	1924.79	.	.	Q .	.V	.
18.917	2893.6338	1906.43	.	.	Q .	.V	.
19.000	2906.6384	1888.29	.	.Q	.	. V	.
19.083	2919.5249	1871.12	.	.Q	.	. V	.
19.167	2932.3018	1855.20	.	.Q	.	. V	.
19.250	2944.9707	1839.55	.	.Q	.	. V	.
19.333	2957.5388	1824.90	.	.Q	.	. V	.
19.417	2970.0117	1811.06	.	.Q	.	. V	.
19.500	2982.3906	1797.40	.	.Q	.	. V	.
19.583	2994.6768	1783.95	.	.Q	.	. V	.
19.667	3006.8708	1770.59	.	.Q	.	. V	.
19.750	3018.9741	1757.39	.	.Q	.	. V	.
19.833	3030.9812	1743.44	.	.Q	.	. V	.
19.917	3042.8860	1728.58	.	Q	.	. V	.
20.000	3054.6384	1706.47	.	Q	.	. V	.
20.083	3066.2725	1689.25	.	Q	.	. V	.
20.167	3077.8218	1676.97	.	Q	.	. V	.
20.250	3089.2925	1665.55	.	Q	.	. V	.
20.333	3100.6841	1654.07	.	Q	.	. V	.
20.417	3111.9973	1642.69	.	Q	.	. V	.
20.500	3123.2351	1631.72	.	Q	.	. V	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1575.0	3150.0	4725.0	6300.0
20.583	3134.3999	1621.12	.	Q	.	.	V .
20.667	3145.4939	1610.85	.	Q	.	.	V .
20.750	3156.5193	1600.89	.	Q	.	.	V .
20.833	3167.4780	1591.22	.	Q	.	.	V .
20.917	3178.3721	1581.82	.	Q	.	.	V .
21.000	3189.2043	1572.85	.	Q.	.	.	V .
21.083	3199.9773	1564.23	.	Q.	.	.	V .
21.167	3210.6924	1555.84	.	Q.	.	.	V .
21.250	3221.3513	1547.67	.	Q.	.	.	V .
21.333	3231.9553	1539.71	.	Q.	.	.	V .
21.417	3242.5061	1531.96	.	Q.	.	.	V .
21.500	3253.0046	1524.40	.	Q.	.	.	V .
21.583	3263.4524	1517.03	.	Q.	.	.	V .
21.667	3273.8506	1509.83	.	Q.	.	.	V .
21.750	3284.2004	1502.79	.	Q.	.	.	V .
21.833	3294.5029	1495.92	.	Q.	.	.	V .
21.917	3304.7590	1489.20	.	Q.	.	.	V .
22.000	3314.9695	1482.55	.	Q.	.	.	V .
22.083	3325.1348	1475.99	.	Q.	.	.	V .
22.167	3335.2559	1469.58	.	Q.	.	.	V .
22.250	3345.3335	1463.29	.	Q.	.	.	V .
22.333	3355.3689	1457.13	.	Q.	.	.	V .
22.417	3365.3625	1451.08	.	Q.	.	.	V .
22.500	3375.3154	1445.15	.	Q.	.	.	V .
22.583	3385.2283	1439.33	.	Q.	.	.	V .
22.667	3395.1018	1433.63	.	Q.	.	.	V .
22.750	3404.9368	1428.03	.	Q.	.	.	V .
22.833	3414.7336	1422.52	.	Q.	.	.	V .
22.917	3424.4934	1417.12	.	Q .	.	.	V .
23.000	3434.2166	1411.80	.	Q .	.	.	V .
23.083	3443.9038	1406.59	.	Q .	.	.	V .
23.167	3453.5557	1401.46	.	Q .	.	.	V .
23.250	3463.1729	1396.42	.	Q .	.	.	V .
23.333	3472.7559	1391.46	.	Q .	.	.	V .
23.417	3482.3054	1386.58	.	Q .	.	.	V .
23.500	3491.8218	1381.79	.	Q .	.	.	V .
23.583	3501.3057	1377.07	.	Q .	.	.	V .
23.667	3510.7576	1372.42	.	Q .	.	.	V .
23.750	3520.1780	1367.85	.	Q .	.	.	V .
23.833	3529.5674	1363.35	.	Q .	.	.	V .
23.917	3538.9263	1358.92	.	Q .	.	.	V.
24.000	3548.2551	1354.55	.	Q .	.	.	V.
24.083	3557.4534	1335.60	.	Q .	.	.	V.
24.167	3566.3633	1293.73	.	Q .	.	.	V.
24.250	3574.8557	1233.10	.	Q .	.	.	V.
24.333	3582.7998	1153.47	.	Q .	.	.	V.
24.417	3589.8970	1030.52	.	Q .	.	.	V.
24.500	3595.3721	794.97	.	Q .	.	.	V.
24.583	3599.3914	583.62	. Q	.	.	.	V.
24.667	3602.6738	476.60	. Q	.	.	.	V.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1575.0	3150.0	4725.0	6300.0
24.750	3605.4504	403.17	. Q	.	.	.	V.
24.833	3607.8064	342.08	. Q	.	.	.	V.
24.917	3609.8181	292.09	.Q	.	.	.	V.
25.000	3611.5422	250.34	.Q	.	.	.	V.
25.083	3613.0159	213.99	.Q	.	.	.	V.
25.167	3614.2703	182.15	.Q	.	.	.	V.
25.250	3615.3423	155.64	Q	.	.	.	V.
25.333	3616.2583	132.99	Q	.	.	.	V.
25.417	3617.0312	112.22	Q	.	.	.	V.
25.500	3617.6812	94.35	Q	.	.	.	V.
25.583	3618.2224	78.61	Q	.	.	.	V.
25.667	3618.6775	66.07	Q	.	.	.	V.
25.750	3619.0525	54.45	Q	.	.	.	V.
25.833	3619.3730	46.53	Q	.	.	.	V.
25.917	3619.6428	39.16	Q	.	.	.	V.
26.000	3619.8618	31.81	Q	.	.	.	V.
26.083	3620.0471	26.89	Q	.	.	.	V.
26.167	3620.2236	25.61	Q	.	.	.	V.
26.250	3620.3914	24.37	Q	.	.	.	V.
26.333	3620.5508	23.13	Q	.	.	.	V.
26.417	3620.7017	21.90	Q	.	.	.	V.
26.500	3620.8440	20.67	Q	.	.	.	V.
26.583	3620.9780	19.45	Q	.	.	.	V.
26.667	3621.1035	18.23	Q	.	.	.	V.
26.750	3621.2207	17.01	Q	.	.	.	V.
26.833	3621.3296	15.80	Q	.	.	.	V.
26.917	3621.4302	14.59	Q	.	.	.	V.
27.000	3621.5225	13.39	Q	.	.	.	V.
27.083	3621.6064	12.19	Q	.	.	.	V.
27.167	3621.6821	11.00	Q	.	.	.	V.
27.250	3621.7498	9.80	Q	.	.	.	V.
27.333	3621.8091	8.62	Q	.	.	.	V.
27.417	3621.8604	7.43	Q	.	.	.	V.
27.500	3621.9033	6.25	Q	.	.	.	V.
27.583	3621.9382	5.07	Q	.	.	.	V.
27.667	3621.9651	3.90	Q	.	.	.	V.
27.750	3621.9839	2.73	Q	.	.	.	V.
27.833	3621.9946	1.56	Q	.	.	.	V.
27.917	3621.9973	0.40	Q	.	.	.	V.

END OF FLOODSCx ROUTING ANALYSIS

```
****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2002 Advanced Engineering Software (aes)
            Ver. 8.0  Release Date: 01/01/2002  License ID 1542

                          Analysis prepared by:

                        TRANSTECH ENGINEERS, INC.
                           624 Brea Canyon Road
                            Walnut, CA 91789


 ************************** DESCRIPTION OF STUDY **************************
* WATERMAN CANYON                                                          *
* DEVELOPED CONDITION                                                      *
*                                                                          *
 ****************************************************************************

  FILE NAME: AS-2.DAT
  TIME/DATE OF STUDY: 12:03 03/04/2005
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =    1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =     3394.000 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.490 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         FOOTHILL S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.138
         LOW LOSS FRACTION = 0.115
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.58
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.25
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.74
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  3.40
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  5.36
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 14.50

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.825
          30-MINUTE FACTOR = 0.825
           1-HOUR FACTOR = 0.825
           3-HOUR FACTOR = 0.975
           6-HOUR FACTOR = 0.985
          24-HOUR FACTOR = 0.992

         UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  17.007


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 1.112                456.415
        2                 3.972               1174.010
        3                 8.270               1764.123
        4                14.027               2362.960
        5                23.093               3721.370
        6                40.739               7243.110
        7                56.602               6511.134
        8                64.590               3278.796
```

9	70.054	2242.409
10	74.597	1864.988
11	78.312	1524.745
12	81.413	1272.823
13	84.114	1108.722
14	86.481	971.371
15	88.450	808.551
16	90.133	690.703
17	91.679	634.514
18	93.009	545.824
19	94.182	481.546
20	95.115	383.101
21	95.981	355.334
22	96.569	241.444
23	97.118	225.182
24	97.667	225.232
25	98.032	149.899
26	98.122	37.194
27	98.210	36.157
28	98.298	36.060
29	98.387	36.251
30	98.474	35.919
31	98.562	36.201
32	98.650	36.016
33	98.738	36.107
34	98.826	36.110
35	98.914	36.107
36	99.002	36.110
37	99.090	36.107
38	99.178	36.107
39	99.266	36.107
40	99.354	36.107
41	99.442	36.107
42	99.530	36.107
43	99.618	36.107
44	99.706	36.107
45	99.794	36.107
46	99.882	36.107
47	99.970	36.107
48	100.000	12.470

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0361	0.0042	0.0320
2	0.0362	0.0042	0.0320
3	0.0362	0.0042	0.0321
4	0.0363	0.0042	0.0321
5	0.0363	0.0042	0.0322
6	0.0364	0.0042	0.0322
7	0.0364	0.0042	0.0323
8	0.0365	0.0042	0.0323
9	0.0366	0.0042	0.0324
10	0.0366	0.0042	0.0324
11	0.0367	0.0042	0.0325
12	0.0367	0.0042	0.0325
13	0.0368	0.0042	0.0325
14	0.0368	0.0042	0.0326
15	0.0369	0.0042	0.0327
16	0.0369	0.0042	0.0327
17	0.0370	0.0043	0.0328
18	0.0370	0.0043	0.0328
19	0.0371	0.0043	0.0329
20	0.0372	0.0043	0.0329
21	0.0372	0.0043	0.0330
22	0.0373	0.0043	0.0330
23	0.0374	0.0043	0.0331
24	0.0374	0.0043	0.0331
25	0.0375	0.0043	0.0332
26	0.0375	0.0043	0.0332
27	0.0376	0.0043	0.0333
28	0.0377	0.0043	0.0333
29	0.0377	0.0043	0.0334
30	0.0378	0.0043	0.0334
31	0.0379	0.0044	0.0335
32	0.0379	0.0044	0.0336
33	0.0380	0.0044	0.0336
34	0.0380	0.0044	0.0337
35	0.0381	0.0044	0.0337
36	0.0382	0.0044	0.0338
37	0.0383	0.0044	0.0339
38	0.0383	0.0044	0.0339
39	0.0384	0.0044	0.0340
40	0.0385	0.0044	0.0340
41	0.0385	0.0044	0.0341
42	0.0386	0.0044	0.0342
43	0.0387	0.0044	0.0342
44	0.0387	0.0045	0.0343
45	0.0388	0.0045	0.0344
46	0.0389	0.0045	0.0344
47	0.0390	0.0045	0.0345
48	0.0390	0.0045	0.0345
49	0.0391	0.0045	0.0346
50	0.0392	0.0045	0.0347
51	0.0393	0.0045	0.0348

52	0.0393	0.0045	0.0348
53	0.0394	0.0045	0.0349
54	0.0395	0.0045	0.0349
55	0.0396	0.0046	0.0350
56	0.0396	0.0046	0.0351
57	0.0398	0.0046	0.0352
58	0.0398	0.0046	0.0352
59	0.0399	0.0046	0.0353
60	0.0400	0.0046	0.0354
61	0.0401	0.0046	0.0355
62	0.0401	0.0046	0.0355
63	0.0403	0.0046	0.0356
64	0.0403	0.0046	0.0357
65	0.0404	0.0046	0.0358
66	0.0405	0.0047	0.0358
67	0.0406	0.0047	0.0359
68	0.0407	0.0047	0.0360
69	0.0408	0.0047	0.0361
70	0.0408	0.0047	0.0362
71	0.0410	0.0047	0.0363
72	0.0410	0.0047	0.0363
73	0.0412	0.0047	0.0364
74	0.0412	0.0047	0.0365
75	0.0414	0.0048	0.0366
76	0.0414	0.0048	0.0367
77	0.0416	0.0048	0.0368
78	0.0416	0.0048	0.0368
79	0.0418	0.0048	0.0370
80	0.0418	0.0048	0.0370
81	0.0420	0.0048	0.0371
82	0.0420	0.0048	0.0372
83	0.0422	0.0048	0.0373
84	0.0422	0.0049	0.0374
85	0.0424	0.0049	0.0375
86	0.0425	0.0049	0.0376
87	0.0426	0.0049	0.0377
88	0.0427	0.0049	0.0378
89	0.0428	0.0049	0.0379
90	0.0429	0.0049	0.0380
91	0.0431	0.0050	0.0381
92	0.0431	0.0050	0.0382
93	0.0433	0.0050	0.0383
94	0.0434	0.0050	0.0384
95	0.0435	0.0050	0.0385
96	0.0436	0.0050	0.0386
97	0.0438	0.0050	0.0388
98	0.0439	0.0050	0.0388
99	0.0441	0.0051	0.0390
100	0.0441	0.0051	0.0391
101	0.0443	0.0051	0.0392
102	0.0444	0.0051	0.0393
103	0.0446	0.0051	0.0395
104	0.0447	0.0051	0.0395
105	0.0449	0.0052	0.0397
106	0.0450	0.0052	0.0398
107	0.0452	0.0052	0.0400
108	0.0453	0.0052	0.0400

