MASTER HYDROLOGY REPORT

Golden Hills at Damonte Foothills

Prepared for:

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Prepared by:

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July 15, 2005
Revised October 7, 2005

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INTRODUCTION

This report has been updated to reflect the final design of Golden Hills Phases 2A and 2B. The major revision has been to the 5 and 100 year StormCAD models in Appendicies B and C to reflect a reduction in the number of storm drain manholes.

The following report presents the storm water management plan for the Golden Hills at Damonte Foothills (tentative map LDC04-00381) single family residential development, (referred to as Golden Hills for the remainder of this report). Golden Hills is located within Section 14, Township 18 North, Range 20 East and lies adjacent to and east of the Damonte Ranch development currently under construction. Reference the vicinity map in Appendix A of this report.

Golden Hills consists of 317 single family residential lots on 133.28 acres. The project is bounded to the east by the Palisades (tentative map LDC05-00252), to the west by existing homes, the north by undeveloped land, and to the South by McCauley Ranch Estates (tentative map LDC04-00272) and Damonte Ranch High School. A Vicinity Map, project site map, and Assessor Parcel map have been included within Appendix A of this report for reference.

The existing site consists of shallow slopes with substantial range land vegetation. The soil type for the site was derived from the USCS soil survey Washoe County, Nevada, South Part. Please reference the Storm Drainage Master Plan prepared by Wood Rodgers in Appendix F for a breakdown of the soil conditions.

This report contains the design and sizing for the storm water management system for the build out of the entire development, and conformance to the Storm Drainage Master Plan. These calculations include the design of all inlets, pipes, manholes, ditches, culverts and rock rip associated with this development.

FLOOD HAZARD AREAS

The proposed Golden Hills site, per the FEMA Flood Insurance Rate Map (FIRM) 32031C3187E, dated September 30, 1994, is located within the flood zone X. This indicates areas located outside of the 500 year floodplain.

PREVIOUS STUDIES

A master hydrology report was prepared by Wood Rodgers, Inc. entitled "Storm Drainage Master Plan Golden Hills Subdivision / Damonte Foothills" and dated March 2005. This report included an analysis of the existing and proposed basins for the entire development and the existing drainage channels for the entire development. The development plan for this portion of the Damonte Foothills project is in conformance with the master hydrology report. Please reference Appendix F for a copy of the master drainage report.

BACKGROUND AND EXISTING DRAINAGE

The criteria used for this analysis was the *City of Reno Design Manual.* All storm runoff calculations, overland flows, and pipe system flows were designed in accordance with the design criteria as outlined in the above mentioned manual. The Intensity Duration Frequency (IDF) Curve used for the calculations was the Point Precipitation Frequency Estimates from NOAA Atlas 14 (reference Appendix A for a copy of the NOAA information). This IDF curves gives a more accurate rainfall event located at the site rather than using the IDF curve that was established for areas within the City of Reno. Similarly the five (5) and 100 year design events have been modeled in conformance with previous investigations.

Since the base for all design within this development is the *Storm Drainage Master Plan Golden Hills Subdivision / Damonte Foothills, March 2005* prepared by Wood Rodgers, Inc., it was first determined that the final design and drainage patterns of Golden Hills project were in conformance with this investigation. This hydrology and hydraulics report was referenced to determine the extent of offsite flows impacting the site as well as for the sizing of the culverts and channels associated with the Damonte Foothills project.

DEVELOPED SITE HYDROLOGY

For each individual developed basin, areas were determined, runoff coefficients were established and times of concentrations were calculated as outlined in *City of Reno Design Manual.* The runoff coefficients were selected per the City of Reno Design Manual, Chapter 2, Section 3. The time of concentration calculations were performed in accordance with City of Reno Design Manual and the Washoe County Drainage Design and Hydrologic Criteria Manual. The time of concentration and developed flow calculations are located within the modified form 2 located in the Appendix B and C of this report.

The master hydrology report prepared by Wood Rodgers, Inc. indicates that there will not be a need for any on or off site detention areas relevant to this site. If fact the master study indicates an overall reduction in the discharged flows associated with the development of the Golden Hills/Damonte Foothills project. Please reference Appendix F for a copy of the master drainage report.

STORM DRAINAGE SYSTEM

As stated above, the criteria used for the design of the proposed storm drainage system was Chapter 2 of the *City of Reno Design Manual.* The system designed is a standard urbanized system with Type 4R catch basins connected to piped storm sewer systems. These systems have several outfalls which discharge either to the proposed north or central channel. From the point of discharge the developed flows are conveyed to the downstream drainage facilities located to the west of the project.

The proposed storm sewer system has been designed to convey flows in accordance with the master drainage study, Referenced above, and City of Reno requirements. The storm sewer system designed for this project has been sized to convey the 100 year event in entirety. Reference Appendix B and C for the 5 and 100-year storm drainage system analysis.

CULVERTS AND CHANNELS

The Storm Drainage Master Plan by Wood Rodgers, Inc. was used to determine the developed flows carried by the channels and culverts. Please reference Appendix F for a copy of the master drainage report.

This report covers the design analysis of the culverts associated with the Golden Hills portion of the Damonte Foothills project. These culverts were preliminarily sized in the Storm Drainage Master Plan. The design anaysis for the culverts can be found in Appendix E of this report.

This report also includes the design analysis for the channels associated with the Damonte Foohills development and preliminarily modeled in the Storm Drainage Master Plan. The design anaysis for the channels can be found in Appendix D of this report.

CONCLUSIONS

The proposed storm sewer system has capacity for the developed flows from the Golden Hills site in both the minor (5-year) and major (100 year) storm events in accordance with the *City of Reno Design Manual*. Additionally. The final drainage design is in accordance with the referenced Wood Rodgers, Inc. Storm Drainage Master Plan..

All supporting exhibits and calculations are included within the Appendices of this report.

REFERENCES

City of Reno, 2000. City of Reno Design Manual, Chapter II Storm Drainage. March, 2004.

Washoe County, 1996. Washoe County Hydrologic Criteria and Drainage Design Manual. Prepared by WRC Nevada, December 1996.

Wood Rodgers, Inc., 2005. Storm Drainage Master Plan – Golden Hills / Damonte Foothills, March, 2005.

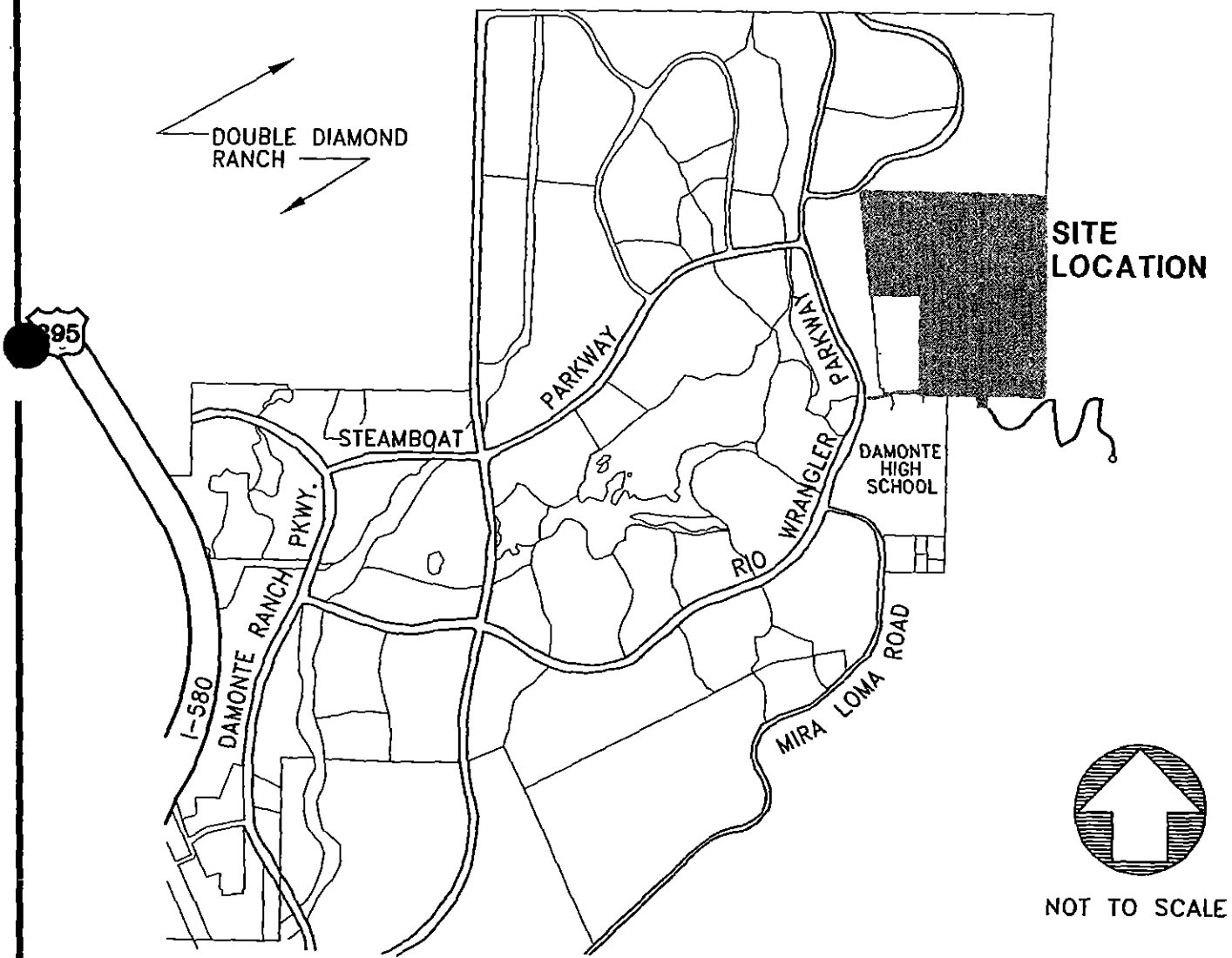
VICINITY MAP

GOLDEN HILLS AT DAMONTE FOOTHILLS

REYNEN AND BARDIS

CITY OF RENO **NEVADA**

JULY 2005



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Reno, NV. 89509 Fax 775.823.4068

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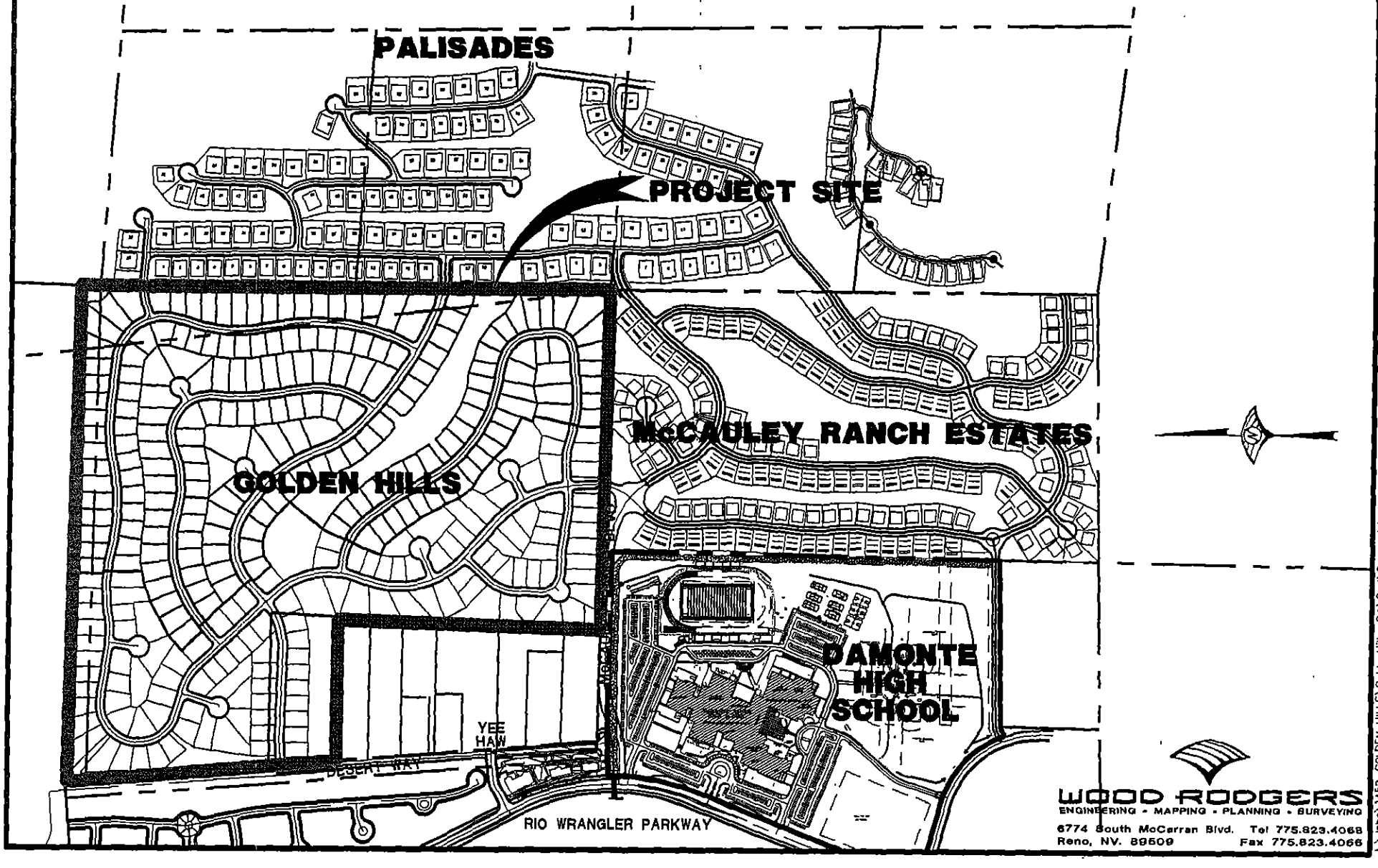
SITE PLAN

GOLDEN HILLS AT DAMONTE FOOTHILLS

JULY 2005



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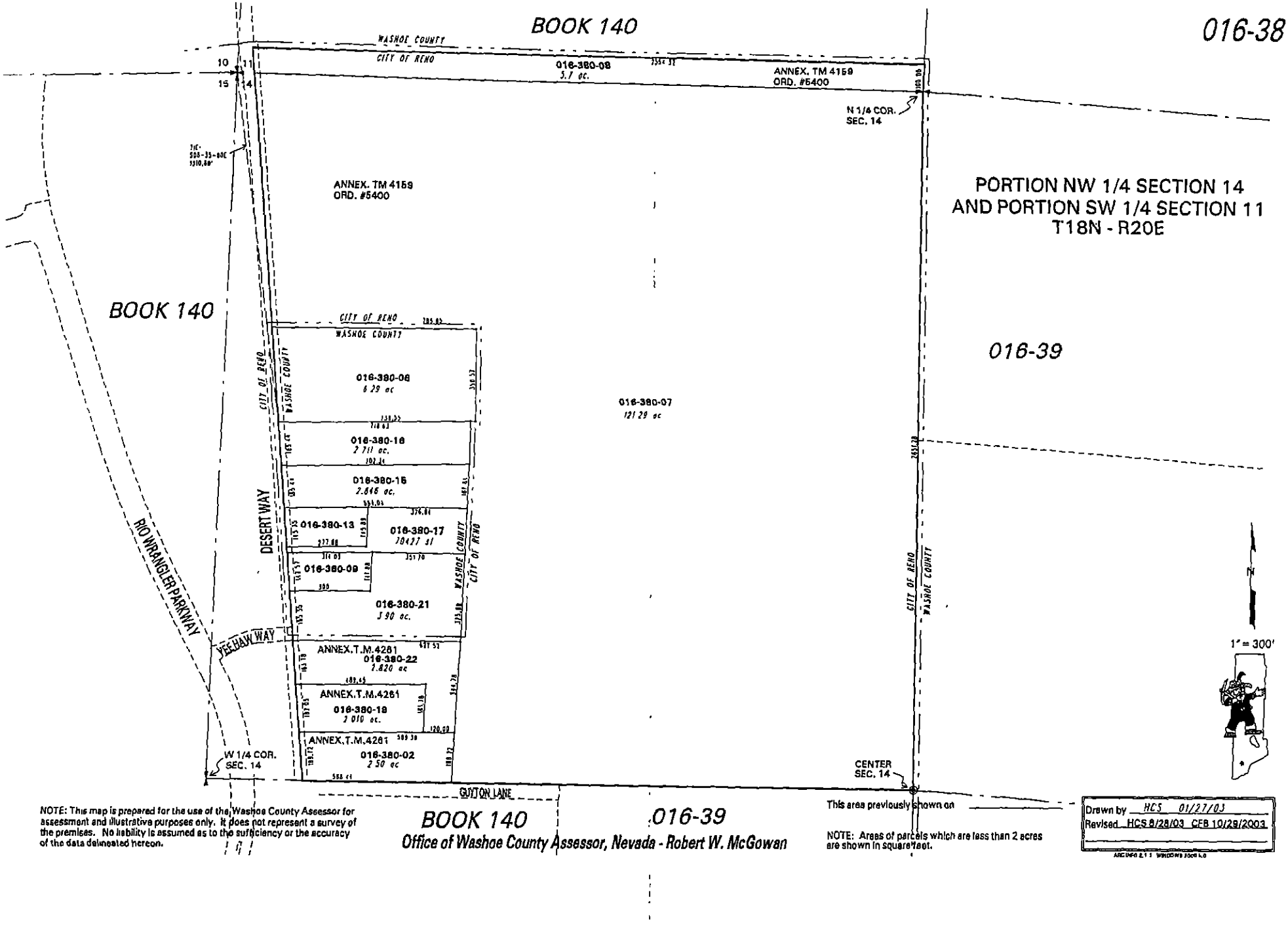

BOOK 140
016-38
WASHOE COUNTY
CITY OF RENO
016-380-08
5.7 ac.
ANNEX. TM 4159
ORD. #5400
N 1/4 COR.
SEC. 14
ANNEX. TM 4159
ORD. #5400
PORTION NW 1/4 SECTION 14
AND PORTION SW 1/4 SECTION 11
T18N - R20E
BOOK 140
016-39
016-380-07
12.29 ac
016-380-06
6.29 ac
016-380-16
2.711 ac.
016-380-15
2.646 ac.
016-380-13
016-380-17
10427 sf
016-380-09
016-380-21
3.90 ac.
ANNEX.T.M.4261
016-380-22
2.620 ac
ANNEX.T.M.4261
016-380-18
2.010 ac.
ANNEX.T.M.4261
016-380-02
2.50 ac
DESERT WAY
RIO WRANGLER PARKWAY
YEEHAW WAY
GUTTON LANE
W 1/4 COR.
SEC. 14
CENTER
SEC. 14
1" = 300'
N
Drawn by HCS 01/27/03
Revised HCS 8/28/03 CEB 10/29/2003
NOTE: This map is prepared for the use of the Washoe County Assessor for assessment and illustrative purposes only. It does not represent a survey of the premises. No liability is assumed as to the sufficiency or the accuracy of the data delineated hereon.
BOOK 140
016-39
Office of Washoe County Assessor, Nevada - Robert W. McGowan
This area previously shown on
NOTE: Areas of parcels which are less than 2 acres are shown in square feet.

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Nevada 39.4408 N 119.7298 W 4566 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 3
G.M. Bonnin, D Todd, B Lin, T Parzybok, M.Yekta, and D Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2003

Extracted: Wed Jun 22 2005

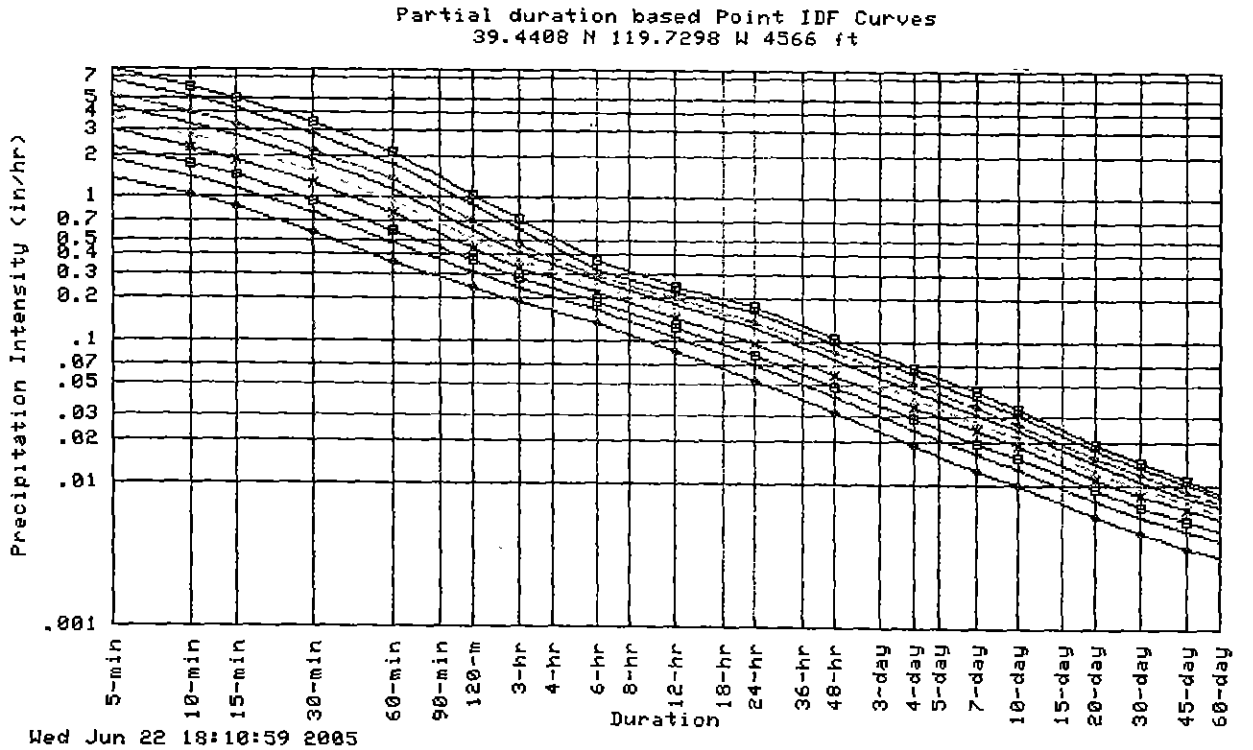
Confidence Limits | Seasonality | Location Maps | Other Info | Grids | Maps | Help | Docs | U.S.

Precipitation Intensity Estimates (in/hr)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.36	1.03	0.86	0.58	0.36	0.24	0.19	0.13	0.09	0.05	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
5	1.85	1.40	1.16	0.78	0.48	0.31	0.24	0.16	0.11	0.07	0.04	0.02	0.02	0.01	0.01	0.01	0.00	0.00
10	2.27	1.72	1.42	0.96	0.59	0.36	0.28	0.19	0.13	0.08	0.05	0.03	0.02	0.02	0.01	0.01	0.01	0.00
25	2.96	2.26	1.86	1.25	0.78	0.45	0.33	0.22	0.15	0.10	0.06	0.04	0.02	0.02	0.01	0.01	0.01	0.01
50	3.59	2.73	2.26	1.52	0.94	0.52	0.37	0.24	0.17	0.11	0.07	0.04	0.03	0.02	0.01	0.01	0.01	0.01
100	4.33	3.29	2.72	1.83	1.13	0.60	0.42	0.27	0.18	0.12	0.08	0.05	0.03	0.02	0.01	0.01	0.01	0.01
200	5.20	3.95	3.27	2.20	1.36	0.69	0.48	0.29	0.20	0.14	0.09	0.05	0.04	0.03	0.02	0.01	0.01	0.01
500	6.61	5.03	4.16	2.80	1.73	0.88	0.60	0.32	0.22	0.16	0.10	0.06	0.04	0.03	0.02	0.01	0.01	0.01
1000	7.92	6.02	4.98	3.35	2.07	1.05	0.71	0.36	0.24	0.18	0.11	0.07	0.05	0.03	0.02	0.01	0.01	0.01

Text version of table

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to the documentation for more information NOTE. Formatting forces estimates near zero to appear as zero.



Confidence Limits -

*** Upper bound of the 90% confidence interval**
Precipitation Intensity Estimates (in/hr)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.61	1.22	1.01	0.68	0.42	0.28	0.21	0.15	0.09	0.06	0.04	0.02	0.01	0.01	0.01	0.01	0.00	0.00
5	2.17	1.65	1.36	0.92	0.57	0.36	0.27	0.18	0.12	0.08	0.05	0.03	0.02	0.01	0.01	0.01	0.01	0.00
10	2.68	2.03	1.68	1.13	0.70	0.42	0.31	0.21	0.14	0.09	0.05	0.03	0.02	0.02	0.01	0.01	0.01	0.01
25	3.54	2.69	2.23	1.50	0.93	0.53	0.37	0.25	0.17	0.11	0.07	0.04	0.03	0.02	0.01	0.01	0.01	0.01
50	4.36	3.31	2.74	1.84	1.14	0.62	0.43	0.28	0.19	0.12	0.08	0.05	0.03	0.02	0.01	0.01	0.01	0.01
100	5.32	4.04	3.34	2.25	1.39	0.74	0.51	0.31	0.21	0.14	0.09	0.05	0.04	0.03	0.02	0.01	0.01	0.01
200	6.55	4.99	4.12	2.77	1.72	0.87	0.60	0.34	0.24	0.16	0.10	0.06	0.04	0.03	0.02	0.01	0.01	0.01
500	8.70	6.62	5.48	3.69	2.28	1.16	0.78	0.42	0.27	0.19	0.11	0.07	0.05	0.04	0.02	0.02	0.01	0.01
1000	10.73	8.16	6.74	4.54	2.81	1.42	0.96	0.51	0.30	0.21	0.13	0.08	0.05	0.04	0.02	0.02	0.01	0.01

* The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than
** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

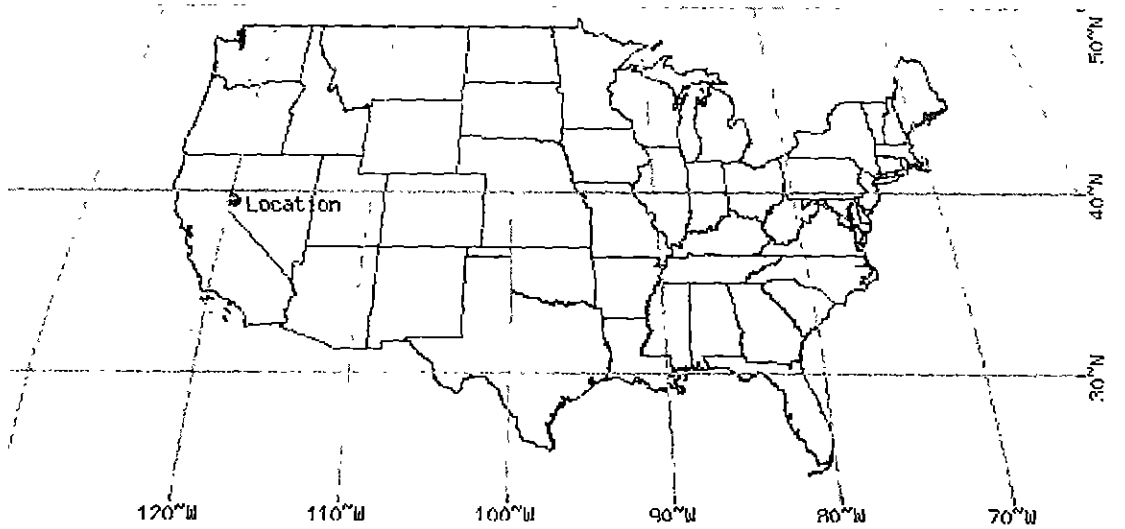
*** Lower bound of the 90% confidence interval**
Precipitation Intensity Estimates (in/hr)

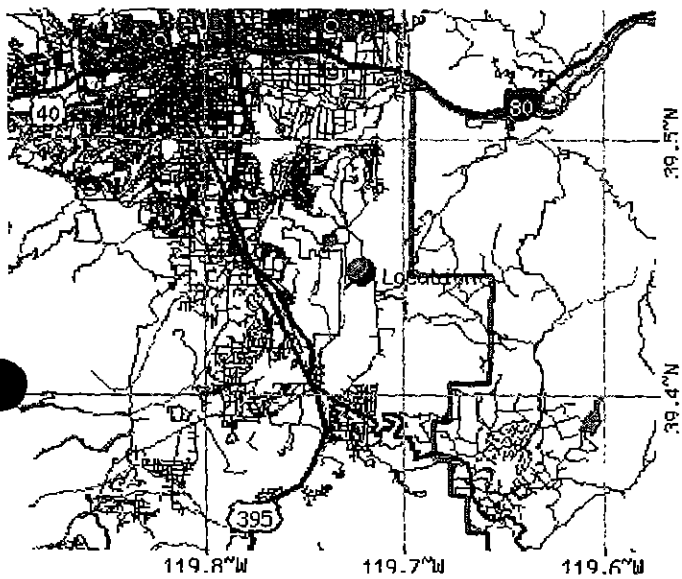
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.18	0.89	0.74	0.50	0.31	0.21	0.17	0.12	0.08	0.05	0.03	0.02	0.01	0.01	0.01	0.00	0.00	0.00
5	1.57	1.20	0.99	0.67	0.41	0.27	0.22	0.15	0.10	0.06	0.04	0.02	0.01	0.01	0.01	0.01	0.00	0.00
10	1.92	1.46	1.20	0.81	0.50	0.32	0.24	0.17	0.11	0.07	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.00
25	2.44	1.85	1.53	1.03	0.64	0.37	0.28	0.19	0.13	0.09	0.05	0.03	0.02	0.02	0.01	0.01	0.01	0.01
50	2.81	2.14	1.77	1.19	0.74	0.42	0.31	0.21	0.14	0.10	0.06	0.04	0.02	0.02	0.01	0.01	0.01	0.01
100	3.28	2.49	2.06	1.39	0.86	0.47	0.35	0.22	0.16	0.11	0.07	0.04	0.03	0.02	0.01	0.01	0.01	0.01
200	3.76	2.86	2.36	1.59	0.98	0.53	0.39	0.24	0.17	0.12	0.07	0.05	0.03	0.02	0.01	0.01	0.01	0.01
500	4.43	3.37	2.78	1.87	1.16	0.63	0.48	0.25	0.18	0.13	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01
1000	5.03	3.83	3.16	2.13	1.32	0.73	0.55	0.29	0.19	0.14	0.09	0.06	0.04	0.03	0.02	0.01	0.01	0.01

* The lower bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.
** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.

Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Maps -





These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server

Please read disclaimer for more information.

LEGEND

State	Connector
County	Stream
Indian Resv	Military Area
Lake/Pond/Ocean	National Park
Street	Other Park
Expressway	City
Highway	County

Scale 1:228583 0 2 4 6 8 10 18 mi / 0 2 4 6 8 10 km

*average--true scale depends on monitor resolution

Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available
from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the USGS for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information
about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study,
please refer to our documentation.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

+/-30 minutes ...OR... +/-1 degree of this location (39.4408/-119.7298). Digital ASCII data can be obtained directly from NCDC.

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the Western Regional Climate Center's state-specific SNOTEL station maps.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

(301) 713-1669
Questions? HDSC.Questions@noaa.gov

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Project: GOLDEN HIGHLANDS

MODIFIED FORM 2

5-YEAR STORM EVENT

Sub-Basin	Initial Overland					Channelized Flow				Tc	Tc Urbanized Basin		Final	Region 2				Check Flow	Check Flow	
Data										(Ti+Tt)	Check	Tc	Tc	INTENSITIES (min)		Final intensity	Q=CIA	STORMCAD	STORMCAD	BYPASS
Basin	R10	Area (ac)	Li (ft)	Slope (%)	Ti (min)	Lt (ft)	Slope (%)	Vel (fps)	Tt (min)	(min)	Total Length	(check)	Min	10	15	(in/hr)	(cfs)	INTERCEPTED Q	BYPASSED Q	TARGET
B1	0 53	3 17	200 00	3.50	9 60	625 00	0.64	1.60	6.51	16.11	825.00	14.58	14 58	1.40	1.16	1.18	1.98	1.31	0.69	CB 1-12
B2	0 53	2 91	142.00	1.65	10 36	717 00	5.00	4 47	2.67	13.04	859 00	14 77	13 04	1 40	1.16	1.25	1.93	2.43	0	
B3	0 53	4 40	151.00	4 90	7.46	800.00	5.00	4.47	2 98	10.44	951.00	15 28	10 44	1 40	1 16	1.38	3.22	3.64	0	
B4	0 53	3.66	166 00	6 10	7.28	736 00	4.70	4.34	2 83	10.11	902.00	15.01	10.11	1 40	1 16	1.39	2.71	2.73	0	
B5	0 53	6 01	165 00	1 94	10 59	799.00	4 09	4 04	3.29	13 88	964.00	15 36	13 88	1.40	1.16	1.21	3.87	3.9	0	
B6	0 53	4 45	124 00	2 10	8 94	577 00	5 10	4 52	2 13	11 07	701.00	13.89	11 07	1.40	1.16	1.35	3.18	3.21	0	
B7	0 53	1 81	216 00	5.50	8 59	179.00	4 03	4 01	0 74	9.33	395.00	12.19	10.00	1 40	1.16	1.40	1.34	1.69	0	
B8	0.53	2 64	134 00	1 98	9.48	825 00	6.78	5 21	2.64	12.12	959.00	15.33	12 12	1.40	1 16	1.30	1.82	1.52	0.31	CB 1-19
B9	0 53	4 88	200 00	6 90	7 67	883 00	6 39	5.06	2.91	10 58	1083 00	16.02	10.58	1 40	1.16	1.37	3.55	2.29	1.29	CB 1-22
B10	0.53	0 35	2 00	2 00	1.15	369.00	0 60	1.55	3.97	5.12	371.00	12.06	10.00	1 40	1.16	1.40	0.26	1.57	0	
B11	0.53	3.23	137 00	1 75	9.98	812 00	5.82	4 82	2 80	12 79	949 00	15 27	12 79	1.40	1.16	1.27	2.17	1.82	0.36	CB 1-15
B12	0 53	3 48	198 00	7 11	7 56	830.00	5 65	4.75	2 91	10.47	1028 00	15.71	10.47	1 40	1 16	1.38	2.54	2.03	0.53	CB 1-14
B13	0 53	0.06	4.00	2 00	1.63	106.00	2.00	2 83	0 62	2 26	110.00	10.61	10 00	1.40	1 16	1.40	0.04	0.86	0	
B14	0 53	0 35	20 00	20 00	1 71	269.00	0 54	1.47	3 05	4.76	289 00	11.61	10 00	1 40	1 16	1.40	0.26	0.74	0	
B15	0 53	2 59	66 00	1 30	7 64	1300 00	3.89	3.94	5 49	13.14	1366.00	17 59	13 14	1 40	1.16	1.25	1.72	1.31	0.43	CB 1-11
B16	0 53	3 14	156 00	9 20	6 16	372 00	5.07	4.50	1 38	7 54	528 00	12 93	10 00	1.40	1 16	1.40	2.33	2.35	0	
B17	0 53	1 45	77 00	1 16	8 57	642.00	7.41	5.44	1 97	10.54	719 00	13 99	10 54	1.40	1 16	1.37	1.06	1.05	0.01	CB 1-10
B18	0 53	0 17	4 00	2 00	1 63	280 00	7 96	5 64	0 83	2.46	284 00	11.58	10 00	1.40	1.16	1.40	0.13	0.13	0	
B19	0 53	3.42	77.00	1 17	8 55	852.00	1.24	2.23	6 38	14 92	929.00	15.16	14 92	1 40	1.16	1.16	2.11	2.48	0	
B20	0 53	4 59	124 00	1 13	10 97	936.00	1 26	2 24	6 95	17 92	1060 00	15 89	15.89	1.40	1.16	1.12	2.72	2.79	0	
B21	0 53	2 99	116 00	1 06	10 84	543 00	1 63	2 55	3 54	14 38	659.00	13 66	13 66	1.40	1.16	1.22	1.94	1.96	0	
B22	0 53	2 90	148 00	1.41	11 14	723 00	2 12	2.91	4.14	15.28	871.00	14.84	14 84	1 40	1.16	1.17	1.79	2.43	0	
B23	0 53	2 87	151.00	1.78	10 42	657.00	2 16	2.94	3 73	14.15	808.00	14.49	14 15	1 40	1.16	1.20	1.83	2.99	0	
B24	0 53	2 01	152 00	2 79	9 02	560 00	2.53	3.18	2 93	11 95	712 00	13.96	11.95	1.40	1.16	1.31	1.39	1.44	0.43	CB 1-08
B25	0.53	3.42	227.00	7 36	8.00	738 00	2 36	3.07	4.00	12.00	965 00	15.36	12 00	1 40	1.16	1.30	2.36	1.68	0.7	CB 1-07
B26	0.53	5 74	225.00	10 75	7 03	917 00	2.67	3 27	4 68	11.71	1142.00	16.34	11.71	1.40	1.16	1.32	4.01	4.04	0	
B27	0 53	2 96	119.00	1 05	11.01	830.00	2 75	3.32	4 17	15.18	949 00	15.27	15.18	1.40	1.16	1.15	1.81	1.41	0.41	CB 2-08
B28	0 53	1.49	62 00	1.10	7.83	728 00	2.25	3.00	4.04	11.87	790.00	14 39	11.87	1 40	1.16	1.31	1.03	1.32	0.4	CB 1-04
B29	0 53	1 40	153.00	1.42	11 30	199.00	1.00	2.00	1.66	12 96	352.00	11.96	11 96	1 40	1.16	1.31	0.97	1.72	0	
B30	0 53	3.72	247.00	2.02	12 79	958 00	2.97	3.45	4 63	17.42	1205.00	16 69	16 69	1 40	1 16	1.08	2.13	1.64	0.58	CB 1-02
B31	0.53	2 80	145 00	1 94	9.93	839.00	3 08	3.51	3.98	13.91	984 00	15.47	13.91	1.40	1.16	1.21	1.80	1.48	0.41	CB 1-01
B32	0 53	0 07	107.00	1.11	10 25	300.00	1.32	2 30	2 18	12.43	407.00	12.26	12.26	1.40	1.16	1.29	0.05	0.75	0.08	CB 2-02
B33	0 53	1.47	192 00	3.10	9 79	307.00	1 32	2.30	2.23	12.01	499 00	12 77	12 01	1 40	1 16	1.30	1.02	2.02	0	
B34	0.53	3.60	255 00	4 60	9.90	891 00	1 98	2 81	5 28	15.18	1146 00	16.37	15 18	1 40	1.16	1.15	2.20	1.5	0.72	CB 1-08
B35	0.53	5 12	110 00	1 00	10.76	2435 00	2 42	10 17	3.99	14.75	2545 00	24.14	14 75	1 40	1.16	1.17	3.18	0	0	to channel
B36	0 53	1 71	76 00	1 17	8.49	780.00	1 21	2.20	5.91	14 40	856 00	14.76	14 40	1.40	1.16	1.19	1.08	1.09	0	
B37	0.53	2 24	147.00	1.00	12.44	581.00	1.20	2.19	4.42	16.86	728.00	14.04	14.04	1.40	1 16	1.21	1.43	1.44	0	
B38	0.53	2 29	107 00	1.07	10.38	620 00	2.30	3.03	3.41	13 79	727 00	14.04	13 79	1.40	1.16	1.22	1.48	1.21	0.28	CB 1-01
B39	0 53	5 16	310.00	8.24	9 01	985.00	2 64	3.25	5.05	14.06	1295 00	17.19	14 06	1 40	1.16	1.21	3.30	2.4	0.92	CB 2-04
B40	0.53	3 51	118.00	1 40	9.97	1030 00	2.64	3.25	5 28	15 26	1148 00	16 38	15.26	1.40	1 16	1.15	2.14	1.47	0.7	CB 2-03
B41	0 53	1.67	726.00	2 04	21 85	147.00	0 50	1.41	1 73	23.58	873.00	14.85	14 85	1 40	1.16	1.17	1.03	2.35	0	
B42	0 53	5.94	687 00	2.04	21.25	350 00	0.50	1.41	4 12	25.38	1037.00	15.76	15 76	1.40	1 16	1.12	3.54	3.36	1.29	CB 1-25
B43	0 53	6.56	647 00	2 04	20 63	350 00	0.50	1 41	4 12	24.75	997.00	15.54	15.54	1 40	1 16	1.13	3.94	2.98	1.04	CB-1-26
B44	0 53	10 55	145 00	1 00	12 35	1950.00	5.64	4 75	6 84	19.20	2095 00	21 64	19.20	1 40	1 16	0.96	5.36	0	0	to channel
B45	0 53	4 33	131 00	1 00	11 74	1050 00	1.14	2 14	8 20	19 94	1181 00	16.56	16.56	1 40	1 16	1.09	2.49	0	0	to channel