109	0.0455	0.0052	0.0402
110	0.0456	0.0052	0.0403
111	0.0458	0.0053	0.0405
112	0.0459	0.0053	0.0406
113	0.0461	0.0053	0.0408
114	0.0462	0.0053	0.0409
115	0.0464	0.0053	0.0411
116	0.0465	0.0053	0.0412
117	0.0467	0.0054	0.0414
118	0.0468	0.0054	0.0415
119	0.0471	0.0054	0.0417
120	0.0472	0.0054	0.0418
121	0.0474	0.0055	0.0420
122	0.0476	0.0055	0.0421
123	0.0478	0.0055	0.0423
124	0.0479	0.0055	0.0424
125	0.0482	0.0055	0.0427
126	0.0483	0.0056	0.0428
127	0.0486	0.0056	0.0430
128	0.0487	0.0056	0.0431
129	0.0490	0.0056	0.0434
130	0.0492	0.0057	0.0435
131	0.0495	0.0057	0.0438
132	0.0496	0.0057	0.0439
133	0.0499	0.0057	0.0442
134	0.0501	0.0058	0.0443
135	0.0504	0.0058	0.0446
136	0.0505	0.0058	0.0447
137	0.0509	0.0059	0.0450
138	0.0511	0.0059	0.0452
139	0.0514	0.0059	0.0455
140	0.0516	0.0059	0.0456
141	0.0519	0.0060	0.0460
142	0.0521	0.0060	0.0461
143	0.0525	0.0060	0.0465
144	0.0527	0.0061	0.0467
145	0.0493	0.0057	0.0437
146	0.0496	0.0057	0.0439
147	0.0500	0.0058	0.0443
148	0.0503	0.0058	0.0445
149	0.0508	0.0058	0.0449
150	0.0510	0.0059	0.0452
151	0.0516	0.0059	0.0456
152	0.0519	0.0060	0.0459
153	0.0524	0.0060	0.0464
154	0.0527	0.0061	0.0466
155	0.0533	0.0061	0.0472
156	0.0536	0.0062	0.0475
157	0.0543	0.0062	0.0480
158	0.0546	0.0063	0.0483
159	0.0553	0.0064	0.0490
160	0.0557	0.0064	0.0493
161	0.0564	0.0065	0.0500
162	0.0568	0.0065	0.0503
163	0.0577	0.0066	0.0510
164	0.0581	0.0067	0.0514
165	0.0590	0.0068	0.0522

166	0.0595	0.0068	0.0526
167	0.0605	0.0070	0.0535
168	0.0610	0.0070	0.0540
169	0.0704	0.0081	0.0623
170	0.0709	0.0081	0.0627
171	0.0719	0.0083	0.0636
172	0.0724	0.0083	0.0641
173	0.0736	0.0085	0.0651
174	0.0742	0.0085	0.0656
175	0.0755	0.0087	0.0668
176	0.0762	0.0088	0.0674
177	0.0777	0.0089	0.0687
178	0.0785	0.0090	0.0694
179	0.0802	0.0092	0.0710
180	0.0812	0.0093	0.0718
181	0.0833	0.0096	0.0737
182	0.0845	0.0097	0.0748
183	0.0871	0.0100	0.0771
184	0.0886	0.0102	0.0784
185	0.0584	0.0067	0.0516
186	0.0613	0.0070	0.0542
187	0.0684	0.0079	0.0605
188	0.0731	0.0084	0.0647
189	0.0775	0.0089	0.0686
190	0.0870	0.0100	0.0770
191	0.1221	0.0115	0.1106
192	0.1656	0.0115	0.1541
193	0.4785	0.0115	0.4670
194	0.1005	0.0115	0.0890
195	0.0787	0.0090	0.0696
196	0.0645	0.0074	0.0571
197	0.0903	0.0104	0.0799
198	0.0857	0.0099	0.0759
199	0.0822	0.0095	0.0728
200	0.0793	0.0091	0.0702
201	0.0769	0.0088	0.0680
202	0.0748	0.0086	0.0662
203	0.0730	0.0084	0.0646
204	0.0714	0.0082	0.0632
205	0.0615	0.0071	0.0545
206	0.0600	0.0069	0.0531
207	0.0585	0.0067	0.0518
208	0.0572	0.0066	0.0507
209	0.0561	0.0064	0.0496
210	0.0550	0.0063	0.0486
211	0.0540	0.0062	0.0477
212	0.0530	0.0061	0.0469
213	0.0521	0.0060	0.0461
214	0.0513	0.0059	0.0454
215	0.0505	0.0058	0.0447
216	0.0498	0.0057	0.0441
217	0.0529	0.0061	0.0468
218	0.0523	0.0060	0.0463
219	0.0518	0.0060	0.0458
220	0.0512	0.0059	0.0453
221	0.0507	0.0058	0.0449
222	0.0502	0.0058	0.0445

223	0.0498	0.0057	0.0440
224	0.0493	0.0057	0.0436
225	0.0489	0.0056	0.0433
226	0.0485	0.0056	0.0429
227	0.0481	0.0055	0.0425
228	0.0477	0.0055	0.0422
229	0.0473	0.0054	0.0419
230	0.0470	0.0054	0.0416
231	0.0466	0.0054	0.0413
232	0.0463	0.0053	0.0410
233	0.0460	0.0053	0.0407
234	0.0457	0.0053	0.0404
235	0.0454	0.0052	0.0401
236	0.0451	0.0052	0.0399
237	0.0448	0.0051	0.0396
238	0.0445	0.0051	0.0394
239	0.0442	0.0051	0.0391
240	0.0440	0.0051	0.0389
241	0.0437	0.0050	0.0387
242	0.0435	0.0050	0.0385
243	0.0432	0.0050	0.0383
244	0.0430	0.0049	0.0380
245	0.0428	0.0049	0.0378
246	0.0425	0.0049	0.0376
247	0.0423	0.0049	0.0374
248	0.0421	0.0048	0.0373
249	0.0419	0.0048	0.0371
250	0.0417	0.0048	0.0369
251	0.0415	0.0048	0.0367
252	0.0413	0.0047	0.0365
253	0.0411	0.0047	0.0364
254	0.0409	0.0047	0.0362
255	0.0407	0.0047	0.0360
256	0.0405	0.0047	0.0359
257	0.0404	0.0046	0.0357
258	0.0402	0.0046	0.0356
259	0.0400	0.0046	0.0354
260	0.0399	0.0046	0.0353
261	0.0397	0.0046	0.0351
262	0.0395	0.0045	0.0350
263	0.0394	0.0045	0.0349
264	0.0392	0.0045	0.0347
265	0.0391	0.0045	0.0346
266	0.0389	0.0045	0.0345
267	0.0388	0.0045	0.0343
268	0.0386	0.0044	0.0342
269	0.0385	0.0044	0.0341
270	0.0384	0.0044	0.0339
271	0.0382	0.0044	0.0338
272	0.0381	0.0044	0.0337
273	0.0380	0.0044	0.0336
274	0.0378	0.0044	0.0335
275	0.0377	0.0043	0.0334
276	0.0376	0.0043	0.0333
277	0.0374	0.0043	0.0331
278	0.0373	0.0043	0.0330
279	0.0372	0.0043	0.0329

280	0.0371	0.0043	0.0328
281	0.0370	0.0043	0.0327
282	0.0369	0.0042	0.0326
283	0.0367	0.0042	0.0325
284	0.0366	0.0042	0.0324
285	0.0365	0.0042	0.0323
286	0.0364	0.0042	0.0322
287	0.0363	0.0042	0.0321
288	0.0362	0.0042	0.0320

TOTAL STORM RAINFALL(INCHES) = 14.38
TOTAL SOIL-LOSS(INCHES) = 1.60
TOTAL EFFECTIVE RAINFALL(INCHES) = 12.78

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 452.6700
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3613.7358

---

2 4 - 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 FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1625.0	3250.0	4875.0	6500.0
0.083	0.1005	14.59	Q	.	.	.	.
0.167	0.4596	52.14	Q	.	.	.	.
0.250	1.2076	108.61	Q	.	.	.	.
0.333	2.4769	184.30	VQ	.	.	.	.
0.417	4.5673	303.53	VQ	.	.	.	.
0.500	8.2553	535.51	V Q	.	.	.	.
0.583	13.3819	744.38	V Q	.	.	.	.
0.667	19.2378	850.27	V Q	.	.	.	.
0.750	25.5958	923.19	V Q	.	.	.	.
0.833	32.3738	984.17	V Q	.	.	.	.
0.917	39.4974	1034.35	V Q	.	.	.	.
1.000	46.9118	1076.57	V Q	.	.	.	.
1.083	54.5813	1113.61	V Q	.	.	.	.
1.167	62.4761	1146.33	V Q	.	.	.	.
1.250	70.5608	1173.89	V Q	.	.	.	.
1.333	78.8098	1197.75	V Q	.	.	.	.
1.417	87.2109	1219.85	V Q	.	.	.	.
1.500	95.7451	1239.16	.V Q	.	.	.	.
1.583	104.3983	1256.44	.V Q	.	.	.	.
1.667	113.1492	1270.63	.V Q	.	.	.	.
1.750	121.9918	1283.95	.V Q	.	.	.	.
1.833	130.9013	1293.66	.V Q	.	.	.	.
1.917	139.8743	1302.88	.V Q	.	.	.	.
2.000	148.9111	1312.14	.V Q	.	.	.	.
2.083	157.9951	1319.00	.V Q	.	.	.	.
2.167	167.1018	1322.29	.V Q	.	.	.	.
2.250	176.2309	1325.55	.V Q	.	.	.	.
2.333	185.3827	1328.84	. V Q	.	.	.	.
2.417	194.5572	1332.14	. V Q	.	.	.	.
2.500	203.7545	1335.46	. V Q	.	.	.	.
2.583	212.9749	1338.79	. V Q	.	.	.	.
2.667	222.2184	1342.15	. V Q	.	.	.	.
2.750	231.4850	1345.52	. V Q	.	.	.	.
2.833	240.7751	1348.92	. V Q	.	.	.	.
2.917	250.0886	1352.33	. V Q	.	.	.	.
3.000	259.4258	1355.76	. V Q	.	.	.	.
3.083	268.7868	1359.21	. V Q	.	.	.	.
3.167	278.1716	1362.68	. V Q	.	.	.	.
3.250	287.5805	1366.16	. V Q	.	.	.	.
3.333	297.0135	1369.68	. V Q	.	.	.	.
3.417	306.4709	1373.20	. V Q	.	.	.	.
3.500	315.9527	1376.76	. V Q	.	.	.	.
3.583	325.4591	1380.33	. V Q	.	.	.	.
3.667	334.9903	1383.93	. V Q	.	.	.	.
3.750	344.5463	1387.53	. V Q	.	.	.	.