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-163	SDMH 2-2	SDMH 2-2(	N/A	2.26	156.00	0.016859	15 inch	0.014	7.79	4,473.60	4,470.97	4,479.70	4,477.07	4,474.20	4,471.68
P-162	SDMH 2-2	SDMH 2-2	N/A	0.13	351.00	0.078205	12 inch	0.014	9.25	4,548.59	4,521.14	4,554.59	4,527.24	4,548.74	4,521.48
P-161	SDMH 2-1	SDMH 2-1	N/A	4.95	119.00	0.021765	18 inch	0.014	14.39	4,492.49	4,489.90	4,498.59	4,496.00	4,493.35	4,490.93
P-160	SDMH 2-1	SDMH 2-1	N/A	4 89	215.00	0.023674	18 inch	0.014	15.01	4,487.44	4,482.35	4,493.54	4,488.45	4,488.29	4,483.37
P-159	SDMH 2-1	SDMH 2-1	N/A	7.43	151.00	0 020000	24 inch	0.014	29.71	4,475.65	4,472.63	4,481.75	4,478.73	4,476.62	4,473 78
P-158	SDMH 2-1	SDMH 2-1	N/A	7.32	162.00	0.016914	24 inch	0.014	27.32	4,469.42	4,466.68	4,475.52	4,472.78	4,470.38	4,467.82
P-156	CB 1-27 A	SDMH 1-3	0.53	2.98	22.00	0.095455	12 inch	0.014	10.22	4,462.18	4,460.08	4,465.18	4,465.30	4,462.92	4,461.16
P-155	SDMH 2-0	BT: 2-03	N/A	5.43	8.00	0.028750	18 inch	0.014	16.54	4,511.21	4,510 98	4,517.31	4,517.22	4,512.11	4,511 93
P-154	BT: 2-03	SDMH 2-0	N/A	6.09	88.00	0.028068	18 inch	0.014	16.34	4,510.98	4,508.51	4,517.22	4,514.61	4,511.93	4,509.67
P-153	BT 1-25	O-10	N/A	12.87	18.00	0.015556	24 inch	0 014	26.20	4,455 76	4,455.48	4,463.07	4,463.31	4,457.05	4,456.55
P-152	SDMH 1-3	BT 1-25	N/A	10.68	145.00	0.016345	24 inch	0 014	26.85	4,458.13	4,455.76	4,463.73	4,463.07	4,459.30	4,457.33
P-151	CB 1-23	BT 1-23	0.53	1.44	61.00	0.067705	12 inch	0.014	8.61	4,460.95	4,456 82	4,463.95	4,460.00	4,461.46	4,457.64
P-150	SDMH 2-0	SDMH 2-0	N/A	6.06	100.00	0.037000	18 inch	0 014	18.76	4,508.51	4,504.81	4,514.61	4,510.91	4,509 46	4,505.96
P-149	BT 1-24	BT 1-23	N/A	1.08	41.00	0.005122	12 inch	0.014	2.37	4,457.03	4,456.82	4,460 00	4,460.00	4,457 68	4,457 64
P-148	SDMH 2-0	SDMH 2-0	N/A	6.01	336 00	0.030030	18 inch	0.014	16.90	4,501.10	4,491.01	4,507 20	4,497 11	4,502.05	4,492.15
P-147	BT 1-23	O-9	N/A	2.47	28.00	0.076429	12 inch	0 014	9.15	4,456.82	4,454 68	4,460.00	4,460.26	4,457.49	4,455 04
P-146	SDMH 2-0	BT:CB 2-0	N/A	5.88	185.00	0.025081	24 inch	0.014	33.27	4,488.10	4,483 46	4,494.20	4,489.46	4,488 96	4,484.59
P-145	SDMH 2-0	SDMH 2-0	N/A	8.73	153.00	0.028758	24 inch	0.014	35.62	4,482.59	4,478.19	4,488.69	4,484.29	4,483.64	4,479 45
P-144	SDMH 1-3	SDMH 1-3	N/A	7.48	350 00	0.005000	24 inch	0.014	14.85	4,459.98	4,458.23	4,465.30	4,463.73	4,460.98	4,459 54
P-143	SDMH 1-3	SDMH 1-3	N/A	4.50	350.00	0.005000	18 inch	0.014	6.90	4,461.83	4,460 08	4,466.88	4,465.30	4,462.71	4,461.16
P-142	I-43	SDMH 1-3	0.00	4.50	116.00	0.027328	12 inch	0.010	7.66	4,465.00	4,461.83	4,468.00	4,466.88	4,465.89	4,462.85
P-140	BT 2-04	SDMH 2-0	N/A	5.45	55.00	0.018000	15 inch	0.014	8.05	4,512.20	4,511.21	4,518.20	4,517.31	4,513.15	4,512.30
P-139	SDMH 2-0	BT 2-04	N/A	3.71	54.00	0.009444	15 inch	0.014	5.83	4,512.71	4,512.20	4,518.81	4,518.20	4,513.49	4,513.38
P-138	SDMH 2-1	SDMH 2-0	N/A	3.76	210.00	0.013762	15 inch	0.014	7.04	4,515.60	4,512.71	4,521.60	4,518.81	4,516.38	4,513.36
P-135	BT:CB 1-3	SDMH 1-2	N/A	9.54	144.00	0.018681	24 inch	0.014	28.71	4,469.06	4,466.37	4,475.00	4,472.37	4,470.16	4,467.59
P-134	SDMH 1-2	BT:CB 1-3	N/A	8.55	121.00	0.017190	24 inch	0.014	27.54	4,471.14	4,469.06	4,477.24	4,475.00	4,472.18	4,470.16
P-133	SDMH 1-0	SDMH 1-0	N/A	17.72	79.00	0.006835	36 inch	0.014	51.20	4,454.38	4,453.84	4,462.48	4,462.08	4,456.28	4,456.29
P-132	CB 1-05 A	SDMH 1-0	0.53	2.79	21.00	0.071429	12 inch	0.014	8.84	4,459.24	4,457.74	4,462.24	4,462.08	4,459.96	4,458.15
P-131	SDMH 1-2	SDMH 1-1	N/A	6.69	240.00	0.007500	30 inch	0.014	32.98	4,474.28	4,472.48	4,480.83	4,485.33	4,475.14	4,473.80
P-130	BT:CB 1-1	SDMH 1-1	N/A	17.07	52.00	0.004038	36 inch	0.014	39.36	4,468.30	4,468.09	4,475.69	4,475.29	4,471.02	4,471.00
P-129	SDMH 2-1	BT:CB 1-0	N/A	7.26	152.00	0.022763	24 inch	0.014	31.69	4,466.68	4,463.22	4,472.78	4,469.00	4,467.64	4,464.97
P-127	BT:CB 1-0	SDMH 1-2	N/A	11.89	267.00	0.040974	24 inch	0.014	42.52	4,465.35	4,454.41	4,471.84	4,466.78	4,466.59	4,455.73
P-125	BT 1-06	SDMH 1-0	N/A	17.88	155.00	0.007935	36 inch	0 014	55.17	4,455.71	4,454.48	4,464.00	4,462.48	4,457.06	4,456.39
P-124	SDMH 1-0	SDMH 1-0	N/A	21.97	60.00	0.002000	36 inch	0.014	27.70	4,453.00	4,452.88	4,464.02	4,464.54	4,455.67	4,455.61
P-123	SDMH 1-0	O-5	N/A	33.13	391.00	0.001995	48 inch	0.014	59.57	4,452.78	4,452.00	4,464.54	4,456.00	4,455.50	4,455.27

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-118	SDMH 2-06	SDMH 2-05	N/A	6.04	100.00	0.035300	18 inch	0.014	18.33	4,504.81	4,501.28	4,510.91	4,507.20	4,505.76	4,502.25
P-115	SDMH 2-04	SDMH 2-03	N/A	5.93	144.00	0.018194	18 inch	0.014	13.16	4,491.01	4,488.39	4,497.11	4,494.20	4,491.95	4,489.10
P-111	BT:CB 2-02	SDMH 2-02	N/A	7.15	29.00	0.030000	24 inch	0.014	36.38	4,483.46	4,482.59	4,489.46	4,488.69	4,484.41	4,483.85
P-107	SDMH 2-01	SDMH 1-29	N/A	8.67	313.00	0.022204	24 inch	0.014	31.30	4,478 19	4,471.24	4,484.29	4,477.24	4,479.24	4,472.39
P-103	SDMH 1-28	BT:CB 1-02	N/A	9.47	6.00	0.044333	24 inch	0.014	44.23	4,466.27	4,466.00	4,472.37	4,472.14	4,467.37	4,467 41
P-102	BT:CB 1-02	BT:CB 1-01	N/A	10.52	16 00	0.040875	24 inch	0.014	42 47	4,466 00	4,465.35	4,472.14	4,471.84	4,467.17	4,466 85
P-99	SDMH 1-27	SDMH 1-26	N/A	11.78	142.00	0.001972	36 inch	0.014	27 50	4,453.41	4,453.13	4,466.78	4,465.25	4,455.70	4,455.65
P-98	SDMH 1-26	SDMH 1-01	N/A	11.59	77.00	0.001948	36 inch	0 014	27.33	4,453.03	4,452.88	4,465.25	4,464 54	4,455 63	4,455.61
P-95	SDMH 1-03	SDMH 1-02	N/A	22.13	76.00	0.001974	36 inch	0.014	27 51	4,453 25	4,453.10	4,463.33	4,464.02	4,455.83	4,455.75
P-94	SDMH 1-04	SDMH 1-03	N/A	22 26	65.00	0.002000	36 inch	0.014	27 70	4,453.48	4,453 35	4,462.74	4,463.33	4,456 00	4,455 92
P-93	SDMH 1-05	SDMH 1-04	N/A	22.42	78.00	0.002051	36 inch	0.014	28 05	4,453.74	4,453.58	4,462.08	4,462.74	4,456 18	4,456.09
P-83	SDMH 2-18	SDMH 2-17	N/A	4.92	108.00	0 022778	18 inch	0 014	14.72	4,489 90	4,487.44	4,496 00	4,493 54	4,490.75	4,488 46
P-78	SDMH 2-16	SDMH 2-15	N/A	4.84	128.00	0.022500	18 inch	0.014	14.63	4,482.35	4,479.47	4,488.45	4,485.35	4,483.20	4,480 06
P-77	SDMH 2-15	BT:CB 2-07	N/A	4 81	52 00	0 024808	24 inch	0.014	33 08	4,479.35	4,478.06	4,485.35	4,484.06	4,480.12	4,479.11
P-76	BT:CB 2-01	BT:CB 2-08	N/A	6.24	13.00	0.023077	24 inch	0.014	31.91	4,478.06	4,477.76	4,484.06	4,483.76	4,478 94	4,478 92
P-75	BT:CB 2-08	SDMH 2-14	N/A	7 46	95.00	0.022211	24 inch	0.014	31.30	4,477.76	4,475.65	4,483.76	4,481 75	4,478.73	4,476.81
P-72	SDMH 2-13	SDMH 2-12	N/A	7 38	160.00	0.020063	24 inch	0.014	29.75	4,472 63	4,469.42	4,478.73	4,475.52	4,473.60	4,470.57
P-67	BT:CB 1-06	SDMH 1-09	N/A	12.14	34.00	0.000588	24 inch	0.014	5.09	4,463.22	4,463.20	4,469.00	4,468.80	4,464.82	4,464.45
P-66	SDMH 1-10	BT:CB 1-08	N/A	3.39	33.00	0.010909	18 inch	0.014	10.19	4,467.15	4,466.79	4,473.25	4,473.00	4,467.85	4,467.79
P-65	BT:CB 1-08	SDMH 1-09	N/A	4.65	284.00	0.010880	18 inch	0.014	10.17	4,466.79	4,463.70	4,473.00	4,468.80	4,467.62	4,464.41
P-64	SDMH 1-09	SDMH 1-08	N/A	16 43	189.00	0.029947	30 inch	0 014	65.91	4,462.70	4,457.04	4,468.80	4,466 14	4,464.07	4,457.89
P-63	SDMH 1-08	SDMH 1-07	N/A	16.32	63.00	0.003651	36 inch	0.014	37 42	4,456.54	4,456.31	4,466.14	4,465.31	4,457.93	4,457.74
P-62	SDMH 1-07	BT 1-06	N/A	16.24	54.00	0.009259	36 inch	0.014	59.59	4,456.21	4,455.71	4,465.31	4,464.00	4,457.50	4,457.32
P-49	SDMH 2-24	BT 2-10	N/A	0.12	27.00	0.008519	12 inch	0.014	3.05	4,521.14	4,520.91	4,527.24	4,526.00	4,521 48	4,521.48
P-48	BT 2-10	O-3	N/A	1.13	202.00	0.004505	12 inch	0.014	2.22	4,520.91	4,520.00	4,526.00	4,522.00	4,521.41	4,520.45
P-45	SDMH 2-23	SDMH 2-22	N/A	2.34	186.00	0.025161	15 inch	0.014	9.51	4,480.95	4,476.27	4,487.05	4,482.15	4,481.56	4,476.69
P-44	SDMH 2-22	SDMH 2-21	N/A	2.30	144.00	0.011528	15 inch	0.014	6.44	4,476.05	4,474.39	4,482.15	4,479.70	4,476.66	4,474.91
P-41	SDMH 2-20	BT:CB 1-09	N/A	2.22	160.00	0.016750	15 inch	0.014	7.76	4,470.97	4,468.29	4,477 07	4,474.29	4,471.57	4,469.19
P-40	BT:CB 1-09	SDMH 1-10	N/A	3.40	38.00	0.027368	15 inch	0.014	9.92	4,468.29	4,467.25	4,474.29	4,473.25	4,469.03	4,467.76
P-38	SDMH 1-11	BT:CB 1-11	N/A	0.74	29.00	0.010690	12 inch	0.014	3.42	4,467 91	4,467.60	4,474.01	4,473 00	4,470.82	4,470.81
P-37	BT:CB 1-11	O-1	N/A	1.57	42.00	0.011905	12 inch	0.014	3.61	4,467.60	4,467.10	4,473.00	4,475 00	4,470.77	4,470.68
P-27	SDMH 2-26	SDMH 2-27	N/A	3.68	142.00	0.012676	18 inch	0.014	10.98	4,516.68	4,514.88	4,521.68	4,520.00	4,517.41	4,515 75
P-26	SDMH 2-27	O-4	N/A	3.62	111.00	0.007928	18 inch	0.014	8.68	4,514.88	4,514.00	4,520.00	4,516.00	4,515.61	4,514.68
P-22	SDMH 1-25	SDMH 1-24	N/A	5.14	100.00	0.023200	18 inch	0.014	14.86	4,507.76	4,505.44	4,513.76	4,511.34	4,508.63	4,506.39
P-21	SDMH 1-24	BT:CB 1-18	N/A	5.10	113.00	0.047257	18 inch	0.014	21.20	4,505.34	4,500.00	4,511.34	4,505.74	4,506.21	4,501 21

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-20	BT:CB 1-1[illegible]	SDMH 1-23	N/A	6.60	40.00	0.040250	18 inch	0.014	19.57	4,500.00	4,498.39	4,505.74	4,504.28	4,500.99	4,499.39
P-19	SDMH 1-23	SDMH 1-22	N/A	6.58	153.00	0.045621	18 inch	0.014	20.83	4,498.18	4,491 20	4,504.28	4,497.09	4,499.17	4,492.19
P-18	SDMH 1-22	SDMH 1-19	N/A	6.52	246.00	0.071585	18 inch	0.014	26.10	4,490.99	4,473.38	4,497.09	4,485.33	4,491.98	4,473.89
P-15	SDMH 1-21	SDMH 1-20	N/A	6.74	56.00	0.004828	30 inch	0.014	26 46	4,474.66	4,474.38	4,479.72	4,480.83	4,475.52	4,475.29
P-12	SDMH 1-19	SDMH 1-18	N/A	12.48	87.00	0.005057	30 inch	0 014	27.08	4,472 38	4,471.94	4,485.33	4,481.52	4,473.57	4,473.28
P-11	SDMH 1-18	BT:CB 1-15	N/A	12.41	71 00	0.005070	30 inch	0.014	27.12	4,471.84	4,471.48	4,481.52	4,479.48	4,473.08	4,473.03
P-10	BT:CB 1-15	SDMH 1-17	N/A	14.59	28.00	0.005000	30 inch	0.014	26.93	4,471.48	4,471.34	4,479 48	4,478.90	4,472.79	4,472.68
P-9	SDMH 1-17	SDMH 1-16	N/A	14.57	112.00	0.005893	36 inch	0.014	47.54	4,471.24	4,470.58	4,478.90	4,478.09	4,472 46	4,472.02
P-8	SDMH 1-16	SDMH 1-15	N/A	14.47	132.00	0.005000	36 inch	0.014	43.79	4,470.58	4,469.92	4,478.09	4,477.22	4,471 79	4,471 25
P-7	SDMH 1-15	SDMH 1-14	N/A	14.34	102.00	0.009314	36 inch	0.014	59.77	4,469.82	4,468.87	4,477.22	4,476.48	4,471.03	4,471.16
P-6	SDMH 1-14	BT:CB 1-14	N/A	14.26	118.00	0.003983	36 inch	0.014	39.09	4,468.77	4,468.30	4,476.48	4,475.69	4,471.11	4,471.07
P-3	SDMH 1-13	BT:CB 1-12	N/A	19.15	97.00	0.003505	36 inch	0.014	36.67	4,467.99	4,467.65	4,475.29	4,474.84	4,470.94	4,470.85
P-2	BT:CB 1-12	SDMH 1-12	N/A	20.24	43.00	0.003953	36 inch	0.014	38.94	4,467.65	4,467.48	4,474.84	4,474.63	4,470.79	4,470.74
P-1	SDMH 1-12	O-2	N/A	20.12	58.00	0.005690	42 inch	0.014	70.47	4,467.33	4,467.00	4,474.63	4,475.00	4,470.70	4,470.68
LAT:I-35	DITCH 2-1	O-8	0.00	0.00	57.00	0.020000	12 inch	0.014	4.68	4,530 00	4,528.86	4,533.00	4,531.86	4,530.00	4,528.86
LAT:CB 2-15	CB 2-15 A-	SDMH 2-26	0.53	1.82	35.00	0.100000	12 inch	0.014	10.46	4,520.28	4,516.78	4,523.28	4,521.68	4,520.85	4,517.56
LAT:CB 2-14	CB 2-14 A-	SDMH 2-26	0.53	2.03	26.00	0.145385	12 inch	0.014	12.61	4,520.56	4,516.78	4,523.56	4,521.68	4,521.17	4,517.56
LAT:CB 2-13	CB 2-13	SDMH 2-25	0.53	0.13	40.00	0.065750	12 inch	0.014	8.48	4,551.22	4,548.59	4,554.22	4,554.59	4,551.37	4,548.76
LAT:CB 2-12	CB 2-12	BT 2-10	0.53	1.05	25.00	0.161200	12 inch	0.014	13.28	4,525.94	4,521.91	4,528.94	4,526 00	4,526.37	4,522.10
LAT:CB 2-10	CB 2-10 A-	SDMH 2-19	0.53	4.04	31.00	0.135484	12 inch	0.014	12.18	4,496.69	4,492.49	4,499.69	4,498.59	4,497 54	4,493.52
LAT:CB 2-09	CB 2-09	SDMH 2-19	0.53	1.41	49.00	0.088367	12 inch	0.014	9.83	4,496.82	4,492 49	4,499.82	4,498.59	4,497.32	4,493.52
LAT:CB 2-08	CB 2-08 A-	BT:CB 2-08	0.53	1.44	24.00	0.112917	12 inch	0.014	11.12	4,480.97	4,478.26	4,483.97	4,483.76	4,481.48	4,478.92
LAT:CB 2-07	CB 2-07 A-	BT:CB 2-07	0.53	1.68	7.00	0.384286	12 inch	0.014	20.51	4,481.25	4,478.56	4,484.25	4,484.06	4,481.80	4,479.11
LAT:CB 1-21	CB 1-22 A-	SDMH 1-25	0.53	1.57	57.00	0.063684	12 inch	0.014	8.35	4,511.49	4,507.86	4,514.49	4,513 76	4,512 02	4,508.81
LAT:CB 1-20	CB 1-21 A-	SDMH 1-25	0.53	2.29	40.00	0.096000	12 inch	0.014	10.25	4,511.70	4,507.86	4,514.70	4,513.76	4,512.35	4,508.81
LAT:CB 1-19	CB 1-20	SDMH 1-25	0.53	1.52	33.00	0.123030	12 inch	0.014	11.60	4,511.92	4,507.86	4,514.92	4,513.76	4,512.44	4,508.81
LAT:CB 1-18	CB 1-19 A-	BT:CB 1-18	0.53	1.69	36.00	0.086111	12 inch	0.014	9.71	4,503.60	4,500.50	4,506.60	4,505.74	4,504.15	4,501.21
LAT:CB 1-17	CB 1-18 A-	SDMH 1-21	0.53	3.21	50.00	0.024200	15 inch	0.014	9.33	4,476.62	4,475.41	4,479.62	4,479.72	4,477.34	4,475.92
LAT:CB 1-16	CB 1-17 A-	SDMH 1-21	0.53	3.90	58.00	0.020862	15 inch	0.014	8.66	4,476.62	4,475.41	4,479.62	4,479.72	4,477.42	4,476.00
LAT:CB 1-15	CB 1-16	BT:CB 1-15	0.53	2.73	5.00	0.732000	12 inch	0.014	28.30	4,476.64	4,472.98	4,479.64	4,479.48	4,477.35	4,473.25
LAT:CB 1-14	CB 1-15 A-	BT:CB 1-14	0.53	3.64	7.00	0.397143	12 inch	0.014	20.85	4,472.97	4,470.19	4,475.97	4,475.69	4,473.78	4,471.07
LAT:CB 1-13	CB 1-14	SDMH 1-13	0.53	2.43	26.00	0.135000	12 inch	0.014	12 15	4,473.50	4,469.99	4,476.50	4,475.29	4,474.17	4,471.00
LAT:CB 1-12	CB 1-13	BT:CB 1-12	0.53	1.31	27.00	0.128148	12 inch	0.014	11.84	4,472.06	4,468.60	4,475.06	4,474.84	4,472.54	4,470.85
LAT.CB 1-11	CB 1-12	BT:CB 1-11	0.53	0.86	12.00	0.140000	12 inch	0.014	12 38	4,471.12	4,469.44	4,474.12	4,473.00	4,471.51	4,470.81
LAT:CB 1-10	CB 1-11	SDMH 1-11	0.53	0.74	12 00	0.100833	12 inch	0.014	10.50	4,471.12	4,469.91	4,474.12	4,474.01	4,471.48	4,470.83

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
LAT:CB 1-09	CB 1-10	BT:CB 1-09	0.53	1.31	34.00	0.055882	12 inch	0.014	7.82	4,471.19	4,469.29	4,474.19	4,474 29	4,471.67	4,469 57
LAT:CB 1-08	CB 1-09 A-	BT:CB 1-08	0.53	1.50	7.00	0.134286	12 inch	0.014	12.12	4,470.00	4,469.06	4,473.00	4,473.00	4,470.52	4,469.34
LAT:CB 1-06	CB 1-07 A-	BT:CB 1-06	0.53	2.43	7.00	0.341429	12 inch	0.014	19.33	4,466.11	4,463.72	4,469.11	4,469.00	4,466.78	4,464.97
LAT:CB 1-05	CB 1-06	BT 1-06	0.53	1.96	54.00	0.090741	12 inch	0.014	9.97	4,461.61	4,456.71	4,464.61	4,464.00	4,462.21	4,457.32
LAT:CB 1-02	CB 1-02 A-	BT:CB 1-02	0.53	1.32	6.00	0.435000	12 inch	0.014	21.82	4,469 11	4,466.50	4,472.11	4,472.14	4,469.60	4,467 41
LAT: CB 2-11	CB 2-11 A-	SDMH 2-23	0.53	2.35	53.00	0.085094	12 inch	0.014	9.65	4,485.46	4,480.95	4,488.46	4,487.05	4,486.12	4,481.68
LAT: CB 1-08	CB 1-08 A-	BT:CB 1-06	0.53	2.99	26.00	0.106538	12 inch	0.010	15.12	4,466.49	4,463.72	4,469.49	4,469.00	4,467 23	4,464.97
LAT: CB 1-03	CB 1-04 A-	SDMH 1-05	0.53	2.48	34.00	0.073529	12 inch	0.010	12.56	4,459.24	4,456.74	4,462.35	4,462.08	4,459.91	4,457.06
LAT. 2-06	CB 2-06 A-	SDMH 2-10	0.53	2.40	45.00	0.085333	12 inch	0.014	9.66	4,519.48	4,515.64	4,522.48	4,521.60	4,520 14	4,516.55
LAT: 2-05	CB 2-05	SDMH 2-10	0.53	1.47	27.00	0.117778	12 inch	0.014	11.35	4,518.82	4,515.64	4,521.82	4,521.60	4,519.33	4,516.55
LAT: 2-03	CB 2-03 A-	BT: 2-03	0.53	0.75	32.00	0.115000	12 inch	0.010	15.71	4,514.66	4,510.98	4,517.66	4,517.22	4,515.02	4,511.93
LAT: 1-25	CB 1-25	BT 1-25	0 53	2.35	23.00	0.182174	12 inch	0.014	14.12	4,459.95	4,455.76	4,462.95	4,463.07	4,460.61	4,457.33
LAT 2-04	CB 2-04 A-	BT 2-04	0.53	2.02	7.00	0.458571	12 inch	0.014	22.40	4,515.41	4,512.20	4,518.41	4,518.20	4,516.02	4,513.38
LAT 2-02	CB 2-02 A-	BT:CB 2-02	0.53	1.48	26.00	0.087308	12 inch	0.014	9.77	4,486.73	4,484.46	4,489.73	4,489.46	4,487.25	4,484.72
LAT 2-01	CB 2-01 A-	SDMH 2-02	0.53	1.64	10.00	0.233000	12 inch	0.014	15.97	4,485.92	4,483.59	4,488.92	4,488.69	4,486.46	4,483.83
LAT 1-3	CB 1-03	BT:CB 1-3	0.53	1.21	24.00	0.117083	12 inch	0.010	15.85	4,472.37	4,469.56	4,475.37	4,475.00	4,472.83	4,470.16
LAT 1-26	CB 1-26 A-	SDMH 1-30	0.53	3.36	22.00	0.108182	12 inch	0.010	15.23	4,460.61	4,458.23	4,463.61	4,463 73	4,461.39	4,459.54
LAT 1-24	CB 1-24	BT 1-24	0.53	1.09	54.00	0.072593	12 inch	0.014	8.91	4,460.95	4,457.03	4,463.95	4,460.00	4,461.39	4,457.71
LAT 1-01	CB 1-01 A-	BT:CB 1-01	0.53	1.72	54.00	0.053889	12 inch	0.014	7.68	4,468.80	4,465.89	4,471.80	4,471.84	4,469.36	4,466.85

Inlet Report

Label	Calculated Station (ft)	Ground Elevation (ft)	Rim Elevation (ft)	Sump Elevation (ft)	Area (acres)	Inlet C	Inlet CA (acres)	Total Flow To Inlet (cfs)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target	Time of Concentration (min)	Inlet Location	Known Flow (cfs)	Inlet
CB 1-01 A-E	9+31	4,471.80	4,471.80	4,468.80	1.40	0.53	0.74	1.72	1.72	0.00		11.96	In Sag	0.00	Combination DUAL
CB 1-02 A-E	8+99	4,472.11	4,472.11	4,469.11	1.49	0.53	0.79	1.72	1.32	0.40	CB 1-04 A-	11.87	On Grad	0.00	Combination DUAL
CB 1-03	10+67	4,475.37	4,475.37	4,472.37	2.29	0.53	1.21	1.49	1 21	0.28	CB 1-01 A-	13.79	On Grad	0.00	Combination 4R
CB 1-04 A-E	7+04	4,462.35	4,462.35	4,459.24	3.42	0.53	1.81	2.48	2.48	0.00		14.92	In Sag	0.00	Combination DUAL
CB 1-05 A-E	6+91	4,462.24	4,462.24	4,459.24	4.59	0.53	2.43	2.79	2.79	0.00		15.89	In Sag	0.00	Combination DUAL
CB 1-06	9+58	4,464.61	4,464.61	4,461.61	2.99	0.53	1.58	1.96	1.96	0.00		13.66	In Sag	0.00	Combination 4R
CB 1-07 A-E	12+51	4,469.11	4,469.11	4,466.11	2.90	0.53	1.54	2.43	2.43	0.00		14.84	In Sag	0.00	Combination DUAL
CB 1-08 A-E	12+70	4,469.49	4,469.49	4,466.49	2.87	0.53	1.52	2.99	2.99	0.00		14.15	In Sag	0.00	Combination DUAL
CB 1-09 A-E	15+01	4,473.00	4,473.00	4,470.00	3.60	0.53	1.91	2.22	1.50	0.72	CB 1-08 A-	15.18	On Grad	0.00	Combination DUAL
CB 1-10	15+99	4,474.19	4,474.19	4,471.19	2.59	0.53	1.37	1.74	1.31	0.43	CB 1-11	13.14	On Grad	0.00	Combination 4R
CB 1-11	0+83	4,474.12	4,474.12	4,471.12	0.35	0.53	0.19	0.74	0.74	0.00		10.00	In Sag	0.00	Combination 4R
CB 1-12	0+54	4,474.12	4,474.12	4,471.12	0.06	0.53	0.03	0.86	0.86	0.00		10.00	In Sag	0.00	Combination 4R
CB 1-13	1+28	4,475.06	4,475.06	4,472.06	3.17	0.53	1.68	2.00	1.31	0.69	CB 1-12	14.58	On Grad	0.00	Combination 4R
CB 1-14	2+24	4,476.50	4,476.50	4,473.50	2.91	0.53	1 54	2.43	2.43	0.00		13.04	In Sag	0.00	Combination 4R
CB 1-15 A-E	2+57	4,475.97	4,475.97	4,472.97	4.40	0.53	2.33	3.64	3.64	0.00		10.44	In Sag	0.00	Combination DUAL
CB 1-16	7+47	4,479.64	4,479.64	4,476.64	3.66	0.53	1.94	2.73	2.73	0.00		10.11	In Sag	0.00	Combination 4R
CB 1-17 A-E	12+56	4,479.62	4,479.62	4,476.62	6.01	0.53	3.19	3.90	3.90	0.00		13.88	In Sag	0.00	Combination DUAL
CB 1-18 A-E	12+48	4,479.62	4,479.62	4,476.62	4.45	0.53	2.36	3.21	3.21	0.00		11.07	In Sag	0.00	Combination DUAL
CB 1-19 A-E	13+75	4,506.60	4,506.60	4,503.60	1.81	0.53	0.96	1.69	1.69	0.00		10 00	In Sag	0.00	Combination DUAL
CB 1-20	15+85	4,514.92	4,514.92	4,511.92	2.64	0.53	1.40	1.83	1.52	0.31	CB 1-19 A-	12.12	On Grad	0 00	Combination 4R
CB 1-21 A-E	15+92	4,514.70	4,514.70	4,511.70	4.88	0.53	2.59	3.58	2.29	1.29	CB 1-22 A-	10.58	On Grad	0.00	Combination DUAL
CB 1-22 A-E	16+09	4,514.49	4,514.49	4,511.49	0.35	0.53	0.19	1.57	1.57	0.00		10.00	In Sag	0.00	Combination DUAL
CB 1-23	0+89	4,463.95	4,463 95	4,460.95	2.24	0.53	1 19	1.44	1.44	0.00		14.04	In Sag	0.00	Combination 4R
CB 1-24	1+23	4,463.95	4,463.95	4,460.95	1.71	0.53	0.91	1 09	1.09	0.00		14.40	In Sag	0.00	Combination 4R
CB 1-25	0+41	4,462.95	4,462.95	4,459.95	1.65	0.53	0.87	2.35	2.35	0.00		14.85	In Sag	0.00	Combination DUAL
CB 1-26 A-E	1+85	4,463.61	4,463.61	4,460.61	5.94	0.53	3.15	4.65	3.36	1.29	CB 1-25	15.76	On Grad	0.00	Combination DUAL
CB 1-27 A-E	5+35	4,465.18	4,465.18	4,462.18	6.56	0.53	3 48	4 02	2.98	1.04	CB 1-26 A-	15.54	On Grad	0.00	Combination DUAL
CB 2-01 A-E	16+40	4,488.92	4,488.92	4,485.92	3.72	0.53	1.97	2.22	1.64	0.58	CB 1-02 A-	16.69	On Grad	0.00	Combination DUAL
CB 2-02 A-E	16+85	4,489.73	4,489.73	4,486.73	2.80	0.53	1.48	1.89	1.48	0.41	CB 1-01 A-	13.91	On Grad	0.00	Combination DUAL
CB 2-03 A-E	26+44	4,517.66	4,517.66	4,514 66	0.07	0 53	0 04	0.83	0 75	0.08	CB 2-02 A-	12.26	On Grad	0 00	Combination DUAL
CB 2-04 A-E	26+82	4,518.41	4,518.41	4,515.41	1.47	0.53	0.78	2.02	2.02	0.00		12.01	In Sag	0.00	Combination DUAL
CB 2-05	29+66	4,521.82	4,521.82	4,518.82	3.51	0.53	1.86	2.16	1.47	0.70	CB 2-03 A-	15.26	On Grad	0.00	Combination Type4
CB 2-06 A-E	29+84	4,522.48	4,522.48	4,519.48	5.16	0.53	2.73	3.32	2.40	0.92	CB 2-04 A-	14.06	On Grad	0.00	Combination DUAL
CB 2-07 A-E	19+84	4,484.25	4,484.25	4,481.25	3.42	0.53	1.81	2.38	1.68	0.70	CB 1-07 A-	12.00	On Grad	0.00	Combination DUAL
CB 2-08 A-E	19+88	4,483.97	4,483.97	4,480.97	2.01	0.53	1.07	1.87	1.44	0.43	CB 1-08 A-	11.95	On Grad	0.00	Combination DUAL

Inlet Report

Label	Calculated Station (ft)	Ground Elevation (ft)	Rim Elevation (ft)	Sump Elevation (ft)	Area (acres)	Inlet C	Inlet CA (acres)	Total Flow To Inlet (cfs)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target	Time of Concentration (min)	Inlet Location	Known Flow (cfs)	Inlet
CB 2-09	26+48	4,499.82	4,499.82	4,496 82	2.96	0.53	1.57	1.83	1 41	0.41	CB 2-08 A-	15.18	On Grad	0.00	Combination 4R
CB 2-10 A-E	26+30	4,499.69	4,499.69	4,496.69	5.74	0.53	3.04	4.04	4.04	0.00		11.71	In Sag	0.00	Combination DUAL
CB 2-11 A-E	22+64	4,488.46	4,488.46	4,485.46	3.14	0.53	1.66	2.35	2.35	0.00		10.00	In Sag	0.00	Combination DUAL
CB 2-12	2+27	4,528.94	4,528.94	4,525.94	1.45	0.53	0.77	1.06	1.05	0.01	CB 1-10	10.54	On Grad	0.00	Combination 4R
CB 2-13	6+20	4,554.22	4,554.22	4,551.22	0.17	0.53	0.09	0.13	0.13	0.00	CB 2-04 A-	10.00	On Grad	0.00	Combination 4R
CB 2-14 A-E	2+79	4,523.56	4,523.56	4,520.56	3.48	0.53	1.84	2.56	2.03	0.53	CB 1-14	10.47	On Grad	0.00	Combination DUAL
CB 2-15 A-E	2+88	4,523.28	4,523.28	4,520.28	3.23	0.53	1.71	2.18	1.82	0.36	CB 1-15 A-	12.79	On Grad	0.00	Combination DUAL
DITCH 2-1	0+57	4,533.00	4,533.00	4,530.00	3.07	0.00	0.00	0.00	0 00	0.00		18.33	In Sag	0.00	Generic Default 10
I-43	9+79	4,468.00	4,468.00	4,465.00	0.00	0.00	0.00	4.50	4.50	0.00		0.00	In Sag	0.00	Generic Default 10