3.833	354.1274	1391.18	.	V	Q .	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1625.0	3250.0	4875.0	6500.0
3.917	363.7337	1394.83	.	V Q .	.	.	.
4.000	373.3601	1397.76	.	V Q .	.	.	.
4.083	383.0041	1400.30	.	V Q .	.	.	.
4.167	392.6657	1402.88	.	V Q .	.	.	.
4.250	402.3453	1405.47	.	V Q .	.	.	.
4.333	412.0429	1408.09	.	V Q .	.	.	.
4.417	421.7586	1410.72	.	V Q .	.	.	.
4.500	431.4927	1413.39	.	V Q .	.	.	.
4.583	441.2452	1416.07	.	V Q .	.	.	.
4.667	451.0165	1418.78	.	V Q .	.	.	.
4.750	460.8065	1421.51	.	V Q .	.	.	.
4.833	470.6155	1424.27	.	V Q .	.	.	.
4.917	480.4436	1427.04	.	V Q .	.	.	.
5.000	490.2911	1429.85	.	V Q .	.	.	.
5.083	500.1580	1432.68	.	V Q .	.	.	.
5.167	510.0447	1435.55	.	V Q .	.	.	.
5.250	519.9512	1438.43	.	V Q .	.	.	.
5.333	529.8779	1441.35	.	V Q .	.	.	.
5.417	539.8247	1444.28	.	V Q .	.	.	.
5.500	549.7920	1447.25	.	V Q .	.	.	.
5.583	559.7798	1450.24	.	V Q .	.	.	.
5.667	569.7886	1453.27	.	V Q .	.	.	.
5.750	579.8183	1456.32	.	V Q .	.	.	.
5.833	589.8693	1459.41	.	V Q .	.	.	.
5.917	599.9417	1462.51	.	V Q.	.	.	.
6.000	610.0358	1465.66	.	V Q.	.	.	.
6.083	620.1518	1468.84	.	V Q.	.	.	.
6.167	630.2899	1472.05	.	V Q.	.	.	.
6.250	640.4503	1475.28	.	V Q.	.	.	.
6.333	650.6332	1478.57	.	V Q.	.	.	.
6.417	660.8389	1481.87	.	V Q.	.	.	.
6.500	671.0677	1485.22	.	V Q.	.	.	.
6.583	681.3197	1488.59	.	V Q.	.	.	.
6.667	691.5953	1492.01	.	V Q.	.	.	.
6.750	701.8945	1495.45	.	V Q.	.	.	.
6.833	712.2179	1498.95	.	V Q.	.	.	.
6.917	722.5654	1502.46	.	V Q.	.	.	.
7.000	732.9376	1506.04	.	VQ.	.	.	.
7.083	743.3345	1509.63	.	VQ.	.	.	.
7.167	753.7565	1513.28	.	VQ.	.	.	.
7.250	764.2039	1516.95	.	VQ.	.	.	.
7.333	774.6769	1520.69	.	VQ.	.	.	.
7.417	785.1758	1524.45	.	VQ.	.	.	.
7.500	795.7011	1528.27	.	VQ.	.	.	.
7.583	806.2529	1532.12	.	VQ.	.	.	.
7.667	816.8316	1536.03	.	Q.	.	.	.
7.750	827.4374	1539.97	.	Q.	.	.	.
7.833	838.0709	1543.97	.	Q.	.	.	.
7.917	848.7321	1548.00	.	Q.	.	.	.
8.000	859.4214	1552.10	.	Q.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1625.0	3250.0	4875.0	6500.0
8.083	870.1393	1556.24	.	Q.	.	.	.
8.167	880.8862	1560.44	.	Q.	.	.	.
8.250	891.6623	1564.68	.	Q.	.	.	.
8.333	902.4680	1569.00	.	Q.	.	.	.
8.417	913.3037	1573.34	.	QV	.	.	.
8.500	924.1699	1577.77	.	QV	.	.	.
8.583	935.0668	1582.23	.	QV	.	.	.
8.667	945.9951	1586.78	.	QV	.	.	.
8.750	956.9548	1591.36	.	QV	.	.	.
8.833	967.9467	1596.02	.	QV	.	.	.
8.917	978.9709	1600.73	.	QV	.	.	.
9.000	990.0283	1605.52	.	QV	.	.	.
9.083	1001.1188	1610.36	.	Q.V	.	.	.
9.167	1012.2434	1615.29	.	Q.V	.	.	.
9.250	1023.4022	1620.26	.	Q.V	.	.	.
9.333	1034.5959	1625.33	.	QV	.	.	.
9.417	1045.8250	1630.45	.	QV	.	.	.
9.500	1057.0900	1635.68	.	QV	.	.	.
9.583	1068.3914	1640.95	.	QV	.	.	.
9.667	1079.7297	1646.34	.	QV	.	.	.
9.750	1091.1056	1651.78	.	Q V	.	.	.
9.833	1102.5197	1657.33	.	Q V	.	.	.
9.917	1113.9724	1662.94	.	Q V	.	.	.
10.000	1125.4646	1668.67	.	Q V	.	.	.
10.083	1136.9967	1674.46	.	Q V	.	.	.
10.167	1148.5695	1680.37	.	Q V	.	.	.
10.250	1160.1835	1686.35	.	Q V	.	.	.
10.333	1171.8396	1692.46	.	Q V	.	.	.
10.417	1183.5382	1698.65	.	Q V	.	.	.
10.500	1195.2804	1704.97	.	Q V	.	.	.
10.583	1207.0667	1711.37	.	Q V	.	.	.
10.667	1218.8981	1717.92	.	Q V	.	.	.
10.750	1230.7751	1724.55	.	Q V	.	.	.
10.833	1242.6990	1731.33	.	Q V	.	.	.
10.917	1254.6700	1738.20	.	Q V	.	.	.
11.000	1266.6897	1745.25	.	Q V	.	.	.
11.083	1278.7584	1752.38	.	Q V	.	.	.
11.167	1290.8776	1759.69	.	Q V	.	.	.
11.250	1303.0477	1767.11	.	Q V	.	.	.
11.333	1315.2703	1774.71	.	Q V	.	.	.
11.417	1327.5459	1782.42	.	Q V	.	.	.
11.500	1339.8761	1790.34	.	.Q V	.	.	.
11.583	1352.2616	1798.38	.	.Q V	.	.	.
11.667	1364.7040	1806.63	.	.Q V	.	.	.
11.750	1377.2041	1815.02	.	.Q V	.	.	.
11.833	1389.7635	1823.64	.	.Q V	.	.	.
11.917	1402.3834	1832.40	.	.Q V	.	.	.
12.000	1415.0653	1841.41	.	.Q V	.	.	.
12.083	1427.7999	1849.06	.	.Q V	.	.	.
12.167	1440.5726	1854.59	.	.Q V	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1625.0	3250.0	4875.0	6500.0
12.250	1453.3712	1858.36	.	.Q	V .	.	.
12.333	1466.1843	1860.47	.	.Q	V .	.	.
12.417	1478.9825	1858.30	.	.Q	V .	.	.
12.500	1491.6877	1844.80	.	.Q	V .	.	.
12.583	1504.3196	1834.15	.	.Q	V .	.	.
12.667	1516.9564	1834.86	.	.Q	V .	.	.
12.750	1529.6244	1839.39	.	.Q	V .	.	.
12.833	1542.3356	1845.66	.	.Q	V .	.	.
12.917	1555.1001	1853.41	.	.Q	V .	.	.
13.000	1567.9274	1862.52	.	.Q	V .	.	.
13.083	1580.8236	1872.54	.	.Q	V .	.	.
13.167	1593.7959	1883.58	.	.Q	V .	.	.
13.250	1606.8507	1895.55	.	.Q	V .	.	.
13.333	1619.9949	1908.54	.	.Q	V .	.	.
13.417	1633.2328	1922.15	.	.Q	V .	.	.
13.500	1646.5712	1936.74	.	.Q	V .	.	.
13.583	1660.0150	1952.04	.	. Q	V .	.	.
13.667	1673.5718	1968.44	.	. Q	V .	.	.
13.750	1687.2460	1985.50	.	. Q	V .	.	.
13.833	1701.0461	2003.79	.	. Q	V .	.	.
13.917	1714.9773	2022.80	.	. Q	V .	.	.
14.000	1729.0460	2042.78	.	. Q	V.	.	.
14.083	1743.2825	2067.13	.	. Q	V.	.	.
14.167	1757.7328	2098.19	.	. Q	V.	.	.
14.250	1772.4319	2134.32	.	. Q	V.	.	.
14.333	1787.4174	2175.89	.	. Q	V.	.	.
14.417	1802.7627	2228.14	.	. Q	V.	.	.
14.500	1818.6523	2307.18	.	. Q	V	.	.
14.583	1835.0515	2381.15	.	. Q	V	.	.
14.667	1851.8011	2432.05	.	. Q	V	.	.
14.750	1868.8549	2476.20	.	. Q	V	.	.
14.833	1886.2041	2519.11	.	. Q	V	.	.
14.917	1903.8409	2560.87	.	. Q	.V	.	.
15.000	1921.7665	2602.79	.	. Q	.V	.	.
15.083	1939.9852	2645.35	.	. Q	.V	.	.
15.167	1958.5083	2689.55	.	. Q	.V	.	.
15.250	1977.3448	2735.06	.	. Q	.V	.	.
15.333	1996.5132	2783.25	.	. Q	. V	.	.
15.417	2015.9410	2820.93	.	. Q	. V	.	.
15.500	2035.5131	2841.87	.	. Q	. V	.	.
15.583	2055.1509	2851.40	.	. Q	. V	.	.
15.667	2074.7949	2852.32	.	. Q	. V	.	.
15.750	2094.2327	2822.35	.	. Q	. V	.	.
15.833	2112.8384	2701.56	.	. Q	. V	.	.
15.917	2130.9861	2635.05	.	. Q	. V	.	.
16.000	2149.7747	2728.11	.	. Q	. V	.	.
16.083	2170.7910	3051.57	.	. Q	. V	.	.
16.167	2194.7502	3478.89	.	.	.Q V	.	.
16.250	2221.5796	3895.61	.	.	. QV	.	.
16.333	2251.9746	4413.37	.	.	. V Q	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1625.0	3250.0	4875.0	6500.0
16.417	2287.8955	5215.72	.	.	.	V . Q	.
16.500	2332.3181	6450.16	.	.	.	V .	Q.
16.583	2373.0947	5920.76	.	.	.	V .	Q .
16.667	2404.2109	4518.08	.	.	.	VQ .	.
16.750	2431.5879	3975.15	.	.	.	Q V .	.
16.833	2457.9072	3821.57	.	.	.	Q V .	.
16.917	2483.4363	3706.81	.	.	.	Q V .	.
17.000	2507.9556	3560.20	.	.	.Q	V .	.
17.083	2531.5645	3428.00	.	.	.Q	V .	.
17.167	2554.3101	3302.67	.	.	Q	V .	.
17.250	2576.1177	3166.48	.	.	Q.	V .	.
17.333	2597.0869	3044.75	.	.	Q .	V .	.
17.417	2617.3220	2938.14	.	.	Q .	V .	.
17.500	2636.5942	2798.34	.	.	Q .	V.	.
17.583	2654.9866	2670.56	.	.	Q .	V.	.
17.667	2672.5859	2555.42	.	.	Q .	V.	.
17.750	2689.6226	2473.73	.	.	Q .	V.	.
17.833	2705.9517	2370.99	.	.	Q .	V.	.
17.917	2721.8464	2307.93	.	.	Q .	V	.
18.000	2737.3301	2248.21	.	.	Q .	V	.
18.083	2752.2478	2166.07	.	.	Q .	V	.
18.167	2766.5745	2080.23	.	.	Q .	V	.
18.250	2780.6465	2043.24	.	.	Q .	V	.
18.333	2794.5220	2014.70	.	.	Q .	V	.
18.417	2808.2463	1992.78	.	.	Q .	.V	.
18.500	2821.9006	1982.59	.	.	Q .	.V	.
18.583	2835.4885	1972.97	.	.	Q .	.V	.
18.667	2848.9534	1955.09	.	.	Q .	.V	.
18.750	2862.2844	1935.67	.	.Q	.	.V	.
18.833	2875.4880	1917.16	.	.Q	.	.V	.
18.917	2888.5657	1898.87	.	.Q	.	.V	.
19.000	2901.5190	1880.82	.	.Q	.	. V	.
19.083	2914.3547	1863.73	.	.Q	.	. V	.
19.167	2927.0813	1847.88	.	.Q	.	. V	.
19.250	2939.7004	1832.29	.	.Q	.	. V	.
19.333	2952.2192	1817.72	.	.Q	.	. V	.
19.417	2964.6431	1803.94	.	.Q	.	. V	.
19.500	2976.9731	1790.34	.	.Q	.	. V	.
19.583	2989.2112	1776.95	.	Q	.	. V	.
19.667	3001.3574	1763.65	.	Q	.	. V	.
19.750	3013.4133	1750.51	.	Q	.	. V	.
19.833	3025.3730	1736.56	.	Q	.	. V	.
19.917	3037.2295	1721.56	.	Q	.	. V	.
20.000	3048.9307	1699.02	.	Q	.	. V	.
20.083	3060.5122	1681.65	.	Q	.	. V	.
20.167	3072.0095	1669.42	.	Q	.	. V	.
20.250	3083.4287	1658.06	.	Q	.	. V	.
20.333	3094.7690	1646.63	.	Q	.	. V	.
20.417	3106.0315	1635.30	.	Q	.	. V	.
20.500	3117.2188	1624.38	.	Q.	.	. V	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1625.0	3250.0	4875.0	6500.0
20.583	3128.3333	1613.83	.	Q.	.	.	V .
20.667	3139.3774	1603.61	.	Q.	.	.	V .
20.750	3150.3533	1593.69	.	Q.	.	.	V .
20.833	3161.2627	1584.06	.	Q.	.	.	V .
20.917	3172.1077	1574.70	.	Q.	.	.	V .
21.000	3182.8914	1565.78	.	Q.	.	.	V .
21.083	3193.6157	1557.19	.	Q.	.	.	V .
21.167	3204.2827	1548.84	.	Q.	.	.	V .
21.250	3214.8936	1540.70	.	Q.	.	.	V .
21.333	3225.4500	1532.79	.	Q.	.	.	V .
21.417	3235.9531	1525.07	.	Q.	.	.	V .
21.500	3246.4045	1517.55	.	Q.	.	.	V .
21.583	3256.8054	1510.20	.	Q.	.	.	V .
21.667	3267.1570	1503.03	.	Q.	.	.	V .
21.750	3277.4602	1496.03	.	Q.	.	.	V .
21.833	3287.7163	1489.19	.	Q.	.	.	V .
21.917	3297.9263	1482.50	.	Q.	.	.	V .
22.000	3308.0908	1475.88	.	Q.	.	.	V .
22.083	3318.2102	1469.35	.	Q.	.	.	V .
22.167	3328.2856	1462.96	.	Q.	.	.	V .
22.250	3338.3181	1456.71	.	Q .	.	.	V .
22.333	3348.3083	1450.57	.	Q .	.	.	V .
22.417	3358.2571	1444.55	.	Q .	.	.	V .
22.500	3368.1650	1438.65	.	Q .	.	.	V .
22.583	3378.0332	1432.86	.	Q .	.	.	V .
22.667	3387.8623	1427.18	.	Q .	.	.	V .
22.750	3397.6528	1421.60	.	Q .	.	.	V .
22.833	3407.4058	1416.12	.	Q .	.	.	V .
22.917	3417.1216	1410.74	.	Q .	.	.	V .
23.000	3426.8010	1405.45	.	Q .	.	.	V .
23.083	3436.4446	1400.26	.	Q .	.	.	V .
23.167	3446.0530	1395.15	.	Q .	.	.	V .
23.250	3455.6270	1390.13	.	Q .	.	.	V .
23.333	3465.1670	1385.20	.	Q .	.	.	V .
23.417	3474.6736	1380.34	.	Q .	.	.	V .
23.500	3484.1472	1375.57	.	Q .	.	.	V .
23.583	3493.5886	1370.88	.	Q .	.	.	V .
23.667	3502.9980	1366.25	.	Q .	.	.	V .
23.750	3512.3762	1361.70	.	Q .	.	.	V .
23.833	3521.7234	1357.22	.	Q .	.	.	V .
23.917	3531.0403	1352.80	.	Q .	.	.	V.
24.000	3540.3271	1348.45	.	Q .	.	.	V.
24.083	3549.4841	1329.59	.	Q .	.	.	V.
24.167	3558.3540	1287.91	.	Q .	.	.	V.
24.250	3566.8081	1227.55	.	Q .	.	.	V.
24.333	3574.7163	1148.28	.	Q .	.	.	V.
24.417	3581.7817	1025.88	.	Q .	.	.	V.
24.500	3587.2322	791.39	.	Q .	.	.	V.
24.583	3591.2334	580.99	.	Q .	.	.	V.
24.667	3594.5010	474.46	.	Q .	.	.	V.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	1625.0	3250.0	4875.0	6500.0
24.750	3597.2651	401.36	. Q	.	.	.	V.
24.833	3599.6104	340.54	. Q	.	.	.	V.
24.917	3601.6130	290.78	.Q	.	.	.	V.
25.000	3603.3293	249.21	.Q	.	.	.	V.
25.083	3604.7964	213.02	.Q	.	.	.	V.
25.167	3606.0452	181.33	.Q	.	.	.	V.
25.250	3607.1123	154.94	Q	.	.	.	V.
25.333	3608.0242	132.39	Q	.	.	.	V.
25.417	3608.7935	111.71	Q	.	.	.	V.
25.500	3609.4404	93.93	Q	.	.	.	V.
25.583	3609.9792	78.25	Q	.	.	.	V.
25.667	3610.4321	65.77	Q	.	.	.	V.
25.750	3610.8054	54.21	Q	.	.	.	V.
25.833	3611.1245	46.32	Q	.	.	.	V.
25.917	3611.3931	38.98	Q	.	.	.	V.
26.000	3611.6111	31.66	Q	.	.	.	V.
26.083	3611.7954	26.77	Q	.	.	.	V.
26.167	3611.9709	25.50	Q	.	.	.	V.
26.250	3612.1379	24.26	Q	.	.	.	V.
26.333	3612.2966	23.03	Q	.	.	.	V.
26.417	3612.4468	21.80	Q	.	.	.	V.
26.500	3612.5886	20.58	Q	.	.	.	V.
26.583	3612.7219	19.36	Q	.	.	.	V.
26.667	3612.8469	18.15	Q	.	.	.	V.
26.750	3612.9636	16.94	Q	.	.	.	V.
26.833	3613.0720	15.73	Q	.	.	.	V.
26.917	3613.1721	14.53	Q	.	.	.	V.
27.000	3613.2639	13.33	Q	.	.	.	V.
27.083	3613.3474	12.14	Q	.	.	.	V.
27.167	3613.4229	10.95	Q	.	.	.	V.
27.250	3613.4900	9.76	Q	.	.	.	V.
27.333	3613.5491	8.58	Q	.	.	.	V.
27.417	3613.6001	7.40	Q	.	.	.	V.
27.500	3613.6431	6.22	Q	.	.	.	V.
27.583	3613.6777	5.05	Q	.	.	.	V.
27.667	3613.7046	3.88	Q	.	.	.	V.
27.750	3613.7234	2.72	Q	.	.	.	V.
27.833	3613.7341	1.56	Q	.	.	.	V.
27.917	3613.7368	0.40	Q	.	.	.	V