Scenario: Base

Junction Report

Label	Calculated Station (ft)	Ground Elevation (ft)	Set Rim Equal to Ground Elevation?	Rim Elevation (ft)	Sump Elevation (ft)	Bolted Cover?	Structure Diameter (ft)	Description
BT 1-06	9+04	4,464.00	true	4,464.00	4,455.71	true	0.00	
BT 1-23	0+28	4,460.00	true	4,460.00	4,456.82	true	0 00	
BT 1-24	0+69	4,460.00	true	4,460.00	4,457.03	true	0.00	
BT 1-25	0+18	4,463.07	true	4,463.07	4,455.76	true	0 00	
BT 2-04	26+75	4,518.20	true	4,518.20	4,512.20	true	0 00	
BT 2-10	2+02	4,526.00	true	4,526.00	4,520.91	true	0.00	
BT: 2-03	26+12	4,517.22	true	4,517.22	4,510.98	true	0.00	
BT:CB 1-01	8+77	4,471.84	true	4,471.84	4,465.35	true	0.00	
BT:CB 1-02	8+93	4,472.14	true	4,472.14	4,466.00	true	0.00	
BT:CB 1-06	12+44	4,469.00	true	4,469.00	4,463.22	true	0.00	
BT:CB 1-08	14+94	4,473.00	true	4,473.00	4,466.79	true	0.00	
BT:CB 1-09	15+65	4,474.29	true	4,474.29	4,468.29	true	0.00	
BT:CB 1-11	0+42	4,473.00	true	4,473.00	4,467.60	true	0.00	
BT:CB 1-12	1+01	4,474.84	true	4,474.84	4,467.65	true	0.00	
BT:CB 1-14	2+50	4,475.69	true	4,475.69	4,468.30	true	0.00	
BT.CB 1-15	7+42	4,479.48	true	4,479.48	4,471.48	true	0.00	
BT:CB 1-18	13+39	4,505.74	true	4,505.74	4,500.00	true	0.00	
BT:CB 1-3	10+43	4,475.00	true	4,475.00	4,469.06	true	0.00	
BT:CB 2-02	16+59	4,489.46	true	4,489.46	4,483.46	true	0.00	
BT:CB 2-07	19+77	4,484.06	true	4,484.06	4,478.06	true	0.00	
BT:CB 2-08	19+64	4,483.76	true	4,483.76	4,477.76	true	0.00	
SDMH 1-01	3+91	4,464.54	true	4,464.54	4,452.78	false	4.00	
SDMH 1-02	4+51	4,464.02	true	4,464.02	4,453.00	false	4 00	
SDMH 1-03	5+27	4,463.33	true	4,463.33	4,453.25	false	4 00	
SDMH 1-04	5+92	4,462.74	true	4,462.74	4,453.48	false	4.00	
SDMH 1-05	6+70	4,462.08	true	4,462.08	4,453.74	false	4.00	
SDMH 1-06	7+49	4,462.48	true	4,462.48	4,454.38	false	4.00	
SDMH 1-07	9+58	4,465.31	true	4,465.31	4,456.21	false	4.00	
SDMH 1-08	10+21	4,466.14	true	4,466.14	4,456.54	false	4 00	
SDMH 1-09	12+10	4,468.80	true	4,468.80	4,462.70	false	4.00	
SDMH 1-10	15+27	4,473.25	true	4,473.25	4,467.15	false	4.00	
SDMH 1-11	0+71	4,474.01	true	4,474.01	4,467.91	false	4.00	
SDMH 1-12	0+58	4,474.63	true	4,474.63	4,467.33	false	4 00	
SDMH 1-13	1+98	4,475.29	true	4,475.29	4,467.99	false	4.00	
SDMH 1-14	3+68	4,476.48	true	4,476.48	4,468.77	false	4.00	
SDMH 1-15	4+70	4,477.22	true	4,477.22	4,469.82	false	4 00	
SDMH 1-16	6+02	4,478.09	true	4,478.09	4,470.58	false	4.00	
SDMH 1-17	7+14	4,478.90	true	4,478.90	4,471.24	false	4.00	
SDMH 1-18	8+13	4,481.52	true	4,481.52	4,471.84	false	4.00	
SDMH 1-19	9+00	4,485.33	true	4,485.33	4,472.38	false	4.00	
SDMH 1-20	11+40	4,480.83	true	4,480.83	4,474.28	false	4.00	
SDMH 1-21	11+98	4,479.72	true	4,479.72	4,474 66	false	4 00	
SDMH 1-22	11+46	4,497.09	true	4,497.09	4,490.99	false	4 00	
SDMH 1-23	12+99	4,504.28	true	4,504.28	4,498.18	false	4.00	
SDMH 1-24	14+52	4,511.34	true	4,511.34	4,505.34	false	4.00	
SDMH 1-25	15+52	4,513.76	true	4,513.76	4,507.76	false	4.00	
SDMH 1-26	4+68	4,465.25	true	4,465.25	4,453.03	false	4.00	
SDMH 1-27	6+10	4,466.78	true	4,466.78	4,453.41	false	4.00	
SDMH 1-28	8+99	4,472.37	true	4,472.37	4,466.27	false	4.00	
SDMH 1-29	11+64	4,477.24	true	4,477 24	4,471.14	false	4.00	
SDMH 1-30	1+63	4,463.73	true	4,463.73	4,458.13	false	4.00	

Scenario: Base

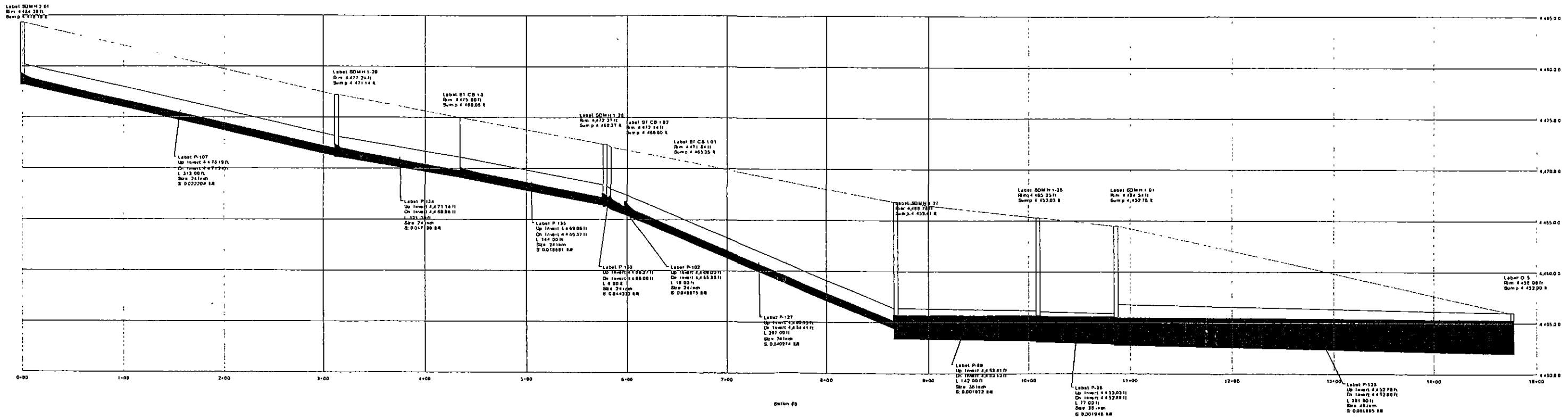
Junction Report

Label	Calculated Station (ft)	Ground Elevation (ft)	Set Rim Equal to Ground Elevation?	Rim Elevation (ft)	Sump Elevation (ft)	Bolted Cover?	Structure Diameter (ft)	Description
SDMH 1-31	5+13	4,465.30	true	4,465.30	4,459.98	false	4.00	
SDMH 1-32	8+63	4,466.88	true	4,466.88	4,461.83	false	4.00	
SDMH 2-01	14+77	4,484.29	true	4,484.29	4,478.19	false	4.00	
SDMH 2-02	16+30	4,488 69	true	4,488.69	4,482.59	true	0.00	
SDMH 2-03	18+44	4,494.20	true	4,494.20	4,488.10	false	4.00	
SDMH 2-04	19+88	4,497.11	true	4,497.11	4,491.01	false	4.00	
SDMH 2-05	23+24	4,507.20	true	4,507.20	4,501.10	false	4.00	
SDMH 2-06	24+24	4,510.91	true	4,510.91	4,504.81	false	4.00	
SDMH 2-07	25+24	4,514.61	true	4,514.61	4,508.51	false	4.00	
SDMH 2-08	26+20	4,517.31	true	4,517.31	4,511.21	false	4.00	
SDMH 2-09	27+29	4,518.81	true	4,518.81	4,512.71	false	4.00	
SDMH 2-10	29+39	4,521.60	true	4,521.60	4,515.60	false	4.00	
SDMH 2-11	13+96	4,472.78	true	4,472.78	4,466.68	false	4.00	
SDMH 2-12	15+58	4,475.52	true	4,475.52	4,469.42	false	4.00	
SDMH 2-13	17+18	4,478.73	true	4,478.73	4,472.63	false	4.00	
SDMH 2-14	18+69	4,481 75	true	4,481.75	4,475.65	false	4.00	
SDMH 2-15	20+29	4,485 35	true	4,485.35	4,479.35	false	4.00	
SDMH 2-16	21+57	4,488.45	true	4,488.45	4,482.35	false	4.00	
SDMH 2-17	23+72	4,493.54	true	4,493.54	4,487.44	false	4.00	
SDMH 2-18	24+80	4,496.00	true	4,496.00	4,489.90	false	4.00	
SDMH 2-19	25+99	4,498.59	true	4,498.59	4,492.49	false	4.00	
SDMH 2-20	17+25	4,477.07	true	4,477.07	4,470.97	false	4.00	
SDMH 2-21	18+81	4,479.70	true	4,479.70	4,473.60	false	4.00	
SDMH 2-22	20+25	4,482.15	true	4,482.15	4,476.05	false	4.00	
SDMH 2-23	22+11	4,487.05	true	4,487.05	4,480.95	false	4.00	
SDMH 2-24	2+29	4,527.24	true	4,527.24	4,521.14	false	4.00	
SDMH 2-25	5+80	4,554.59	true	4,554.59	4,548.59	false	4.00	
SDMH 2-26	2+53	4,521.68	true	4,521.68	4,516.68	false	4.00	
SDMH 2-27	1+11	4,520.00	true	4,520.00	4,514.88	false	4.00	

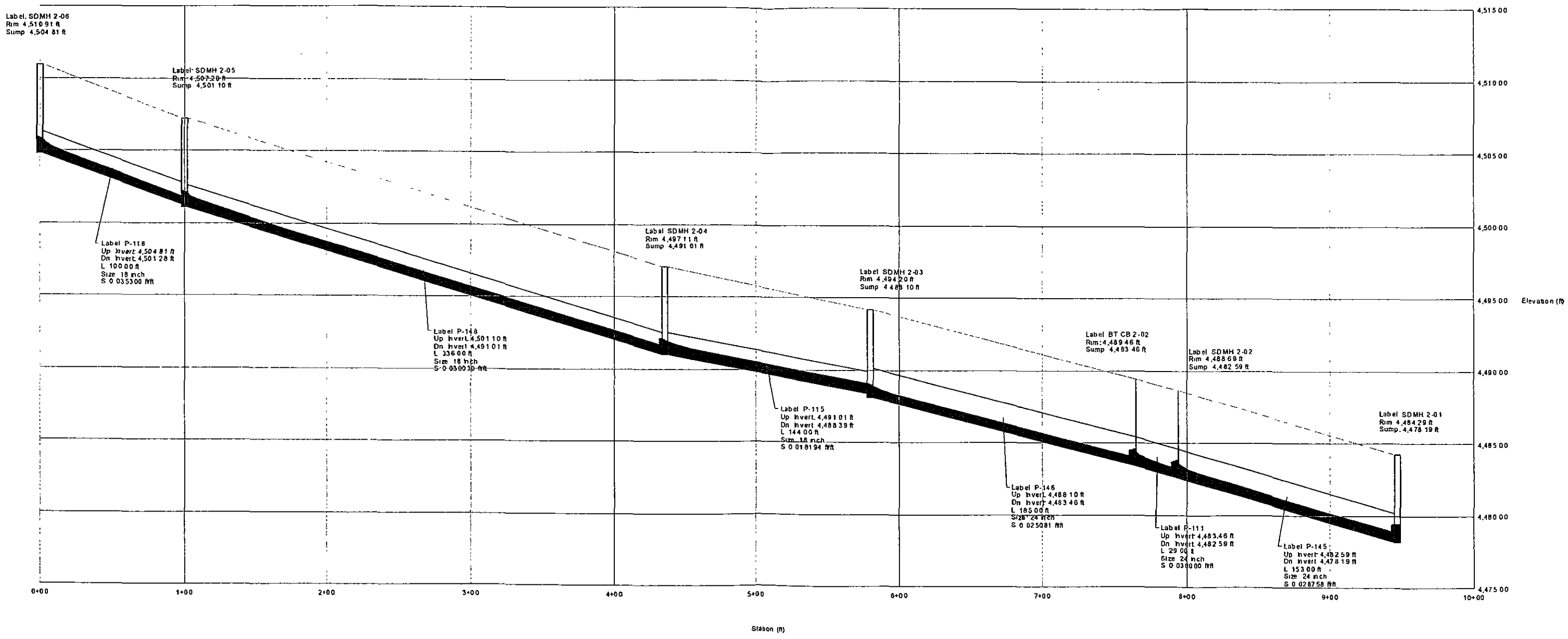
Profile
Scenario: Base

Profile: GOLD RIVER NORTH - A

Scenario: Base

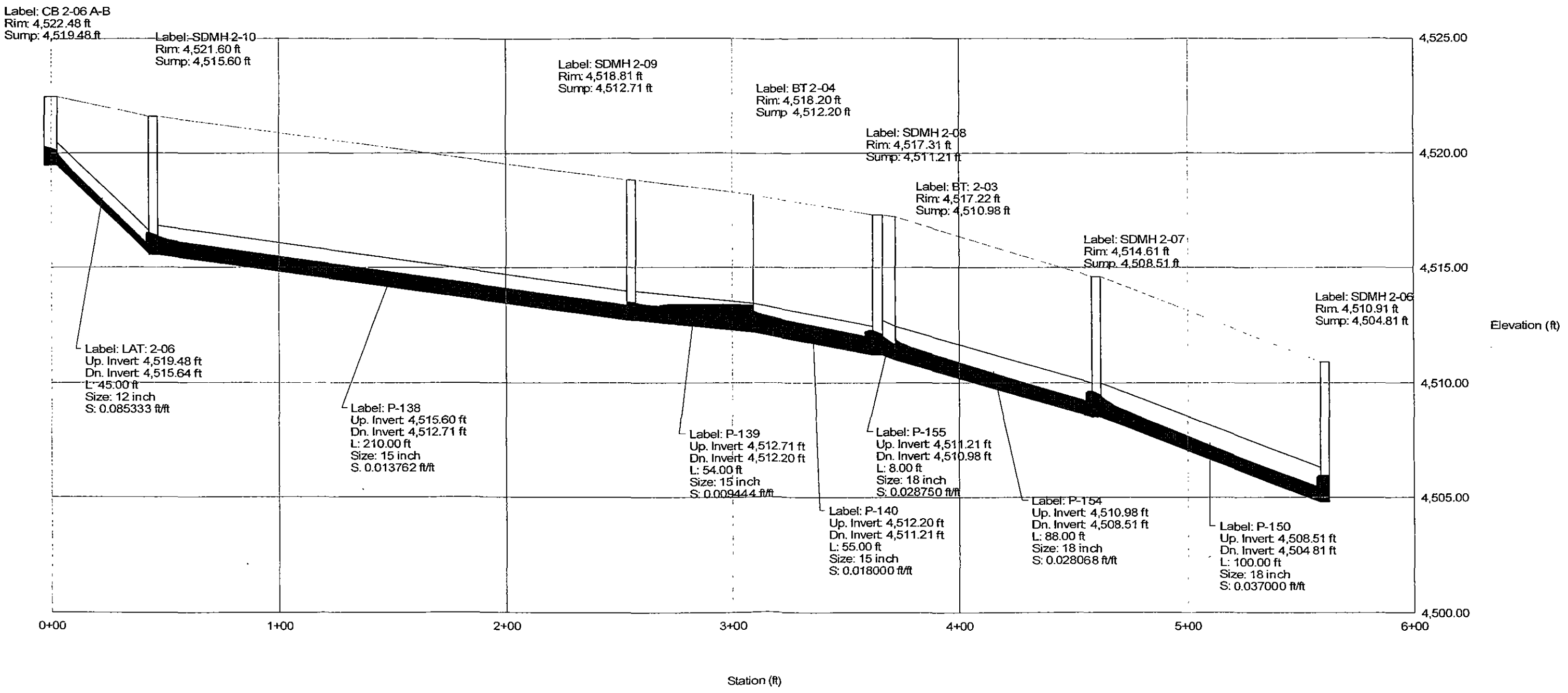


Profile: GOLD RIVER NORTH - B
Scenario: Base



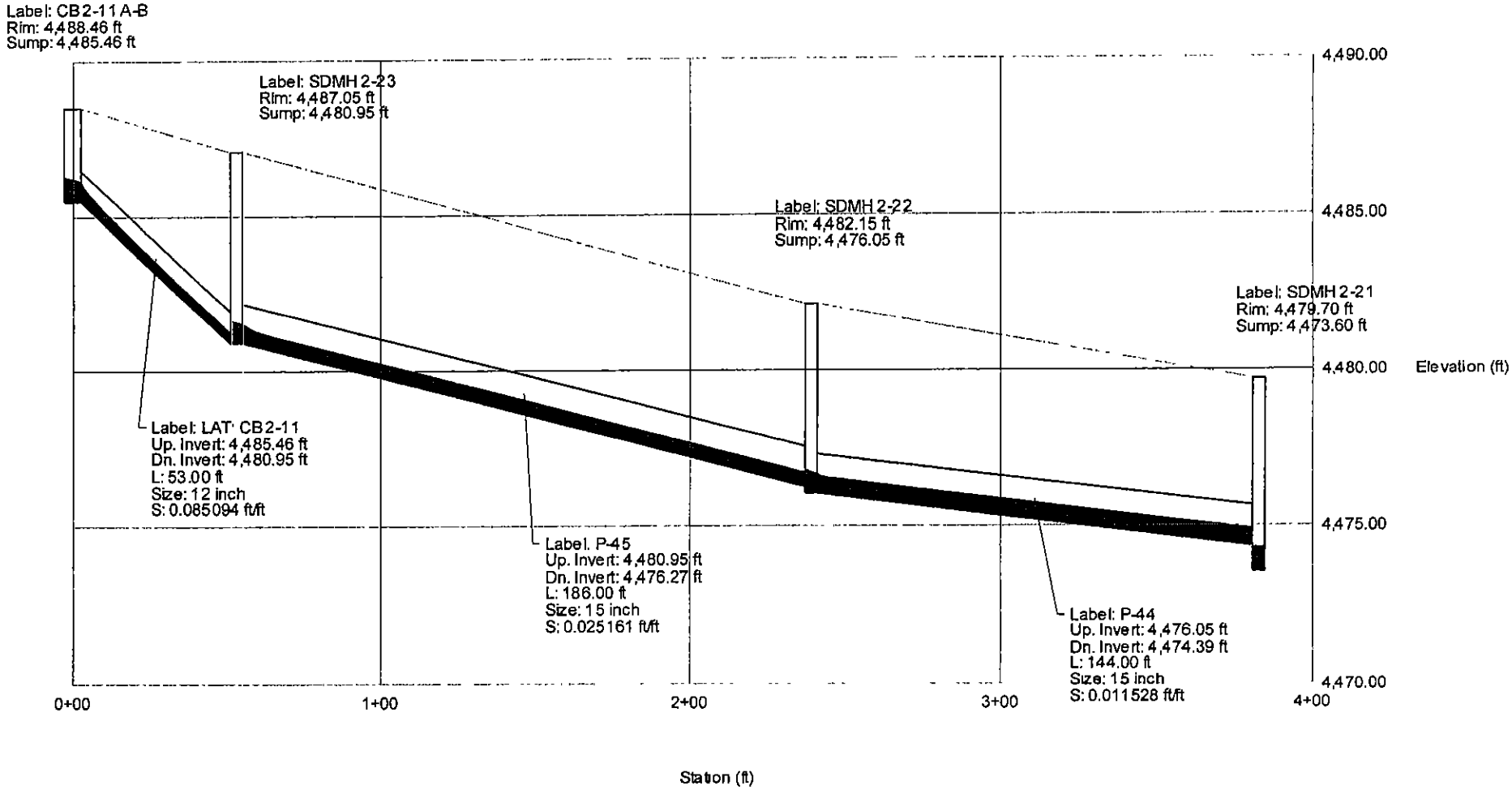
Profile: GOLD RIVER NORTH - C

Scenario: Base



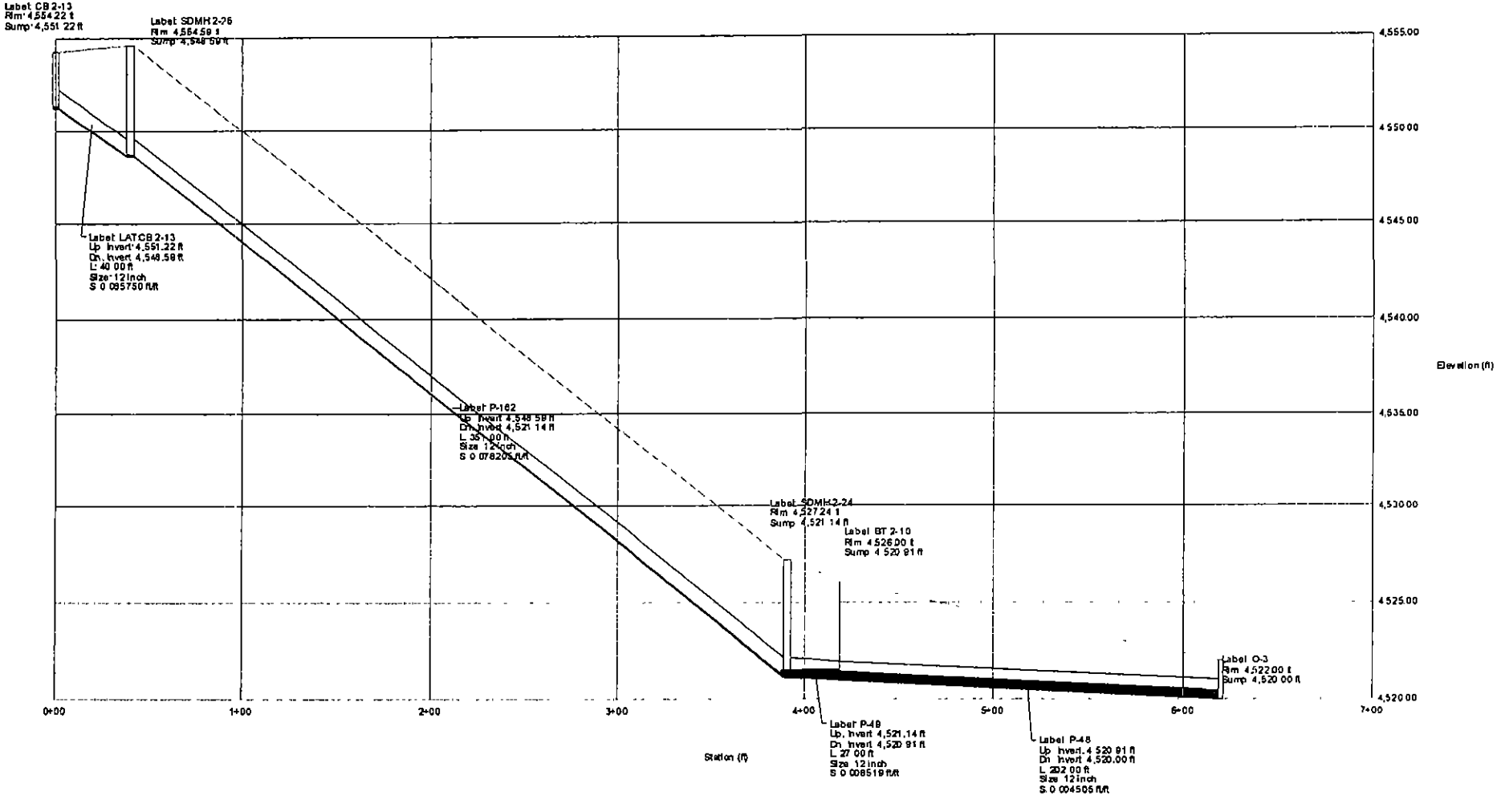
Profile: HOLLOW BASIN - A

Scenario: Base



ofile
Scenario: Base

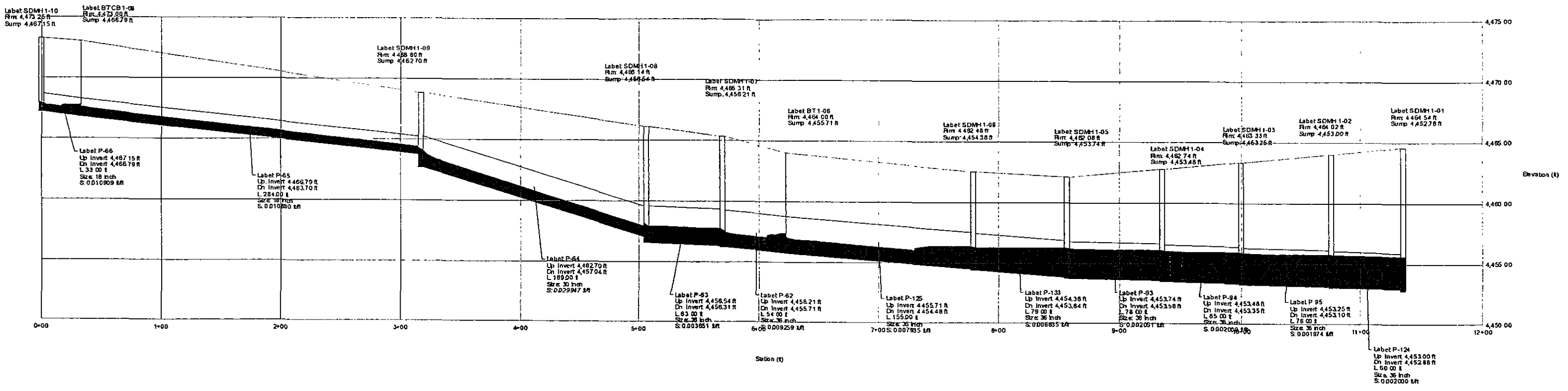
Profile: HOLLOW BASIN - B
Scenario: Base



Profile
Scenario: Base

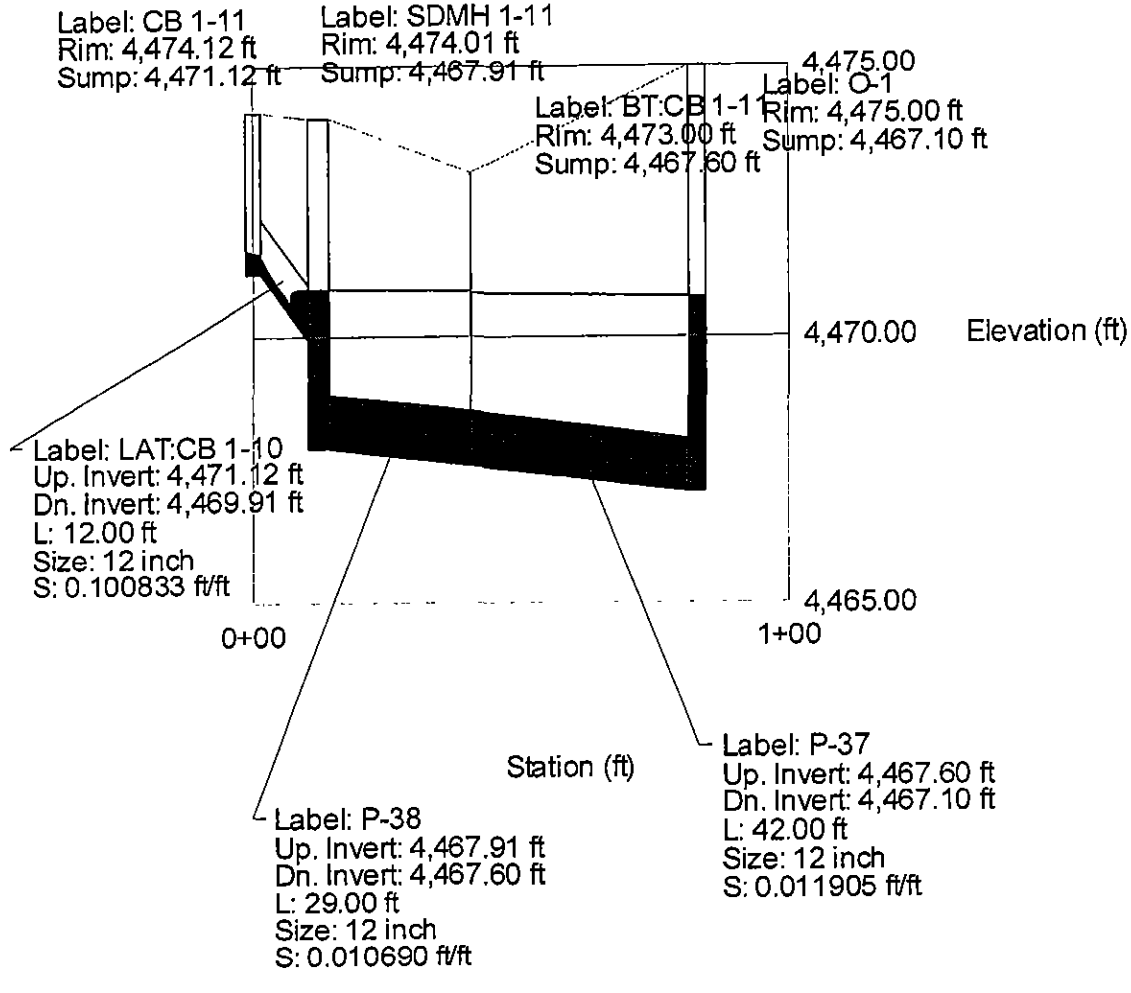
Profile: GOLD RIVER SOUTH - A

Scenario. Base



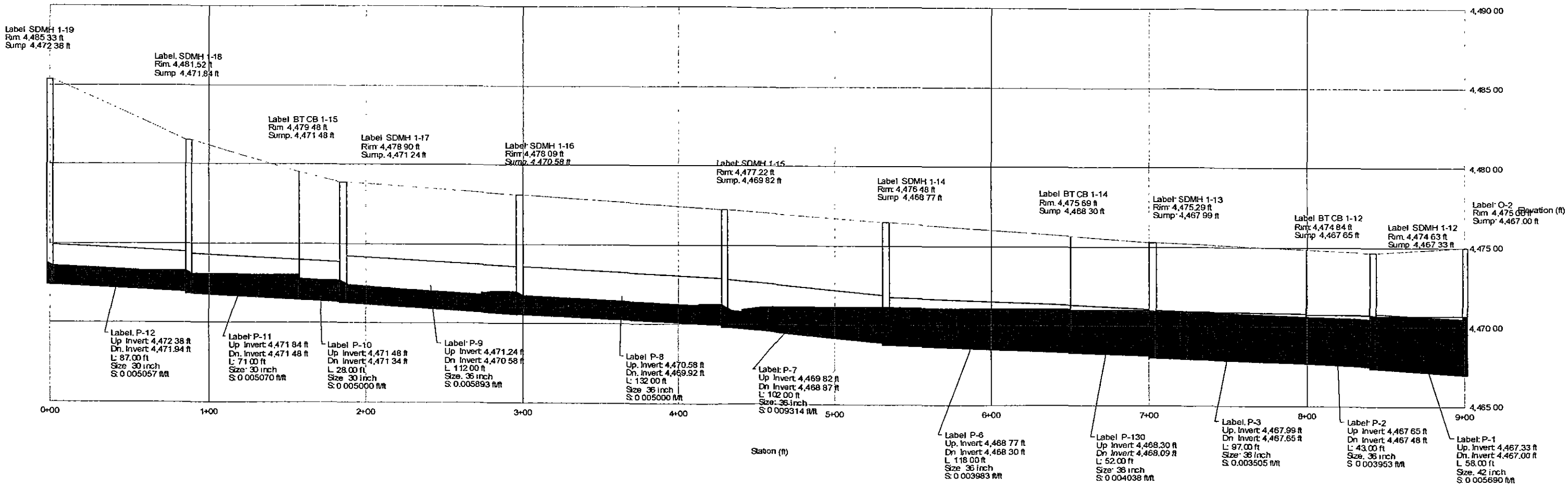
Profile: GOLD RIVER SOUTH - B

Scenario: Base



Profile: GOLD RIVER SOUTH - C

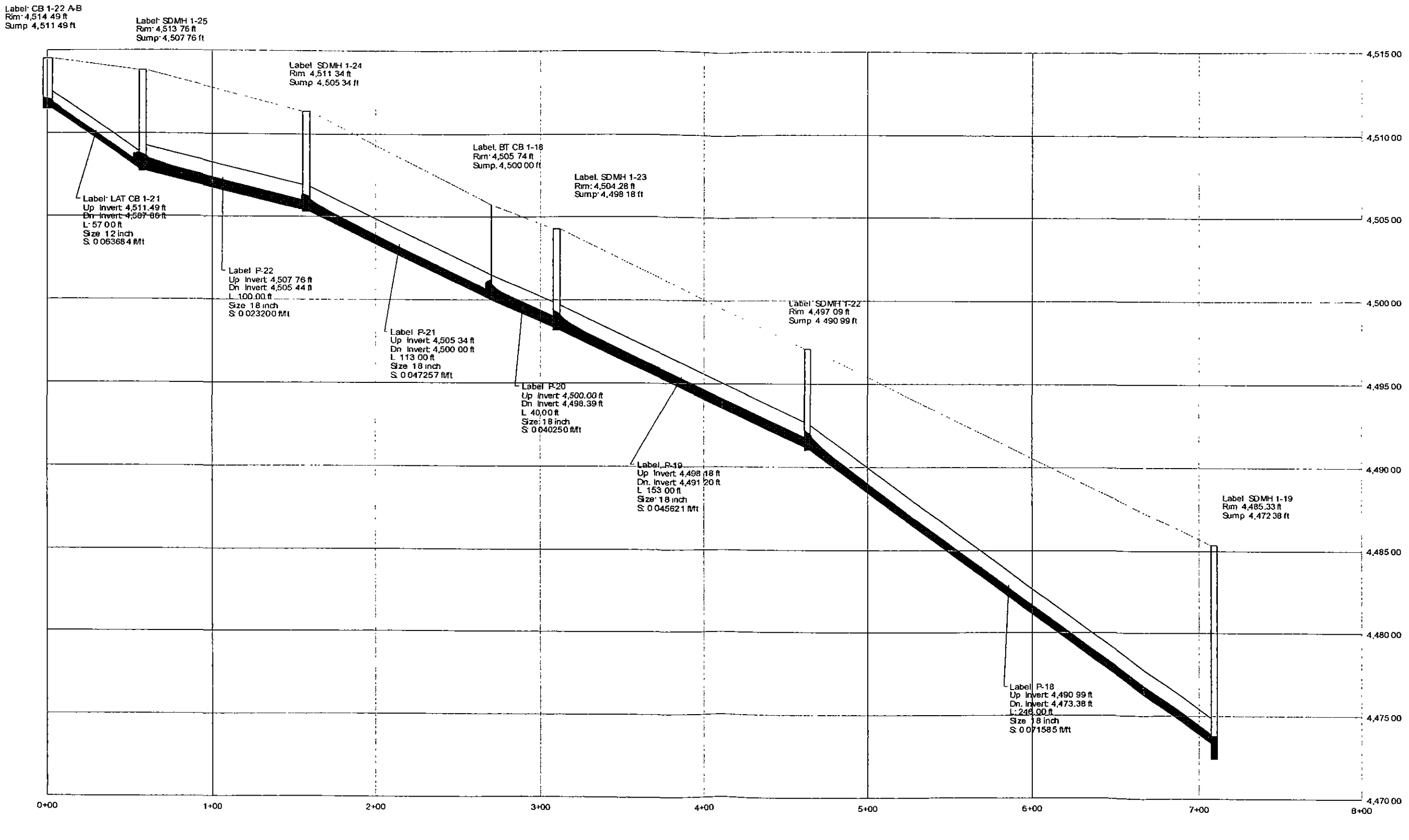
Scenario: Base



Profile
Scenario: Base

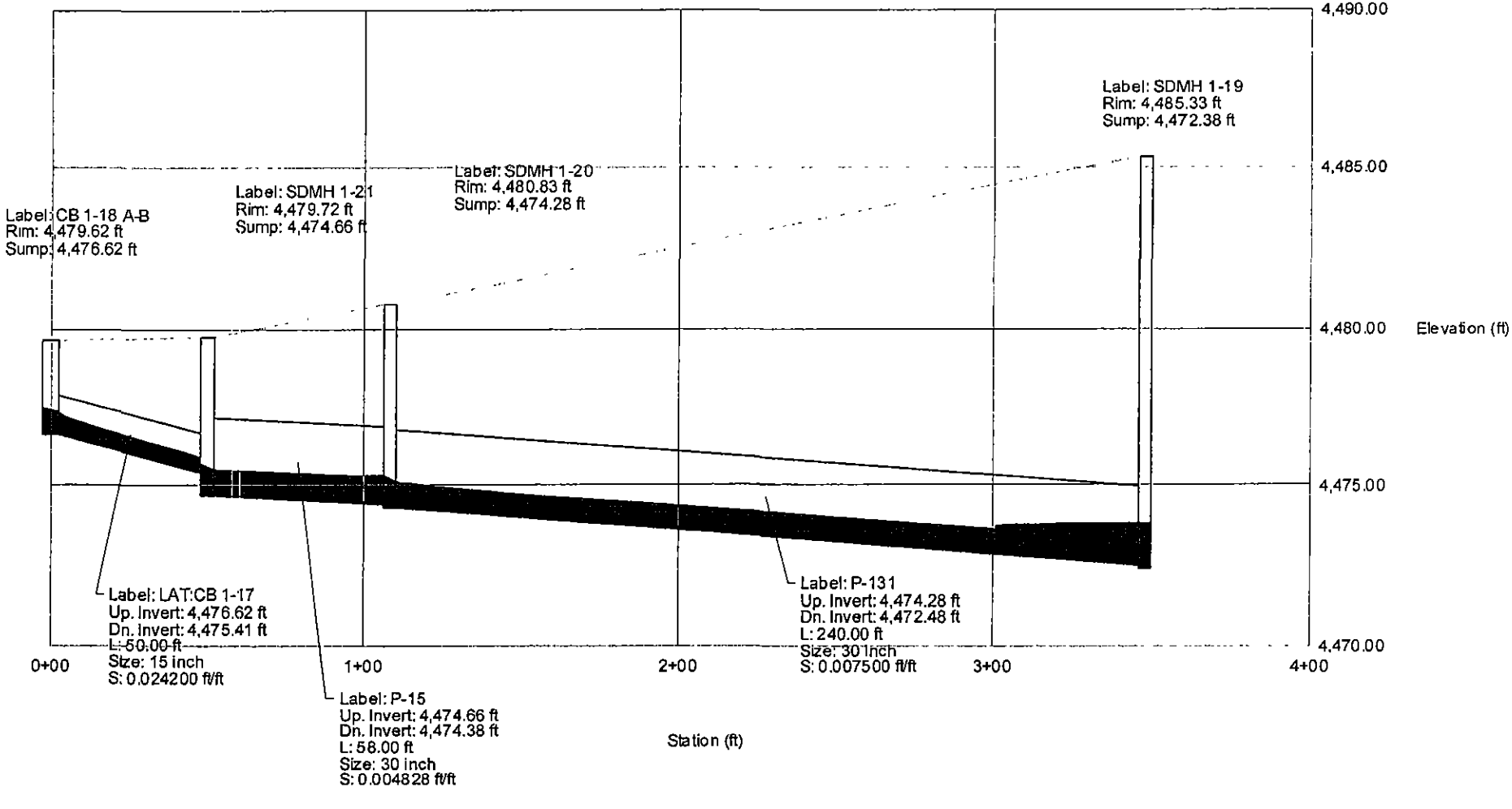
Profile: GOLD RIVER SOUTH - D

Scenario: Base



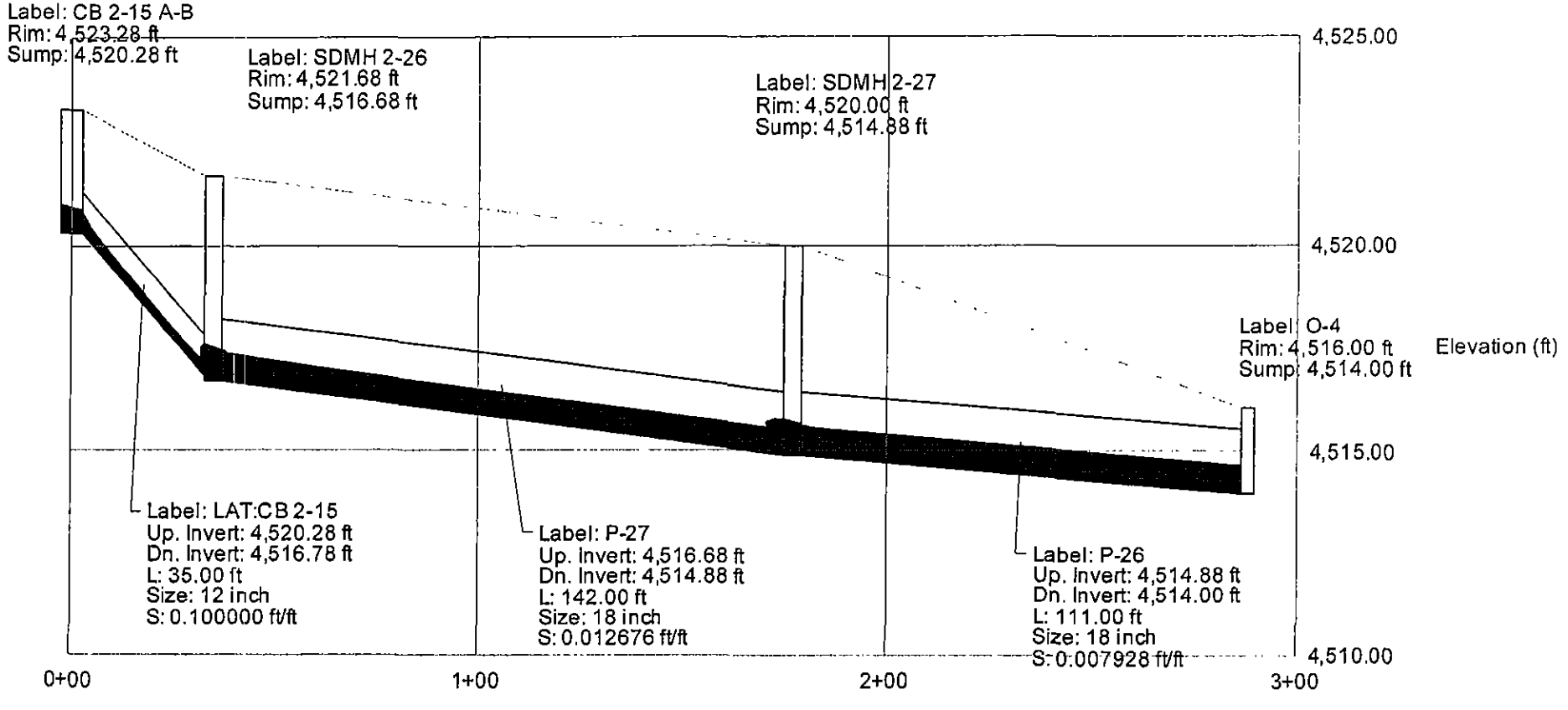
Profile: DRY GULCH - A

Scenario: Base



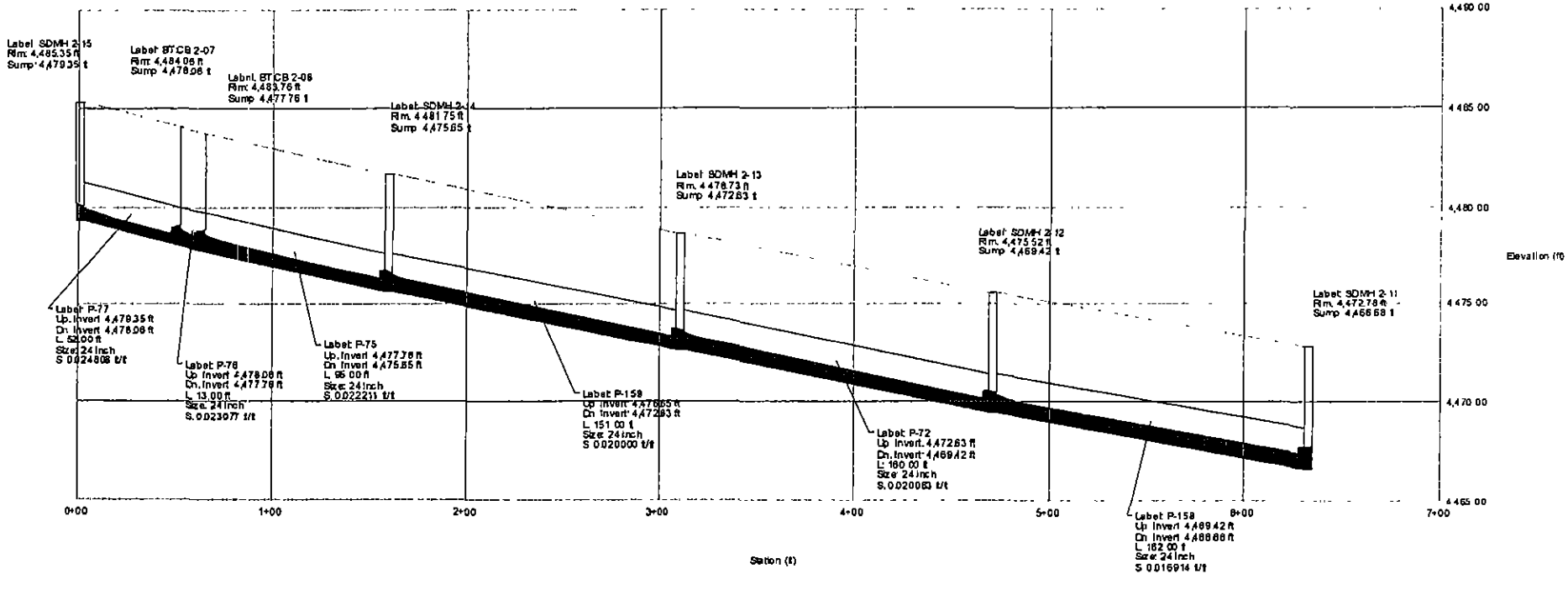
Profile: DRY GULCH - B

Scenario: Base



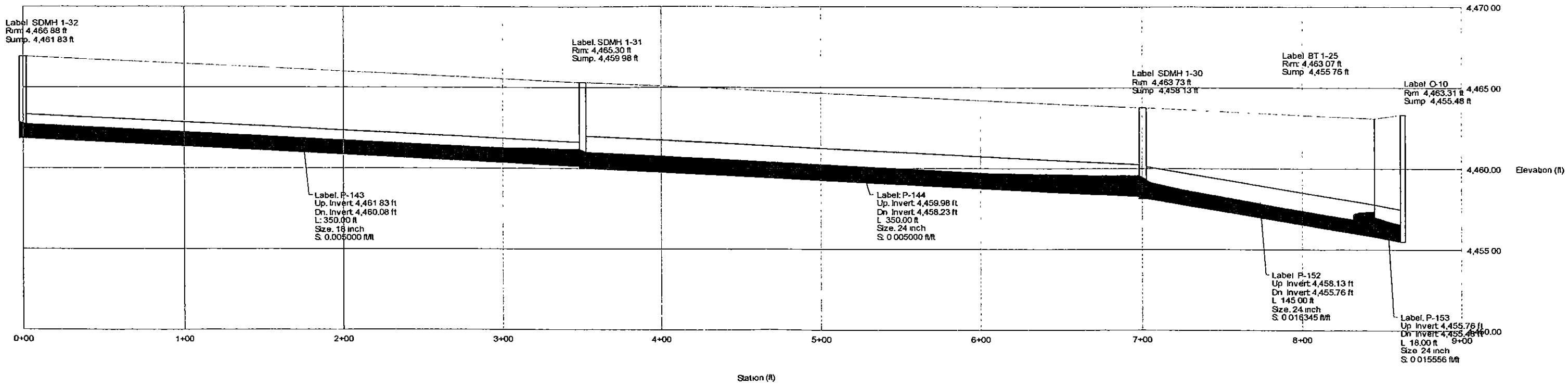
ofile
Scenario: Base

Profile: ORE CIRCLE - A
Scenario: Base



Profile: DESERT WAY

Scenario: Base



WOOD RODGERS
ENGINEERING ▪ PLANNING ▪ MAPPING ▪ SURVEYING

Project: GOLDEN HIGHLANDS

MODIFIED FORM 2

100-YEAR STORM EVENT

Sub-Basin	Initial Overland					Channelized Flow				Tc	Tc Urbanized Basin		Final	Region 2				Check Flow	Check Flow	
Data										(Ti+Tt)	Check	Tc	Tc	INTENSITIES (min)		Final intensity	Q=CIA	STORMCAD	STORMCAD	BYPASS
Basin	R10	Area (ac)	Li (ft)	Slope (%)	Ti (min)	Lt (ft)	Slope (%)	Vel. (fps)	Tt (min)	(min)	Total Length	(check)	Min	10	15	(in/hr)	(cfs)	INTERCEPTED Q	BYPASSED Q	TARGET
B1	0.53	3 17	200.00	3.50	9 60	625.00	0 64	1.60	6 51	16.11	825 00	14.58	14 58	3.29	2 72	2.77	4.65	2.32	2.37	CB 1-12
B2	0 53	2 91	142.00	1 65	10 36	717 00	5 00	4.47	2.67	13 04	859 00	14 77	13 04	3.29	2.72	2.94	4.54	6.98	0	
B3	0.53	4.40	151 00	4 90	7.46	800 00	5.00	4 47	2 98	10 44	951 00	15.28	10 44	3.29	2.72	3.24	7.55	9.81	0	
B4	0 53	3 66	166.00	6.10	7.28	736 00	4 70	4.34	2.83	10 11	902 00	15.01	10 11	3 29	2 72	3.28	6.36	6.41	0	
B5	0.53	6.01	165.00	1.94	10.59	799 00	4.09	4.04	3 29	13.88	964.00	15 36	13.88	3 29	2 72	2.85	9.07	9.14	0	
B6	0.53	4 45	124 00	2 10	8 94	577 00	5.10	4.52	2.13	11 07	701.00	13.89	11 07	3.29	2.72	3.17	7.47	7.53	0	
B7	0 53	1 81	216 00	5.50	8.59	179 00	4 03	4.01	0 74	9 33	395.00	12.19	10 00	3 29	2.72	3.29	3.16	4.97	0	
B8	0 53	2 64	134.00	1 98	9.48	825 00	6.78	5.21	2 64	12.12	959 00	15.33	12 12	3.29	2.72	3.05	4.27	2.64	1.66	CB 1-19
B9	0 53	4.88	200.00	6.90	7.67	883.00	6.39	5.06	2.91	10 58	1083.00	16.02	10 58	3.29	2 72	3.22	8.34	3.84	4.56	CB 1-22
B10	0.53	0.35	2 00	2 00	1.15	369 00	0 60	1.55	3 97	5.12	371.00	12.06	10 00	3.29	2.72	3.29	0.61	5.27	0	
B11	0 53	3.23	137 00	1 75	9 98	812.00	5 82	4 82	2 80	12 79	949.00	15.27	12 79	3.29	2.72	2.97	5 09	3.12	2.01	CB 1-15
B12	0 53	3 48	198.00	7.11	7 56	830 00	5 65	4.75	2 91	10 47	1028.00	15 71	10 47	3 29	2 72	3.24	5.97	3.38	2.64	CB 1-14
B13	0 53	0 06	4 00	2 00	1 63	106 00	2 00	2.83	0.62	2 26	110.00	10.61	10.00	3.29	2 72	3.29	0.10	2.92	0	
B14	0 53	0 35	20 00	20.00	1.71	269.00	0.54	1 47	3 05	4 76	289.00	11.61	10 00	3 29	2 72	3.29	0.61	2.94	0	
B15	0 53	2 59	66 00	1 30	7 64	1300.00	3.89	3.94	5 49	13 14	1366.00	17.59	13 14	3 29	2 72	2.93	4.03	2.41	2.07	CB 1-11
B16	0 53	3 14	156 00	9.20	6.16	372 00	5.07	4.50	1 38	7 54	528 00	12.93	10 00	3 29	2 72	3.29	5.48	5.52	0	
B17	0 53	1 45	77 00	1.16	8 57	642.00	7 41	5 44	1 97	10 54	719 00	13.99	10 54	3.29	2 72	3.23	2.48	2.04	0.46	CB 1-10
B18	0 53	0 17	4 00	2.00	1 63	280 00	7.96	5.64	0 83	2 46	284 00	11 58	10.00	3.29	2.72	3.29	0.30	0.3	0	
B19	0 53	3 42	77 00	1.17	8.55	852.00	1.24	2.23	6 38	14 92	929 00	15.16	14.92	3.29	2 72	2.73	4.95	7.26	0	
B20	0 53	4 59	124.00	1 13	10.97	936.00	1 26	2.24	6 95	17.92	1060 00	15 89	15.89	3 29	2.72	2.62	6.37	6.54	0	
B21	0 53	2 99	116 00	1 06	10.84	543 00	1.63	2.55	3 54	14 38	659 00	13.66	13.66	3 29	2 72	2.87	4.55	4.59	0	
B22	0 53	2 90	148 00	1 41	11.14	723 00	2.12	2.91	4 14	15 28	871 00	14.84	14.84	3.29	2.72	2.74	4.21	6.68	0	
B23	0 53	2 87	151 00	1 78	10.42	657 00	2.16	2 94	3 73	14 15	808.00	14.49	14 15	3.29	2.72	2.82	4.29	9.42	0	
B24	0.53	2 01	152.00	2.79	9.02	560.00	2.53	3.18	2 93	11 95	712.00	13 96	11.95	3.29	2 72	3.07	3.27	2.81	2.58	CB 1-08
B25	0 53	3 42	227 00	7.36	8.00	738.00	2 36	3.07	4 00	12 00	965.00	15.36	12.00	3.29	2.72	3.06	5.55	2.87	2.72	CB 1-07
B26	0.53	5 74	225.00	10 75	7.03	917.00	2.67	3 27	4 68	11 71	1142.00	16.34	11 71	3.29	2.72	3.10	9.42	9.49	0	
B27	0 53	2 96	119 00	1.05	11.01	830.00	2.75	3.32	4 17	15.18	949.00	15.27	15.18	3.29	2.72	2.70	4.23	2.44	1.85	CB 2-08
B28	0.53	1 49	62.00	1.10	7.83	728.00	2.25	3 00	4.04	11.87	790.00	14.39	11.87	3.29	2 72	3.08	2.43	2.7	2.56	CB 1-04
B29	0 53	1 40	153.00	1 42	11.30	199.00	1.00	2 00	1.66	12.96	352.00	11.96	11 96	3.29	2.72	3.07	2.28	6.47	0	
B30	0 53	3 72	247.00	2.02	12.79	958.00	2.97	3 45	4 63	17.42	1205.00	16.69	16 69	3 29	2.72	2.53	4.98	2.81	2.4	CB 1-02
B31	0 53	2 80	145.00	1.94	9.93	839.00	3.08	3.51	3.98	13 91	984.00	15.47	13 91	3 29	2.72	2.84	4.22	2.85	2.49	CB 1-01
B32	0.53	0 07	107.00	1 11	10 25	300.00	1.32	2 30	2.18	12.43	407.00	12 26	12 26	3.29	2 72	3.03	0.11	1.8	1.16	CB 2-02
B33	0 53	1 47	192.00	3 10	9.79	307.00	1.32	2 30	2 23	12.01	499 00	12.77	12 01	3 29	2.72	3.06	2.38	5.93	0	
B34	0 53	3 60	255 00	4 60	9 90	891.00	1 98	2 81	5.28	15 18	1146.00	16.37	15 18	3.29	2 72	2.70	5.15	2.59	2.62	CB 1-08
B35	0.53	5 12	110.00	1 00	10.76	2435.00	2.42	10 17	3 99	14.75	2545.00	24.14	14 75	3.29	2.72	2.75	7.46	0	0	to channel
B36	0.53	1 71	76 00	1 17	8.49	780.00	1.21	2 20	5 91	14 40	856.00	14 76	14.40	3 29	2 72	2.79	2.53	2.55	0	
B37	0 53	2 24	147 00	1 00	12.44	581.00	1 20	2 19	4.42	16.86	728.00	14 04	14 04	3 29	2.72	2.83	3.36	3.39	0	
B38	0 53	2 29	107.00	1 07	10.38	620 00	2.30	3 03	3 41	13 79	727.00	14.04	13.79	3 29	2.72	2.86	3.47	2.11	1.39	CB 1-01
B39	0 53	5 16	310.00	8 24	9.01	985 00	2.64	3.25	5.05	14.06	1295.00	17.19	14.06	3.29	2.72	2.83	7.73	4.54	3.25	CB 2-04
B40	0.53	3 51	118.00	1 40	9 97	1030.00	2.64	3 25	5 28	15 26	1148 00	16 38	15 26	3 29	2 72	2.69	5.01	2.53	2.54	CB 2-03
B41	0 53	1 67	726.00	2 04	21.85	147.00	0 50	1 41	1.73	23 58	873.00	14.85	14 85	3 29	2 72	2.74	2.42	7.36	0	
B42	0.53	5 94	687.00	2.04	21 25	350.00	0 50	1.41	4 12	25.38	1037.00	15 76	15.76	3 29	2 72	2.63	8.29	7.14	4.83	CB 1-25
B43	0.53	6 56	647.00	2 04	20 63	350.00	0.50	1 41	4 12	24 75	997.00	15 54	15 54	3.29	2.72	2.66	9.24	5.92	3.5	CB 1-26
B44	0 53	10 55	145.00	1 00	12 35	1950 00	5 64	4 75	6 84	19 20	2095.00	21.64	19 20	3 29	2.72	2.24	12 53	0	0	to channel
B45	0 53	4 33	131 00	1 00	11 74	1050.00	1 14	2 14	8 20	19 94	1181 00	16.56	16 56	3 29	2 72	2.54	5 83	0	0	to channel

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-163	SDMH 2-2	SDMH 2-2	N/A	5.35	156.00	0 016859	15 inch	0.014	7.79	4,473 60	4,470.97	4,479.70	4,477.07	4,474.54	4,472.13
P-162	SDMH 2-2	SDMH 2-2	N/A	0.30	351.00	0.078205	12 inch	0.014	9.25	4,548.59	4,521.14	4,554.59	4,527.24	4,548 81	4,521 83
P-161	SDMH 2-1	SDMH 2-1	N/A	10.73	119.00	0.021765	18 inch	0.014	14.39	4,492.49	4,489.90	4,498.59	4,496.00	4,493.75	4,491.51
P-160	SDMH 2-1	SDMH 2-1	N/A	10.63	215.00	0.023674	18 inch	0.014	15.01	4,487.44	4,482.35	4,493.54	4,488.45	4,488.69	4,483.95
P-159	SDMH 2-1	SDMH 2-1	N/A	15.28	151.00	0.020000	24 inch	0.014	29.71	4,475.65	4,472.63	4,481.75	4,478.73	4,477.06	4,474.36
P-158	SDMH 2-1	SDMH 2-1	N/A	15.09	162.00	0.016914	24 inch	0.014	27.32	4,469.42	4,466.68	4,475.52	4,472.78	4,470.82	4,468.39
P-156	CB 1-27 A	SDMH 1-3	0.53	5.92	22.00	0.095455	12 inch	0.014	10.22	4,462.18	4,460.08	4,465.18	4,465.30	4,463.13	4,461.42
P-155	SDMH 2-0	BT: 2-03	N/A	11.86	8.00	0.028750	18 inch	0.014	16.54	4,511.21	4,510.98	4,517.31	4,517.22	4,512.52	4,512.35
P-154	BT: 2-03	SDMH 2-0	N/A	13.43	88.00	0.028068	18 inch	0.014	16.34	4,510.98	4,508.51	4,517.22	4,514.61	4,512.35	4,510.36
P-153	BT 1-25	O-10	N/A	24.18	18.00	0.015556	24 inch	0.014	26.20	4,455.76	4,455.48	4,463.07	4,463.31	4,457.50	4,457.07
P-152	SDMH 1-3	BT 1-25	N/A	17.26	145.00	0.016345	24 inch	0.014	26.85	4,458.13	4,455.76	4,463.73	4,463.07	4,459.63	4,458.04
P-151	CB 1-23	BT 1-23	0.53	3.39	61.00	0.067705	12 inch	0.014	8.61	4,460.95	4,456.82	4,463.95	4,460.00	4,461.74	4,458 21
P-150	SDMH 2-0	SDMH 2-0	N/A	13.39	100.00	0.037000	18 inch	0.014	18.76	4,508.51	4,504.81	4,514.61	4,510.91	4,509 87	4,506.66
P-149	BT 1-24	BT 1-23	N/A	2.54	41.00	0.005122	12 inch	0.014	2.37	4,457.03	4,456.82	4,460.00	4,460.00	4,458.45	4,458 21
P-148	SDMH 2-0	SDMH 2-0	N/A	13.30	336.00	0.030030	18 inch	0.014	16.90	4,501.10	4,491.01	4,507.20	4,497.11	4,502.46	4,492.84
P-147	BT 1-23	O-9	N/A	5.81	28.00	0.076429	12 inch	0.014	9.15	4,456.82	4,454.68	4,460.00	4,460.26	4,457.77	4,455.30
P-146	SDMH 2-0	BT:CB 2-0	N/A	13.06	185.00	0.025081	24 inch	0.014	33.27	4,488.10	4,483.46	4,494.20	4,489.46	4,489.40	4,485.21
P-145	SDMH 2-0	SDMH 2-0	N/A	18.25	153 00	0.028758	24 inch	0.014	35.62	4,482.59	4,478.19	4,488.69	4,484.29	4,484.13	4,480.11
P-144	SDMH 1-3	SDMH 1-3	N/A	10.42	350.00	0.005000	24 inch	0.014	14.85	4,459.98	4,458.23	4,465.30	4,463.73	4,461.21	4,459.99
P-143	SDMH 1-3	SDMH 1-3	N/A	4.50	350 00	0.005000	18 inch	0.014	6.90	4,461.83	4,460.08	4,466.88	4,465.30	4,462.71	4,461.42
P-142	I-43	SDMH 1-3	0.00	4.50	116.00	0.027328	12 inch	0.010	7.66	4,465.00	4,461.83	4,468.00	4,466.88	4,465.89	4,462.85
P-140	BT 2-04	SDMH 2-0	N/A	11.89	55.00	0.018000	15 inch	0.014	8.05	4,512.20	4,511.21	4,518.20	4,517.31	4,515.09	4,512 93
P-139	SDMH 2-0	BT 2-04	N/A	6.77	54.00	0.009444	15 inch	0.014	5.83	4,512.71	4,512.20	4,518.81	4,518.20	4,516.51	4,515.82
P-138	SDMH 2-1	SDMH 2-0	N/A	6.87	210.00	0.013762	15 inch	0.014	7.04	4,515.60	4,512.71	4,521.60	4,518.81	4,519 26	4,516.51
P-135	BT.CB 1-3	SDMH 1-2	N/A	19.69	144.00	0.018681	24 inch	0.014	28 71	4,469.06	4,466.37	4,475.00	4,472.37	4,470.65	4,468.68
P-134	*SDMH 1-2*	*BT:CB 1-3*	*N/A*	*17.94*	*121.00*	*0.017190*	*24 inch*	*0.014*	*27.54*	*4,471.14*	*4,469.06*	*4,477.24*	*4,475 00*	*4,472.67*	*4,470 65*
P-133	SDMH 1-0	SDMH 1-0	N/A	41.40	79.00	0.006835	36 inch	0.014	51 20	4,454.38	4,453.84	4,462.48	4,462.08	4,461.19	4,460.84
P-132	CB 1-05 A	SDMH 1-0	0.53	6.54	21.00	0 071429	12 inch	0.014	8.84	4,459.24	4,457.74	4,462 24	4,462.08	4,461 66	4,460.84
P-131	SDMH 1-2	SDMH 1-1	N/A	15.64	240.00	0 007500	30 inch	0 014	32.98	4,474.28	4,472.48	4,480.83	4,485.33	4,477 45	4,477 05
P-130	BT:CB 1-1	SDMH 1-1	N/A	40.27	52.00	0 004038	36 inch	0 014	39 36	4,468.30	4,468.09	4,475.69	4,475.29	4,472.73	4,472.51
P-129	SDMH 2-1	BT:CB 1-0	N/A	14.99	152.00	0.022763	24 inch	0 014	31.69	4,466.68	4,463.22	4,472.78	4,469.00	4,468.08	4,467.11
P-127	BT:CB 1-0	SDMH 1-2	N/A	26.98	267.00	0.040974	24 inch	0.014	42.52	4,465.35	4,454.41	4,471.84	4,466.78	4,467.16	4,457 59
P-125	BT 1-06	SDMH 1-0	N/A	41.83	155 00	0 007935	36 inch	0.014	55.17	4,455.71	4,454.48	4,464.00	4,462.48	4,462.16	4,461.45
P-124	SDMH 1-0	SDMH 1-0	N/A	53.19	60.00	0.002000	36 inch	0.014	27.70	4,453.00	4,452.88	4,464.02	4,464.54	4,457 41	4,456 97
P-123	SDMH 1-0	O-5	N/A	78.51	391.00	0.001995	48 inch	0.014	59.57	4,452.78	4,452.00	4,464.54	4,456.00	4,456 66	4,455 27

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-118	SDMH 2-06	SDMH 2-05	N/A	13.35	100.00	0.035300	18 inch	0.014	18.33	4,504.81	4,501.28	4,510.91	4,507.20	4,506.17	4,502.95
P-115	SDMH 2-04	SDMH 2-03	N/A	13.14	144.00	0.018194	18 inch	0.014	13.16	4,491.01	4,488.39	4,497.11	4,494.20	4,492.37	4,489.62
P-111	BT:CB 2-02	SDMH 2-02	N/A	15.53	29.00	0.030000	24 inch	0.014	36.38	4,483.46	4,482.59	4,489.46	4,488.69	4,484.88	4,484.51
P-107	SDMH 2-01	SDMH 1-29	N/A	18.16	313.00	0.022204	24 inch	0.014	31.30	4,478.19	4,471.24	4,484.29	4,477.24	4,479.72	4,473.04
P-103	SDMH 1-26	BT:CB 1-02	N/A	19 58	6.00	0.044333	24 inch	0.014	44.23	4,466.27	4,466.00	4,472.37	4,472.14	4,468.38	4,468.33
P-102	BT:CB 1-02	BT:CB 1-01	N/A	21.75	16.00	0.040875	24 inch	0.014	42.47	4,466.00	4,465.35	4,472.14	4,471.84	4,467.95	4,467.79
P-99	SDMH 1-27	SDMH 1-26	N/A	26.78	142.00	0.001972	36 inch	0.014	27.50	4,453.41	4,453.13	4,466.78	4,465.25	4,457.48	4,457.22
P-98	SDMH 1-26	SDMH 1-01	N/A	26.38	77.00	0.001948	36 inch	0.014	27.33	4,453.03	4,452.88	4,465.25	4,464.54	4,457.11	4,456 97
P-95	SDMH 1-03	SDMH 1-02	N/A	53.41	76.00	0.001974	36 inch	0.014	27.51	4,453.25	4,453.10	4,463.33	4,464.02	4,458.42	4,457.85
P-94	SDMH 1-04	SDMH 1-03	N/A	53.60	65.00	0.002000	36 inch	0.014	27.70	4,453.48	4,453.35	4,462.74	4,463.33	4,459.35	4,458.86
P-93	SDMH 1-05	SDMH 1-04	N/A	53.82	78.00	0.002051	36 inch	0.014	28.05	4,453.74	4,453.58	4,462.08	4,462.74	4,460.38	4,459.80
P-83	SDMH 2-18	SDMH 2-17	N/A	10.68	108.00	0.022778	18 inch	0.014	14.72	4,489.90	4,487.44	4,496.00	4,493.54	4,491.15	4,489 05
P-78	SDMH 2-16	SDMH 2-15	N/A	10.54	128.00	0.022500	18 inch	0.014	14.63	4,482.35	4,479.47	4,488.45	4,485.35	4,483.60	4,480.75
P-77	SDMH 2-15	BT:CB 2-07	N/A	10.48	52.00	0.024808	24 inch	0.014	33.08	4,479.35	4,478.06	4,485.35	4,484.06	4,480.51	4,479.64
P-76	BT:CB 2-07	BT:CB 2-08	N/A	12.93	13.00	0.023077	24 inch	0.014	31.91	4,478.06	4,477.76	4,484.06	4,483.76	4,479.35	4,479.50
P-75	BT:CB 2-08	SDMH 2-14	N/A	15.34	95.00	0.022211	24 inch	0.014	31.30	4,477.76	4,475.65	4,483.76	4,481.75	4,479.17	4,477 38
P-72	SDMH 2-13	SDMH 2-12	N/A	15.19	160.00	0.020063	24 inch	0.014	29.75	4,472.63	4,469.42	4,478.73	4,475.52	4,474.04	4,471.14
P-67	BT:CB 1-06	SDMH 1-09	N/A	29.71	34.00	0.000588	24 inch	0.014	5.09	4,463.22	4,463.20	4,469.00	4,468.80	4,466.42	4,465.74
P-66	SDMH 1-10	BT:CB 1-08	N/A	7.29	33.00	0.010909	18 inch	0.014	10.19	4,467.15	4,466.79	4,473.25	4,473.00	4,468.75	4,468.57
P-65	BT:CB 1-08	SDMH 1-09	N/A	9.36	284.00	0 010880	18 inch	0.014	10.17	4,466.79	4,463 70	4,473.00	4,468.80	4,468.35	4,465.74
P-64	SDMH 1-09	SDMH 1-08	N/A	38.50	189.00	0.029947	30 inch	0.014	65.91	4,462.70	4,457.04	4,468.80	4,466.14	4,465.26	4,463.33
P-63	SDMH 1-08	SDMH 1-07	N/A	38.14	63.00	0.003651	36 inch	0.014	37.42	4,456.54	4,456.31	4,466.14	4,465.31	4,463.10	4,462.86
P-62	SDMH 1-07	BT 1-06	N/A	37.97	54.00	0.009259	36 inch	0.014	59.59	4,456.21	4,455 71	4,465.31	4,464.00	4,462.64	4,462.43
P-49	SDMH 2-24	BT 2-10	N/A	0.29	27.00	0.008519	12 inch	0.014	3.05	4,521 14	4,520.91	4,527.24	4,526.00	4,521.83	4,521.83
P-48	BT 2-10	O-3	N/A	2.26	202.00	0.004505	12 inch	0.014	2.22	4,520 91	4,520.00	4,526.00	4,522.00	4,521.75	4,520.64
P-45	SDMH 2-23	SDMH 2-22	N/A	5.51	186.00	0.025161	15 inch	0.014	9.51	4,480.95	4,476.27	4,487.05	4,482.15	4,481.90	4,477.23
P-44	SDMH 2-22	SDMH 2-21	N/A	5.43	144.00	0.011528	15 inch	0.014	6.44	4,476.05	4,474.39	4,482 15	4,479 70	4,476.99	4,475.27
P-41	SDMH 2-20	BT:CB 1-09	N/A	5.28	160.00	0.016750	15 inch	0.014	7.76	4,470.97	4,468.29	4,477.07	4,474.29	4,471.90	4,469 70
P-40	BT:CB 1-09	SDMH 1-10	N/A	7.31	38.00	0.027368	15 inch	0.014	9.92	4,468.29	4,467.25	4,474.29	4,473.25	4,469.37	4,468.88
P-38	SDMH 1-11	BT:CB 1-11	N/A	2.93	29.00	0.010690	12 inch	0.014	3 42	4,467 91	4,467.60	4,474.01	4,473.00	4,472.63	4,472.40
P-37	BT:CB 1-11	O-1	N/A	5.82	42.00	0.011905	12 inch	0.014	3.61	4,467.60	4,467.10	4,473.00	4,475.00	4,471.98	4,470.68
P-27	SDMH 2-26	SDMH 2-27	N/A	6.21	142.00	0 012676	18 inch	0.014	10.98	4,516.68	4,514.88	4,521.68	4,520.00	4,517.64	4,516.04
P-26	SDMH 2-27	O-4	N/A	6.12	111.00	0.007928	18 inch	0.014	8.68	4,514.88	4,514.00	4,520.00	4,516.00	4,515.84	4,514.93
P-22	SDMH 1-25	SDMH 1-24	N/A	11.14	100.00	0.023200	18 Inch	0 014	14.86	4,507.76	4,505.44	4,513.76	4,511.34	4,509.04	4,506.99
P-21	SDMH 1-24	BT:CB 1-18	N/A	11.06	113.00	0.047257	18 inch	0.014	21.20	4,505.34	4,500.00	4,511.34	4,505.74	4,506.61	4,502.04

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-20	BT:CB 1-1	SDMH 1-2	N/A	15.54	40.00	0.040250	18 inch	0.014	19.57	4,500.00	4,498.39	4,505.74	4,504.28	4,501.42	4,500.22
P-19	SDMH 1-2	SDMH 1-2	N/A	15.51	153.00	0.045621	18 inch	0.014	20.83	4,498.18	4,491.20	4,504.28	4,497.09	4,499.60	4,493.02
P-18	SDMH 1-2	SDMH 1-1	N/A	15.39	246.00	0.071585	18 inch	0.014	26.10	4,490.99	4,473.38	4,497.09	4,485.33	4,492.40	4,477.05
P-15	SDMH 1-2	SDMH 1-2	N/A	15.83	58.00	0.004828	30 inch	0.014	26.46	4,474.66	4,474.38	4,479.72	4,480.83	4,477.63	4,477 53
P-12	SDMH 1-1	SDMH 1-1	N/A	28.91	87.00	0.005057	30 inch	0.014	27.08	4,472.38	4,471.94	4,485.33	4,481.52	4,476.78	4,476.28
P-11	SDMH 1-1	BT:CB 1-1	N/A	28.75	71.00	0.005070	30 inch	0.014	27.12	4,471.84	4,471.48	4,481.52	4,479.48	4,476.01	4,475.61
P-10	BT:CB 1-1	SDMH 1-1	N/A	33.82	28.00	0.005000	30 inch	0.014	26.93	4,471.48	4,471.34	4,479.48	4,478.90	4,475.24	4,475.02
P-9	SDMH 1-1	SDMH 1-1	N/A	33.77	112.00	0.005893	36 inch	0.014	47.54	4,471.24	4,470.58	4,478.90	4,478.09	4,474.84	4,474.51
P-8	SDMH 1-1	SDMH 1-1	N/A	33.47	132.00	0.005000	36 inch	0.014	43.79	4,470 58	4,469.92	4,478.09	4,477.22	4,474.33	4,473.95
P-7	SDMH 1-1	SDMH 1-1	N/A	33.12	102.00	0.009314	36 inch	0.014	59.77	4,469.82	4,468.87	4,477.22	4,476.48	4,473.78	4,473.49
P-6	SDMH 1-1	BT:CB 1-1	N/A	32.85	118.00	0.003983	36 inch	0.014	39.09	4,468.77	4,468.30	4,476.48	4,475.69	4,473.32	4,472.99
P-3	SDMH 1-1	BT:CB 1-1	N/A	46.17	97.00	0.003505	36 inch	0.014	36.67	4,467.99	4,467.65	4,475.29	4,474.84	4,472.18	4,471.64
P-2	BT:CB 1-1	SDMH 1-1	N/A	48.03	43.00	0.003953	36 inch	0.014	38.94	4,467.65	4,467.48	4,474.84	4,474.63	4,471.28	4,471.03
P-1	SDMH 1-1	O-2	N/A	47.92	58.00	0.005690	42 inch	0.014	70.47	4,467 33	4,467.00	4,474.63	4,475.00	4,470.83	4,470.68
LAT:I-35	DITCH 2-1	O-8	0.00	0.00	57.00	0 020000	12 inch	0.014	4.68	4,530.00	4,528.86	4,533 00	4,531.86	4,530.00	4,528.86
LAT:CB 2-15	CB 2-15 A	SDMH 2-2	0.53	3 12	35.00	0.100000	12 inch	0.014	10.46	4,520.28	4,516.78	4,523.28	4,521.68	4,521.04	4,517.85
LAT:CB 2-14	CB 2-14 A	SDMH 2-2	0.53	3 38	26.00	0.145385	12 inch	0.014	12.61	4,520.56	4,516 78	4,523.56	4,521.68	4,521.35	4,517.85
LAT:CB 2-13	CB 2-13	SDMH 2-2	0.53	0.30	40.00	0.065750	12 inch	0 014	8.48	4,551.22	4,548.59	4,554.22	4,554.59	4,551.44	4,548.85
LAT:CB 2-12	CB 2-12	BT 2-10	0.53	2.04	25.00	0 161200	12 inch	0 014	13.28	4,525.94	4,521 91	4,528 94	4,526.00	4,526.55	4,522.18
LAT:CB 2-10	CB 2-10 A	SDMH 2-1	0.53	9.49	31 00	0 135484	12 inch	0 014	12.18	4,496 69	4,492.49	4,499 69	4,498.59	4,497.68	4,494.10
LAT:CB 2-09	CB 2-09	SDMH 2-1	0.53	2.44	49 00	0.088367	12 inch	0 014	9.83	4,496 82	4,492.49	4,499.82	4,498 59	4,497 49	4,494 10
LAT:CB 2-08	CB 2-08 A	BT:CB 2-0	0.53	2.81	24 00	0.112917	12 inch	0.014	11.12	4,480.97	4,478 26	4,483 97	4,483 76	4,481 69	4,479 50
LAT:CB 2-07	CB 2-07 A	BT:CB 2-0	0 53	2.87	7.00	0.384286	12 inch	0 014	20 51	4,481.25	4,478 56	4,484.25	4,484.06	4,481.98	4,479.64
LAT:CB 1-21	CB 1-22 A	SDMH 1-2	0.53	5.27	57.00	0.063684	12 inch	0.014	8 35	4,511.49	4,507.86	4,514.49	4,513 76	4,512 42	4,509 41
LAT:CB 1-20	CB 1-21 A	SDMH 1-2	0.53	3.84	40.00	0 096000	12 inch	0.014	10 25	4,511 70	4,507 86	4,514.70	4,513 76	4,512.53	4,509.41
LAT:CB 1-19	CB 1-20	SDMH 1-2	0.53	2.64	33 00	0 123030	12 inch	0.014	11.60	4,511.92	4,507.86	4,514.92	4,513 76	4,512 62	4,509.41
LAT:CB 1-18	CB 1-19 A	BT:CB 1-1	0.53	4.97	36.00	0.086111	12 inch	0.014	9.71	4,503.60	4,500.50	4,506.60	4,505.74	4,504.52	4,502.04
LAT:CB 1-17	CB 1-18 A	SDMH 1-2	0.53	7.53	50.00	0.024200	15 inch	0.014	9.33	4,476.62	4,475.41	4,479.62	4,479.72	4,478.50	4,477.71
LAT:CB 1-16	CB 1-17 A	SDMH 1-2	0.53	9.14	58.00	0.020862	15 inch	0.014	8.66	4,476.62	4,475.41	4,479.62	4,479.72	4,479.06	4,477.71
LAT:CB 1-15	CB 1-16	BT:CB 1-1	0.53	6.41	5.00	0.732000	12 inch	0.014	28.30	4,476.64	4,472.98	4,479.64	4,479 48	4,477 61	4,475.61
LAT:CB 1-14	CB 1-15 A	BT:CB 1-1	0.53	9.81	7.00	0 397143	12 inch	0.014	20.85	4,472.97	4,470.19	4,475.97	4,475 69	4,473.96	4,472.99
LAT:CB 1-13	CB 1-14	SDMH 1-1	0.53	6.98	26.00	0.135000	12 inch	0.014	12.15	4,473.50	4,469.99	4,476.50	4,475 29	4,474.47	4,472.51
LAT:CB 1-12	CB 1-13	BT:CB 1-1	0.53	2.32	27.00	0.128148	12 inch	0.014	11.84	4,472.06	4,468.60	4,475.06	4,474.84	4,472.71	4,471.64
LAT:CB 1-11	CB 1-12	BT:CB 1-1	0.53	2.92	12.00	0.140000	12 inch	0.014	12.38	4,471.12	4,469.44	4,474.12	4,473.00	4,472 50	4,472.40
LAT:CB 1-10	CB 1-11	SDMH 1-1	0.53	2.94	12.00	0.100833	12 inch	0.014	10.50	4,471.12	4,469.91	4,474.12	4,474.01	4,472 83	4,472.74