END OF FLOODSCx ROUTING ANALYSIS

```
****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2002 Advanced Engineering Software (aes)
            Ver. 8.0  Release Date: 01/01/2002  License ID 1542

                          Analysis prepared by:

                        TRANSTECH ENGINEERS, INC.
                           624 Brea Canyon Road
                             Walnut, CA 91789


 ************************** DESCRIPTION OF STUDY **************************
* EAST TWIN CREEK                                                          *
* UNDEVELOPED CONDITION                                                    *
*                                                                          *
 ****************************************************************************

  FILE NAME: AS-3.DAT
  TIME/DATE OF STUDY: 12:04 03/04/2005
```

```
****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =    1
----------------------------------------------------------------------------
 >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

     (UNIT-HYDROGRAPH ADDED TO STREAM #1)

        WATERSHED AREA =     5929.000 ACRES
        BASEFLOW =    0.000 CFS/SQUARE-MILE
        *USER ENTERED "LAG" TIME =     0.460 HOURS
         CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
         THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
         MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
        FOOTHILL S-GRAPH SELECTED
        MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.328
        LOW LOSS FRACTION = 0.109
        *HYDROGRAPH MODEL #1 SPECIFIED*

        SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.62
        SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.33
        SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.78
        SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  3.50
        SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  5.40
        SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 14.70

        *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
          5-MINUTE FACTOR = 0.754
         30-MINUTE FACTOR = 0.754
          1-HOUR FACTOR = 0.754
          3-HOUR FACTOR = 0.960
          6-HOUR FACTOR = 0.980
         24-HOUR FACTOR = 0.990

        UNIT HYDROGRAPH TIME UNIT =    5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  18.116


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                1.192               854.907
        2                4.323              2245.042
        3                9.081              3411.125
        4               15.792              4812.522
        5               26.926              7983.473
        6               47.997             15108.547
        7               60.489              8957.346
        8               67.334              4908.329
```

9	72.642	3805.979
10	77.045	3157.087
11	80.404	2408.095
12	83.519	2233.962
13	86.066	1826.344
14	88.232	1552.843
15	90.044	1299.660
16	91.693	1182.010
17	93.105	1012.318
18	94.321	872.085
19	95.305	705.720
20	96.161	613.732
21	96.754	425.260
22	97.338	418.996
23	97.890	395.265
24	98.081	137.371
25	98.175	67.332
26	98.269	67.025
27	98.363	67.332
28	98.456	67.102
29	98.550	67.255
30	98.644	67.255
31	98.737	67.255
32	98.831	67.102
33	98.925	67.102
34	99.019	67.414
35	99.112	67.102
36	99.206	67.102
37	99.299	67.102
38	99.393	67.102
39	99.487	67.102
40	99.580	67.102
41	99.674	67.102
42	99.767	67.102
43	99.861	67.102
44	99.954	67.102
45	100.000	32.632

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0369	0.0040	0.0329
2	0.0369	0.0040	0.0329
3	0.0370	0.0040	0.0330
4	0.0370	0.0040	0.0330
5	0.0371	0.0040	0.0331
6	0.0371	0.0040	0.0331
7	0.0372	0.0041	0.0332
8	0.0372	0.0041	0.0332
9	0.0373	0.0041	0.0333
10	0.0374	0.0041	0.0333
11	0.0374	0.0041	0.0333
12	0.0375	0.0041	0.0334
13	0.0375	0.0041	0.0334
14	0.0376	0.0041	0.0335
15	0.0377	0.0041	0.0336
16	0.0377	0.0041	0.0336
17	0.0378	0.0041	0.0337
18	0.0378	0.0041	0.0337
19	0.0379	0.0041	0.0338
20	0.0379	0.0041	0.0338
21	0.0380	0.0041	0.0339
22	0.0380	0.0041	0.0339
23	0.0381	0.0042	0.0340
24	0.0382	0.0042	0.0340
25	0.0382	0.0042	0.0341
26	0.0383	0.0042	0.0341
27	0.0384	0.0042	0.0342
28	0.0384	0.0042	0.0342
29	0.0385	0.0042	0.0343
30	0.0385	0.0042	0.0343
31	0.0386	0.0042	0.0344
32	0.0387	0.0042	0.0345
33	0.0388	0.0042	0.0345
34	0.0388	0.0042	0.0346
35	0.0389	0.0042	0.0347
36	0.0389	0.0042	0.0347
37	0.0390	0.0043	0.0348
38	0.0391	0.0043	0.0348
39	0.0392	0.0043	0.0349
40	0.0392	0.0043	0.0349
41	0.0393	0.0043	0.0350
42	0.0393	0.0043	0.0351
43	0.0394	0.0043	0.0351
44	0.0395	0.0043	0.0352
45	0.0396	0.0043	0.0353
46	0.0396	0.0043	0.0353
47	0.0397	0.0043	0.0354
48	0.0398	0.0043	0.0354
49	0.0399	0.0043	0.0355
50	0.0399	0.0044	0.0356
51	0.0400	0.0044	0.0357

52	0.0401	0.0044	0.0357
53	0.0402	0.0044	0.0358
54	0.0402	0.0044	0.0359
55	0.0403	0.0044	0.0359
56	0.0404	0.0044	0.0360
57	0.0405	0.0044	0.0361
58	0.0406	0.0044	0.0361
59	0.0407	0.0044	0.0362
60	0.0407	0.0044	0.0363
61	0.0408	0.0045	0.0364
62	0.0409	0.0045	0.0364
63	0.0410	0.0045	0.0365
64	0.0411	0.0045	0.0366
65	0.0412	0.0045	0.0367
66	0.0412	0.0045	0.0367
67	0.0413	0.0045	0.0368
68	0.0414	0.0045	0.0369
69	0.0415	0.0045	0.0370
70	0.0416	0.0045	0.0371
71	0.0417	0.0045	0.0372
72	0.0418	0.0046	0.0372
73	0.0419	0.0046	0.0373
74	0.0420	0.0046	0.0374
75	0.0421	0.0046	0.0375
76	0.0422	0.0046	0.0376
77	0.0423	0.0046	0.0377
78	0.0424	0.0046	0.0377
79	0.0425	0.0046	0.0379
80	0.0426	0.0046	0.0379
81	0.0427	0.0047	0.0380
82	0.0428	0.0047	0.0381
83	0.0429	0.0047	0.0382
84	0.0430	0.0047	0.0383
85	0.0431	0.0047	0.0384
86	0.0432	0.0047	0.0385
87	0.0433	0.0047	0.0386
88	0.0434	0.0047	0.0387
89	0.0436	0.0047	0.0388
90	0.0436	0.0048	0.0389
91	0.0438	0.0048	0.0390
92	0.0439	0.0048	0.0391
93	0.0440	0.0048	0.0392
94	0.0441	0.0048	0.0393
95	0.0443	0.0048	0.0394
96	0.0443	0.0048	0.0395
97	0.0445	0.0049	0.0397
98	0.0446	0.0049	0.0397
99	0.0448	0.0049	0.0399
100	0.0449	0.0049	0.0400
101	0.0450	0.0049	0.0401
102	0.0451	0.0049	0.0402
103	0.0453	0.0049	0.0404
104	0.0454	0.0049	0.0404
105	0.0456	0.0050	0.0406
106	0.0457	0.0050	0.0407
107	0.0459	0.0050	0.0409
108	0.0460	0.0050	0.0409

109	0.0462	0.0050	0.0411
110	0.0463	0.0050	0.0412
111	0.0465	0.0051	0.0414
112	0.0466	0.0051	0.0415
113	0.0468	0.0051	0.0417
114	0.0469	0.0051	0.0418
115	0.0471	0.0051	0.0420
116	0.0472	0.0051	0.0421
117	0.0474	0.0052	0.0423
118	0.0475	0.0052	0.0424
119	0.0478	0.0052	0.0426
120	0.0479	0.0052	0.0427
121	0.0481	0.0052	0.0429
122	0.0482	0.0053	0.0430
123	0.0485	0.0053	0.0432
124	0.0486	0.0053	0.0433
125	0.0489	0.0053	0.0436
126	0.0490	0.0053	0.0437
127	0.0493	0.0054	0.0439
128	0.0494	0.0054	0.0440
129	0.0497	0.0054	0.0443
130	0.0498	0.0054	0.0444
131	0.0501	0.0055	0.0447
132	0.0503	0.0055	0.0448
133	0.0506	0.0055	0.0451
134	0.0507	0.0055	0.0452
135	0.0510	0.0056	0.0455
136	0.0512	0.0056	0.0456
137	0.0515	0.0056	0.0459
138	0.0517	0.0056	0.0461
139	0.0520	0.0057	0.0464
140	0.0522	0.0057	0.0465
141	0.0526	0.0057	0.0468
142	0.0528	0.0058	0.0470
143	0.0531	0.0058	0.0473
144	0.0533	0.0058	0.0475
145	0.0483	0.0053	0.0430
146	0.0485	0.0053	0.0432
147	0.0490	0.0053	0.0437
148	0.0493	0.0054	0.0439
149	0.0498	0.0054	0.0443
150	0.0500	0.0055	0.0446
151	0.0506	0.0055	0.0451
152	0.0509	0.0055	0.0453
153	0.0514	0.0056	0.0458
154	0.0517	0.0056	0.0461
155	0.0524	0.0057	0.0467
156	0.0527	0.0057	0.0469
157	0.0534	0.0058	0.0475
158	0.0537	0.0059	0.0479
159	0.0544	0.0059	0.0485
160	0.0548	0.0060	0.0488
161	0.0556	0.0061	0.0495
162	0.0560	0.0061	0.0499
163	0.0569	0.0062	0.0507
164	0.0573	0.0062	0.0511
165	0.0582	0.0063	0.0519

166	0.0587	0.0064	0.0523
167	0.0598	0.0065	0.0533
168	0.0603	0.0066	0.0537
169	0.0781	0.0085	0.0696
170	0.0785	0.0086	0.0700
171	0.0793	0.0086	0.0706
172	0.0797	0.0087	0.0710
173	0.0806	0.0088	0.0718
174	0.0810	0.0088	0.0722
175	0.0820	0.0089	0.0731
176	0.0825	0.0090	0.0735
177	0.0836	0.0091	0.0745
178	0.0842	0.0092	0.0751
179	0.0855	0.0093	0.0762
180	0.0862	0.0094	0.0768
181	0.0878	0.0096	0.0782
182	0.0887	0.0097	0.0790
183	0.0906	0.0099	0.0807
184	0.0916	0.0100	0.0816
185	0.0482	0.0053	0.0429
186	0.0509	0.0055	0.0453
187	0.0574	0.0063	0.0512
188	0.0618	0.0067	0.0551
189	0.0742	0.0081	0.0661
190	0.0834	0.0091	0.0743
191	0.1176	0.0128	0.1047
192	0.1600	0.0174	0.1426
193	0.4712	0.0273	0.4439
194	0.0965	0.0105	0.0860
195	0.0671	0.0073	0.0598
196	0.0538	0.0059	0.0480
197	0.0928	0.0101	0.0827
198	0.0896	0.0098	0.0798
199	0.0870	0.0095	0.0775
200	0.0849	0.0093	0.0756
201	0.0831	0.0091	0.0740
202	0.0815	0.0089	0.0726
203	0.0801	0.0087	0.0714
204	0.0789	0.0086	0.0703
205	0.0609	0.0066	0.0542
206	0.0592	0.0065	0.0528
207	0.0578	0.0063	0.0515
208	0.0564	0.0062	0.0503
209	0.0552	0.0060	0.0492
210	0.0541	0.0059	0.0482
211	0.0530	0.0058	0.0472
212	0.0521	0.0057	0.0464
213	0.0511	0.0056	0.0456
214	0.0503	0.0055	0.0448
215	0.0495	0.0054	0.0441
216	0.0488	0.0053	0.0434
217	0.0535	0.0058	0.0477
218	0.0530	0.0058	0.0472
219	0.0524	0.0057	0.0467
220	0.0519	0.0057	0.0462
221	0.0514	0.0056	0.0458
222	0.0509	0.0055	0.0453

223	0.0504	0.0055	0.0449
224	0.0500	0.0054	0.0445
225	0.0496	0.0054	0.0442
226	0.0491	0.0054	0.0438
227	0.0488	0.0053	0.0434
228	0.0484	0.0053	0.0431
229	0.0480	0.0052	0.0428
230	0.0477	0.0052	0.0425
231	0.0473	0.0052	0.0422
232	0.0470	0.0051	0.0419
233	0.0467	0.0051	0.0416
234	0.0464	0.0051	0.0413
235	0.0461	0.0050	0.0410
236	0.0458	0.0050	0.0408
237	0.0455	0.0050	0.0405
238	0.0452	0.0049	0.0403
239	0.0449	0.0049	0.0400
240	0.0447	0.0049	0.0398
241	0.0444	0.0048	0.0396
242	0.0442	0.0048	0.0394
243	0.0439	0.0048	0.0392
244	0.0437	0.0048	0.0389
245	0.0435	0.0047	0.0387
246	0.0433	0.0047	0.0385
247	0.0430	0.0047	0.0383
248	0.0428	0.0047	0.0382
249	0.0426	0.0046	0.0380
250	0.0424	0.0046	0.0378
251	0.0422	0.0046	0.0376
252	0.0420	0.0046	0.0374
253	0.0418	0.0046	0.0373
254	0.0417	0.0045	0.0371
255	0.0415	0.0045	0.0369
256	0.0413	0.0045	0.0368
257	0.0411	0.0045	0.0366
258	0.0409	0.0045	0.0365
259	0.0408	0.0044	0.0363
260	0.0406	0.0044	0.0362
261	0.0404	0.0044	0.0360
262	0.0403	0.0044	0.0359
263	0.0401	0.0044	0.0358
264	0.0400	0.0044	0.0356
265	0.0398	0.0043	0.0355
266	0.0397	0.0043	0.0354
267	0.0395	0.0043	0.0352
268	0.0394	0.0043	0.0351
269	0.0393	0.0043	0.0350
270	0.0391	0.0043	0.0349
271	0.0390	0.0042	0.0347
272	0.0388	0.0042	0.0346
273	0.0387	0.0042	0.0345
274	0.0386	0.0042	0.0344
275	0.0385	0.0042	0.0343
276	0.0383	0.0042	0.0342
277	0.0382	0.0042	0.0340
278	0.0381	0.0042	0.0339
279	0.0380	0.0041	0.0338

280	0.0378	0.0041	0.0337
281	0.0377	0.0041	0.0336
282	0.0376	0.0041	0.0335
283	0.0375	0.0041	0.0334
284	0.0374	0.0041	0.0333
285	0.0373	0.0041	0.0332
286	0.0372	0.0041	0.0331
287	0.0371	0.0040	0.0330
288	0.0370	0.0040	0.0329

TOTAL STORM RAINFALL(INCHES) = 14.55
TOTAL SOIL-LOSS(INCHES) = 1.56
TOTAL EFFECTIVE RAINFALL(INCHES) = 12.99

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 771.8786
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 6415.2002

24-HOUR STORM RUNOFF HYDROGRAPH

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 2875.0 5750.0 8625.0 11500.0
0.083	0.1935	28.10	Q
0.167	0.8955	101.92	Q
0.250	2.3704	214.17	Q
0.333	4.9367	372.63	VQ
0.417	9.3136	635.53	V Q
0.500	17.1164	1132.96	V Q
0.583	26.9569	1428.84	V Q
0.667	37.9227	1592.23	V Q
0.750	49.7652	1719.52	V Q
0.833	62.3395	1825.80	V Q
0.917	75.4766	1907.51	V Q
1.000	89.1388	1983.75	V Q
1.083	103.2337	2046.59	V Q
1.167	117.7012	2100.68	V Q
1.250	132.4836	2146.40	V Q
1.333	147.5558	2188.48	V Q
1.417	162.8789	2224.92	.V Q
1.500	178.4227	2256.96	.V Q
1.583	194.1490	2283.45	.V Q
1.667	210.0383	2307.13	.V Q
1.750	226.0475	2324.53	.V Q
1.833	242.1764	2341.91	.V Q
1.917	258.4189	2358.41	.V Q
2.000	274.7179	2366.61	.V Q
2.083	291.0568	2372.42	.V Q
2.167	307.4368	2378.37	.V Q
2.250	323.8571	2384.23	. V Q
2.333	340.3189	2390.25	. V Q
2.417	356.8215	2396.18	. V Q
2.500	373.3661	2402.27	. V Q
2.583	389.9518	2408.24	. V Q
2.667	406.5798	2414.39	. V Q
2.750	423.2495	2420.44	. V Q
2.833	439.9620	2426.66	. V Q
2.917	456.7166	2432.76	. V Q
3.000	473.5144	2439.04	. V Q
3.083	490.3547	2445.21	. V Q
3.167	507.2387	2451.56	. V Q
3.250	524.1656	2457.79	. V Q
3.333	541.1368	2464.22	. V Q
3.417	558.1516	2470.54	. V Q
3.500	575.2111	2477.04	. V Q
3.583	592.3146	2483.42	. V Q
3.667	609.4633	2490.00	. V Q
3.750	626.6487	2495.32	. V Q

3.833	643.8647	2499.77	.	V	Q	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2875.0	5750.0	8625.0	11500.0
3.917	661.1105	2504.08	.	V Q .	.	.	.
4.000	678.3874	2508.61	.	V Q .	.	.	.
4.083	695.6945	2513.00	.	V Q .	.	.	.
4.167	713.0333	2517.59	.	V Q .	.	.	.
4.250	730.4029	2522.07	.	V Q .	.	.	.
4.333	747.8047	2526.74	.	V Q .	.	.	.
4.417	765.2378	2531.29	.	V Q .	.	.	.
4.500	782.7037	2536.04	.	V Q .	.	.	.
4.583	800.2015	2540.68	.	V Q .	.	.	.
4.667	817.7326	2545.52	.	V Q .	.	.	.
4.750	835.2962	2550.23	.	V Q .	.	.	.
4.833	852.8937	2555.16	.	V Q .	.	.	.
4.917	870.5243	2559.95	.	V Q .	.	.	.
5.000	888.1894	2564.97	.	V Q .	.	.	.
5.083	905.8881	2569.86	.	V Q .	.	.	.
5.167	923.6221	2574.97	.	V Q .	.	.	.
5.250	941.3903	2579.95	.	V Q .	.	.	.
5.333	959.1944	2585.15	.	V Q .	.	.	.
5.417	977.0334	2590.22	.	V Q.	.	.	.
5.500	994.9089	2595.53	.	V Q.	.	.	.
5.583	1012.8200	2600.69	.	V Q.	.	.	.
5.667	1030.7683	2606.09	.	V Q.	.	.	.
5.750	1048.7529	2611.36	.	V Q.	.	.	.
5.833	1066.7755	2616.88	.	V Q.	.	.	.
5.917	1084.8350	2622.23	.	V Q.	.	.	.
6.000	1102.9331	2627.85	.	V Q.	.	.	.
6.083	1121.0690	2633.32	.	V Q.	.	.	.
6.167	1139.2443	2639.06	.	V Q.	.	.	.
6.250	1157.4581	2644.64	.	V Q.	.	.	.
6.333	1175.7123	2650.50	.	V Q.	.	.	.
6.417	1194.0056	2656.19	.	V Q.	.	.	.
6.500	1212.3401	2662.17	.	V Q.	.	.	.
6.583	1230.7146	2667.98	.	V Q.	.	.	.
6.667	1249.1312	2674.09	.	V Q.	.	.	.
6.750	1267.5887	2680.03	.	V Q.	.	.	.
6.833	1286.0892	2686.28	.	VQ.	.	.	.
6.917	1304.6315	2692.34	.	VQ.	.	.	.
7.000	1323.2177	2698.71	.	VQ.	.	.	.
7.083	1341.8466	2704.91	.	VQ.	.	.	.
7.167	1360.5204	2711.44	.	VQ.	.	.	.
7.250	1379.2378	2717.77	.	VQ.	.	.	.
7.333	1398.0011	2724.44	.	VQ.	.	.	.
7.417	1416.8091	2730.93	.	VQ.	.	.	.
7.500	1435.6641	2737.75	.	VQ.	.	.	.
7.583	1454.5647	2744.37	.	Q.	.	.	.
7.667	1473.5134	2751.35	.	Q.	.	.	.
7.750	1492.5089	2758.14	.	Q.	.	.	.
7.833	1511.5536	2765.29	.	Q.	.	.	.
7.917	1530.6462	2772.25	.	Q.	.	.	.
8.000	1549.7894	2779.58	.	Q.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2875.0	5750.0	8625.0	11500.0
8.083	1568.9816	2786.70	.	Q.	.	.	.
8.167	1588.2255	2794.22	.	Q.	.	.	.
8.250	1607.5197	2801.51	.	QV	.	.	.
8.333	1626.8668	2809.21	.	QV	.	.	.
8.417	1646.2656	2816.71	.	QV	.	.	.
8.500	1665.7189	2824.61	.	QV	.	.	.
8.583	1685.2251	2832.30	.	QV	.	.	.
8.667	1704.7871	2840.40	.	QV	.	.	.
8.750	1724.4036	2848.30	.	QV	.	.	.
8.833	1744.0773	2856.63	.	QV	.	.	.
8.917	1763.8069	2864.74	.	QV	.	.	.
9.000	1783.5955	2873.30	.	Q.V	.	.	.
9.083	1803.4414	2881.63	.	QV	.	.	.
9.167	1823.3480	2890.44	.	QV	.	.	.
9.250	1843.3137	2899.01	.	QV	.	.	.
9.333	1863.3418	2908.07	.	QV	.	.	.
9.417	1883.4307	2916.90	.	QV	.	.	.
9.500	1903.5837	2926.23	.	QV	.	.	.
9.583	1923.7994	2935.32	.	QV	.	.	.
9.667	1944.0813	2944.93	.	Q V	.	.	.
9.750	1964.4277	2954.30	.	Q V	.	.	.
9.833	1984.8424	2964.20	.	Q V	.	.	.
9.917	2005.3236	2973.88	.	Q V	.	.	.
10.000	2025.8752	2984.10	.	Q V	.	.	.
10.083	2046.4956	2994.08	.	Q V	.	.	.
10.167	2067.1887	3004.63	.	Q V	.	.	.
10.250	2087.9529	3014.94	.	Q V	.	.	.
10.333	2108.7920	3025.85	.	Q V	.	.	.
10.417	2129.7046	3036.51	.	Q V	.	.	.
10.500	2150.6948	3047.79	.	Q V	.	.	.
10.583	2171.7610	3058.82	.	Q V	.	.	.
10.667	2192.9077	3070.50	.	Q V	.	.	.
10.750	2214.1331	3081.94	.	Q V	.	.	.
10.833	2235.4419	3094.04	.	Q V	.	.	.
10.917	2256.8323	3105.89	.	Q V	.	.	.
11.000	2278.3091	3118.45	.	Q V	.	.	.
11.083	2299.8708	3130.75	.	Q V	.	.	.
11.167	2321.5225	3143.80	.	Q V	.	.	.
11.250	2343.2620	3156.58	.	Q V	.	.	.
11.333	2365.0950	3170.15	.	.Q V	.	.	.
11.417	2387.0195	3183.46	.	.Q V	.	.	.
11.500	2409.0415	3197.58	.	.Q V	.	.	.
11.583	2431.1589	3211.44	.	.Q V	.	.	.
11.667	2453.3777	3226.17	.	.Q V	.	.	.
11.750	2475.6960	3240.63	.	.Q V	.	.	.
11.833	2498.1204	3256.01	.	.Q V	.	.	.
11.917	2520.6487	3271.12	.	.Q V	.	.	.
12.000	2543.2878	3287.21	.	.Q V	.	.	.
12.083	2566.0073	3298.87	.	.Q V	.	.	.
12.167	2588.7678	3304.83	.	.Q V	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2875.0	5750.0	8625.0	11500.0
12.250	2611.5291	3304.95	.	.Q	V .	.	.
12.333	2634.2529	3299.49	.	.Q	V .	.	.
12.417	2656.8325	3278.57	.	.Q	V .	.	.
12.500	2679.0400	3224.52	.	.Q	V .	.	.
12.583	2701.0833	3200.66	.	.Q	V .	.	.
12.667	2723.1101	3198.29	.	.Q	V .	.	.
12.750	2745.1570	3201.20	.	.Q	V .	.	.
12.833	2767.2573	3208.97	.	.Q	V .	.	.
12.917	2789.4353	3220.24	.	.Q	V .	.	.
13.000	2811.7092	3234.16	.	.Q	V .	.	.
13.083	2834.0916	3249.91	.	.Q	V .	.	.
13.167	2856.6047	3268.92	.	.Q	V .	.	.
13.250	2879.2563	3289.01	.	.Q	V .	.	.
13.333	2902.0647	3311.76	.	.Q	V .	.	.
13.417	2925.0344	3335.22	.	.Q	V .	.	.
13.500	2948.1860	3361.63	.	.Q	V .	.	.
13.583	2971.5247	3388.76	.	.Q	V .	.	.
13.667	2995.0703	3418.84	.	.Q	V .	.	.
13.750	3018.8293	3449.80	.	.Q	V .	.	.
13.833	3042.8208	3483.57	.	. Q	V .	.	.
13.917	3067.0459	3517.49	.	. Q	V.	.	.
14.000	3091.5347	3555.78	.	. Q	V.	.	.
14.083	3116.3779	3607.24	.	. Q	V.	.	.
14.167	3141.7407	3682.68	.	. Q	V.	.	.
14.250	3167.7395	3775.04	.	. Q	V.	.	.
14.333	3194.5378	3891.13	.	. Q	V.	.	.
14.417	3222.4524	4053.18	.	. Q	V	.	.
14.500	3252.2263	4323.16	.	. Q	V	.	.
14.583	3283.2014	4497.58	.	. Q	V	.	.
14.667	3314.9663	4612.26	.	. Q	V	.	.
14.750	3347.4021	4709.66	.	. Q	V	.	.
14.833	3380.4607	4800.11	.	. Q	.V	.	.
14.917	3414.0642	4879.24	.	. Q	.V	.	.
15.000	3448.2205	4959.50	.	. Q	.V	.	.
15.083	3482.8911	5034.18	.	. Q	.V	.	.
15.167	3518.0808	5109.54	.	. Q	.V	.	.
15.250	3553.7720	5182.37	.	. Q	. V	.	.
15.333	3589.9956	5259.67	.	. Q	. V	.	.
15.417	3626.5093	5301.79	.	. Q	. V	.	.
15.500	3662.9709	5294.25	.	. Q	. V	.	.
15.583	3699.0908	5244.61	.	. Q	. V	.	.
15.667	3734.5947	5155.17	.	. Q	. V	.	.
15.750	3768.7146	4954.19	.	. Q	. V	.	.
15.833	3799.7310	4503.57	.	. Q	. V	.	.
15.917	3829.8474	4372.91	.	. Q	. V	.	.
16.000	3861.0439	4529.73	.	. Q	. V	.	.
16.083	3896.1587	5098.65	.	. Q	. V	.	.
16.167	3937.0916	5943.44	.	. Q	V	.	.
16.250	3983.6692	6763.07	.	.	.QV	.	.
16.333	4037.2358	7777.86	.	.	. V Q	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2875.0	5750.0	8625.0	11500.0
16.417	4101.0986	9272.86	.	.	.	V . Q	.
16.500	4179.6616	11407.36	.	.	.	V .	Q.
16.583	4240.7998	8877.27	.	.	.	V Q	.
16.667	4289.5303	7075.68	.	.	.	Q V .	.
16.750	4334.4106	6516.66	.	.	. Q	V .	.
16.833	4379.3638	6527.21	.	.	. Q	V .	.
16.917	4423.1113	6352.12	.	.	. Q	V .	.
17.000	4466.1201	6244.88	.	.	.Q	V .	.
17.083	4507.7104	6038.95	.	.	.Q	V .	.
17.167	4548.0068	5851.03	.	.	Q	V .	.
17.250	4586.8677	5642.62	.	.	Q.	V .	.
17.333	4624.5596	5472.85	.	.	Q.	V .	.
17.417	4660.5928	5232.01	.	.	Q .	V.	.
17.500	4694.2456	4886.39	.	. Q	.	V.	.
17.583	4726.0352	4615.85	.	. Q	.	V.	.
17.667	4756.5420	4429.59	.	. Q	.	V.	.
17.750	4785.7046	4234.43	.	. Q	.	V.	.
17.833	4813.9927	4107.42	.	. Q	.	V	.
17.917	4841.3921	3978.38	.	. Q	.	V	.
18.000	4867.4443	3782.81	.	. Q	.	V	.
18.083	4892.6938	3666.22	.	. Q	.	V	.
18.167	4917.4590	3595.90	.	. Q	.	V	.
18.250	4941.8574	3542.66	.	. Q	.	V	.
18.333	4965.9131	3492.90	.	. Q	.	V	.
18.417	4989.7593	3462.50	.	. Q	.	.V	.
18.500	5013.6753	3472.62	.	. Q	.	.V	.
18.583	5037.4976	3459.02	.	. Q	.	.V	.
18.667	5061.1201	3430.02	.	.Q	.	.V	.
18.750	5084.5430	3400.99	.	.Q	.	.V	.
18.833	5107.7607	3371.19	.	.Q	.	.V	.
18.917	5130.7622	3339.80	.	.Q	.	.V	.
19.000	5153.5806	3313.26	.	.Q	.	. V	.
19.083	5176.2310	3288.84	.	.Q	.	. V	.
19.167	5198.7231	3265.89	.	.Q	.	. V	.
19.250	5221.0571	3242.87	.	.Q	.	. V	.
19.333	5243.2354	3220.27	.	.Q	.	. V	.
19.417	5265.2568	3197.53	.	.Q	.	. V	.
19.500	5287.1201	3174.56	.	.Q	.	. V	.
19.583	5308.8179	3150.48	.	Q	.	. V	.
19.667	5330.3369	3124.58	.	Q	.	. V	.
19.750	5351.5972	3086.99	.	Q	.	. V	.
19.833	5372.6211	3052.67	.	Q	.	. V	.
19.917	5393.4995	3031.54	.	Q	.	. V	.
20.000	5414.2373	3011.11	.	Q	.	. V	.
20.083	5434.8306	2990.15	.	Q	.	. V	.
20.167	5455.2764	2968.74	.	Q	.	. V	.
20.250	5475.5796	2948.05	.	Q	.	. V	.
20.333	5495.7451	2928.02	.	Q	.	. V	.
20.417	5515.7769	2908.61	.	Q	.	. V	.
20.500	5535.6787	2889.77	.	Q	.	. V	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2875.0	5750.0	8625.0	11500.0
20.583	5555.4546	2871.46	.	Q.	.	.	V .
20.667	5575.1079	2853.65	.	Q.	.	.	V .
20.750	5594.6455	2836.83	.	Q.	.	.	V .
20.833	5614.0737	2820.98	.	Q.	.	.	V .
20.917	5633.3960	2805.57	.	Q.	.	.	V .
21.000	5652.6147	2790.59	.	Q.	.	.	V .
21.083	5671.7334	2776.02	.	Q.	.	.	V .
21.167	5690.7544	2761.85	.	Q.	.	.	V .
21.250	5709.6802	2748.04	.	Q.	.	.	V .
21.333	5728.5137	2734.59	.	Q.	.	.	V .
21.417	5747.2568	2721.48	.	Q.	.	.	V .
21.500	5765.9116	2708.67	.	Q.	.	.	V .
21.583	5784.4805	2696.18	.	Q.	.	.	V .
21.667	5802.9653	2683.98	.	Q.	.	.	V .
21.750	5821.3667	2671.88	.	Q.	.	.	V .
21.833	5839.6855	2659.89	.	Q.	.	.	V .
21.917	5857.9238	2648.16	.	Q.	.	.	V .
22.000	5876.0830	2636.68	.	Q.	.	.	V .
22.083	5894.1646	2625.43	.	Q.	.	.	V .
22.167	5912.1704	2614.42	.	Q.	.	.	V .
22.250	5930.1016	2603.62	.	Q.	.	.	V .
22.333	5947.9600	2593.03	.	Q.	.	.	V .
22.417	5965.7466	2582.64	.	Q .	.	.	V .
22.500	5983.4634	2572.45	.	Q .	.	.	V .
22.583	6001.1108	2562.44	.	Q .	.	.	V .
22.667	6018.6909	2552.61	.	Q .	.	.	V .
22.750	6036.2046	2542.96	.	Q .	.	.	V .
22.833	6053.6528	2533.48	.	Q .	.	.	V .
22.917	6071.0371	2524.16	.	Q .	.	.	V .
23.000	6088.3584	2515.02	.	Q .	.	.	V .
23.083	6105.6177	2506.03	.	Q .	.	.	V .
23.167	6122.8159	2497.19	.	Q .	.	.	V .
23.250	6139.9541	2488.48	.	Q .	.	.	V .
23.333	6157.0337	2479.92	.	Q .	.	.	V .
23.417	6174.0552	2471.51	.	Q .	.	.	V .
23.500	6191.0195	2463.23	.	Q .	.	.	V .
23.583	6207.9277	2455.08	.	Q .	.	.	V .
23.667	6224.7808	2447.06	.	Q .	.	.	V .
23.750	6241.5796	2439.16	.	Q .	.	.	V .
23.833	6258.3247	2431.38	.	Q .	.	.	V.
23.917	6275.0171	2423.73	.	Q .	.	.	V.
24.000	6291.6572	2416.18	.	Q .	.	.	V.
24.083	6308.0527	2380.65	.	Q .	.	.	V.
24.167	6323.8906	2299.67	.	Q .	.	.	V.
24.250	6338.9092	2180.71	.	Q .	.	.	V.
24.333	6352.7944	2016.13	.	Q .	.	.	V.
24.417	6364.8325	1747.96	.	Q .	.	.	V.
24.500	6373.4180	1246.62	. Q	.	.	.	V.
24.583	6379.9521	948.74	. Q	.	.	.	V.
24.667	6385.3564	784.70	. Q	.	.	.	V.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2875.0	5750.0	8625.0	11500.0
24.750	6389.8838	657.34	. Q	.	.	.	V.
24.833	6393.6831	551.68	.Q	.	.	.	V.
24.917	6396.9263	470.94	.Q	.	.	.	V.
25.000	6399.6548	396.15	.Q	.	.	.	V.
25.083	6401.9619	334.98	.Q	.	.	.	V.
25.167	6403.9106	282.97	Q	.	.	.	V.
25.250	6405.5596	239.43	Q	.	.	.	V.
25.333	6406.9360	199.89	Q	.	.	.	V.
25.417	6408.0796	166.04	Q	.	.	.	V.
25.500	6409.0225	136.90	Q	.	.	.	V.
25.583	6409.8027	113.30	Q	.	.	.	V.
25.667	6410.4419	92.80	Q	.	.	.	V.
25.750	6410.9829	78.55	Q	.	.	.	V.
25.833	6411.4272	64.54	Q	.	.	.	V.
25.917	6411.7808	51.36	Q	.	.	.	V.
26.000	6412.1025	46.69	Q	.	.	.	V.
26.083	6412.4077	44.33	Q	.	.	.	V.
26.167	6412.6968	41.99	Q	.	.	.	V.
26.250	6412.9697	39.65	Q	.	.	.	V.
26.333	6413.2266	37.32	Q	.	.	.	V.
26.417	6413.4678	35.00	Q	.	.	.	V.
26.500	6413.6929	32.68	Q	.	.	.	V.
26.583	6413.9019	30.37	Q	.	.	.	V.
26.667	6414.0952	28.08	Q	.	.	.	V.
26.750	6414.2729	25.79	Q	.	.	.	V.
26.833	6414.4346	23.50	Q	.	.	.	V.
26.917	6414.5806	21.23	Q	.	.	.	V.
27.000	6414.7109	18.96	Q	.	.	.	V.
27.083	6414.8262	16.70	Q	.	.	.	V.
27.167	6414.9258	14.45	Q	.	.	.	V.
27.250	6415.0098	12.20	Q	.	.	.	V.
27.333	6415.0786	9.96	Q	.	.	.	V.
27.417	6415.1318	7.73	Q	.	.	.	V.
27.500	6415.1699	5.51	Q	.	.	.	V.
27.583	6415.1924	3.29	Q	.	.	.	V.
27.667	6415.1997	1.07	Q	.	.	.	V.