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Rational Coefficient	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
LAT:CB 1-09	CB 1-10	BT:CB 1-09	0.53	2.41	34.00	0.055882	12 inch	0.014	7.82	4,471.19	4,469.29	4,474.19	4,474.29	4,471.85	4,469.67
LAT:CB 1-08	CB 1-09 A-	BT:CB 1-08	0.53	2.59	7.00	0.134286	12 inch	0.014	12.12	4,470.00	4,469.06	4,473.00	4,473.00	4,470.69	4,469.45
LAT:CB 1-06	CB 1-07 A-	BT:CB 1-06	0.53	6.68	7.00	0.341429	12 inch	0.014	19.33	4,466.11	4,463.72	4,469.11	4,469.00	4,467.40	4,467 11
LAT:CB 1-05	CB 1-06	BT 1-06	0.53	4.59	54.00	0.090741	12 inch	0.014	9.97	4,461.61	4,456.71	4,464.61	4,464.00	4,463.47	4,462.43
LAT:CB 1-02	CB 1-02 A-	BT:CB 1-02	0.53	2.70	6.00	0.435000	12 inch	0.014	21.82	4,469.11	4,466.50	4,472.11	4,472 14	4,469.81	4,468.33
LAT: CB 2-11	CB 2-11 A-	SDMH 2-23	0.53	5.52	53.00	0.085094	12 inch	0.014	9.65	4,485.46	4,480.95	4,488.46	4,487.05	4,486.40	4,482.14
LAT: CB 1-08	CB 1-08 A-	BT:CB 1-06	0.53	9.42	26.00	0.106538	12 inch	0.010	15.12	4,466.49	4,463.72	4,469.49	4,469.00	4,468.18	4,467.11
LAT: CB 1-03	CB 1-04 A-	SDMH 1-05	0.53	7.26	34.00	0.073529	12 inch	0.010	12.56	4,459.24	4,456.74	4,462.35	4,462.08	4,461.67	4,460.84
LAT: 2-06	CB 2-06 A-	SDMH 2-10	0.53	4.54	45.00	0.085333	12 inch	0.014	9.66	4,519.48	4,515.64	4,522.48	4,521.60	4,520.37	4,519.50
LAT: 2-05	CB 2-05	SDMH 2-10	0.53	2.53	27.00	0.117778	12 inch	0.014	11.35	4,518.82	4,515.64	4,521.82	4,521.60	4,519.57	4,519.50
LAT: 2-03	CB 2-03 A-	BT: 2-03	0.53	1.80	32.00	0.115000	12 inch	0.010	15.71	4,514.66	4,510.98	4,517.66	4,517.22	4,515.23	4,512.35
LAT: 1-25	CB 1-25	BT 1-25	0.53	7.36	23.00	0.182174	12 inch	0.014	14.12	4,459.95	4,455.76	4,462.95	4,463.07	4,460.93	4,458.04
LAT 2-04	CB 2-04 A-	BT 2-04	0.53	5.93	7.00	0.458571	12 inch	0.014	22.40	4,515.41	4,512 20	4,518.41	4,518.20	4,516.36	4,515.82
LAT 2-02	CB 2-02 A-	BT:CB 2-02	0.53	2.85	26.00	0.087308	12 inch	0.014	9 77	4,486.73	4,484.46	4,489.73	4,489.46	4,487.45	4,485 21
LAT 2-01	CB 2-01 A-	SDMH 2-02	0.53	2.81	10 00	0.233000	12 inch	0.014	15.97	4,485.92	4,483.59	4,488.92	4,488 69	4,486.64	4,484 51
LAT 1-3	CB 1-03	BT:CB 1-3	0.53	2 11	24.00	0.117083	12 inch	0.010	15 85	4,472 37	4,469 56	4,475 37	4,475 00	4,472.99	4,470 65
LAT 1-26	CB 1-26 A-	SDMH 1-30	0.53	7.14	22.00	0 108182	12 inch	0.010	15.23	4,460 61	4,458 23	4,463.61	4,463.73	4,461.59	4,459.99
LAT 1-24	CB 1-24	BT 1-24	0.53	2.55	54.00	0.072593	12 inch	0.014	8.91	4,460.95	4,457.03	4,463.95	4,460.00	4,461.63	4,458 53
LAT 1-01	CB 1-01 A-	BT.CB 1-01	0.53	6.47	54.00	0.053889	12 inch	0.014	7 68	4,468.80	4,465.89	4,471.80	4,471.84	4,469 86	4,467.79

Inlet Report

Label	Calculated Station (ft)	Ground Elevation (ft)	Rim Elevation (ft)	Sump Elevation (ft)	Area (acres)	Inlet C	Inlet CA (acres)	Total Flow To Inlet (cfs)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target	Time of Concentration (min)	Inlet Location	Known Flow (cfs)	Inlet
CB 1-01 A-E	9+31	4,471.80	4,471.80	4,468.80	1.40	0.53	0.74	6.47	6.47	0.00		11.96	In Sag	0.00	Combination DUAL
CB 1-02 A-E	8+99	4,472.11	4,472.11	4,469.11	1.49	0.53	0.79	5.27	2.70	2.56	CB 1-04 A-	11.87	On Grad	0.00	Combination DUAL
CB 1-03	10+67	4,475.37	4,475.37	4,472.37	2.29	0.53	1.21	3.50	2.11	1.39	CB 1-01 A-	13.79	On Grad	0.00	Combination 4R
CB 1-04 A-E	7+04	4,462.35	4,462.35	4,459.24	3.42	0.53	1.81	7.26	7.26	0.00		14.92	In Sag	0.00	Combination DUAL
CB 1-05 A-E	6+91	4,462.24	4,462.24	4,459.24	4.59	0.53	2.43	6.54	6.54	0.00		15.89	In Sag	0.00	Combination DUAL
CB 1-06	9+58	4,464.61	4,464.61	4,461.61	2.99	0.53	1.58	4.59	4.59	0.00		13.66	In Sag	0.00	Combination 4R
CB 1-07 A-E	12+51	4,469.11	4,469.11	4,466.11	2.90	0.53	1.54	6.68	6.68	0.00		14.84	In Sag	0.00	Combination DUAL
CB 1-08 A-E	12+70	4,469.49	4,469.49	4,466.49	2.87	0.53	1 52	9.42	9.42	0.00		14.15	In Sag	0.00	Combination DUAL
CB 1-09 A-E	*15+01*	*4,473.00*	*4,473.00*	*4,470 00*	*3.60*	*0 53*	*1.91*	*5.21*	*2.59*	*2 62*	*CB 1-08 A-*	*15.18*	*On Grad*	*0.00*	*Combination DUAL*
CB 1-10	15+99	4,474 19	4,474.19	4,471.19	2 59	0.53	1.37	4 48	2.41	2.07	CB 1-11	13.14	On Grad	0.00	Combination 4R
CB 1-11	0+83	4,474.12	4,474.12	4,471.12	0.35	0.53	0.19	2 94	2.94	0.00		10 00	In Sag	0.00	Combination 4R
CB 1-12	0+54	4,474.12	4,474.12	4,471.12	0.06	0.53	0.03	2 92	2.92	0.00		10.00	In Sag	0.00	Combination 4R
CB 1-13	1+28	4,475.06	4,475.06	4,472.06	3.17	0.53	1.68	4.69	2.32	2.37	CB 1-12	14.58	On Grad	0.00	Combination 4R
CB 1-14	2+24	4,476.50	4,476.50	4,473.50	2.91	0 53	1 54	6 98	6 98	0.00		13.04	In Sag	0.00	Combination 4R
CB 1-15 A-E	2+57	4,475.97	4,475 97	4,472 97	4.40	0 53	2.33	9 81	9.81	0 00		10 44	In Sag	0 00	Combination DUAL
CB 1-16	7+47	4,479.64	4,479.64	4,476.64	3.66	0.53	1.94	6.41	6.41	0.00		10 11	In Sag	0.00	Combination 4R
CB 1-17 A-E	12+56	4,479.62	4,479.62	4,476.62	6.01	0 53	3.19	9.14	9.14	0 00		13.88	In Sag	0.00	Combination DUAL
CB 1-18 A-E	12+48	4,479.62	4,479.62	4,476.62	4.45	0.53	2.36	7.53	7.53	0.00		11.07	In Sag	0.00	Combination DUAL
CB 1-19 A-E	13+75	4,506 60	4,506.60	4,503.60	1.81	0.53	0 96	4 97	4 97	0.00		10.00	In Sag	0.00	Combination DUAL
CB 1-20	15+85	4,514 92	4,514 92	4,511.92	2.64	0.53	1.40	4.30	2 64	1.66	CB 1-19 A-	12.12	On Grad	0.00	Combination 4R
CB 1-21 A-E	15+92	4,514.70	4,514.70	4,511.70	4.88	0.53	2.59	8.40	3.84	4.56	CB 1-22 A-	10.58	On Grad	0.00	Combination DUAL
CB 1-22 A-E	*16+09*	*4,514.49*	*4,514.49*	*4,511.49*	*0.35*	*0.53*	*0.19*	*5.27*	*5.27*	*0.00*		*10.00*	*In Sag*	*0.00*	*Combination DUAL*
CB 1-23	0+89	4,463.95	4,463.95	4,460.95	2.24	0.53	1.19	3.39	3.39	0.00		14.04	In Sag	0.00	Combination 4R
CB 1-24	1+23	4,463.95	4,463.95	4,460.95	1.71	0.53	0 91	2.55	2.55	0.00		14.40	In Sag	0.00	Combination 4R
CB 1-25	0+41	4,462.95	4,462.95	4,459.95	1.65	0.53	0.87	7.36	7.36	0.00		14.85	In Sag	0.00	Combination DUAL
CB 1-26 A-E	1+85	4,463.61	4,463.61	4,460.61	5.94	0.53	3.15	11.97	7.14	4.83	CB 1-25	15.76	On Grad	0.00	Combination DUAL
CB 1-27 A-E	5+35	4,465.18	4,465.18	4,462.18	6.56	0.53	3.48	9.42	5.92	3.50	CB 1-26 A-	15.54	On Grad	0.00	Combination DUAL
CB 2-01 A-E	16+40	4,488.92	4,488 92	4,485.92	3.72	0.53	1.97	5.21	2.81	2.40	CB 1-02 A-	16.69	On Grad	0.00	Combination DUAL
CB 2-02 A-E	16+85	4,489.73	4,489.73	4,486.73	2.80	0.53	1.48	5.35	2.85	2.49	CB 1-01 A-	13.91	On Grad	0.00	Combination DUAL
CB 2-03 A-E	26+44	4,517.66	4,517.66	4,514.66	0.07	0.53	0.04	2.96	1.80	1.16	CB 2-02 A-	12.26	On Grad	0.00	Combination DUAL
CB 2-04 A-E	26+82	4,518.41	4,518.41	4,515.41	1.47	0.53	0.78	5.93	5.93	0.00		12.01	In Sag	0.00	Combination DUAL
CB 2-05	29+66	4,521.82	4,521.82	4,518.82	3.51	0.53	1.86	5.07	2.53	2.54	CB 2-03 A-	15.26	On Grad	0.00	Combination Type4
CB 2-06 A-E	29+84	4,522.48	4,522.48	4,519.48	5.16	0.53	2.73	7.79	4.54	3.25	CB 2-04 A-	14.06	On Grad	0.00	Combination DUAL
CB 2-07 A-E	19+84	4,484.25	4,484.25	4,481.25	3.42	0.53	1.81	5.59	2.87	2.72	CB 1-07 A-	12.00	On Grad	0.00	Combination DUAL
CB 2-08 A-E	19+88	4,483.97	4,483.97	4,480.97	2.01	0.53	1.07	5.38	2.81	2.58	CB 1-08 A-	11.95	On Grad	0 00	Combination DUAL

Inlet Report

Label	Calculated Station (ft)	Ground Elevation (ft)	Rim Elevation (ft)	Sump Elevation (ft)	Area (acres)	Inlet C	Inlet CA (acres)	Total Flow To Inlet (cfs)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target	Time of Concentration (min)	Inlet Location	Known Flow (cfs)	Inlet
CB 2-09	26+48	4,499.82	4,499.82	4,496.82	2.96	0.53	1.57	4.28	2.44	1.85	CB 2-08 A-	15.18	On Grad	0.00	Combination 4R
CB 2-10 A-E	26+30	4,499.69	4,499.69	4,496.69	5.74	0.53	3.04	9.49	9.49	0.00		11.71	In Sag	0.00	Combination DUAL
CB 2-11 A-E	22+64	4,488.46	4,488.46	4,485.46	3.14	0.53	1.66	5.52	5.52	0.00		10.00	In Sag	0.00	Combination DUAL
CB 2-12	2+27	4,528.94	4,528.94	4,525.94	1.45	0.53	0.77	2.50	2.04	0.46	CB 1-10	10.54	On Grad	0.00	Combination 4R
CB 2-13	6+20	4,554.22	4,554.22	4,551.22	0.17	0.53	0.09	0 30	0 30	0.00	CB 2-04 A-	10.00	On Grad	0.00	Combination 4R
CB 2-14 A-E	2+79	4,523.56	4,523.56	4,520.56	3.48	0.53	1.84	6.02	3.38	2.64	CB 1-14	10.47	On Grad	0.00	Combination DUAL
CB 2-15 A-E	2+88	4,523.28	4,523.28	4,520.28	3.23	0.53	1.71	5.13	3.12	2.01	CB 1-15 A-	12.79	On Grad	0.00	Combination DUAL
DITCH 2-1	0+57	4,533.00	4,533.00	4,530.00	3.07	0.00	0.00	0.00	0.00	0.00		18.33	In Sag	0.00	Generic Default 10
I-43	9+79	4,468.00	4,468.00	4,465 00	0.00	0.00	0 00	4 50	4 50	0 00		0 00	In Sag	0 00	Generic Default 10

Scenario: Base

Junction Report

Label	Calculated Station (ft)	Ground Elevation (ft)	Set Rim Equal to Ground Elevation?	Rim Elevation (ft)	Sump Elevation (ft)	Bolted Cover?	Structure Diameter (ft)	Description
BT 1-06	9+04	4,464 00	true	4,464.00	4,455.71	true	0.00	
BT 1-23	0+28	4,460.00	true	4,460.00	4,456.82	true	0.00	
BT 1-24	0+69	4,460.00	true	4,460.00	4,457.03	true	0.00	
BT 1-25	0+18	4,463 07	true	4,463.07	4,455.76	true	0.00	
BT 2-04	26+75	4,518.20	true	4,518.20	4,512.20	true	0.00	
BT 2-10	2+02	4,526.00	true	4,526.00	4,520.91	true	0.00	
BT: 2-03	26+12	4,517 22	true	4,517.22	4,510.98	true	0.00	
BT:CB 1-01	8+77	4,471.84	true	4,471.84	4,465.35	true	0 00	
BT:CB 1-02	8+93	4,472.14	true	4,472.14	4,466.00	true	0.00	
BT:CB 1-06	12+44	4,469.00	true	4,469.00	4,463.22	true	0.00	
BT:CB 1-08	14+94	4,473.00	true	4,473.00	4,466.79	true	0.00	
BT:CB 1-09	15+65	4,474.29	true	4,474.29	4,468.29	true	0.00	
BT:CB 1-11	0+42	4,473.00	true	4,473.00	4,467.60	true	0.00	
BT:CB 1-12	1+01	4,474.84	true	4,474.84	4,467.65	true	0.00	
BT:CB 1-14	2+50	4,475.69	true	4,475.69	4,468.30	true	0.00	
BT:CB 1-15	7+42	4,479.48	true	4,479.48	4,471.48	true	0.00	
BT.CB 1-18	13+39	4,505.74	true	4,505.74	4,500.00	true	0.00	
BT:CB 1-3	10+43	4,475.00	true	4,475.00	4,469.06	true	0.00	
BT:CB 2-02	16+59	4,489.46	true	4,489.46	4,483.46	true	0.00	
BT:CB 2-07	19+77	4,484.06	true	4,484.06	4,478.06	true	0.00	
BT:CB 2-08	19+64	4,483.76	true	4,483.76	4,477.76	true	0.00	
SDMH 1-01	3+91	4,464.54	true	4,464.54	4,452.78	false	4.00	
SDMH 1-02	4+51	4,464.02	true	4,464.02	4,453.00	false	4.00	
SDMH 1-03	5+27	4,463.33	true	4,463.33	4,453.25	false	4.00	
SDMH 1-04	5+92	4,462.74	true	4,462.74	4,453.48	false	4.00	
SDMH 1-05	6+70	4,462 08	true	4,462.08	4,453.74	false	4.00	
SDMH 1-06	7+49	4,462.48	true	4,462.48	4,454.38	false	4.00	
SDMH 1-07	9+58	4,465.31	true	4,465.31	4,456.21	false	4.00	
SDMH 1-08	10+21	4,466.14	true	4,466.14	4,456.54	false	4.00	
SDMH 1-09	12+10	4,468.80	true	4,468.80	4,462.70	false	4.00	
SDMH 1-10	15+27	4,473.25	true	4,473.25	4,467.15	false	4.00	
SDMH 1-11	0+71	4,474.01	true	4,474.01	4,467.91	false	4.00	
SDMH 1-12	0+58	4,474.63	true	4,474.63	4,467.33	false	4.00	
SDMH 1-13	1+98	4,475.29	true	4,475.29	4,467.99	false	4.00	
SDMH 1-14	3+68	4,476 48	true	4,476.48	4,468.77	false	4.00	
SDMH 1-15	4+70	4,477.22	true	4,477.22	4,469.82	false	4.00	
SDMH 1-16	6+02	4,478.09	true	4,478 09	4,470.58	false	4.00	
SDMH 1-17	7+14	4,478.90	true	4,478.90	4,471.24	false	4.00	
SDMH 1-18	8+13	4,481.52	true	4,481.52	4,471.84	false	4.00	
SDMH 1-19	9+00	4,485.33	true	4,485.33	4,472.38	false	4.00	
SDMH 1-20	11+40	4,480.83	true	4,480.83	4,474.28	false	4.00	
SDMH 1-21	11+98	4,479.72	true	4,479.72	4,474 66	false	4.00	
SDMH 1-22	11+46	4,497.09	true	4,497.09	4,490.99	false	4.00	
SDMH 1-23	12+99	4,504 28	true	4,504 28	4,498.18	false	4.00	
SDMH 1-24	14+52	4,511.34	true	4,511.34	4,505.34	false	4.00	
SDMH 1-25	15+52	4,513 76	true	4,513.76	4,507.76	false	4.00	
SDMH 1-26	4+68	4,465.25	true	4,465.25	4,453.03	false	4.00	
SDMH 1-27	6+10	4,466.78	true	4,466.78	4,453.41	false	4.00	
SDMH 1-28	8+99	4,472.37	true	4,472.37	4,466.27	false	4.00	
SDMH 1-29	11+64	4,477.24	true	4,477.24	4,471.14	false	4.00	
SDMH 1-30	1+63	4,463.73	true	4,463.73	4,458.13	false	4.00	

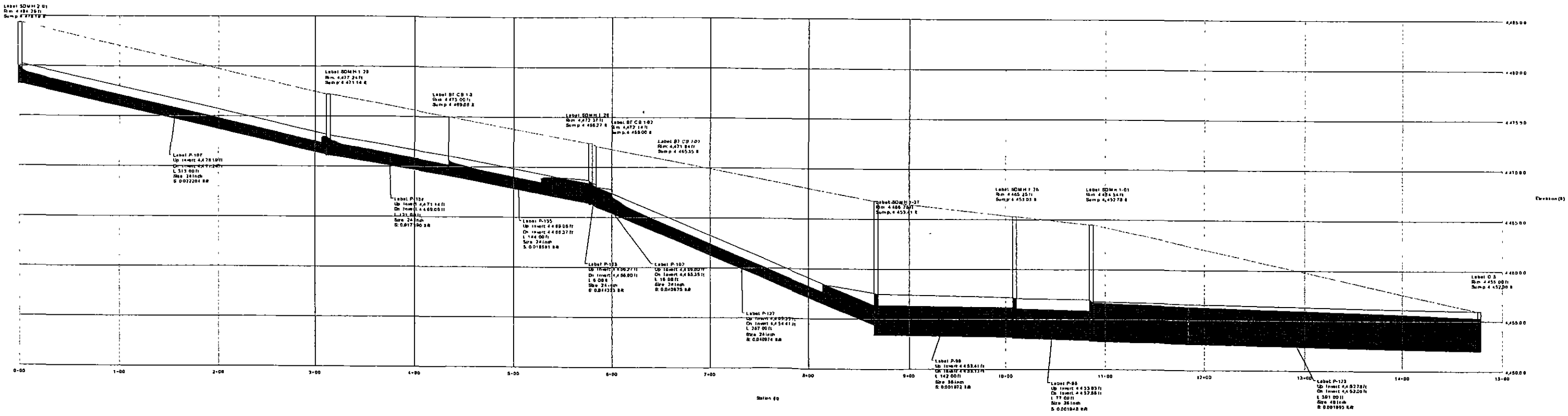
Scenario: Base

Junction Report

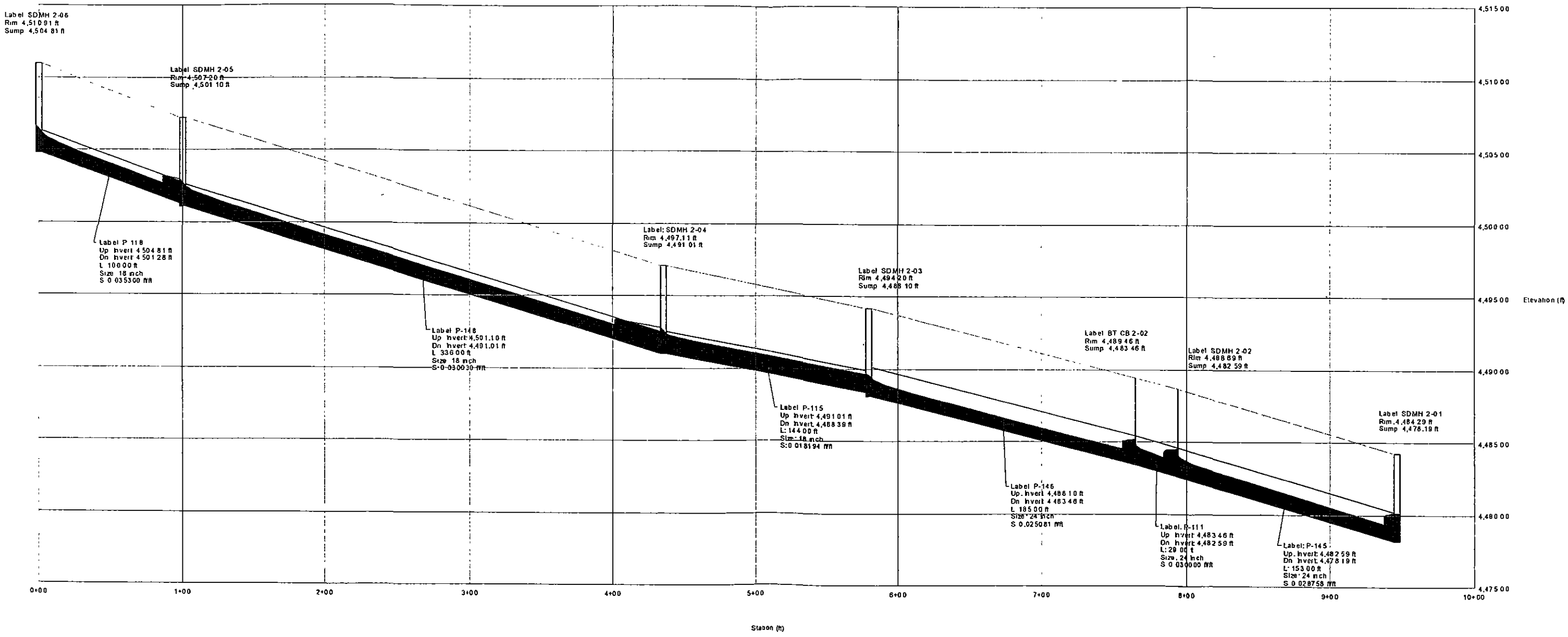
Label	Calculated Station (ft)	Ground Elevation (ft)	Set Rim Equal to Ground Elevation?	Rim Elevation (ft)	Sump Elevation (ft)	Bolted Cover?	Structure Diameter (ft)	Description
SDMH 1-31	5+13	4,465.30	true	4,465.30	4,459.98	false	4.00	
SDMH 1-32	8+63	4,466.68	true	4,466 88	4,461.83	false	4.00	
SDMH 2-01	14+77	4,484.29	true	4,484.29	4,478.19	false	4.00	
SDMH 2-02	16+30	4,488 69	true	4,488.69	4,482.59	true	0.00	
SDMH 2-03	18+44	4,494.20	true	4,494.20	4,488.10	false	4.00	
SDMH 2-04	19+88	4,497.11	true	4,497.11	4,491.01	false	4.00	
SDMH 2-05	23+24	4,507.20	true	4,507.20	4,501.10	false	4.00	
SDMH 2-06	24+24	4,510.91	true	4,510.91	4,504 81	false	4.00	
SDMH 2-07	25+24	4,514.61	true	4,514.61	4,508.51	false	4.00	
SDMH 2-08	26+20	4,517.31	true	4,517.31	4,511.21	false	4.00	
SDMH 2-09	27+29	4,518.81	true	4,518.81	4,512.71	false	4.00	
SDMH 2-10	29+39	4,521.60	true	4,521.60	4,515.60	false	4.00	
SDMH 2-11	13+96	4,472.78	true	4,472.78	4,466.68	false	4.00	
SDMH 2-12	15+58	4,475.52	true	4,475.52	4,469.42	false	4.00	
SDMH 2-13	17+18	4,478.73	true	4,478.73	4,472.63	false	4.00	
SDMH 2-14	18+69	4,481.75	true	4,481.75	4,475.65	false	4.00	
SDMH 2-15	20+29	4,485.35	true	4,485.35	4,479.35	false	4.00	
SDMH 2-16	21+57	4,488.45	true	4,488.45	4,482.35	false	4.00	
SDMH 2-17	23+72	4,493.54	true	4,493.54	4,487.44	false	4.00	
SDMH 2-18	24+80	4,496.00	true	4,496.00	4,489.90	false	4.00	
SDMH 2-19	25+99	4,498.59	true	4,498.59	4,492.49	false	4.00	
SDMH 2-20	17+25	4,477.07	true	4,477.07	4,470.97	false	4.00	
SDMH 2-21	18+81	4,479.70	true	4,479.70	4,473.60	false	4.00	
SDMH 2-22	20+25	4,482.15	true	4,482.15	4,476.05	false	4.00	
SDMH 2-23	22+11	4,487.05	true	4,487.05	4,480.95	false	4.00	
SDMH 2-24	2+29	4,527.24	true	4,527 24	4,521.14	false	4.00	
SDMH 2-25	5+80	4,554.59	true	4,554.59	4,548.59	false	4.00	
SDMH 2-26	2+53	4,521.68	true	4,521 68	4,516.68	false	4.00	
SDMH 2-27	1+11	4,520.00	true	4,520.00	4,514.88	false	4.00	