END OF FLOODSCx ROUTING ANALYSIS

```
****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
        (c) Copyright 1989-2002 Advanced Engineering Software (aes)
            Ver. 8.0  Release Date: 01/01/2002  License ID 1542

                          Analysis prepared by:

                        TRANSTECH ENGINEERS, INC.
                           624 Brea Canyon Road
                            Walnut, CA 91789


 ************************** DESCRIPTION OF STUDY **************************
* EAST TWIN CREEK                                                          *
* DEVELOPED CONDITION                                                      *
*                                                                          *
 ****************************************************************************

  FILE NAME: AS-4.DAT
  TIME/DATE OF STUDY: 12:05 03/04/2005
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =    1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =     5929.000 ACRES
         BASEFLOW =    0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =     0.460 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         FOOTHILL S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.132
         LOW LOSS FRACTION = 0.110
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.62
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  1.33
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.78
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  3.50
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  5.40
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 14.70

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.754
          30-MINUTE FACTOR = 0.754
           1-HOUR FACTOR = 0.754
           3-HOUR FACTOR = 0.960
           6-HOUR FACTOR = 0.980
          24-HOUR FACTOR = 0.990

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  18.116


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                 1.192                854.907
        2                 4.323               2245.042
        3                 9.081               3411.125
        4                15.792               4812.522
        5                26.926               7983.473
        6                47.997              15108.547
        7                60.489               8957.346
        8                67.334               4908.329
```

9	72.642	3805.979
10	77.045	3157.087
11	80.404	2408.095
12	83.519	2233.962
13	86.066	1826.344
14	88.232	1552.843
15	90.044	1299.660
16	91.693	1182.010
17	93.105	1012.318
18	94.321	872.085
19	95.305	705.720
20	96.161	613.732
21	96.754	425.260
22	97.338	418.996
23	97.890	395.265
24	98.081	137.371
25	98.175	67.332
26	98.269	67.025
27	98.363	67.332
28	98.456	67.102
29	98.550	67.255
30	98.644	67.255
31	98.737	67.255
32	98.831	67.102
33	98.925	67.102
34	99.019	67.414
35	99.112	67.102
36	99.206	67.102
37	99.299	67.102
38	99.393	67.102
39	99.487	67.102
40	99.580	67.102
41	99.674	67.102
42	99.767	67.102
43	99.861	67.102
44	99.954	67.102
45	100.000	32.632

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0369	0.0041	0.0328
2	0.0369	0.0041	0.0329
3	0.0370	0.0041	0.0329
4	0.0370	0.0041	0.0330
5	0.0371	0.0041	0.0330
6	0.0371	0.0041	0.0331
7	0.0372	0.0041	0.0331
8	0.0372	0.0041	0.0331
9	0.0373	0.0041	0.0332
10	0.0374	0.0041	0.0332
11	0.0374	0.0041	0.0333
12	0.0375	0.0041	0.0333
13	0.0375	0.0041	0.0334
14	0.0376	0.0041	0.0334
15	0.0377	0.0041	0.0335
16	0.0377	0.0041	0.0335
17	0.0378	0.0042	0.0336
18	0.0378	0.0042	0.0337
19	0.0379	0.0042	0.0337
20	0.0379	0.0042	0.0338
21	0.0380	0.0042	0.0338
22	0.0380	0.0042	0.0339
23	0.0381	0.0042	0.0339
24	0.0382	0.0042	0.0340
25	0.0382	0.0042	0.0340
26	0.0383	0.0042	0.0341
27	0.0384	0.0042	0.0342
28	0.0384	0.0042	0.0342
29	0.0385	0.0042	0.0343
30	0.0385	0.0042	0.0343
31	0.0386	0.0042	0.0344
32	0.0387	0.0043	0.0344
33	0.0388	0.0043	0.0345
34	0.0388	0.0043	0.0345
35	0.0389	0.0043	0.0346
36	0.0389	0.0043	0.0347
37	0.0390	0.0043	0.0347
38	0.0391	0.0043	0.0348
39	0.0392	0.0043	0.0349
40	0.0392	0.0043	0.0349
41	0.0393	0.0043	0.0350
42	0.0393	0.0043	0.0350
43	0.0394	0.0043	0.0351
44	0.0395	0.0043	0.0351
45	0.0396	0.0044	0.0352
46	0.0396	0.0044	0.0353
47	0.0397	0.0044	0.0354
48	0.0398	0.0044	0.0354
49	0.0399	0.0044	0.0355
50	0.0399	0.0044	0.0355
51	0.0400	0.0044	0.0356

52	0.0401	0.0044	0.0357
53	0.0402	0.0044	0.0358
54	0.0402	0.0044	0.0358
55	0.0403	0.0044	0.0359
56	0.0404	0.0044	0.0360
57	0.0405	0.0045	0.0360
58	0.0406	0.0045	0.0361
59	0.0407	0.0045	0.0362
60	0.0407	0.0045	0.0362
61	0.0408	0.0045	0.0363
62	0.0409	0.0045	0.0364
63	0.0410	0.0045	0.0365
64	0.0411	0.0045	0.0365
65	0.0412	0.0045	0.0366
66	0.0412	0.0045	0.0367
67	0.0413	0.0045	0.0368
68	0.0414	0.0046	0.0369
69	0.0415	0.0046	0.0370
70	0.0416	0.0046	0.0370
71	0.0417	0.0046	0.0371
72	0.0418	0.0046	0.0372
73	0.0419	0.0046	0.0373
74	0.0420	0.0046	0.0373
75	0.0421	0.0046	0.0375
76	0.0422	0.0046	0.0375
77	0.0423	0.0047	0.0376
78	0.0424	0.0047	0.0377
79	0.0425	0.0047	0.0378
80	0.0426	0.0047	0.0379
81	0.0427	0.0047	0.0380
82	0.0428	0.0047	0.0381
83	0.0429	0.0047	0.0382
84	0.0430	0.0047	0.0382
85	0.0431	0.0047	0.0384
86	0.0432	0.0048	0.0384
87	0.0433	0.0048	0.0386
88	0.0434	0.0048	0.0386
89	0.0436	0.0048	0.0388
90	0.0436	0.0048	0.0388
91	0.0438	0.0048	0.0390
92	0.0439	0.0048	0.0390
93	0.0440	0.0048	0.0392
94	0.0441	0.0049	0.0393
95	0.0443	0.0049	0.0394
96	0.0443	0.0049	0.0395
97	0.0445	0.0049	0.0396
98	0.0446	0.0049	0.0397
99	0.0448	0.0049	0.0398
100	0.0449	0.0049	0.0399
101	0.0450	0.0050	0.0401
102	0.0451	0.0050	0.0402
103	0.0453	0.0050	0.0403
104	0.0454	0.0050	0.0404
105	0.0456	0.0050	0.0406
106	0.0457	0.0050	0.0406
107	0.0459	0.0050	0.0408
108	0.0460	0.0051	0.0409

109	0.0462	0.0051	0.0411
110	0.0463	0.0051	0.0412
111	0.0465	0.0051	0.0413
112	0.0466	0.0051	0.0414
113	0.0468	0.0051	0.0416
114	0.0469	0.0052	0.0417
115	0.0471	0.0052	0.0419
116	0.0472	0.0052	0.0420
117	0.0474	0.0052	0.0422
118	0.0475	0.0052	0.0423
119	0.0478	0.0053	0.0425
120	0.0479	0.0053	0.0426
121	0.0481	0.0053	0.0428
122	0.0482	0.0053	0.0429
123	0.0485	0.0053	0.0432
124	0.0486	0.0053	0.0433
125	0.0489	0.0054	0.0435
126	0.0490	0.0054	0.0436
127	0.0493	0.0054	0.0439
128	0.0494	0.0054	0.0440
129	0.0497	0.0055	0.0442
130	0.0498	0.0055	0.0444
131	0.0501	0.0055	0.0446
132	0.0503	0.0055	0.0447
133	0.0506	0.0056	0.0450
134	0.0507	0.0056	0.0451
135	0.0510	0.0056	0.0454
136	0.0512	0.0056	0.0456
137	0.0515	0.0057	0.0459
138	0.0517	0.0057	0.0460
139	0.0520	0.0057	0.0463
140	0.0522	0.0057	0.0465
141	0.0526	0.0058	0.0468
142	0.0528	0.0058	0.0470
143	0.0531	0.0058	0.0473
144	0.0533	0.0059	0.0475
145	0.0483	0.0053	0.0430
146	0.0485	0.0053	0.0432
147	0.0490	0.0054	0.0436
148	0.0493	0.0054	0.0438
149	0.0498	0.0055	0.0443
150	0.0500	0.0055	0.0445
151	0.0506	0.0056	0.0450
152	0.0509	0.0056	0.0453
153	0.0514	0.0057	0.0458
154	0.0517	0.0057	0.0461
155	0.0524	0.0058	0.0466
156	0.0527	0.0058	0.0469
157	0.0534	0.0059	0.0475
158	0.0537	0.0059	0.0478
159	0.0544	0.0060	0.0484
160	0.0548	0.0060	0.0488
161	0.0556	0.0061	0.0495
162	0.0560	0.0062	0.0498
163	0.0569	0.0063	0.0506
164	0.0573	0.0063	0.0510
165	0.0582	0.0064	0.0518

166	0.0587	0.0065	0.0523
167	0.0598	0.0066	0.0532
168	0.0603	0.0066	0.0537
169	0.0781	0.0086	0.0695
170	0.0785	0.0086	0.0699
171	0.0793	0.0087	0.0706
172	0.0797	0.0088	0.0709
173	0.0806	0.0089	0.0717
174	0.0810	0.0089	0.0721
175	0.0820	0.0090	0.0730
176	0.0825	0.0091	0.0734
177	0.0836	0.0092	0.0744
178	0.0842	0.0093	0.0750
179	0.0855	0.0094	0.0761
180	0.0862	0.0095	0.0768
181	0.0878	0.0097	0.0781
182	0.0887	0.0098	0.0789
183	0.0906	0.0100	0.0806
184	0.0916	0.0101	0.0816
185	0.0482	0.0053	0.0429
186	0.0509	0.0056	0.0453
187	0.0574	0.0063	0.0511
188	0.0618	0.0068	0.0550
189	0.0742	0.0082	0.0660
190	0.0834	0.0092	0.0742
191	0.1176	0.0110	0.1066
192	0.1600	0.0110	0.1490
193	0.4712	0.0110	0.4602
194	0.0965	0.0106	0.0859
195	0.0671	0.0074	0.0597
196	0.0538	0.0059	0.0479
197	0.0928	0.0102	0.0826
198	0.0896	0.0099	0.0797
199	0.0870	0.0096	0.0774
200	0.0849	0.0093	0.0755
201	0.0831	0.0091	0.0739
202	0.0815	0.0090	0.0725
203	0.0801	0.0088	0.0713
204	0.0789	0.0087	0.0702
205	0.0609	0.0067	0.0542
206	0.0592	0.0065	0.0527
207	0.0578	0.0064	0.0514
208	0.0564	0.0062	0.0502
209	0.0552	0.0061	0.0491
210	0.0541	0.0059	0.0481
211	0.0530	0.0058	0.0472
212	0.0521	0.0057	0.0463
213	0.0511	0.0056	0.0455
214	0.0503	0.0055	0.0448
215	0.0495	0.0054	0.0441
216	0.0488	0.0054	0.0434
217	0.0535	0.0059	0.0476
218	0.0530	0.0058	0.0471
219	0.0524	0.0058	0.0466
220	0.0519	0.0057	0.0462
221	0.0514	0.0056	0.0457
222	0.0509	0.0056	0.0453

223	0.0504	0.0055	0.0449
224	0.0500	0.0055	0.0445
225	0.0496	0.0055	0.0441
226	0.0491	0.0054	0.0437
227	0.0488	0.0054	0.0434
228	0.0484	0.0053	0.0431
229	0.0480	0.0053	0.0427
230	0.0477	0.0052	0.0424
231	0.0473	0.0052	0.0421
232	0.0470	0.0052	0.0418
233	0.0467	0.0051	0.0415
234	0.0464	0.0051	0.0413
235	0.0461	0.0051	0.0410
236	0.0458	0.0050	0.0407
237	0.0455	0.0050	0.0405
238	0.0452	0.0050	0.0402
239	0.0449	0.0049	0.0400
240	0.0447	0.0049	0.0398
241	0.0444	0.0049	0.0395
242	0.0442	0.0049	0.0393
243	0.0439	0.0048	0.0391
244	0.0437	0.0048	0.0389
245	0.0435	0.0048	0.0387
246	0.0433	0.0048	0.0385
247	0.0430	0.0047	0.0383
248	0.0428	0.0047	0.0381
249	0.0426	0.0047	0.0379
250	0.0424	0.0047	0.0378
251	0.0422	0.0046	0.0376
252	0.0420	0.0046	0.0374
253	0.0418	0.0046	0.0372
254	0.0417	0.0046	0.0371
255	0.0415	0.0046	0.0369
256	0.0413	0.0045	0.0367
257	0.0411	0.0045	0.0366
258	0.0409	0.0045	0.0364
259	0.0408	0.0045	0.0363
260	0.0406	0.0045	0.0361
261	0.0404	0.0044	0.0360
262	0.0403	0.0044	0.0359
263	0.0401	0.0044	0.0357
264	0.0400	0.0044	0.0356
265	0.0398	0.0044	0.0354
266	0.0397	0.0044	0.0353
267	0.0395	0.0043	0.0352
268	0.0394	0.0043	0.0351
269	0.0393	0.0043	0.0349
270	0.0391	0.0043	0.0348
271	0.0390	0.0043	0.0347
272	0.0388	0.0043	0.0346
273	0.0387	0.0043	0.0345
274	0.0386	0.0042	0.0343
275	0.0385	0.0042	0.0342
276	0.0383	0.0042	0.0341
277	0.0382	0.0042	0.0340
278	0.0381	0.0042	0.0339
279	0.0380	0.0042	0.0338

280	0.0378	0.0042	0.0337
281	0.0377	0.0042	0.0336
282	0.0376	0.0041	0.0335
283	0.0375	0.0041	0.0334
284	0.0374	0.0041	0.0333
285	0.0373	0.0041	0.0332
286	0.0372	0.0041	0.0331
287	0.0371	0.0041	0.0330
288	0.0370	0.0041	0.0329

TOTAL STORM RAINFALL(INCHES) = 14.55
TOTAL SOIL-LOSS(INCHES) = 1.55
TOTAL EFFECTIVE RAINFALL(INCHES) = 13.00

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 766.5504
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 6420.5244

24-HOUR STORM RUNOFF HYDROGRAPH

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 2950.0 5900.0 8850.0 11800.0
0.083	0.1933	28.07	Q . . . .
0.167	0.8945	101.81	Q . . . .
0.250	2.3678	213.93	Q . . . .
0.333	4.9312	372.21	VQ . . . .
0.417	9.3032	634.81	V Q . . . .
0.500	17.0972	1131.69	V Q . . . .
0.583	26.9267	1427.24	V Q . . . .
0.667	37.8802	1590.45	V Q . . . .
0.750	49.7093	1717.59	V Q . . . .
0.833	62.2696	1823.75	V Q . . . .
0.917	75.3919	1905.37	V Q . . . .
1.000	89.0388	1981.52	V Q . . . .
1.083	103.1179	2044.29	V Q . . . .
1.167	117.5691	2098.32	V Q . . . .
1.250	132.3349	2143.99	V Q . . . .
1.333	147.3902	2186.03	V Q . . . .
1.417	162.6961	2222.42	.V Q . . . .
1.500	178.2225	2254.43	.V Q . . . .
1.583	193.9311	2280.89	.V Q . . . .
1.667	209.8026	2304.54	.V Q . . . .
1.750	225.7938	2321.92	.V Q . . . .
1.833	241.9046	2339.28	.V Q . . . .
1.917	258.1289	2355.77	.V Q . . . .
2.000	274.4096	2363.96	.V Q . . . .
2.083	290.7302	2369.75	.V Q . . . .
2.167	307.0918	2375.70	.V Q . . . .
2.250	323.4937	2381.56	. V Q . . . .
2.333	339.9370	2387.57	. V Q . . . .
2.417	356.4211	2393.49	. V Q . . . .
2.500	372.9471	2399.57	. V Q . . . .
2.583	389.5142	2405.54	. V Q . . . .
2.667	406.1236	2411.69	. V Q . . . .
2.750	422.7746	2417.72	. V Q . . . .
2.833	439.4683	2423.93	. V Q . . . .
2.917	456.2041	2430.03	. V Q . . . .
3.000	472.9831	2436.31	. V Q . . . .
3.083	489.8044	2442.46	. V Q . . . .
3.167	506.6695	2448.81	. V Q . . . .
3.250	523.5774	2455.03	. V Q . . . .
3.333	540.5295	2461.45	. V Q . . . .
3.417	557.5252	2467.77	. V Q . . . .
3.500	574.5656	2474.26	. V Q . . . .
3.583	591.6498	2480.63	. V Q . . . .
3.667	608.7793	2487.20	. V Q . . . .
3.750	625.9454	2492.52	. V Q . . . .