Profile
Scenario: Base

Profile: GOLD RIVER NORTH - A
Scenario: Base

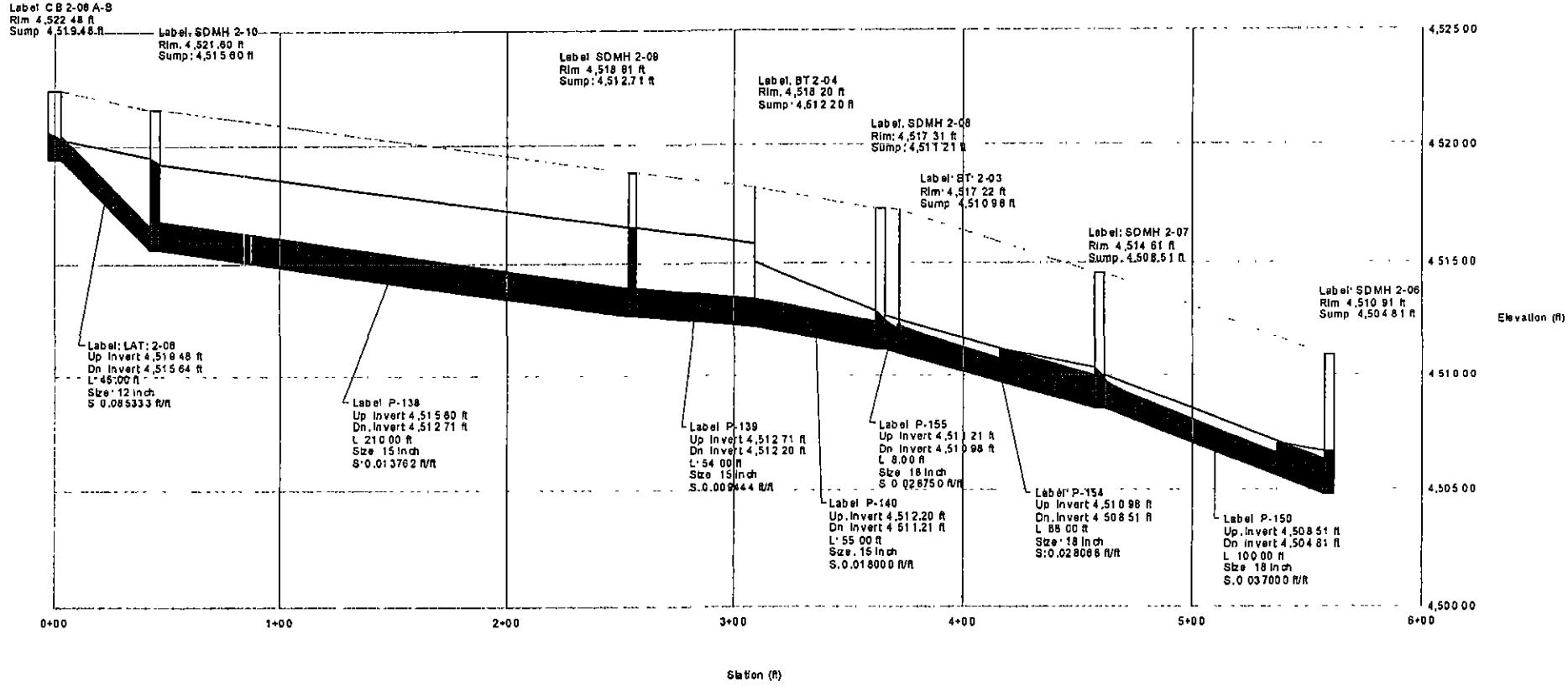


Profile: GOLD RIVER NORTH - B
Scenario. Base



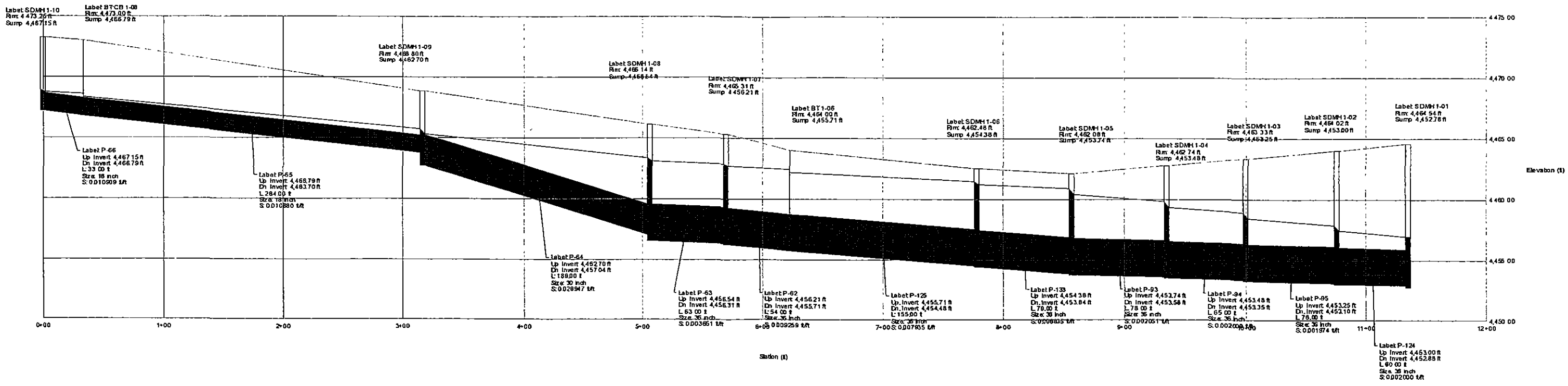
Profile
Scenario: Base

Profile: GOLD RIVER NORTH - C
Scenario: Base



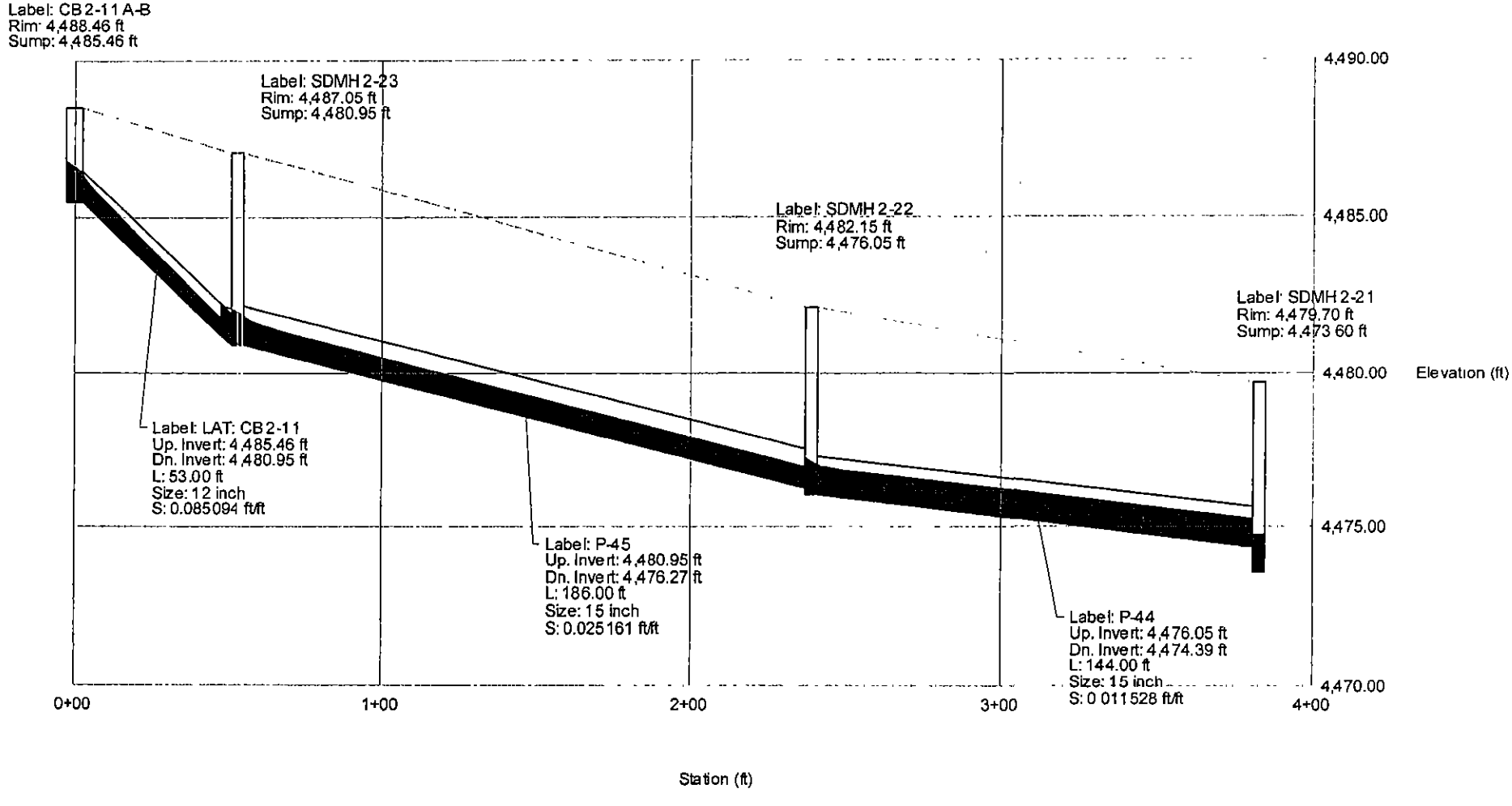
Profile
Scenario: Base

Profile: GOLD RIVER SOUTH - A
Scenario: Base



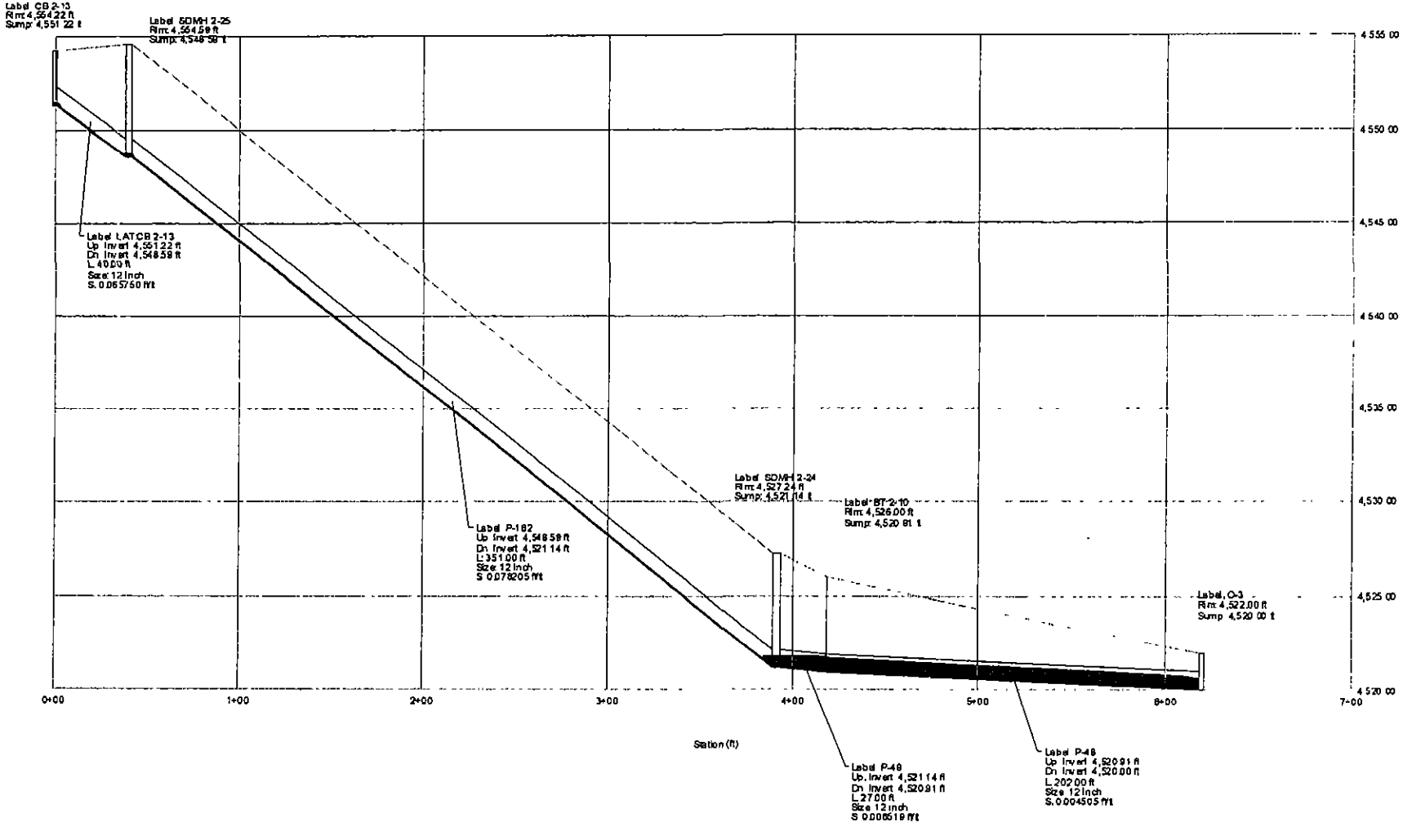
Profile: HOLLOW BASIN - A

Scenario: Base



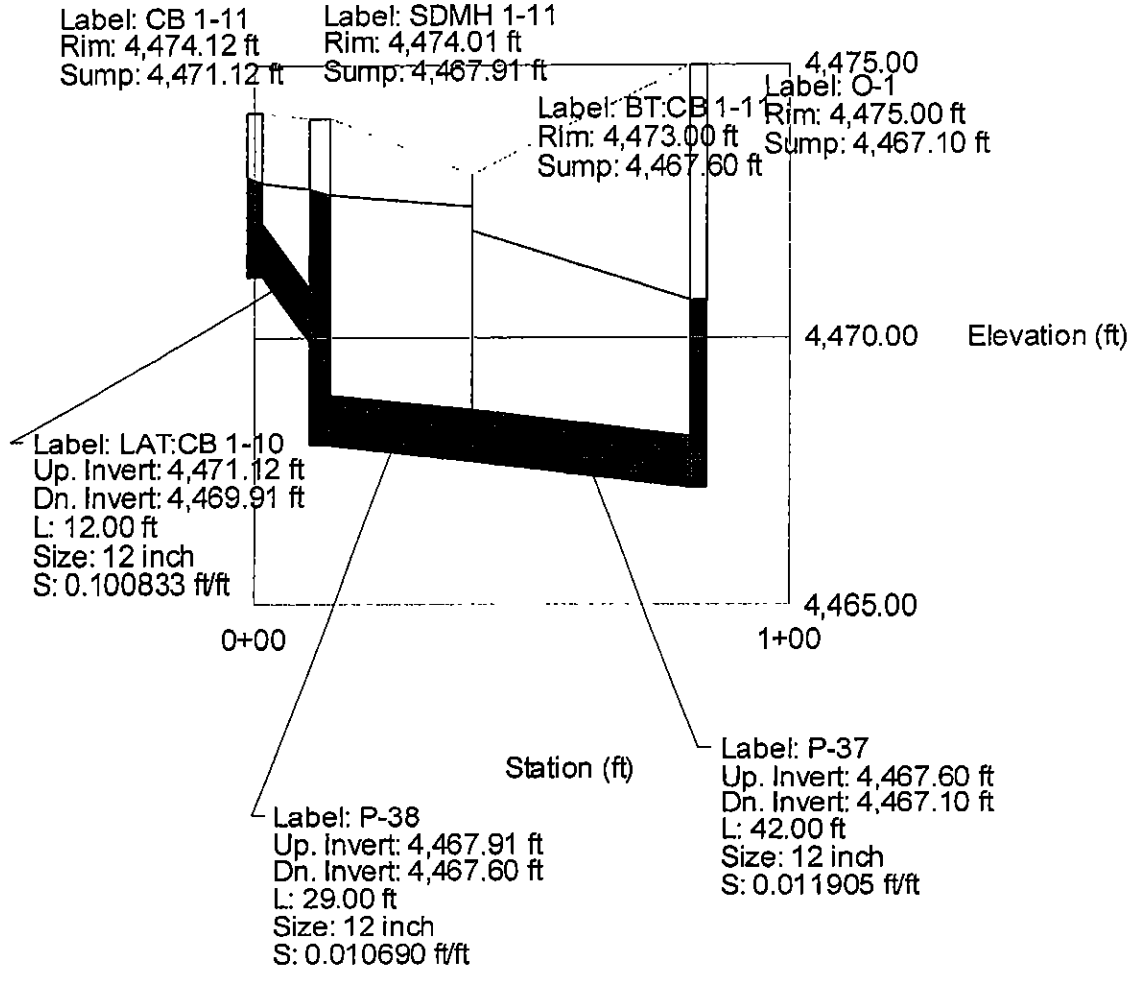
file
Scenario: Base

Profile: HOLLOWBASIN - B
Scenario: Base



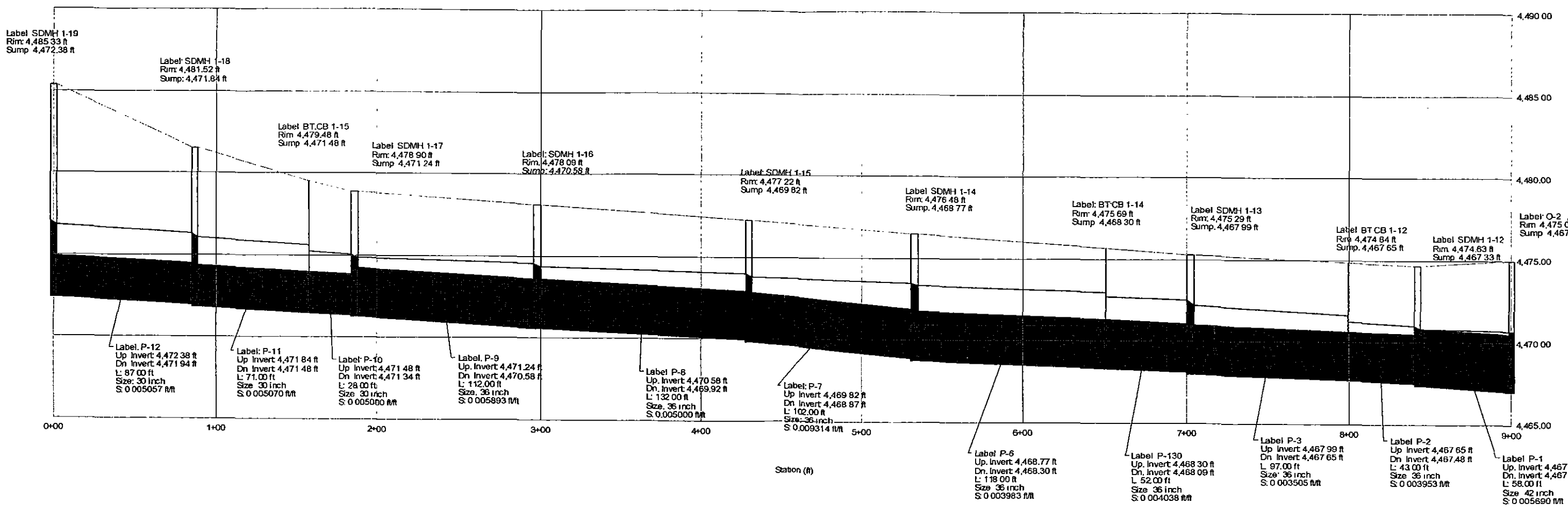
Profile: GOLD RIVER SOUTH - B

Scenario: Base



Profile
Scenario: Base

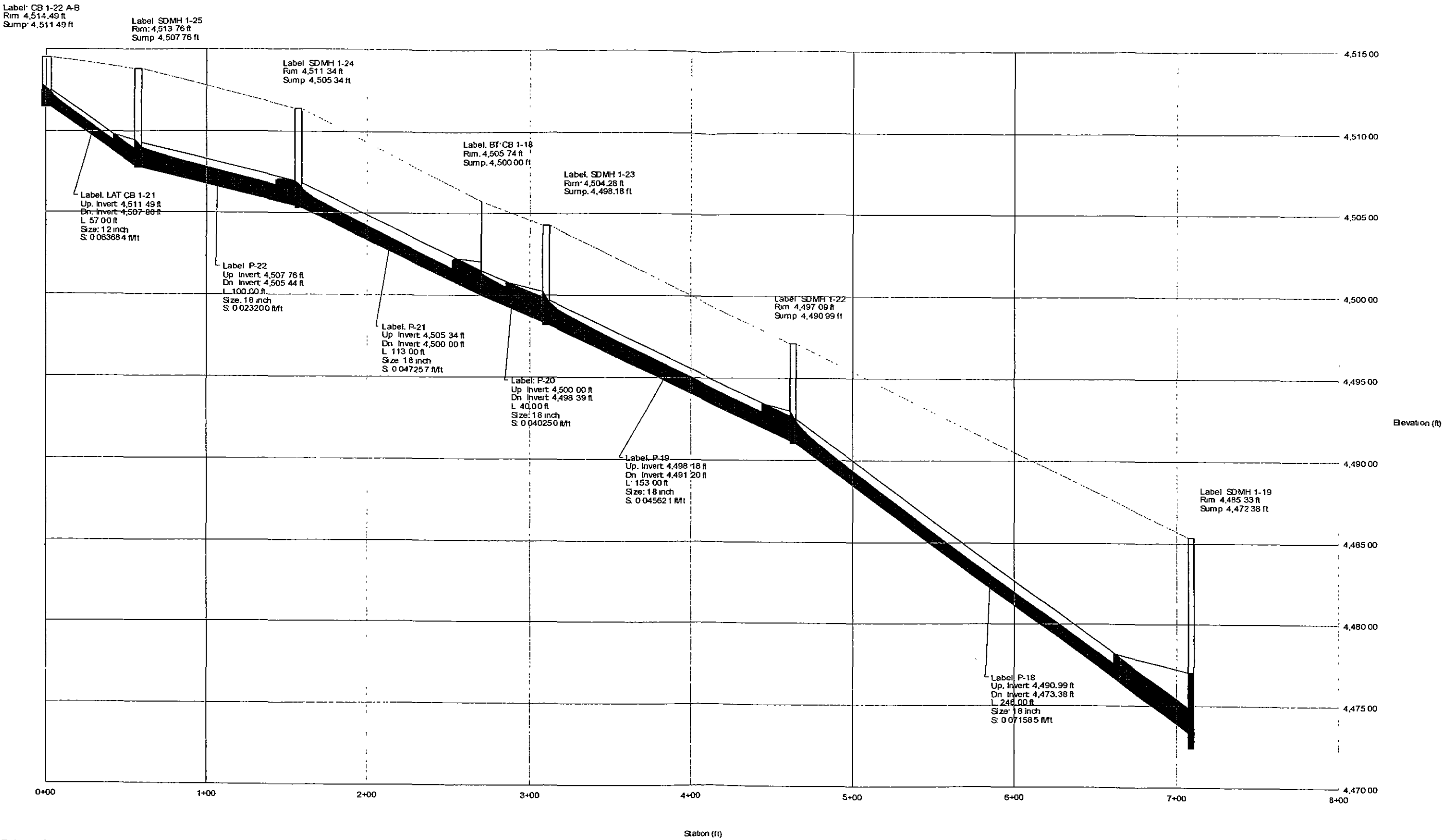
Profile: GOLD RIVER SOUTH - C
Scenario: Base



Profile
Scenario: Base

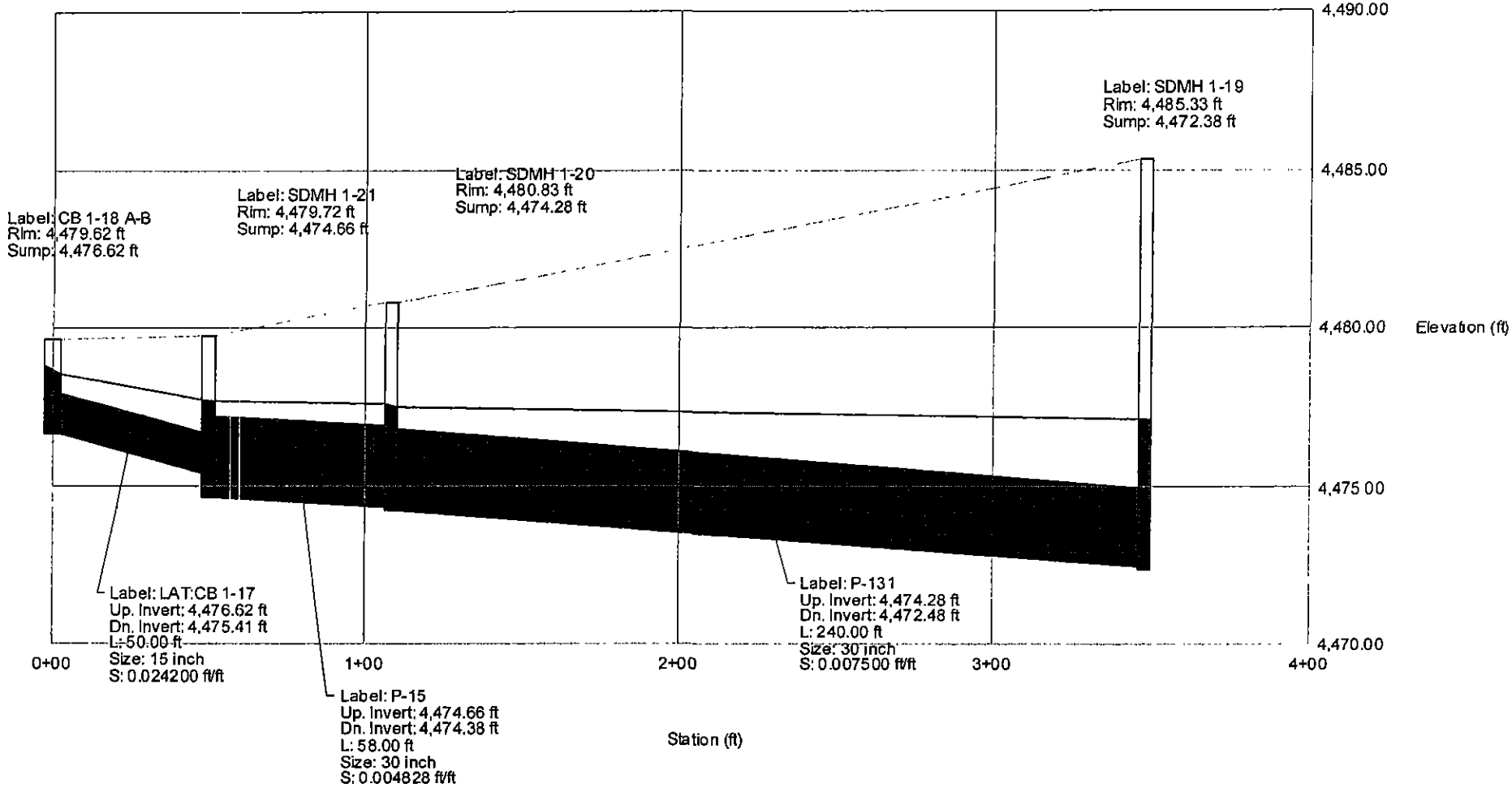
Profile: GOLD RIVER SOUTH - D

Scenario: Base



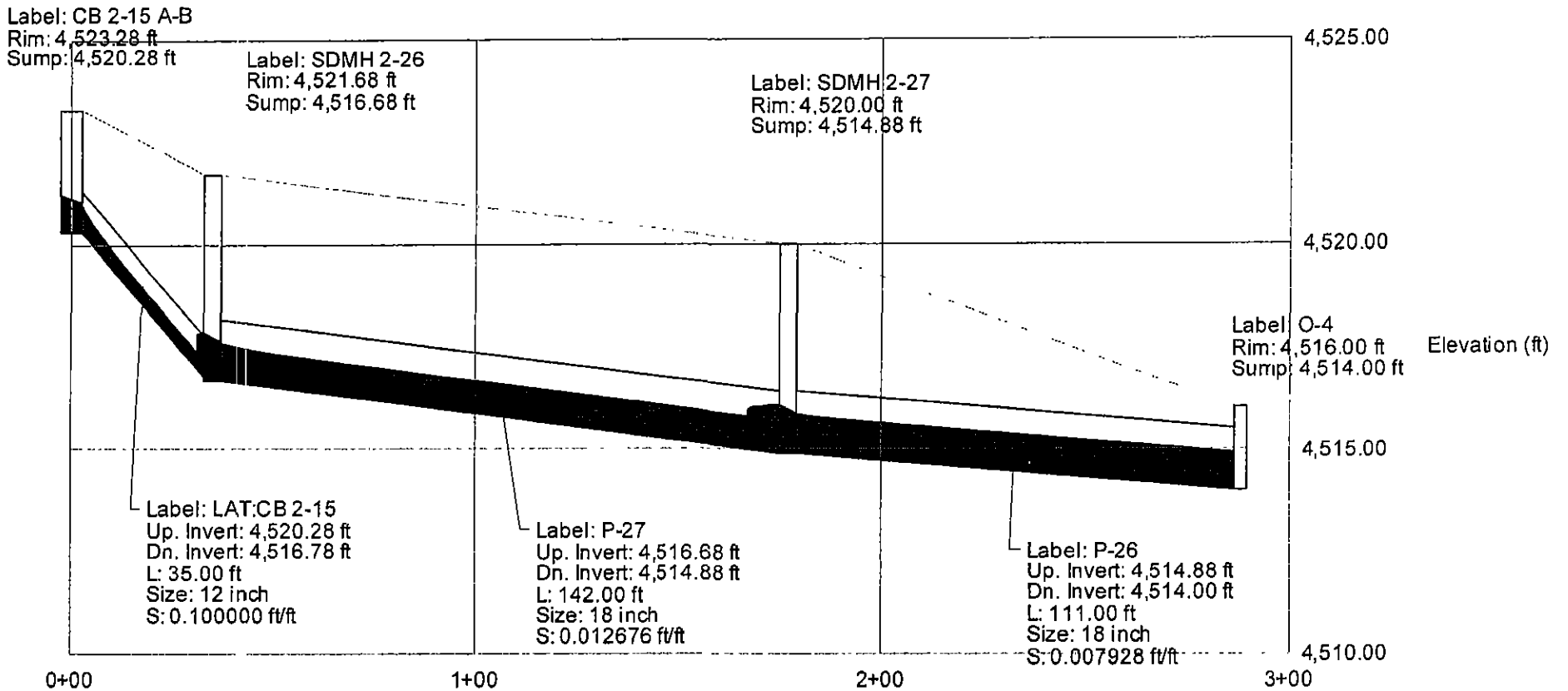
Profile: DRY GULCH - A

Scenario: Base



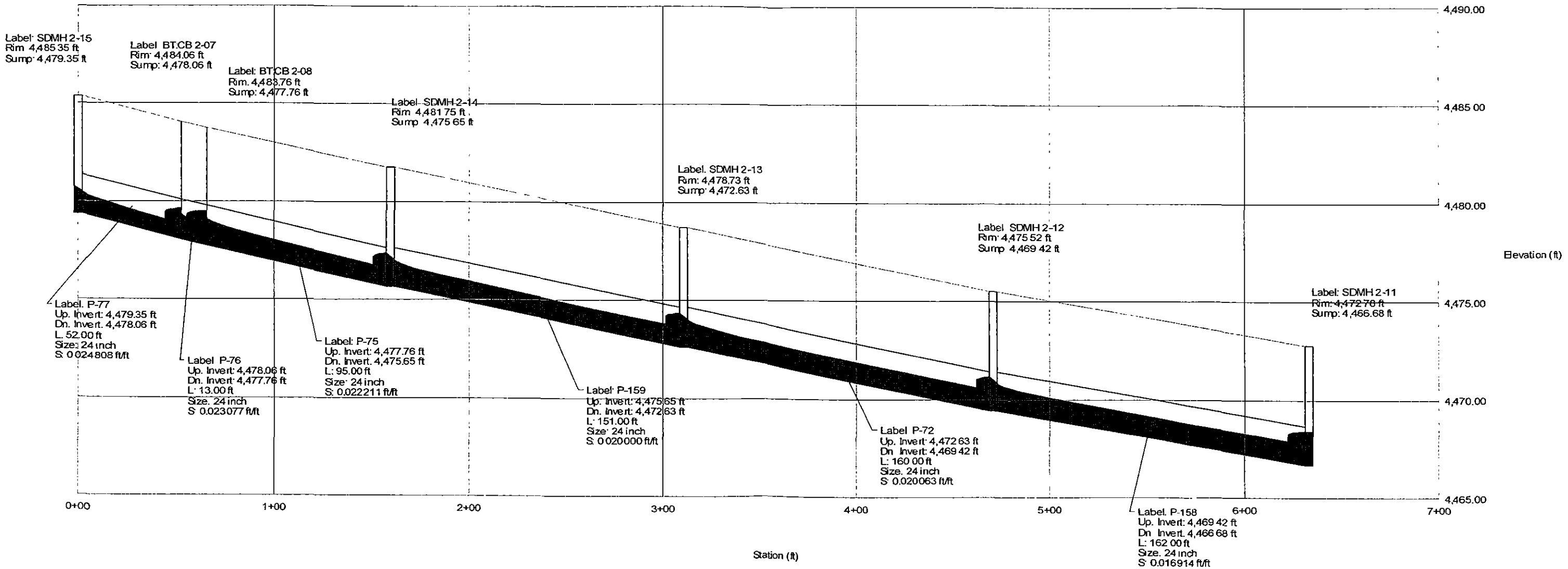
Profile: DRY GULCH - B

Scenario: Base



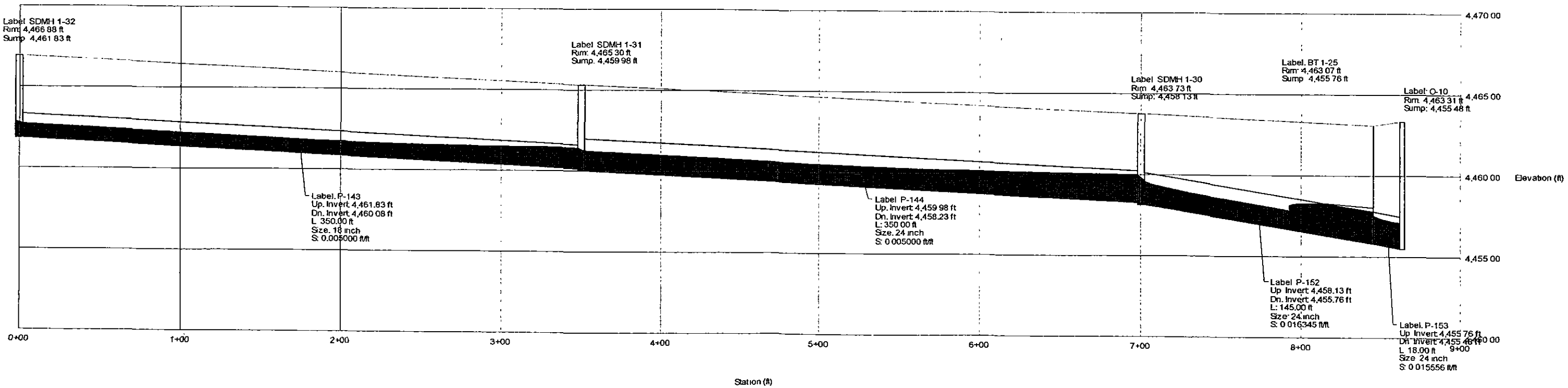
Profile: ORE CIRCLE - A

Scenario: Base



Profile: DESERT WAY

Scenario: Base



Appendix D
Channel Design Information

PALISADES CHANNEL (OFF4 TO CP4)

5' Bottom Width (minimum Depth = 4.00') (3:1 side slopes)

Begin Station	End Station	Slope (%)	Q(100) (cfs)	d(100) (ft)	V(100) (fps)	Flow Type	Se (superelevation) (if necessary)	Freeboard (1' min.)	Channel Depth	Mannings n	Median Rock Size d50 (in)	Rock Rip-Rap Classification	Depth of Riprap (ft)	* Optional TRM Instead of Riprap
38+03 78	41+83 27	0.82	205.00	2.82	5.40	Subcritical	N/A	1 00	3.82	0.035	2	Class 150	1.00	PYRAMAT
41+83.27	47+74.14	5.90	205.00	1.89	10.14	Supercritical	N/A	1.31	3 20	0.040	12	Class 300	2.00	PYRAMAT
47+74.17	52+65.09	9.70	205.00	1.76	11.35	Supercritical	N/A	1.34	3 10	0.044	18	Class 550	3.67	N/A
52+65.09	57+23.66	2.74	205 00	2.13	8.43	Supercritical	N/A	1.27	3.40	0.035	6	Class 150	1.00	PYRAMAT

PALISADES CHANNEL (CP4-TO CP3)

10' Bottom Width (minimum Depth = 4.00') (3:1 side slopes)

Begin Station	End Station	Slope (%)	Q(100) (cfs)	d(100) (ft)	V(100) (fps)	Flow Type	Se (superelevation) (if necessary)	Freeboard (1' min.)	Channel Depth	Mannings n	Median Rock Size d50 (in)	Rock Rip-Rap Classification	Depth of Riprap (ft)	* Optional TRM Instead of Riprap
25+59 99	26+63.71	5.27	342.00	2.00	10.72	Supercritical	0.75 (Tw = 21.15, r = 50 50')	1.34	4.08	0.040	13	Class 300	2.00	PYRAMAT
26+63.71	27+40.31	5.27	342.00	2.00	10.72	Supercritical	0.64 (Tw = 21.15, r = 59.00')	1 34	3 98	0.040	13	Class 300	2.00	PYRAMAT
27+40.31	33+35.36	9.01	342.00	1.82	12.13	Supercritical	N/A	1.37	3.19	0.044	20	Class 550	3 67	N/A
33+35.36	35+35.72	5.33	342.00	1.99	10.77	Supercritical	N/A	1.34	3 33	0.040	13	Class 300	2.00	PYRAMAT
35+35.72	38+03.78	1.34	342.00	2.65	7.20	Subcritical	0 16 (Tw = 25.41, r = 130')	1.30	4.11	0.035	4	Class 150	1.00	PYRAMAT

GOLDEN HILLS NORTH CHANNEL (CP3 TO CP1)

12' Bottom Width (minimum Depth = 5.00') (2:1 side slopes)

Begin Station	End Station	Slope (%)	Q(100) (cfs)	d(100) (ft)	V(100) (fps)	Flow Type	Se (superelevation) (if necessary)	Freeboard (1' min.)	Channel Depth	Mannings n	Median Rock Size d50 (in)	Rock Rip-Rap Classification	Depth of Riprap (ft)	* Optional TRM Instead of Riprap
0+80.68	3+04.33	2.24	584.00	3 27	9.67	Supercritical	N/A	1.36	4.63	0.040	8	Class 300	2.00	PYRAMAT
3+04.33	5+08.33	1.46	584.00	3.41	9.09	Supercritical	N/A	1.34	4.75	0.035	6	Class 150	1.00	PYRAMAT
5+08.33	11+32.33	1.92	584.00	3.41	9 11	Supercritical	N/A	1.34	4.75	0.040	7	Class 300	2.00	PYRAMAT
11+32.33	14+50.51	2.20	584.00	3.29	9.56	Supercritical	N/A	1.36	4.65	0.040	8	Class 300	2.00	PYRAMAT
14+50.51	15+70.51	3.33	584.00	2.94	11.09	Supercritical	N/A	1.40	4.34	0.040	12	Class 300	2.00	PYRAMAT
15+70.51	17+60.51	2.63	584.00	3.14	10.19	Supercritical	N/A	1.37	4 51	0.040	9	Class 300	2.00	PYRAMAT
17+60.51	18+98.51	2.17	584.00	3.30	9.52	Supercritical	N/A	1.35	4.65	0.040	8	Class 300	2.00	PYRAMAT
18+98.51	21+18.51	3.64	584.00	2.87	11.45	Supercritical	N/A	1.41	4.28	0.040	13	Class 300	2.00	PYRAMAT
21+18.51	23+16.51	3.03	584.00	3.02	10.72	Supercritical	N/A	1.39	4.41	0.040	11	Class 300	2.00	PYRAMAT
23+16.51	23+70.51	5.56	584.00	2.70	12.43	Supercritical	N/A	1.43	4.13	0.044	18	Class 550	3.67	N/A
23+70.51	25+00.51	2.31	584.00	3 25	9.73	Supercritical	N/A	1.36	4.61	0.040	8	Class 300	2.00	PYRAMAT
25+00.51	25+59.99	1.68	584.00	3 29	9.56	Supercritical	N/A	1.36	4.65	0.035	7	Class 150	1.00	PYRAMAT

GOLDEN HILLS CENTRAL CHANNEL (CP8 TO CP7 & CP7 TO CP6)

22' Bottom Width (minimum Depth = 5.00') (2:1 & 3:1 side slopes)

Begin Station	End Station	Slope (%)	Q(100) (cfs)	d(100) (ft)	V(100) (fps)	Flow Type	Se (superelevation) (if necessary)	Freeboard (1' min.)	Channel Depth	Mannings n	Median Rock Size d50 (in)	Rock Rip-Rap Classification	Depth of Riprap (ft)	* Optional TRM Instead of Riprap
10+00.00	16+00.00	1.50	695.00	3.82	8 52	Supercritical	1 24 (Tw = 32.90.15, r = 60.00')	1.33	6.39	0.035	5	Class 150	1.00	PYRAMAT
16+00.00	19+00.00	0.50	695.00	3.83	6.11	Subcritical	N/A	1.08	4.91	0.035	2	Class 150	1.00	PYRAMAT
19+00.00	20+50.00	1.00	695.00	3.16	7.77	Subcritical	N/A	1.44	4.60	0.035	4	Class 150	1.00	PYRAMAT
20+50.00	23+00.00	5.04	692.00	2.18	12.07	Supercritical	2.24 (Tw = 29.68, r = 60.00')	1.39	5.81	0 041	16	Class 400	2.67	PYRAMAT
23+00.00	30+00.00	4.56	692 00	2 24	11.67	Supercritical	2.11 (Tw = 29.90, r = 60.00')	1.38	5.73	0.041	15	Class 400	2.67	PYRAMAT
30+00.00 (3 1 sides)	40+00.00 (3 1 sides)	6.71	692.00	2 03	12.14	Supercritical	N/A	2.79	4.82	0.044	18	Class 550	3.67	N/A

DESERT WAY CHANNEL (CP6 TO CP1)
25' Bottom Width (minimum Depth = 6 00') (2.1 side slopes)

Begin Station	End Station	Slope (%)	Q(100) (cfs)	d(100) (ft)	V(100) (fps)	Flow Type	Se (superelevation) (if necessary)	Freeboard (1' min.)	Channel Depth	Mannings n	Channel Lining
N/A	N/A	0.29	695.00	3 85	5.52	Subcritical	N/A	0.97	4.82	0.030	Grass
N/A	N/A	0.29	809 00	4.19	5.79	Subcritical	N/A	1.02	5 21	0 030	Grass
N/A	N/A	0.29	1274.00	5.38	6.63	Subcritical	N/A	1.18	6.56	0.030	Grass

Freeboard:
City of Reno Public Works Design Manual = 1.00' (minimum)
City of Sparks Hydrology Design Manual =

Subcritical Flow
FB = 0.50+(V^2/(2*g))
Where: V = V(100) (fps)
g = 32.2 ft/sec^2
Supercritical Flow
FB = 1+0.025*V*(d^1/3)
Where: V = V(100) (fps)
d = d(100) (ft)

Superelevation:
Superelevation is the height that water will rise as it flows through a bend in the channel
City of Sparks Hydrology Design Manual = Se

Subcritical Flow
Se = (C*V^2*Tw)/(r*g)
Where: C = 0.50
V = V(100) (fps)
Tw = Top width of water on channel (ft)
r = radius (ft)
g = 32 2 ft/sec^2

Supercritical Flow
Se = (C*V^2*Tw)/(r*g)
Where: C = 1.00
V = V(100) (fps)
Tw = Top width of water on channel (ft)
r = radius (ft)
g = 32 2 ft/sec^2

Median Rock Size (d50) :
City of Sparks Hydrology Design Manual =

Equation 806

d50 =(0 50*V^2*S^0.34)/(Sg-1)^1 3332
Where: V = V(100) (fps)
S = Slope (ft/ft)
Sg = Specific Gravity of Rock (2 65 min)

Median Rock Size for Steep Slopes (5.00% and greater) may also be determined by using Figures 812 ~ 816 of the City of Sparks Hydrology Design Manual
Reference Table 804 in the City of Sparks Hydrology Design Manual for Classification and Gradation of riprap.
All Class 150 rip rap is to be buried with native top soil and re-vegetated to protect from vanalism

Calculated Manings n:
City of Sparks Hydrology Design Manual =

Equation 805
n = 0.0395(d50)^1/6
Where:
d50 = from Table 804

Rock rip rap class	d50 (in)	Calculated n value	Depth of riprap placement (ft)
Class 150	6	0.035	1.00
Class 300	12	0.040	2.00
Class 400	16	0.041	2.67
Class 550	22	0 044	3 67
Class 700	28	0.045	4.67
Class 900	35	0.047	5 83

Equation 805 is not valid for grouted rock riprap or very shallow flow (i.e. hydraulic radius les than or equal to 2 times the maximum rock size)

* **Intead of using traditional rip rap channel aromor the contractor and/or developer *may use a suitable Turf Rienforcement* Mat (*TRM*) installed to the manufacturer's specifications and to the approval of the City of Reno Community Development Department.**
PYRAMAT is a SI Geosolutions product and can be obtained through CONTECH Construction Products, Inc or ATTILA Environmental Products .