3.833	643.1421	2496.96	.	V	Q .	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2950.0	5900.0	8850.0	11800.0
3.917	660.3685	2501.27	.	V Q .	.	.	.
4.000	677.6260	2505.79	.	V Q .	.	.	.
4.083	694.9137	2510.18	.	V Q .	.	.	.
4.167	712.2330	2514.77	.	V Q .	.	.	.
4.250	729.5831	2519.23	.	V Q .	.	.	.
4.333	746.9654	2523.90	.	V Q .	.	.	.
4.417	764.3790	2528.45	.	V Q .	.	.	.
4.500	781.8253	2533.20	.	V Q .	.	.	.
4.583	799.3034	2537.82	.	V Q .	.	.	.
4.667	816.8149	2542.66	.	V Q .	.	.	.
4.750	834.3588	2547.37	.	V Q .	.	.	.
4.833	851.9365	2552.29	.	V Q .	.	.	.
4.917	869.5472	2557.08	.	V Q .	.	.	.
5.000	887.1925	2562.09	.	V Q .	.	.	.
5.083	904.8714	2566.97	.	V Q .	.	.	.
5.167	922.5854	2572.08	.	V Q .	.	.	.
5.250	940.3337	2577.05	.	V Q .	.	.	.
5.333	958.1179	2582.25	.	V Q .	.	.	.
5.417	975.9368	2587.32	.	V Q .	.	.	.
5.500	993.7923	2592.61	.	V Q .	.	.	.
5.583	1011.6833	2597.77	.	V Q .	.	.	.
5.667	1029.6115	2603.17	.	V Q .	.	.	.
5.750	1047.5759	2608.43	.	V Q .	.	.	.
5.833	1065.5782	2613.94	.	V Q .	.	.	.
5.917	1083.6174	2619.29	.	V Q .	.	.	.
6.000	1101.6953	2624.90	.	V Q .	.	.	.
6.083	1119.8108	2630.36	.	V Q .	.	.	.
6.167	1137.9657	2636.10	.	VQ .	.	.	.
6.250	1156.1591	2641.68	.	VQ .	.	.	.
6.333	1174.3927	2647.52	.	VQ .	.	.	.
6.417	1192.6655	2653.21	.	VQ .	.	.	.
6.500	1210.9795	2659.18	.	V Q.	.	.	.
6.583	1229.3334	2664.99	.	V Q.	.	.	.
6.667	1247.7292	2671.09	.	V Q.	.	.	.
6.750	1266.1660	2677.03	.	V Q.	.	.	.
6.833	1284.6458	2683.26	.	VQ.	.	.	.
6.917	1303.1672	2689.32	.	VQ.	.	.	.
7.000	1321.7325	2695.68	.	VQ.	.	.	.
7.083	1340.3406	2701.88	.	VQ.	.	.	.
7.167	1358.9934	2708.39	.	VQ.	.	.	.
7.250	1377.6898	2714.72	.	VQ.	.	.	.
7.333	1396.4321	2721.38	.	VQ.	.	.	.
7.417	1415.2190	2727.86	.	VQ.	.	.	.
7.500	1434.0529	2734.68	.	VQ.	.	.	.
7.583	1452.9323	2741.29	.	Q.	.	.	.
7.667	1471.8597	2748.27	.	Q.	.	.	.
7.750	1490.8339	2755.04	.	Q.	.	.	.
7.833	1509.8572	2762.19	.	Q.	.	.	.
7.917	1528.9283	2769.14	.	Q.	.	.	.
8.000	1548.0500	2776.46	.	Q.	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2950.0	5900.0	8850.0	11800.0
8.083	1567.2207	2783.58	.	Q.	.	.	.
8.167	1586.4430	2791.08	.	Q.	.	.	.
8.250	1605.7155	2798.37	.	QV	.	.	.
8.333	1625.0409	2806.06	.	QV	.	.	.
8.417	1644.4180	2813.55	.	QV	.	.	.
8.500	1663.8494	2821.44	.	QV	.	.	.
8.583	1683.3336	2829.12	.	QV	.	.	.
8.667	1702.8737	2837.22	.	QV	.	.	.
8.750	1722.4680	2845.11	.	QV	.	.	.
8.833	1742.1198	2853.42	.	QV	.	.	.
8.917	1761.8273	2861.53	.	QV	.	.	.
9.000	1781.5936	2870.08	.	Q.V	.	.	.
9.083	1801.4174	2878.40	.	Q.V	.	.	.
9.167	1821.3016	2887.19	.	Q.V	.	.	.
9.250	1841.2449	2895.76	.	Q.V	.	.	.
9.333	1861.2505	2904.81	.	Q.V	.	.	.
9.417	1881.3168	2913.63	.	Q.V	.	.	.
9.500	1901.4473	2922.94	.	Q.V	.	.	.
9.583	1921.6403	2932.02	.	Q.V	.	.	.
9.667	1941.8994	2941.62	.	Q. V	.	.	.
9.750	1962.2230	2950.98	.	Q V	.	.	.
9.833	1982.6147	2960.88	.	Q V	.	.	.
9.917	2003.0730	2970.54	.	Q V	.	.	.
10.000	2023.6016	2980.75	.	Q V	.	.	.
10.083	2044.1989	2990.72	.	Q V	.	.	.
10.167	2064.8687	3001.26	.	Q V	.	.	.
10.250	2085.6094	3011.56	.	Q V	.	.	.
10.333	2106.4250	3022.45	.	Q V	.	.	.
10.417	2127.3142	3033.10	.	Q V	.	.	.
10.500	2148.2810	3044.37	.	Q V	.	.	.
10.583	2169.3237	3055.39	.	Q V	.	.	.
10.667	2190.4468	3067.06	.	Q V	.	.	.
10.750	2211.6484	3078.48	.	Q V	.	.	.
10.833	2232.9333	3090.57	.	Q V	.	.	.
10.917	2254.2998	3102.41	.	Q V	.	.	.
11.000	2275.7527	3114.95	.	Q V	.	.	.
11.083	2297.2900	3127.24	.	Q V	.	.	.
11.167	2318.9172	3140.27	.	Q V	.	.	.
11.250	2340.6323	3153.04	.	Q V	.	.	.
11.333	2362.4409	3166.59	.	Q V	.	.	.
11.417	2384.3408	3179.88	.	Q V	.	.	.
11.500	2406.3381	3193.99	.	Q V	.	.	.
11.583	2428.4307	3207.84	.	Q V	.	.	.
11.667	2450.6245	3222.55	.	Q V	.	.	.
11.750	2472.9177	3236.99	.	Q V	.	.	.
11.833	2495.3169	3252.35	.	.Q V	.	.	.
11.917	2517.8201	3267.45	.	.Q V	.	.	.
12.000	2540.4338	3283.52	.	.Q V	.	.	.
12.083	2563.1277	3295.16	.	.Q V	.	.	.
12.167	2585.8628	3301.12	.	.Q V	.	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2950.0	5900.0	8850.0	11800.0
12.250	2608.5986	3301.24	.	.Q	V .	.	.
12.333	2631.2969	3295.79	.	.Q	V .	.	.
12.417	2653.8513	3274.89	.	.Q	V .	.	.
12.500	2676.0339	3220.90	.	Q	V .	.	.
12.583	2698.0522	3197.07	.	Q	V .	.	.
12.667	2720.0544	3194.70	.	Q	V .	.	.
12.750	2742.0767	3197.61	.	Q	V .	.	.
12.833	2764.1521	3205.36	.	Q	V .	.	.
12.917	2786.3052	3216.63	.	Q	V .	.	.
13.000	2808.5540	3230.53	.	Q	V .	.	.
13.083	2830.9111	3246.26	.	.Q	V .	.	.
13.167	2853.3992	3265.25	.	.Q	V .	.	.
13.250	2876.0254	3285.32	.	.Q	V .	.	.
13.333	2898.8081	3308.05	.	.Q	V .	.	.
13.417	2921.7522	3331.47	.	.Q	V .	.	.
13.500	2944.8779	3357.86	.	.Q	V .	.	.
13.583	2968.1902	3384.95	.	.Q	V .	.	.
13.667	2991.7095	3415.00	.	.Q	V .	.	.
13.750	3015.4417	3445.93	.	.Q	V .	.	.
13.833	3039.4062	3479.66	.	.Q	V .	.	.
13.917	3063.6042	3513.54	.	.Q	V.	.	.
14.000	3088.0657	3551.78	.	. Q	V.	.	.
14.083	3112.8811	3603.19	.	. Q	V.	.	.
14.167	3138.2153	3678.55	.	. Q	V.	.	.
14.250	3164.1851	3770.80	.	. Q	V.	.	.
14.333	3190.9534	3886.76	.	. Q	V.	.	.
14.417	3218.8364	4048.63	.	. Q	V	.	.
14.500	3248.5769	4318.31	.	. Q	V	.	.
14.583	3279.5171	4492.53	.	. Q	V	.	.
14.667	3311.2463	4607.09	.	. Q	V	.	.
14.750	3343.6455	4704.38	.	. Q	V	.	.
14.833	3376.6670	4794.72	.	. Q	.V	.	.
14.917	3410.2329	4873.76	.	. Q	.V	.	.
15.000	3444.3508	4953.93	.	. Q	.V	.	.
15.083	3478.9827	5028.53	.	. Q	.V	.	.
15.167	3514.1328	5103.80	.	. Q	.V	.	.
15.250	3549.7839	5176.56	.	. Q	. V	.	.
15.333	3585.9670	5253.77	.	. Q	. V	.	.
15.417	3622.4397	5295.84	.	. Q	. V	.	.
15.500	3658.8606	5288.30	.	. Q	. V	.	.
15.583	3694.9399	5238.72	.	. Q	. V	.	.
15.667	3730.4041	5149.38	.	. Q	. V	.	.
15.750	3764.4856	4948.63	.	. Q	. V	.	.
15.833	3795.4670	4498.51	.	. Q	. V	.	.
15.917	3825.5610	4369.65	.	. Q	. V	.	.
16.000	3856.7913	4534.62	.	. Q	. V	.	.
16.083	3892.1130	5128.73	.	. Q	. V	.	.
16.167	3933.4792	6006.37	.	.	Q V	.	.
16.250	3980.7249	6860.08	.	.	. QV	.	.
16.333	4035.3530	7932.01	.	.	. VQ	.	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2950.0	5900.0	8850.0	11800.0
16.417	4100.8755	9513.86	.	.	.	V . Q	.
16.500	4181.5742	11717.47	.	.	.	V .	Q.
16.583	4243.9561	9057.82	.	.	.	V Q	.
16.667	4293.4160	7181.58	.	.	.	Q V .	.
16.750	4338.8628	6598.90	.	.	. Q	V .	.
16.833	4384.2705	6593.23	.	.	. Q	V .	.
16.917	4428.3740	6403.80	.	.	.Q	V .	.
17.000	4471.6973	6290.53	.	.	.Q	V .	.
17.083	4513.5405	6075.67	.	.	Q	V .	.
17.167	4554.0464	5881.46	.	.	Q.	V .	.
17.250	4593.0815	5667.92	.	.	Q.	V .	.
17.333	4630.9258	5494.97	.	.	Q .	V .	.
17.417	4667.0850	5250.30	.	.	Q .	V.	.
17.500	4700.8413	4901.42	.	.	Q .	V.	.
17.583	4732.7104	4627.42	.	.	Q .	V.	.
17.667	4763.2788	4438.56	.	.	Q .	V.	.
17.750	4792.4824	4240.37	.	.	Q .	V.	.
17.833	4820.8071	4112.74	.	.	Q .	V	.
17.917	4848.2285	3981.60	.	.	Q .	V	.
18.000	4874.2715	3781.45	.	.	Q .	V	.
18.083	4899.5044	3663.81	.	.	Q .	V	.
18.167	4924.2534	3593.57	.	.	Q .	V	.
18.250	4948.6362	3540.39	.	.	Q .	V	.
18.333	4972.6768	3490.68	.	.Q	.	V	.
18.417	4996.5083	3460.32	.	.Q	.	.V	.
18.500	5020.4092	3470.43	.	.Q	.	.V	.
18.583	5044.2168	3456.84	.	.Q	.	.V	.
18.667	5067.8247	3427.87	.	.Q	.	.V	.
18.750	5091.2329	3398.88	.	.Q	.	.V	.
18.833	5114.4360	3369.11	.	.Q	.	.V	.
18.917	5137.4233	3337.76	.	.Q	.	. V	.
19.000	5160.2280	3311.24	.	.Q	.	. V	.
19.083	5182.8647	3286.85	.	.Q	.	. V	.
19.167	5205.3438	3263.93	.	.Q	.	. V	.
19.250	5227.6641	3240.93	.	Q	.	. V	.
19.333	5249.8291	3218.35	.	Q	.	. V	.
19.417	5271.8379	3195.64	.	Q	.	. V	.
19.500	5293.6885	3172.70	.	Q	.	. V	.
19.583	5315.3730	3148.58	.	Q	.	. V	.
19.667	5336.8774	3122.42	.	Q	.	. V	.
19.750	5358.1177	3084.08	.	Q	.	. V	.
19.833	5379.1182	3049.24	.	Q	.	. V	.
19.917	5399.9731	3028.14	.	Q	.	. V	.
20.000	5420.6875	3007.73	.	Q	.	. V	.
20.083	5441.2578	2986.79	.	Q	.	. V	.
20.167	5461.6807	2965.41	.	Q	.	. V	.
20.250	5481.9614	2944.74	.	Q.	.	. V	.
20.333	5502.1045	2924.74	.	Q.	.	. V	.
20.417	5522.1138	2905.35	.	Q.	.	. V	.
20.500	5541.9937	2886.53	.	Q.	.	. V	.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2950.0	5900.0	8850.0	11800.0
20.583	5561.7476	2868.24	.	Q.	.	.	V .
20.667	5581.3789	2850.45	.	Q.	.	.	V .
20.750	5600.8945	2833.65	.	Q.	.	.	V .
20.833	5620.3008	2817.81	.	Q.	.	.	V .
20.917	5639.6011	2802.42	.	Q.	.	.	V .
21.000	5658.7983	2787.45	.	Q.	.	.	V .
21.083	5677.8955	2772.91	.	Q.	.	.	V .
21.167	5696.8950	2758.75	.	Q.	.	.	V .
21.250	5715.7998	2744.96	.	Q.	.	.	V .
21.333	5734.6118	2731.52	.	Q.	.	.	V .
21.417	5753.3335	2718.42	.	Q.	.	.	V .
21.500	5771.9673	2705.63	.	Q.	.	.	V .
21.583	5790.5151	2693.15	.	Q.	.	.	V .
21.667	5808.9790	2680.96	.	Q.	.	.	V .
21.750	5827.3599	2668.88	.	Q.	.	.	V .
21.833	5845.6582	2656.90	.	Q.	.	.	V .
21.917	5863.8760	2645.19	.	Q .	.	.	V .
22.000	5882.0146	2633.72	.	Q .	.	.	V .
22.083	5900.0757	2622.48	.	Q .	.	.	V .
22.167	5918.0610	2611.48	.	Q .	.	.	V .
22.250	5935.9722	2600.70	.	Q .	.	.	V .
22.333	5953.8105	2590.12	.	Q .	.	.	V .
22.417	5971.5771	2579.74	.	Q .	.	.	V .
22.500	5989.2739	2569.56	.	Q .	.	.	V .
22.583	6006.9019	2559.56	.	Q .	.	.	V .
22.667	6024.4619	2549.74	.	Q .	.	.	V .
22.750	6041.9556	2540.11	.	Q .	.	.	V .
22.833	6059.3843	2530.64	.	Q .	.	.	V .
22.917	6076.7490	2521.33	.	Q .	.	.	V .
23.000	6094.0508	2512.19	.	Q .	.	.	V .
23.083	6111.2905	2503.22	.	Q .	.	.	V .
23.167	6128.4697	2494.39	.	Q .	.	.	V .
23.250	6145.5889	2485.69	.	Q .	.	.	V .
23.333	6162.6489	2477.14	.	Q .	.	.	V .
23.417	6179.6514	2468.73	.	Q .	.	.	V .
23.500	6196.5967	2460.46	.	Q .	.	.	V .
23.583	6213.4858	2452.32	.	Q .	.	.	V .
23.667	6230.3198	2444.31	.	Q .	.	.	V .
23.750	6247.0996	2436.42	.	Q .	.	.	V .
23.833	6263.8257	2428.65	.	Q .	.	.	V.
23.917	6280.4995	2421.01	.	Q .	.	.	V.
24.000	6297.1211	2413.47	.	Q .	.	.	V.
24.083	6313.4985	2377.98	.	Q .	.	.	V.
24.167	6329.3188	2297.09	.	Q .	.	.	V.
24.250	6344.3208	2178.26	.	Q .	.	.	V.
24.333	6358.1904	2013.87	.	Q .	.	.	V.
24.417	6370.2153	1746.00	.	Q .	.	.	V.
24.500	6378.7910	1245.22	.	Q .	.	.	V.
24.583	6385.3179	947.67	.	Q .	.	.	V.
24.667	6390.7158	783.82	.	Q .	.	.	V.

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	2950.0	5900.0	8850.0	11800.0
24.750	6395.2378	656.61	. Q	.	.	.	V.
24.833	6399.0332	551.06	.Q	.	.	.	V.
24.917	6402.2729	470.41	.Q	.	.	.	V.
25.000	6404.9980	395.71	.Q	.	.	.	V.
25.083	6407.3022	334.60	.Q	.	.	.	V.
25.167	6409.2490	282.65	Q	.	.	.	V.
25.250	6410.8960	239.16	Q	.	.	.	V.
25.333	6412.2710	199.67	Q	.	.	.	V.
25.417	6413.4131	165.85	Q	.	.	.	V.
25.500	6414.3550	136.74	Q	.	.	.	V.
25.583	6415.1343	113.17	Q	.	.	.	V.
25.667	6415.7725	92.70	Q	.	.	.	V.
25.750	6416.3130	78.46	Q	.	.	.	V.
25.833	6416.7568	64.47	Q	.	.	.	V.
25.917	6417.1104	51.31	Q	.	.	.	V.
26.000	6417.4316	46.64	Q	.	.	.	V.
26.083	6417.7368	44.28	Q	.	.	.	V.
26.167	6418.0259	41.94	Q	.	.	.	V.
26.250	6418.2988	39.60	Q	.	.	.	V.
26.333	6418.5557	37.28	Q	.	.	.	V.
26.417	6418.7964	34.96	Q	.	.	.	V.
26.500	6419.0210	32.65	Q	.	.	.	V.
26.583	6419.2300	30.34	Q	.	.	.	V.
26.667	6419.4233	28.05	Q	.	.	.	V.
26.750	6419.6006	25.76	Q	.	.	.	V.
26.833	6419.7622	23.47	Q	.	.	.	V.
26.917	6419.9082	21.20	Q	.	.	.	V.
27.000	6420.0386	18.94	Q	.	.	.	V.
27.083	6420.1533	16.68	Q	.	.	.	V.
27.167	6420.2529	14.43	Q	.	.	.	V.
27.250	6420.3369	12.19	Q	.	.	.	V.
27.333	6420.4053	9.95	Q	.	.	.	V.
27.417	6420.4585	7.72	Q	.	.	.	V.
27.500	6420.4966	5.50	Q	.	.	.	V.
27.583	6420.5190	3.28	Q	.	.	.	V.
27.667	6420.5264	1.07	Q	.	.	.	V

END OF FLOODSCx ROUTING ANALYSIS