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=0.82% 5' Bottom Palisades
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.035	
Channel Slope	008200	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	5.00	ft
Discharge	205.00	cfs

Results		
Depth	2.82	ft
Flow Area	38.0	ft²
Wetted Perim	22.84	ft
Top Width	21.93	ft
Critical Depth	2.41	ft
Critical Slope	0.016390	ft/ft
Velocity	5.40	ft/s
Velocity Head	0.45	ft
Specific Energ	3.27	ft
Froude Numb	0.72	
Flow Type	Subcritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=5.90% 5' Bottom Palisade:
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	059000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	5.00	ft
Discharge	205.00	cfs

Results		
Depth	1.89	ft
Flow Area	20.2	ft²
Wetted Perim	16.97	ft
Top Width	16.36	ft
Critical Depth	2.41	ft
Critical Slope	0.021412	ft/ft
Velocity	10.14	ft/s
Velocity Head	1.60	ft
Specific Energ	3.49	ft
Froude Numb	1.61	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=9.70% 5' Bottom Palisade:
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.044	
Channel Slope	097000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	5.00	ft
Discharge	205.00	cfs

Results		
Depth	1.76	ft
Flow Area	18.1	ft²
Wetted Perim	16.12	ft
Top Width	15.55	ft
Critical Depth	2.41	ft
Critical Slope	0.025902	ft/ft
Velocity	11.35	ft/s
Velocity Head	2.00	ft
Specific Energ	3.76	ft
Froude Numb	1.86	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=2 74% 5' Bottom Palisades
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.035	
Channel Slope	027400	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H . V
Bottom Width	5.00	ft
Discharge	205.00	cfs

Results		
Depth	2.13	ft
Flow Area	24.3	ft²
Wetted Perim	18.49	ft
Top Width	17.79	ft
Critical Depth	2.41	ft
Critical Slope	0.016390	ft/ft
Velocity	8.43	ft/s
Velocity Head	1.11	ft
Specific Energ	3.24	ft
Froude Numb	1.27	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=5.27% 10' Bottom Palisade
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	052700	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft
Discharge	342.00	cfs

Results		
Depth	2.00	ft
Flow Area	31 9	ft²
Wetted Perim	22.62	ft
Top Width	21.97	ft
Critical Depth	2.56	ft
Critical Slope	0.020078	ft/ft
Velocity	10.72	ft/s
Velocity Head	1.79	ft
Specific Energ	3.78	ft
Froude Numb	1.57	
Flow Type	Supercritical	

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Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=9.01% 10' Bottom Palisade
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.044	
Channel Slope	090100	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft
Discharge	342.00	cfs

Results		
Depth	1.82	ft
Flow Area	28.2	ft²
Wetted Perim	21.53	ft
Top Width	20.93	ft
Critical Depth	2.56	ft
Critical Slope	0.024288	ft/ft
Velocity	12.13	ft/s
Velocity Head	2.29	ft
Specific Energ	4.11	ft
Froude Numb	1.84	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=5.33% 10' Bottom Palisade
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	053300	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft
Discharge	342.00	cfs

Results		
Depth	1.99	ft
Flow Area	31.8	ft²
Wetted Perim	22.58	ft
Top Width	21.94	ft
Critical Depth	2.56	ft
Critical Slope	0.020079	ft/ft
Velocity	10.77	ft/s
Velocity Head	1.80	ft
Specific Energ	3.79	ft
Froude Numb	1.58	
Flow Type	Supercritical	

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Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=1 34% 10' Bottom Palisade
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.035	
Channel Slope	013400	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft
Discharge	342.00	cfs

Results		
Depth	2.65	ft
Flow Area	47.5	ft²
Wetted Perim	26.74	ft
Top Width	25.88	ft
Critical Depth	2.56	ft
Critical Slope	0.015373	ft/ft
Velocity	7.20	ft/s
Velocity Head	0.81	ft
Specific Energ	3.45	ft
Froude Numb	0.94	
Flow Type	Subcritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=2.24% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	022400	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.27	ft
Flow Area	60.7	ft²
Wetted Perim	26.63	ft
Top Width	25.09	ft
Critical Depth	3.44	ft
Critical Slope	0.018589	ft/ft
Velocity	9.63	ft/s
Velocity Head	1.44	ft
Specific Energ	4.71	ft
Froude Numb	1.09	
Flow Type	Supercritical	

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Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=1.46% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0 035	
Channel Slope	014600	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.41	ft
Flow Area	64.3	ft²
Wetted Perim	27.27	ft
Top Width	25.66	ft
Critical Depth	3.44	ft
Critical Slope	0.014229	ft/ft
Velocity	9.09	ft/s
Velocity Head	1.28	ft
Specific Energ	4.70	ft
Froude Numb	1.01	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=1 92% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	019200	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.41	ft
Flow Area	64.1	ft²
Wetted Perim	27.24	ft
Top Width	25.63	ft
Critical Depth	3.44	ft
Critical Slope	0.018594	ft/ft
Velocity	9.11	ft/s
Velocity Head	1.29	ft
Specific Ener	4.70	ft
Froude Numb	1.02	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=2.20% 12' Bottom Golden Hill
Flow Element	*Trapezoidal Channel*
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	022000	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.29	ft
Flow Area	61.1	ft²
Wetted Perim	26.70	ft
Top Width	25.15	ft
Critical Depth	3.44	ft
Critical Slope	0.018589	ft/ft
Velocity	9.56	ft/s
Velocity Head	1.42	ft
Specific Energ	4.71	ft
Froude Numb	1.08	
Flow Type	*Supercritical*	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=3 33% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	033300	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	2.94	ft
Flow Area	52.7	ft²
Wetted Perim	25.16	ft
Top Width	23.77	ft
Critical Depth	3.44	ft
Critical Slope	0.018589	ft/ft
Velocity	11.09	ft/s
Velocity Head	1.91	ft
Specific Energ	4.86	ft
Froude Numb	1.31	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=2.63% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	026300	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	*cfs*

Results		
Depth	3.14	ft
Flow Area	57.3	ft²
Wetted Perim	26.02	ft
Top Width	24.54	ft
Critical Depth	3.44	ft
Critical Slope	0.018589	ft/ft
Velocity	10.19	ft/s
Velocity Head	1.62	ft
Specific Energ	4.75	ft
Froude Numb	1.18	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=2 17% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	021700	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.30	ft
Flow Area	61.4	ft²
Wetted Perim	26.76	ft
Top Width	25.20	ft
Critical Depth	3.44	ft
Critical Slope	0.018590	ft/ft
Velocity	9.52	ft/s
Velocity Head	1.41	ft
Specific Ener	4.71	ft
Froude Numb	1.08	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=3.64% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	036400	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	2.87	ft
Flow Area	51.0	ft²
Wetted Perim	24.85	ft
Top Width	23.50	ft
Critical Depth	3.44	ft
Critical Slope	0.018591	ft/ft
Velocity	11.45	ft/s
Velocity Head	2.04	ft
Specific Energ	4.91	ft
Froude Numb	1.37	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=3.03% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	030300	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.02	ft
Flow Area	54.5	ft²
Wetted Perim	25.50	ft
Top Width	24.08	ft
Critical Depth	3.44	ft
Critical Slope	0.018589	ft/ft
Velocity	10.72	ft/s
Velocity Head	1.79	ft
Specific Energ	4.81	ft
Froude Numb	1.26	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=5.56% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.044	
Channel Slope	055600	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	2.70	ft
Flow Area	47.0	ft²
Wetted Perim	24.07	ft
Top Width	22.80	ft
Critical Depth	3.44	ft
Critical Slope	0.022496	ft/ft
Velocity	12.43	ft/s
Velocity Head	2.40	ft
Specific Energ	5.10	ft
Froude Numb	1.53	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=2.31% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.040	
Channel Slope	023100	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.25	ft
Flow Area	60.0	ft²
Wetted Perim	26.51	ft
Top Width	24.98	ft
Critical Depth	3.44	ft
Critical Slope	0.018585	ft/ft
Velocity	9.73	ft/s
Velocity Head	1.47	ft
Specific Ener	4.72	ft
Froude Numb	1.11	
Flow Type	Supercritical	

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Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=1.68% 12' Bottom Golden Hill
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.035	
Channel Slope	016800	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	12.00	ft
Discharge	584.00	cfs

Results		
Depth	3.29	ft
Flow Area	61.1	ft²
Wetted Perim	26.71	ft
Top Width	25.16	ft
Critical Depth	3.44	ft
Critical Slope	0.014233	ft/ft
Velocity	9.56	ft/s
Velocity Head	1.42	ft
Specific Energ	4.71	ft
Froude Numb	1.08	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=1.50% 22' Bottom Central
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Left Side Slope

Input Data		
Mannings Coeffic	0.035	
Channel Slope	015000	ft/ft
Depth	2.72	ft
Right Side Slope	2.00	H : V
Bottom Width	22.00	ft
Discharge	695.00	cfs

Results		
Left Side Slop	3.82	H : V
Flow Area	81.5	ft²
Wetted Perim	38.85	ft
Top Width	37.86	ft
Critical Depth	2.76	ft
Critical Slope	0.014259	ft/ft
Velocity	8.52	ft/s
Velocity Head	1.13	ft
Specific Energ	3.85	ft
Froude Numb	1.02	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=0.50% 22' *Bottom Central*
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.035	
Channel Slope	005000	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	22.00	ft
Discharge	695.00	cfs

Results		
Depth	3.83	ft
Flow Area	113.7	ft²
Wetted Perim	39.14	ft
Top Width	37.33	ft
Critical Depth	2.87	ft
Critical Slope	0.014105	ft/ft
Velocity	6.11	ft/s
Velocity Head	0.58	ft
Specific Energ	4.41	ft
Froude Numb	0.62	
Flow Type	Subcritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=1.00% 22' Bottom Central
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.035	
Channel Slope	010000	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	22.00	ft
Discharge	695.00	cfs

Results		
Depth	3.16	ft
Flow Area	89.4	ft²
Wetted Perim	36.13	ft
Top Width	34.63	ft
Critical Depth	2.87	ft
Critical Slope	0.014104	ft/ft
Velocity	7.77	ft/s
Velocity Head	0.94	ft
Specific Energ	4.10	ft
Froude Numb	0.85	
Flow Type	Subcritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=5.04% 22' Bottom Central
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.041	
Channel Slope	050400	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	22.00	ft
Discharge	692.00	cfs

Results		
Depth	2.18	ft
Flow Area	57.3	ft²
Wetted Perim	31 73	ft
Top Width	30 70	ft
Critical Depth	2.86	ft
Critical Slope	0.019363	ft/ft
Velocity	12.07	ft/s
Velocity Head	2.26	ft
Specific Energ	4.44	ft
Froude Numb	1.56	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=4.56% 22' Bottom Central
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.041	
Channel Slope	045600	ft/ft
Left Side Slope	2.00	H : V
Right Side Slope	2.00	H : V
Bottom Width	22.00	ft
Discharge	692.00	cfs

Results		
Depth	2.24	ft
Flow Area	59.3	ft²
Wetted Perim	32.01	ft
Top Width	30.96	ft
Critical Depth	2.86	ft
Critical Slope	0.019370	ft/ft
Velocity	11 67	ft/s
Velocity Head	2.12	ft
Specific Energ	4.36	ft
Froude Numb	1 49	
Flow Type	Supercritical	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	S=6.71% 22' Bottom Central
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.044	
Channel Slope	067100	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	22.00	ft
Discharge	692.00	cfs

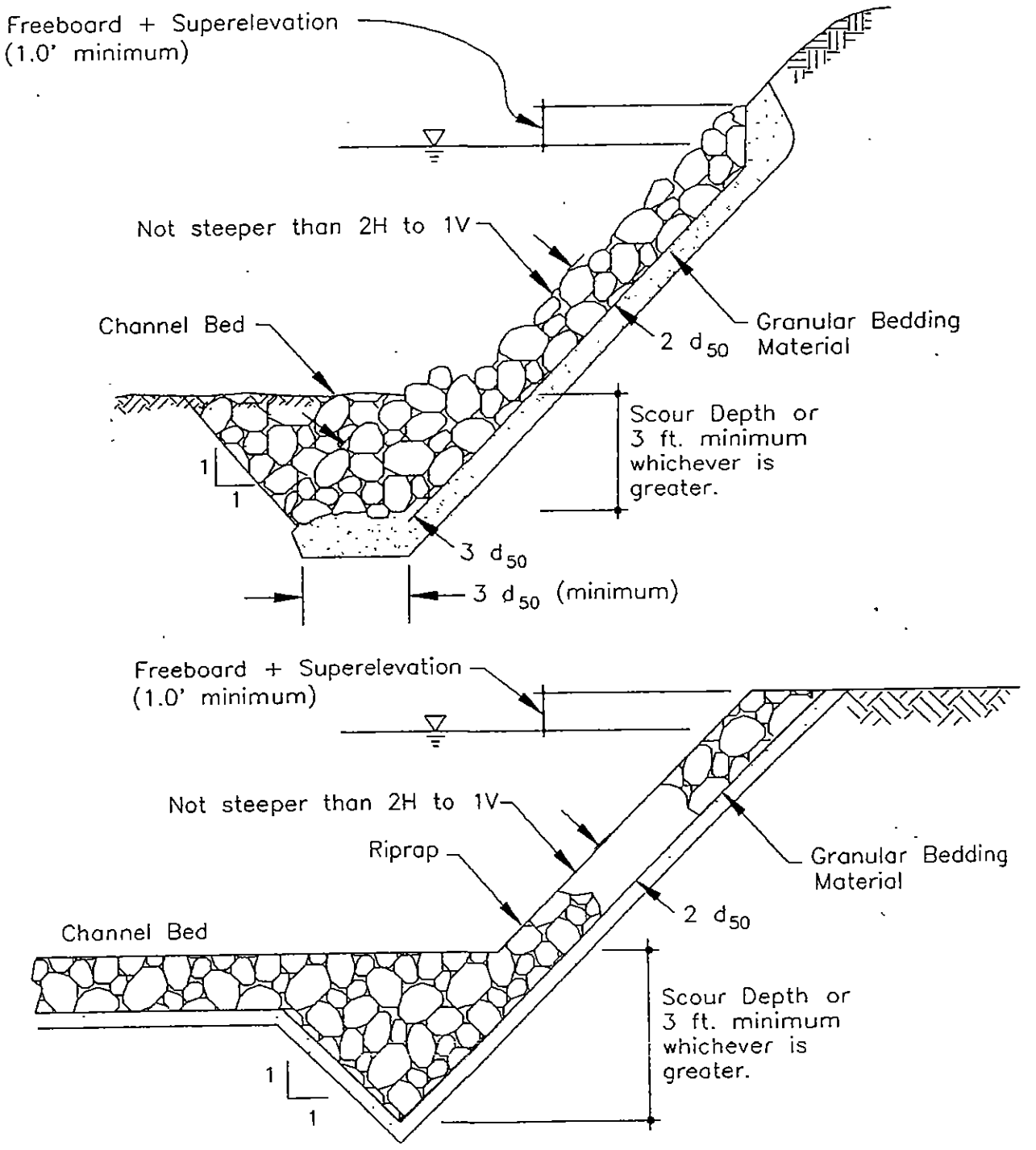
Results		
Depth	2.03	ft
Flow Area	57.0	ft²
Wetted Perim	34.83	ft
Top Width	34.17	ft
Critical Depth	2.75	ft
Critical Slope	0.022507	ft/ft
Velocity	12.14	ft/s
Velocity Head	2.29	ft
Specific Energ	4 32	ft
Froude Numb	1.66	
Flow Type	Supercritical	

CLASSIFICATION AND GRADATION OF LOOSE RIPRAP

RIPRAP CLASS DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	RIPRAP GRADATION (Inches)	d_{50}* (Inches)
Class 150	100	10	
	35 - 50	6	
	0 - 15	2	6**
Class 300	100	20	
	35 - 50	12	
	0 - 15	4	12
Class 400	100	26	
	35 - 50	16	
	0 - 15	6	16
Class 550	100	37	
	35 - 50	22	
	0 - 15	8	22
Class 700	100	45	
	35 - 50	28	
	0 - 15	10	28
Class 900	100	57	
	35 - 50	35	
	0 - 15	14	35

*d_{50} = mean stone size
** Bury Class 150 riprap with native top soil and re-vegetate to protect from vandalism

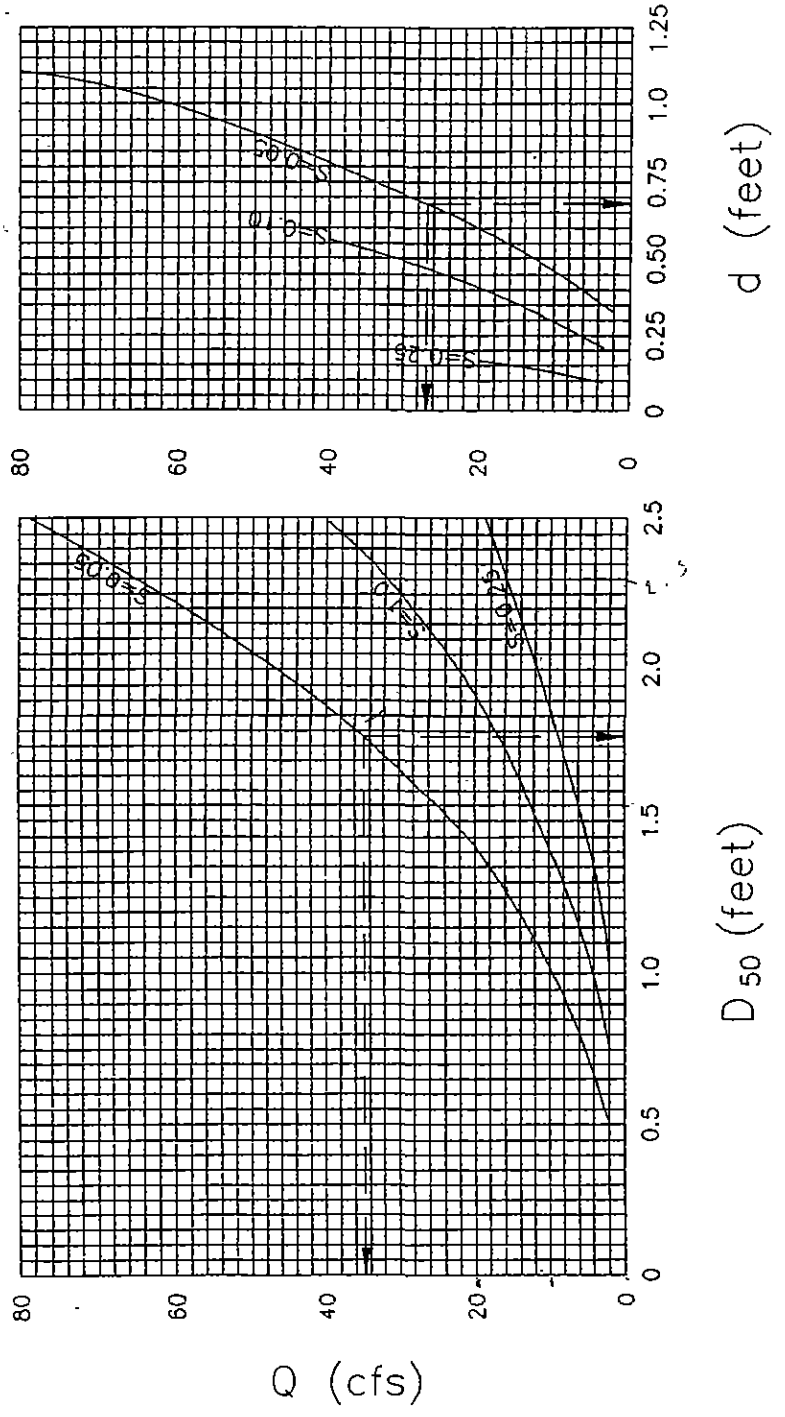
TYPICAL CROSS-SECTIONS FOR RIPRAP-LINED CHANNELS



VERSION: July 31, 1998	REFERENCE: Modified from H.E.C. No. 11, USDOT, 1989	FIGURE 810
WRC NEVADA, INC.		

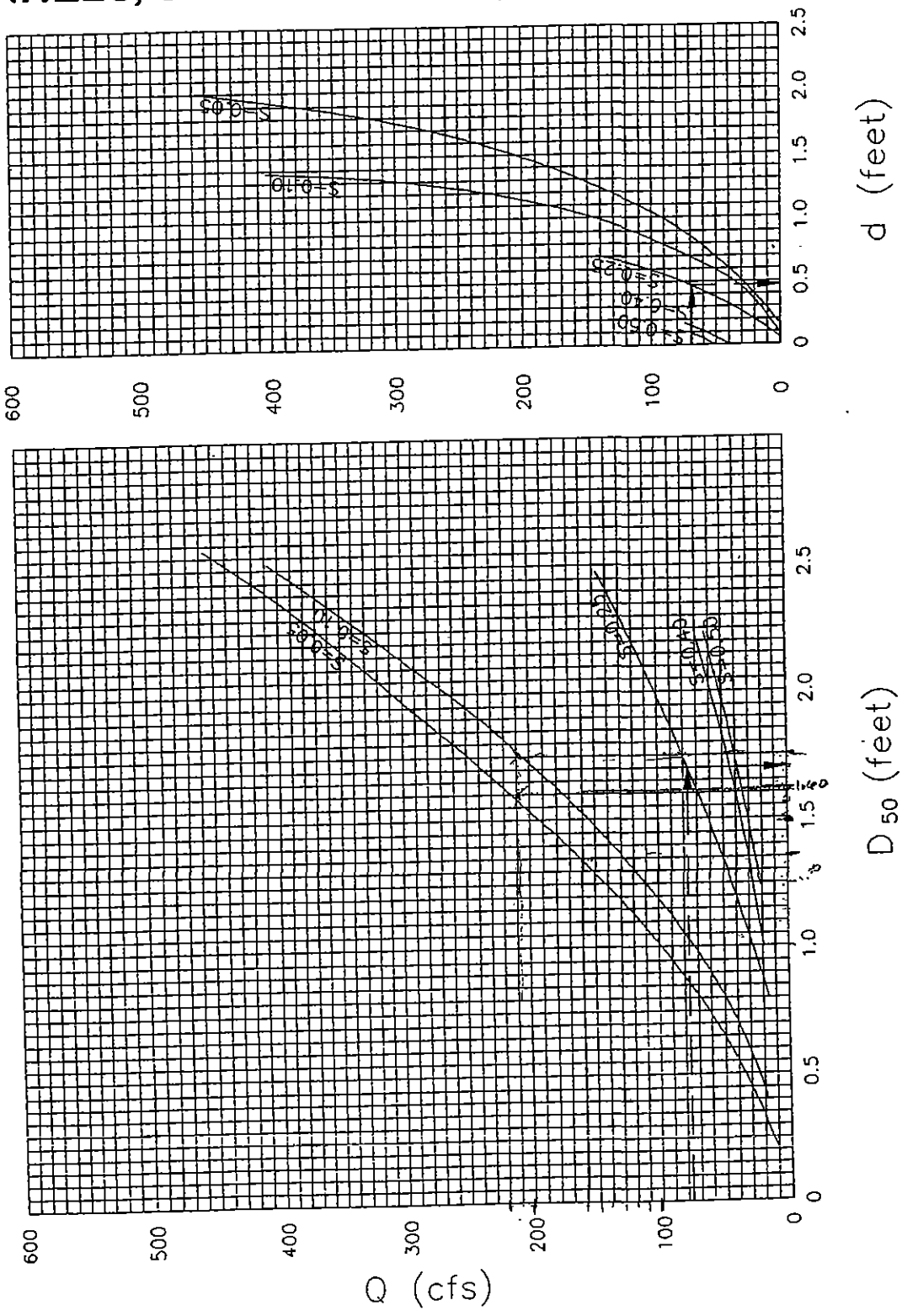
1878, 1878810.DWG, LCD, WRC2 PCP 06-2-97 JLH

STEEP SLOPE RIPRAP DESIGN, TRIANGULAR CHANNELS, 2:1 SIDESLOPES



VERSION: July 31, 1998	REFERENCE: Simons, Li and Assoc., 1989	FIGURE 812
WRC NEVADA, INC.		

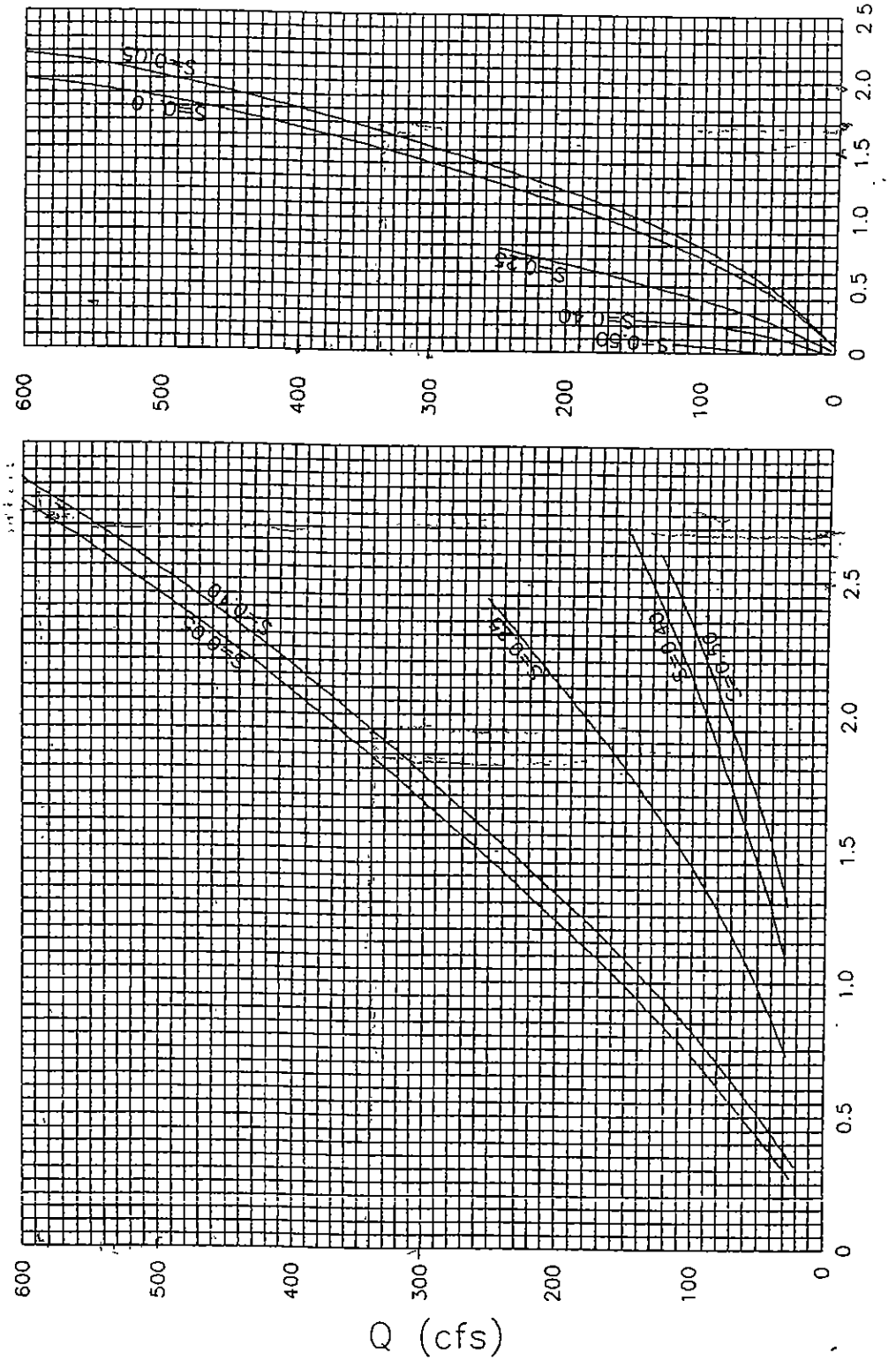
STEEP SLOPE RIPRAP DESIGN, TRAPEZOIDAL CHANNELS, 2:1 SIDESLOPES, 6 FT BASE WIDTH



VERSION: July 31, 1998 WRC NEVADA INC	REFERENCE: Simons, Li and Assoc., 1989	FIGURE 813

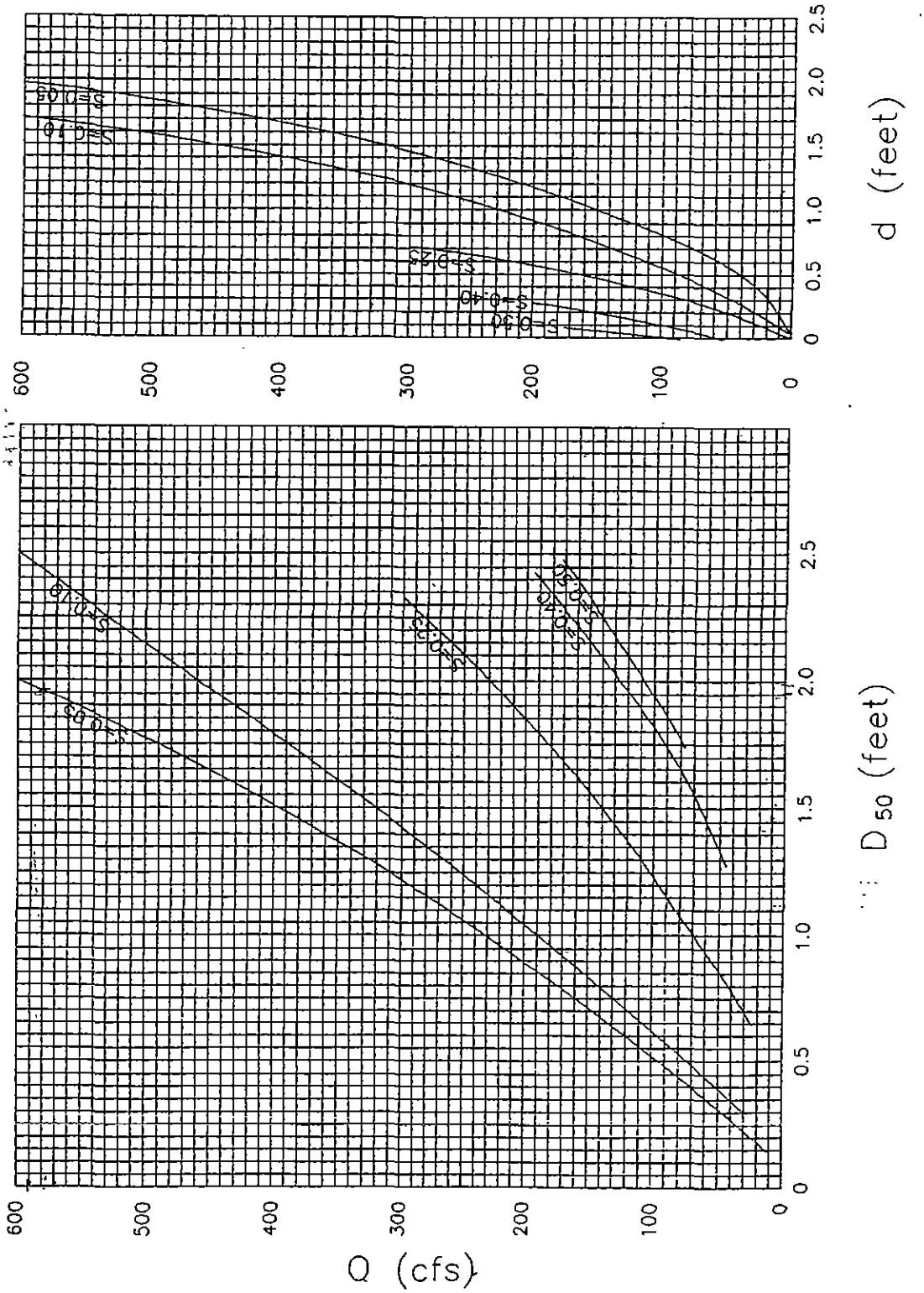
1878.187813.DWG WRC2 PCP 6-2-97 JJH

STEEP SLOPE RIPRAP DESIGN, TRAPEZOIDAL CHANNELS, 2:1 SIDESLOPES, 10 FT BASE WIDTH



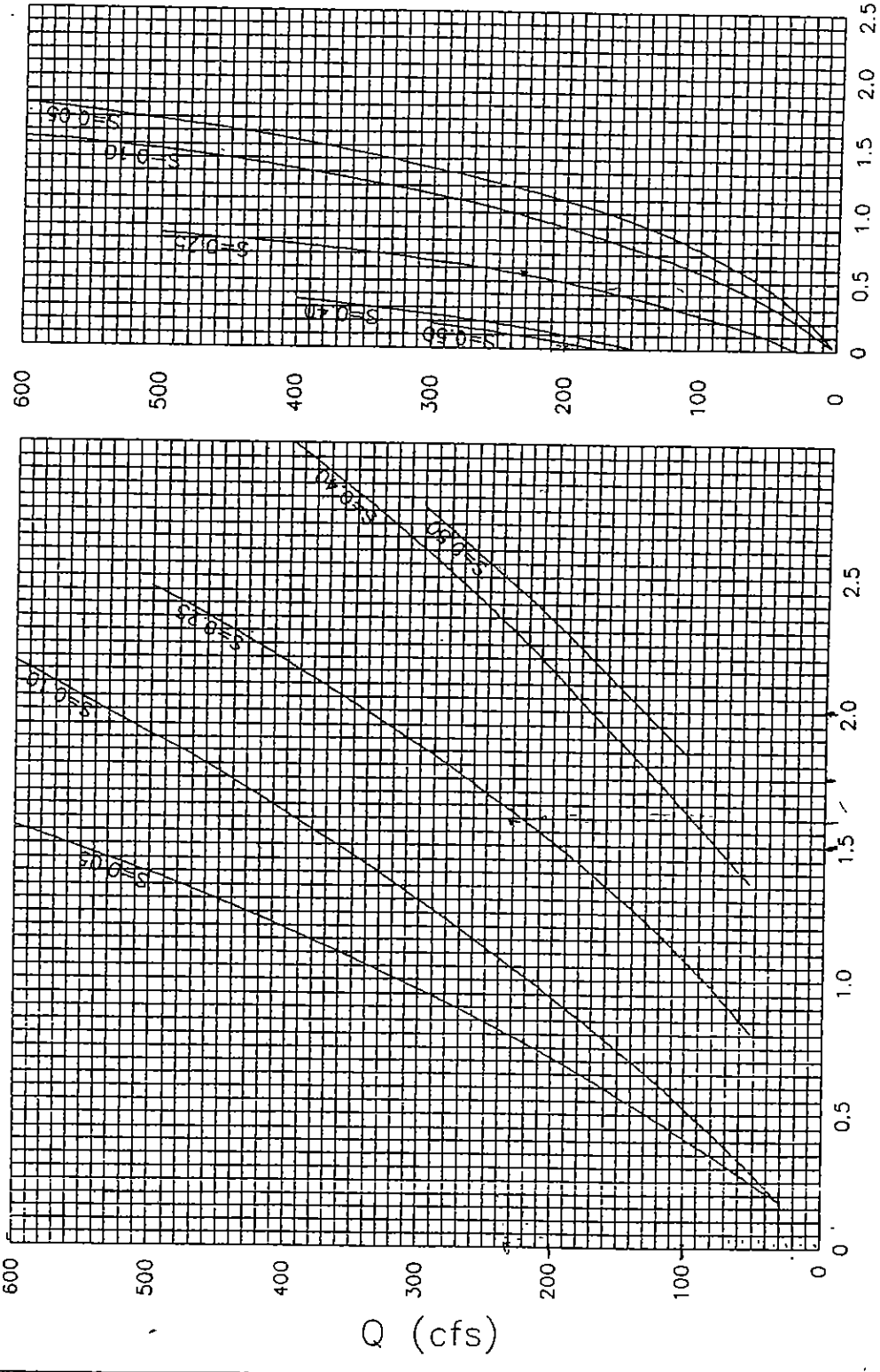
VERSION: July 31, 1998 WRC NEVADA, INC.	REFERENCE: Simons, Li and Assoc., 1989	FIGURE 814

STEEP SLOPE RIPRAP DESIGN, TRAPEZOIDAL CHANNELS, 2:1 SIDESLOPES, 14 FT BASE WIDTH



VERSION: July 31, 1998	REFERENCE:	FIGURE
WRC NEVADA, INC.	Simons, Li and Assoc., 1989	815

STEEP SLOPE RIPRAP DESIGN, TRAPEZOIDAL CHANNELS, 2:1 SIDESLOPES, 20 FT BASE WIDTH



VERSION: July 31, 1998 WRC NEVADA, INC	REFERENCE: Simons, Li and Assoc., 1989	FIGURE 816

1878, 1878816.DWG WRC2.PCP 6-3-97 JJH

Culvert Calculator Report
Dual 10x4 Box Culvert at CP6 - 100-year Storm Event

Comments: This analysis includes 1' of additional freeboard, discharge was obtained from Storm Drainage Master Plan by Wood Rodgers, Inc March, 2005.

Solve For. Headwater Elevation

Culvert Summary					
Allowable HW Elevation	4,463.00	ft	Headwater Depth/Height	1.41	
Computed Headwater Elev	4,461.64	ft	Discharge	695 00	cfs
Inlet Control HW Elev.	4,461.64	ft	Tailwater Elevation	4,458.40	ft
Outlet Control HW Elev.	4,461.36	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	4,456.00	ft	Downstream Invert	4,454.55	ft
Length	270.80	ft	Constructed Slope	0.005	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	2.96	ft
Slope Type	Steep		Normal Depth	2.96	ft
Flow Regime	N/A		Critical Depth	3.35	ft
Velocity Downstream	11.74	ft/s	Critical Slope	0.004	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.014	
Section Material	Concrete		Span	10.00	ft
Section Size	10 x 4 ft		Rise	4.00	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	4,461.36	ft	Upstream Velocity Head	1.67	ft
Ke	0.20		Entrance Loss	0.33	ft

Inlet Control Properties				
Inlet Control HW Elev.	4,461.64	ft	Flow Control	Submerged	
Inlet Type	90° headwall w 45° bevels		Area Full	80.0	ft²
K	0.49500		HDS 5 Chart	10	
M	0.66700		HDS 5 Scale	2	
C	0.03140		Equation Form	2	
Y	0.82000				

Culvert Calculator Report
Dual 10x4 Box Culvert at CP6 - Capacity

Comments: This analysis is based on flow at the maximum water elevation before over topping the roadway

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	4,464.00	ft	Headwater Depth/Height	2.00	
Computed Headwater Elev	4,464.00	ft	Discharge	981.95	cfs
Inlet Control HW Elev	4,464.00	ft	Tailwater Elevation	4,458.40	ft
Outlet Control HW Elev.	4,463.61	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	4,456.00	ft	Downstream Invert	4,454.55	ft
Length	270.80	ft	Constructed Slope	0.005	ft/ft

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	4.00	ft
Slope Type	N/A		Normal Depth	N/A	ft
Flow Regime	N/A		Critical Depth	4.00	ft
Velocity Downstream	12.27	ft/s	Critical Slope	0.008	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.014	
Section Material	Concrete		Span	10.00	ft
Section Size	10 x 4 ft		Rise	4.00	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	4,463.61	ft	Upstream Velocity Head	2.34	ft
Ke	0.20		Entrance Loss	0.47	ft

Inlet Control Properties					
Inlet Control HW Elev.	4,464.00	ft	Flow Control	Submerged	
Inlet Type	90° headwall w 45° bevels		Area Full	80.0	ft²
K	0.49500		HDS 5 Chart	10	
M	0.66700		HDS 5 Scale	2	
C	0.03140		Equation Form	2	
Y	0.82000				

Culvert Calculator Report
Dual 10x4 Box Culvert at CP7 - 100-year Storm Event

Comments This analysis includes 1' of additional freeboard, discharge was obtained from Storm Drainage Master Plan by Wood Rodgers, Inc March, 2005.

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	4,473.21	ft	Headwater Depth/Height	1.40	
Computed Headwater Elev:	4,473.20	ft	Discharge	692.00	cfs
Inlet Control HW Elev.	4,473.20	ft	Tailwater Elevation	4,466.86	ft
Outlet Control HW Elev.	4,472.93	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	4,467.59	ft	Downstream Invert	4,466.86	ft
Length	73.49	ft	Constructed Slope	0.010	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.66	ft
Slope Type	Steep		Normal Depth	2.38	ft
Flow Regime	Supercritical		Critical Depth	3.34	ft
Velocity Downstream	13.03	ft/s	Critical Slope	0.004	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.014	
Section Material	Concrete		Span	10.00	ft
Section Size	10 x 4 ft		Rise	4.00	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	4,472.93	ft	Upstream Velocity Head	1.67	ft
Ke	0.20		Entrance Loss	0.33	ft

Inlet Control Properties					
Inlet Control HW Elev.	4,473.20	ft	Flow Control	Submerged	
Inlet Type	90° headwall w 45° bevels		Area Full	80.0	ft²
K	0.49500		HDS 5 Chart	10	
M	0.66700		HDS 5 Scale	2	
C	0.03140		Equation Form	2	
Y	0.82000				

Culvert Calculator Report
Dual 10x4 Box Culvert at CP7 - Capacity

Comments. This analysis is based on flow at the maximum water elevation before over topping the roadway.

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	4,474.21	ft	Headwater Depth/Height	1.66	
Computed Headwater Elev	4,474.21	ft	Discharge	827.53	cfs
Inlet Control HW Elev.	4,474.21	ft	Tailwater Elevation	4,466.86	ft
Outlet Control HW Elev.	4,473.61	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	4,467.59	ft	Downstream Invert	4,466.86	ft
Length	73.49	ft	Constructed Slope	0.010	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	3.03	ft
Slope Type	Steep		Normal Depth	2.69	ft
Flow Regime	Supercritical		Critical Depth	3.76	ft
Velocity Downstream	13.67	ft/s	Critical Slope	0.004	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.014	
Section Material	Concrete		Span	10.00	ft
Section Size	10 x 4 ft		Rise	4.00	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	4,473.61	ft	Upstream Velocity Head	1.88	ft
Ke	0.20		Entrance Loss	0.38	ft

Inlet Control Properties				
Inlet Control HW Elev.	4,474.21 ft	Flow Control	Submerged	
Inlet Type	90° headwall w 45° bevels	Area Full	80.0	ft²
K	0.49500	HDS 5 Chart	10	
M	0.66700	HDS 5 Scale	2	
C	0.03140	Equation Form	2	
Y	0.82000			

Appendix F
Storm Drainage Master Plan
(Wood Rodgers, Inc. March 2005)

STORM DRAINAGE MASTER PLAN

Golden Hills Subdivision / Damonte Foothills
Project # 1452.002
Section 14 of T18N, R20E MDM
Washoe County, Nevada

Prepared for:
Reynen & Bardis Development, LLC
1380 Greg Street, Suite 230
Sparks, NV 89431

March 28, 2005

Prepared by:
Mary Horvath, P.E.

Mark Gookin, P.E.

WOOD RODGERS
ENGINEERING • PLANNING • MAPPING • SURVEYING

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Reno, Nevada 89511
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STORM DRAINAGE MASTER PLAN

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APPENDICES

1.0 INTRODUCTION

This report presents the Master Drainage Plan for the Damonte Foothill Development, which encompasses the construction of three proposed subdivisions: Golden Hills, the Palisades and McCauley Ranch. The purpose of this report is to address the drainage issues off- and on-site that result from development of the property in accordance with Washoe County and City of Reno regulations. This report includes the overall hydrologic analyses for existing conditions, proposed conditions with the Damonte Foothills development, and general design parameters for on-site flood control facilities. The proposed facilities presented in this report are preliminary as the current design of the subdivisions is preliminary. This master drainage report is meant to establish the overall feasibility of the development with respect to flood control and the potential effects on the downstream properties and to provide general guidance for the design of the drainage facilities within the subdivisions. The final development of each subdivision will need to include additional hydraulic and hydrologic analysis and a more detailed drainage report. As the final design progresses, the detailed analysis for each subdivision will be reviewed by Wood Rodgers, Inc. to ensure conformance with the hydrologic master plan.

1.1 PROJECT LOCATION

The proposed Damonte Foothills Development study site covers approximately 365 acres within both the City of Reno and unincorporated Washoe County within the City of Reno sphere of influence. It is within Section 14 of Township 14 North, Range 20 East and it lies adjacent to and east of the Damonte Ranch development currently under construction. Please see Figure 1: Vicinity Map.

At present, the site is undisturbed rangeland with a vegetative cover of shrub/brush with areas of less dense grass/shrub in the southern portion. Approximately 4.7 square miles of undeveloped land to the east, southeast and northeast drain to the site in semi-defined channels that become unconcentrated shallow flow as they enter the site. Offsite slopes range from 5 to 20% and onsite slopes range from 5 to 20% along the eastern boundary and 3 to less than 1% along the western property boundary. Runoff in the southern portion of the site flows to a constructed channel along the boundary of the Damonte Ranch High School which outlets to a culvert beneath Desert Way and flows to the west to a channel constructed as part of Damonte Ranch. Runoff in the northern portion of the site flows to the western boundary to flow over Desert Way into a constructed channel that flows north and turns west to flow beneath culverts under Rio Wrangler Parkway.

1.2 REGULATORY PERSPECTIVE

The Damonte Foothills development is subject to the regulations of the City of Reno.

1.3 PREVIOUS STUDIES

The proposed subdivision is located just east of the Damonte Ranch development. Nimbus Engineers prepared a Master Drainage Report for Damonte Ranch and the Double Diamond Ranch and a CLOMR to change the floodplain boundaries of Steamboat Creek. These reports: Southeast Truckee Meadows Flood Control Master Plan (Nimbus, 1995) and Application for Conditional Letter of Map Revision (Nimbus, 2001) provided the hydrologic and hydraulic analysis and regional flood control design for the south Meadows area. The hydrologic analysis included the area covered by the proposed Damonte Foothills development as offsite flow; it was considered undeveloped in both existing and proposed conditions. The flood control facilities in the design of the Damonte Ranch and Double Diamond projects do not mitigate any increase in peak flow rates or volumes from the Damonte Foothills developments. However, the final concentration point at the northern boundary of Damonte Ranch to which the Damonte Foothills will contribute has a post-development peak flow that is much less than existing conditions.

The Damonte Foothills Boulevard is currently in design. A drainage study (Wood Rodgers, Inc., 2005) was prepared detailing the current conditions of the Damonte Ranch High School channel and the preliminary design of the proposed culverts that will convey the flow within the channel beneath the proposed road.

2.0 HYDROLOGIC ANALYSIS

2.1 DESIGN RAINFALL

The design rainfall was obtained from the NOAA 14 semi-arid southwest precipitation study for the 24-hour 5- and 100-year events. Table 1 contains the depths utilized in both the existing and proposed conditions hydrology models.

Table 1: 5- and 100-Year Precipitation Depths

Storm Event	Precipitation Depths (inch)			
	1-Hour	6-Hour	12-Hour	24-Hour
5-Year	0.56	1.20	1.68	2.25
100-Year	1.29	1.93	2.87	4.14

2.2 EXISTING CONDITIONS

Currently, runoff from several large drainage areas flows from the east to the eastern property boundary in concentrated or semi-concentrated drainages. As the drainages hit the shallow slopes and highly to semi-highly vegetated land on the proposed site, flow disperses into shallow wide flowpaths. Runoff leaves the property to the west. As part of the Damonte Ranch development, large trapezoidal earthen channels have been constructed to accept the flow from the site. One channel borders the Damonte Ranch High school to convey flows west to a culvert beneath Rio Wrangler Parkway and to a detention basin constructed as part of Damonte Ranch. A second channel runs along the western side of Desert Way to flow west to join the outlet of the detention basin.

2.2.1 Drainage Subdrainage areas

To analyze existing flow conditions, five existing drainage areas were delineated encompassing offsite and onsite areas. Please see Figure 2: Existing Conditions Drainage area Delineation.

Drainage area EX1 concentrates along the northern boundary of the property. Drainage area EX2 concentrates at the western property boundary and includes the northern portion of the site. Drainage area EX3 concentrates near the middle of the western boundary of the site and includes a large upstream offsite drainage area. Drainage area EX4 concentrates along the western boundary to flow to the pre-Damonte Ranch homes along Desert Way. Drainage area EX5 concentrates along the southern portion of the western boundary at what is now the channel bounding the high school.

2.2.2 Runoff Computation

We calculated the 5- and 100-year runoff hydrographs with precipitation depths taken from NOAA Atlas 14 and the SCS rainfall runoff and unit hydrograph methods in HEC-1 according to the methods outlined in the Washoe County Hydrologic Criteria and Drainage Design Manual. On-site topographic mapping was based on the aerial survey generated for this project with 1-ft contour interval and off-site topographic mapping was based on USGS 20-foot contours. Soil types were determined from NRCS Southern

Washoe County Soil Survey maps and vegetation cover was determined from aerial photos and site visits. Please see Table 2 for existing conditions runoff parameters and Appendix A for runoff computation.

Sub Drainage area	Area (acres)		Soil Data (acres)			L_a	L_c	S	CN	Kt	T_{LAG}
	Off-site	On-site	B	C	D	(mile)	(mile)	(ft/mile)			(hours)
EX1	1107	0	13	0	1094	3.4	2.4	1178	81.8	0.09	1.21
EX2	295	129	36	22	366	1.7	0.8	600	74.6	0.09	0.80
EX3	1421	49	119	4	1347	3.1	1.4	474	80.3	0.09	1.36
EX4	119	68	13	0	174	1.5	0.9	819	80.5	0.09	0.74
EX5	74	119	0	32	161	1.2	0.5	1200	82.1	0.09	0.51

Table 2: Existing Conditions Runoff Parameters

2.2.3 Stormwater Routing

The Muskingum Cunge routing subroutine was utilized within HEC-1 to simulate flood routing. Existing conditions drainage areas were routed according to the current channel configuration constructed as part of Damonte Ranch. The channel along Desert Way intercepts runoff from drainage areas EX1 through EX4. Drainage area EX4 was routed with a wide shallow channel from its outlet at the western property boundary to simulate its overland flow through the pre-Damonte Ranch properties. It was then routed to the concentration of drainage area EX3 with the channel configuration of the trapezoidal channel along Desert Way where it was added to runoff from drainage area EX3. Drainage areas EX3 and EX4 were then routed with the trapezoidal channel along Desert Way to the northwest property boundary where it was added to runoff from drainage areas EX1 and EX2 for the final concentration point at this location. Drainage area EX5 was not routed.

2.2.4 Existing Conditions Results

In northwest corner of the property, the final concentration point for runoff from drainage areas 1 through 4, the HEC-1 models compute a peak of 419 cfs in the 5-year event and 1354 cfs in the 100-year event. A peak of 54 cfs is generated in the 5-year event and 195 cfs in the 100-year event for drainage area 5 concentrating in the channel bordering the high school property. Table 3 shows the peak flows and times of peak computed by the existing conditions HEC-1 models.

Table 3: Existing Conditions Runoff Results

Sub Drainage area	5-Year		100-Year	
	Q_p (cfs)	T_p (hours)	Q_p (cfs)	T_p (hours)
EX1	172	13.4	579	13.3
EX2	45	12.9	228	12.9
EX3	188	13.5	515	13.4
EX4	37	12.8	139	12.8
EX5	54	12.6	195	12.6

2.3 PROPOSED CONDITIONS

The goal of the master drainage plan is to perpetuate existing drainage patterns and to mitigate any flow increase to at or below pre-development levels for the two design storms. The SCS runoff and hydrograph methods were used within the HEC-1 model to simulate the 5- and 100-year runoff from the development as described in the Washoe County Hydrologic Criteria and Drainage Design Manual. We then sized a preliminary detention basin for the southern portion of the site to mitigate the increase in runoff caused by development so that the channel bordering the high school will not experience an increase in peak flows. This detention basin design is solely for the purpose of demonstrating that mitigation of peak flows within the southern portion of Damonte Foothills is possible. The detention basin location and size may change in final design.

2.3.1 Subdrainage areas

The subdrainage areas are outlined in Figure 3, Proposed Conditions Drainage area Delineation. The offsite drainage areas correspond to the existing conditions drainage areas with additional divisions to aid in the design of drainage facilities. Onsite drainage areas were delineated according to proposed drainage facility locations and downstream routing. Please see Figure 3: Proposed Conditions Subwatershed Delineation.

Drainage area OFF1 is identical to existing conditions drainage area EX1, concentrating along the northern boundary of the site. Offsite drainage areas OFF2 through OFF4 concentrate near the northeast corner of the site. Runoff from OFF1 through OFF4 will be collected by a trapezoidal channel running along the north boundary of the site that will discharge to a culvert beneath Desert Way. Onsite drainage areas DEV1 through DEV4 will also discharge to the boundary channel. Onsite drainage area DEV5 will drain directly to the Damonte Ranch channel along Desert Way through a culvert.

Offsite drainage area OFF5 corresponds to existing conditions drainage area 3. It will be collected by a channel that will run through the middle of the site, which will also collect runoff from OFF 6 and onsite drainage areas DEV6 through DEV10.

Runoff from offsite drainage areas DEV7 and DEV8 concentrates near the southeast boundary of the site. Offsite drainage area OFF7 will flow through onsite drainage area 12. Runoff from OFF7 and DEV12 will be collected in a channel to be routed though onsite drainage areas DEV11 and DEV13 to the Damonte Ranch bordering the high school. Runoff from offsite drainage area DEV8 will flow through DEV12. Runoff from DEV12 will drain directly to the high school boundary channel.

2.3.2 Runoff Computation

The Washoe County hydrologic methodology was utilized to compute proposed runoff using the SCS loss and hydrograph methodologies. Offsite runoff coefficients were based on soil data obtained from the NRCS Southern Washoe County Soil Maps and

observed vegetation cover. Onsite drainage area coefficients were based on proposed residential density and the Southern Washoe County Soil Survey. Runoff coefficients and lag times were computed using methodology described in the Washoe County Hydrologic Criteria and Drainage Design Manual. Please see Table 4 for proposed conditions runoff parameters and Appendix A for runoff computation.

Table 4: Proposed Conditions Runoff Parameters

Sub Drainage area											
	(acres)		B	C	D	(mile)	(mile)	(ft/mile)			(hours)
OFF1	1107		13	0	1094	3.3	2.4	1178	81.8	0.09	1.21
OFF2	111		0	0	111	1.2	0.7	1934	82	0.09	0.54
OFF3	51		0	0	51	0.6	0.3	1302	82	0.09	0.33
OFF4	133		0	0	132	1.0	0.6	2195	82	0.09	0.48
OFF5	1422		91	0	1331	3.4	1.9	529	80.7	0.09	1.32
OFF6	119		0	0	119	1.0	0.5	1396	82	0.09	0.46
OFF7	60		0	0	60	0.5	0.3	1796	82	0.09	0.31
OFF8	15		0	1	15	0.3	0.1	2212	81.4	0.09	0.14
Sub Drainage area											
	(acres)	(ac/house)	B	C	D	(feet)	(ft/ft)		(%)		(hours)
DEV1	7	0.46	0	7	0	1160	0.001	80.2	8.9	0.78	0.16
DEV2	61	0.41	32	9	20	4144	0.026	77.1	11.5	0.78	0.25
DEV3	46	0.59	3	0	43	3516	0.047	83.5	11.1	0.78	0.17
DEV4	15	0	0	0	15	1694	0.062	82.0	0	0.78	0.14
DEV5	6	0.32	0	6	0	870	0.013	81.0	13.5	0.78	0.11
DEV6	3	0	1	2	0	965	0.015	72.0	0	0.78	0.11
DEV7	15	0.73	14	0	1	1945	0.054	70.1	6.8	0.78	0.17
DEV8	8	1.52	3	0	5	1371	0.077	76.6	10.2	0.78	0.07
DEV9	41	0.37	25	0	16	2340	0.056	75.5	12.0	0.78	0.11
DEV10	61	1.52	0	0	61	2585	0.162	84.0	7.3	0.78	0.07
DEV11	21	0.41	0	11	10	967	0.124	82.9	13.0	0.78	0.05
DEV12	22	1.84	0	0	22	1098	0.164	84.0	2.5	0.78	0.04
DEV13	58	0.48	1	20	37	3834	0.164	83.2	11.0	0.78	0.11

2.3.3 Stormwater Routing

The Muskingum Cunge subroutine was utilized within HEC-1 to simulate routing within the proposed conditions runoff models. In the northern portion of the site runoff from OFF4 is routed within a proposed trapezoidal channel along the eastern boundary of DEV3. Runoff from OFF 3 collects in this channel as well, but because it is such a short reach, it is not routed within HEC-1. CP4 concentrates runoff from OFF3, OFF4 and DEV 4. Runoff collecting at CP4 is routed to CP3 within a trapezoidal channel. Runoff from DEV3 and DEV4 is collected at CP3 without routing. Runoff from CP3 is then routed to CP1 in the continuation of the trapezoidal channel that discharges to the northwest corner of the property to cross beneath Desert Way in a culvert. Runoff from DEV1 and DEV2 also collects at this location.

In the center portion of the site, runoff from OFF6 is collected in a trapezoidal channel that runs through onsite drainage area DEV10. It flows to DEV8 where it co-mingles

with runoff from DEV5 and flows west in a constructed trapezoidal channel. CP8 collects this flow and runoff from DEV8 and DEV10. CP8 is routed to CP7 in the continuation of the channel where it co-mingles with runoff from DEV7 and DEV9. CP7 is then routed to CP6 where runoff from DEV6 also concentrates. This flow then crosses Desert Way in a culvert and flows within the Damonte Ranch channel to join flow from CP1 across the street from the northwest corner of the site. Runoff from onsite drainage area DEV5 crosses the street in a culvert and is routed in the Damonte Ranch channel to this corner as well. This concentration is directly comparable to existing conditions CP1.

In the southern portion of the site runoff from offsite drainage area OFF7 is routed through onsite drainage area DEV12 in a trapezoidal channel to the outlet of DEV12 (CP12). This flow is routed to CP11 in a trapezoidal channel where it joins runoff from DEV11. It is preliminarily proposed for this Master Drainage Plan that a detention basin be constructed at this location to detain this flow and mitigate the increase in peak flow that concentrates within the boundary channel along the high school. Flow exiting the detention basin would be routed to the high school channel in a trapezoidal channel. Runoff from DEV13 drains directly into the high school channel. Runoff from the small offsite drainage area OFF8 drains through DEV11 and DEV13 to co-mingle with the onsite runoff within these drainage areas and be collected within the proposed stormdrains to outlet to the proposed channels. The proposed conditions HEC-1 models were also run without detention in the southern portion of the site.

2.3.4 Proposed Conditions Results

The 5-year proposed conditions HEC-1 model computes a peak flow of 385 cfs at CP1 after the flow from the central portion of site is added. The 100-year model predicts a peak of 1274 cfs. Both of these peak flows are less than existing conditions. Although this seem counter-intuitive as the proposed conditions will increase impervious area and resulting runoff volumes, it makes sense when times to peak are considered. The developed drainage areas on the site, which are much smaller than the large offsite drainage areas OFF1 and OFF5, flush through the system faster when developed, making them less coincident with the runoff from the offsite drainage areas with the longer times of concentration and higher peak flow rates. Please see Table 5 the proposed conditions peak flow results.

In the southern portion of the site, the 5- and 100-year peak flow rates concentrating in the channel increase. In the 5-year event, the peak flow rate concentrating within the channel increases from 54 cfs in existing conditions to 73 cfs in proposed conditions. In the 100-year event the flow increases from 195 cfs in existing conditions to 248 cfs in proposed conditions. Please see Table 5 for all peak flow and times of peak results and Appendix D for the HEC-1 model output.

This increase in peak flow for the two design events will be mitigated in part by detention basins within the McCauley Ranch subdivision. Because this subdivision is still under design by TEC, the site and sizing of the detention basins are not included in this report. The channel bordering the Damonte Ranch High School and the downstream culverts

were designed to convey more than 250 cfs and according to normal depth and culvert rating curves can currently handle much higher flows (Wood Rodgers, Inc., 2005). However, the flow from the site is not the only runoff concentrating within the channel; there are small additional catchments that drain to it. The analysis for the final design of the McCauley Ranch subdivision and peak flow mitigation will insure that any increase in the 100-year peak flow to the channel will not overwhelm the conveyance capability of the channel or downstream culverts and will not increase the peak flow from the area for the two design storms.

Table 5: Proposed Conditions Runoff Results

Sub Drainage area	5-Year		100-Year	
	Q_p (cfs)	T_p (hours)	Q_p (cfs)	T_p (hours)
OFF1	172	13.4	579	13.3
OFF2	30	12.6	108	12.6
OFF3	19	12.4	68	12.4
OFF4	38	12.5	139	12.5
OFF5	192	13.5	663	13.4
OFF6	35	12.5	129	12.5
OFF7	22	12.4	82	12.3
OFF8	7	12.2	26	12.2
DEV1	4	12.2	14	12.2
DEV2	22	12.3	86	12.3
DEV3	30	12.2	97	12.2
DEV4	8	12.2	31	12.2
DEV5	4	12.1	14	12.1
DEV6	1	12.2	5	12.1
DEV7	3	12.2	18	12.2
DEV8	6	12.1	18	12.1
DEV9	20	12.1	80	12.1
DEV10	54	12.1	176	12.1
DEV11	21	12.1	67	12.1
DEV12	21	12.1	71	12.1
DEV13	34	12.2	112	12.2

3.0 PROPOSED DRAINAGE FACILITIES

3.1 STORM DRAINS

The design of the storm drain system will be included in the phased drainage report submittals with the development plans. They will be designed according to City of Reno standards. All storm drains will discharge into proposed or existing channel. Storm drains will convey runoff from almost the entire on-site area. Half-lots that border a channel or detention basin will discharge directly into that channel or detention basin.

3.2 CHANNELS

The channel locations are shown in Figure 4 with the peak 100-year flow rates as described in the figure and Table 6. All side slopes and lining will be designed according to City of Reno standards in the final design of the subdivisions.

Table 6: Preliminary Channel Parameters

Channel ID	Typical Slope (ft/ft)	100 Year Q's (cfs)	Bottom Width (ft)	Side Slope Z (H:V)	Max Depth (ft)
OFF5 to OFF6	0.100	129	10	3	0.8
CPOFF to CP8	0.083	687	10	3	2.2
CP8 to CP7	0.065	692	6	3	3.6
CP7 to CP6	0.15	695	6	3	5.1
OFF4 to CP4	0.052	139 to 205	5	3	1.7
CP4 to CP3	0.083	205 to 342	10	3	1.5
CP3 to CP1	0.027	342 to 584	10	3	2.7

3.3 CULVERTS

The culvert locations are shown in Figure 4. The culverts have been preliminarily designed for the northern portion of the site. Because the roadways and layout of the southern portion is very much in process, the locations and peak flows have been indicated on Figure 4 but no preliminary size has been assigned. The calculations for the culvert designs are located in appendix B.

Because of the steep slopes of the channels through much of the site, the inlets and outlets of the culverts will have to be armored.

3.4 MAINTENANCE ISSUES

The channels will need to be regularly maintained to prevent sediment accumulation that would jeopardize the function of the flood control facilities. Because there is such a relatively large off-site undeveloped area contributing to the portion of the site with the detention basin, significant sediment accumulation may compromise the basin capacity if not maintained.

4.0 CONCLUSION

The proposed Damonte Foothills development will not have negative drainage impacts on the areas surrounding it. It will decrease the amount of runoff discharging from the site in the design events in the northern portion of the site. From the southern portion, the final design of McCauley Ranch subdivision will ensure that any increase in peak flows to the channel will either be mitigated by on-site detention or will not overwhelm the capacity of the Damonte Ranch High School channel or any downstream facilities. In addition, any increase in peak flow from the southern portion of Damonte Foothills will not contribute to an overall increase in peak design flows from Damonte Ranch. Please see Table 7 for a summary of the computed runoff from the site in both existing and proposed conditions.

Table 7: Peak Flow Results

Location	Event			
	5-Year Ex	5-Year Prop	100-Year Ex	100-Year Prop
CP1	419	385	1354	1274
High School Channel	54	73	195	248

As the individual subdivision progress, the hydrology reports will be submitted to Wood Rodgers, Inc. to insure that the design conforms to the master drainage design.

References

City of Reno, 2000. City of Reno Design Manual, Chapter II Storm Drainage. November 1st, 2000.

Natural Resource Conservation District (Formerly Soil Conservation District), 1980. Soil Survey of Washoe County, Nevada, South Part.

Nimbus Engineers, 1995. Southeast Truckee Meadows Flood Control Master Plan. May 1995.

Nimbus Engineers, 2001. Application for Conditional Letter of Map Revision (CLOMR): Damonte Ranch/Double Diamond Ranch Regional Flood Control Improvements. March 2001 and Addendum September 2001.

USACE, Hydrologic Engineering Center, HEC-1 v. 4.1, 1998.

Washoe County, 1996. Washoe County Hydrologic Criteria and Drainage Design Manual. Prepared by WRC Nevada, December 1996.

Wood Rodgers, Inc., 2005. Damonte Hills Boulevard Drainage Study. March 8, 2005.

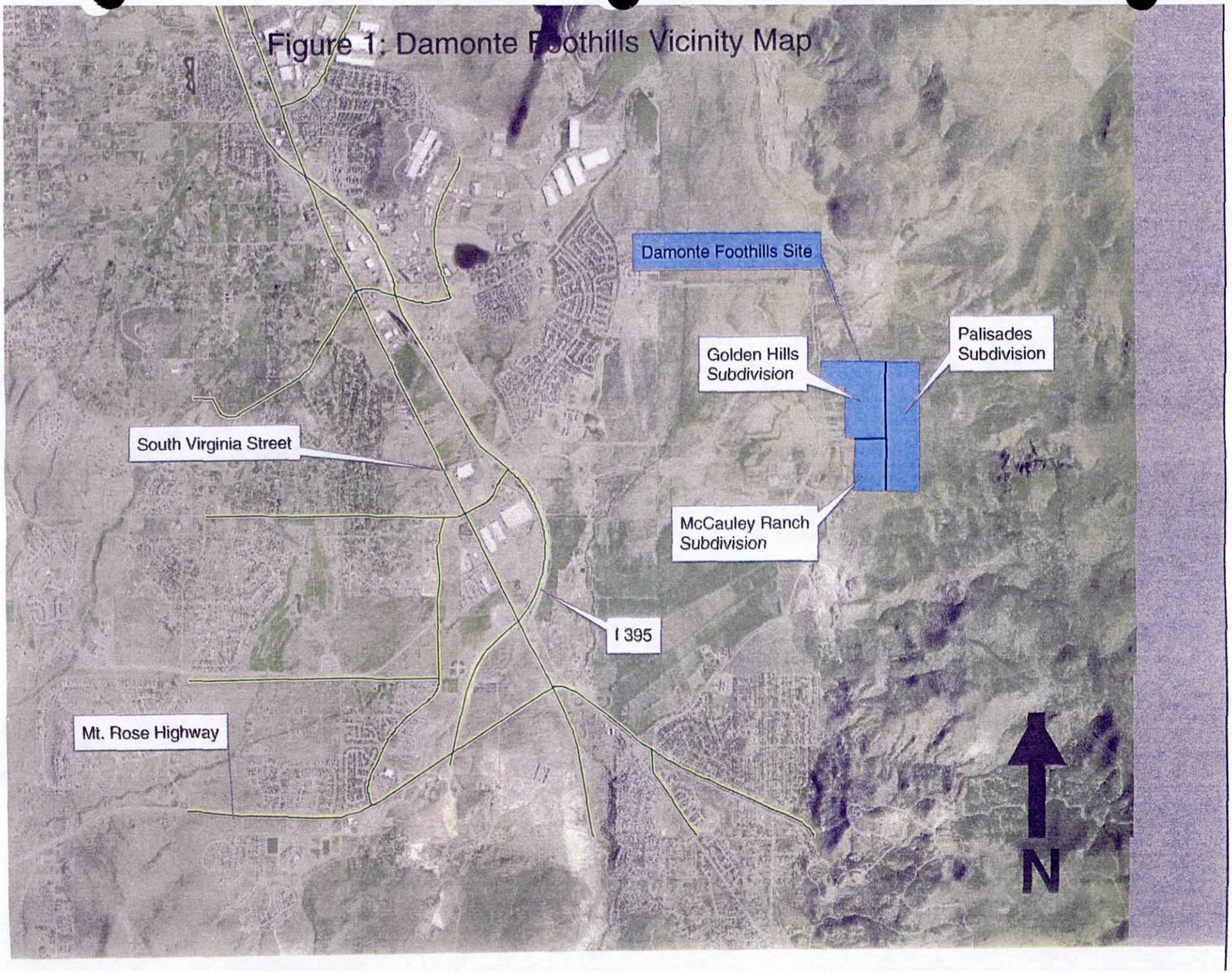


Figure 1: Damonte Foothills Vicinity Map
Damonte Foothills Site
Golden Hills Subdivision
Palisades Subdivision
South Virginia Street
McCauley Ranch Subdivision
I 395
Mt. Rose Highway
N

Figure 2: Existing Conditions Subdrainage Area Delineation

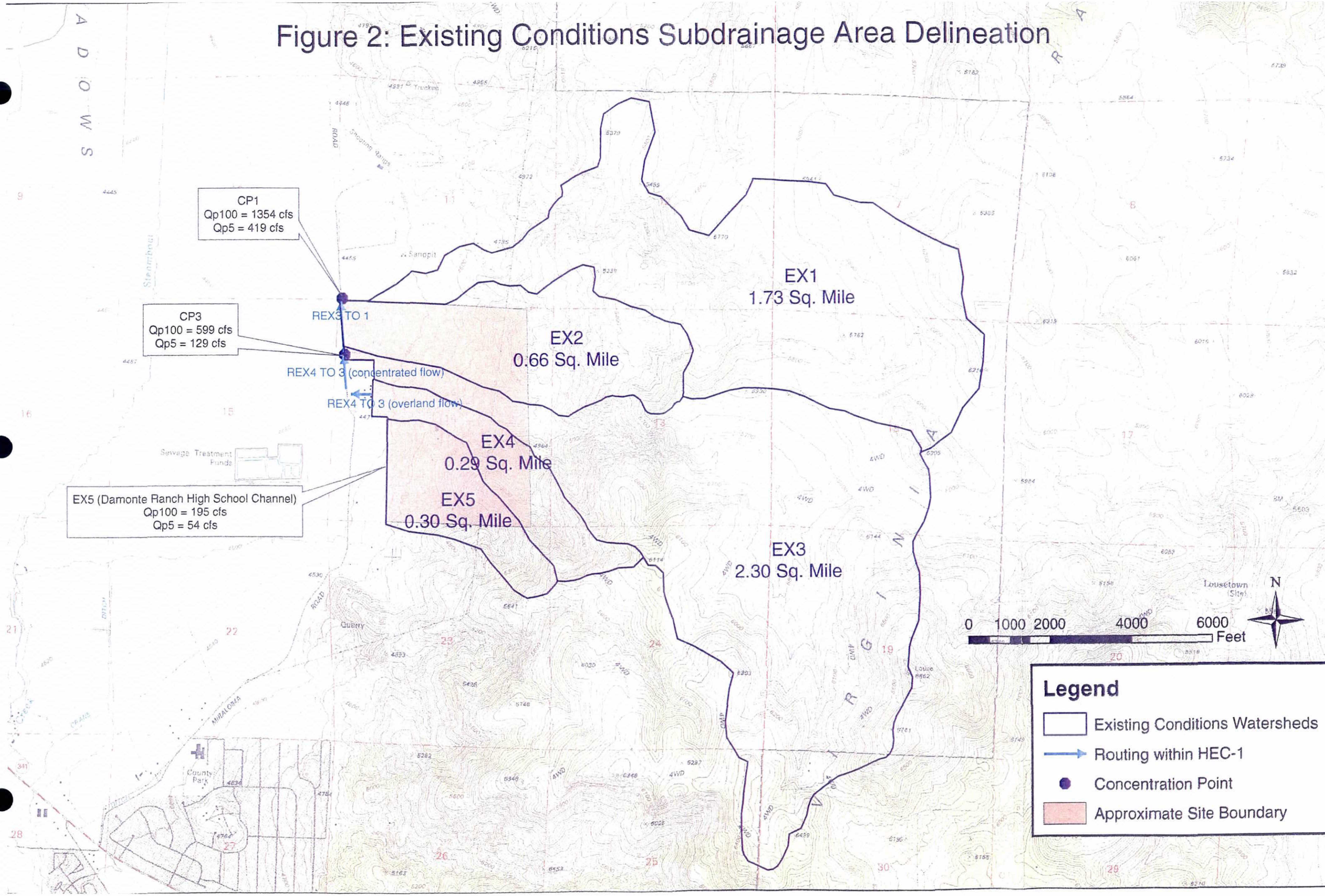
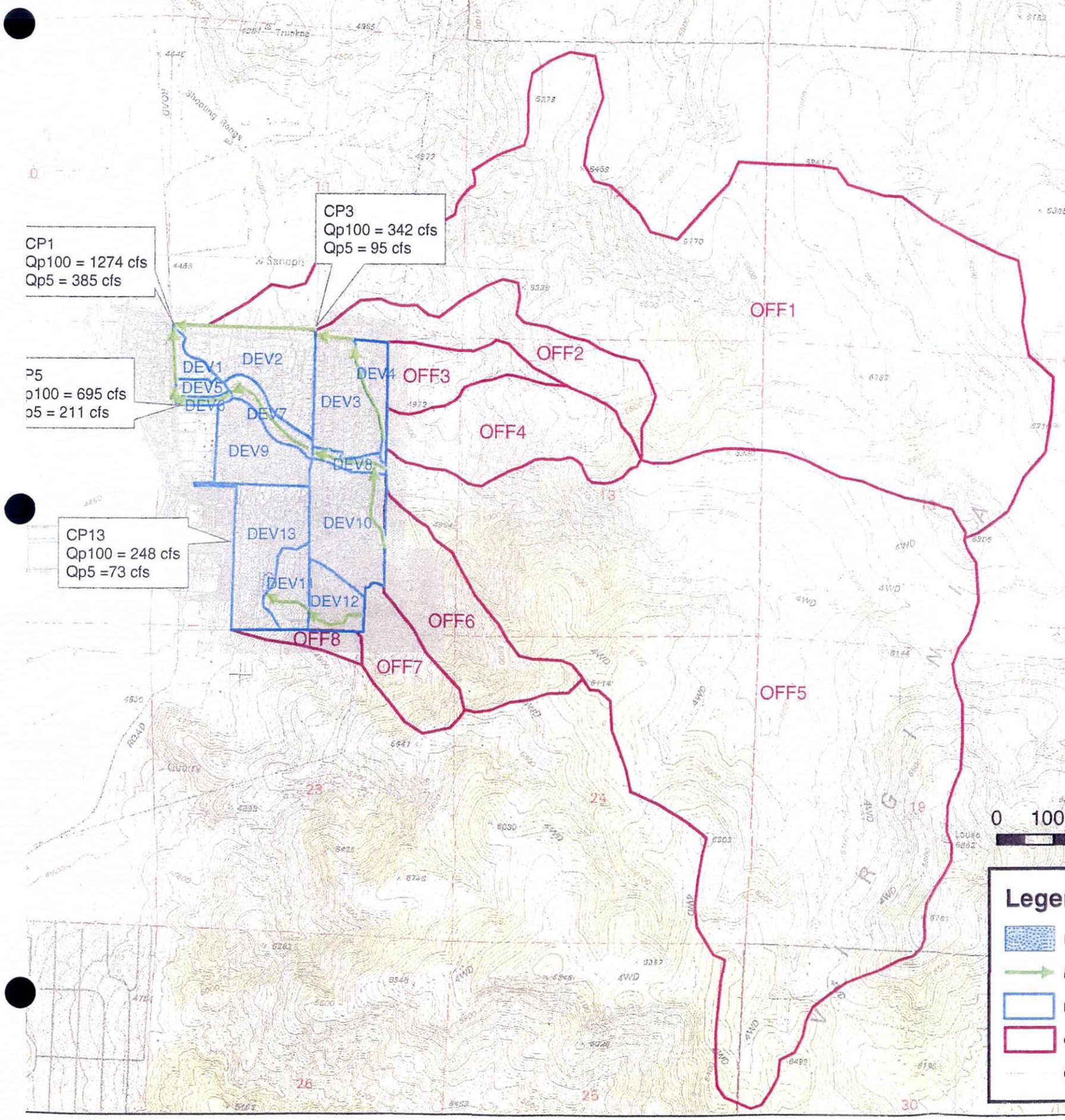


Figure 3: Proposed Conditions Subdrainage Area Delineation



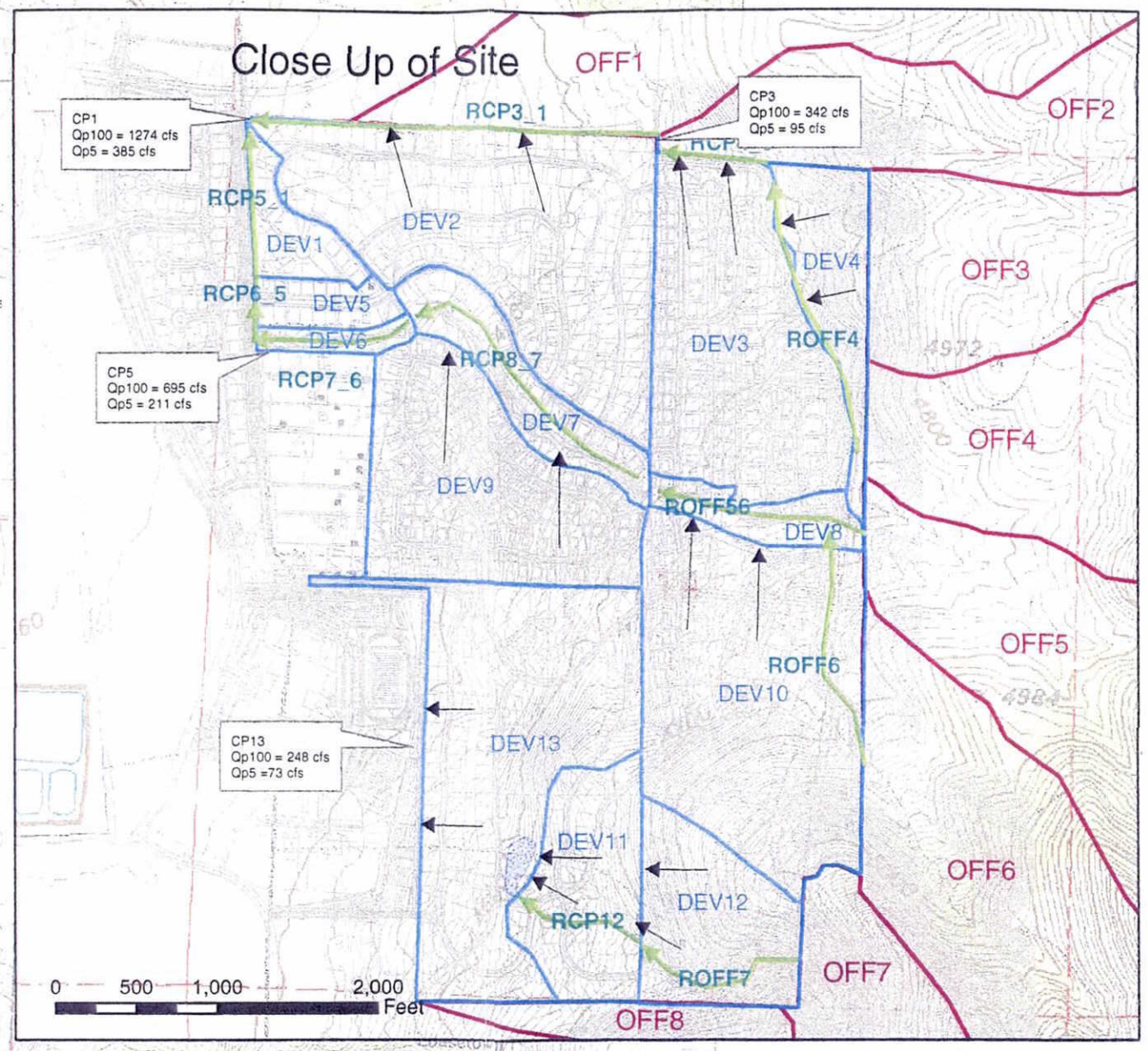
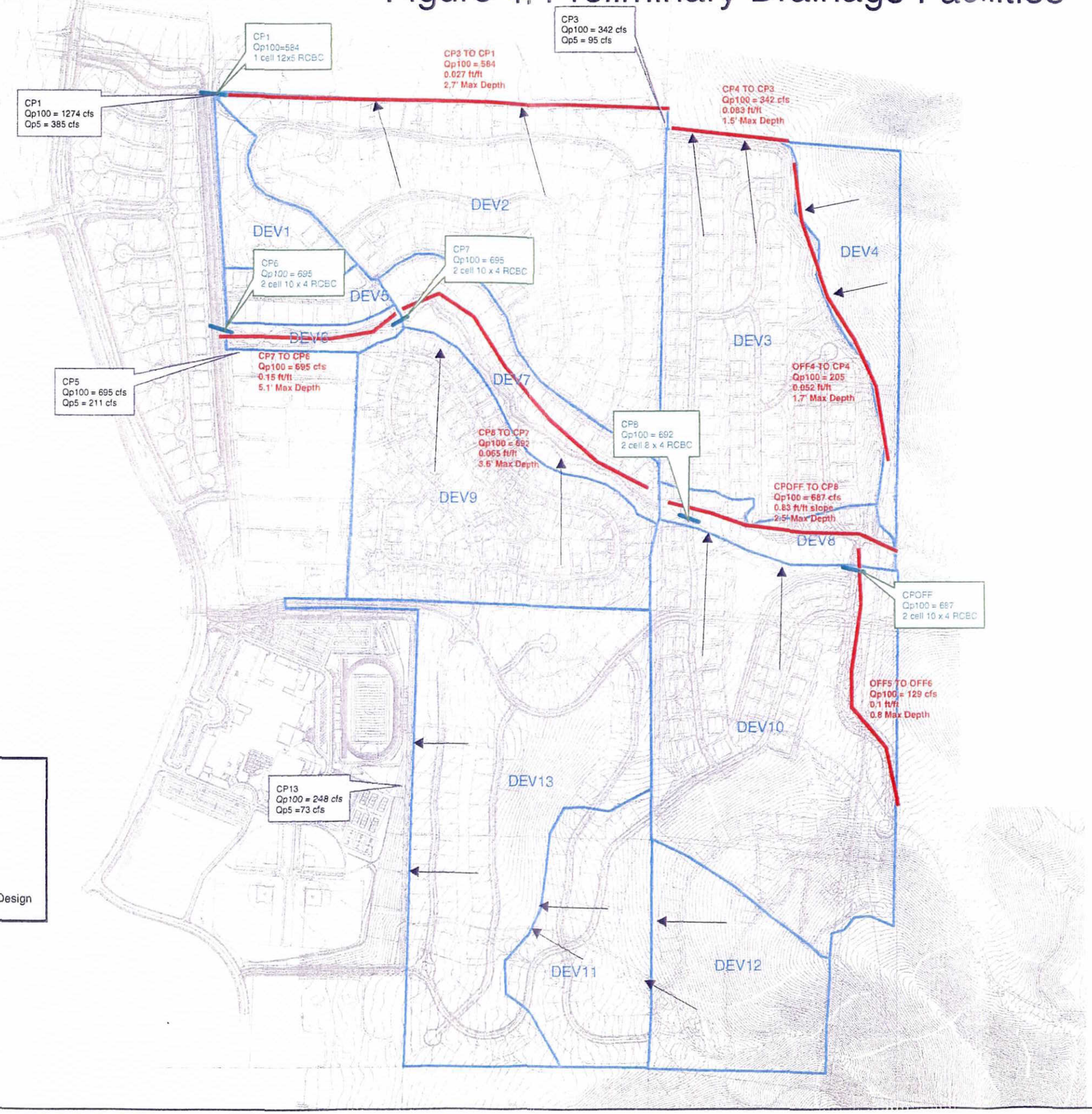


Figure 4: Preliminary Drainage Facilities



POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Nevada 39.433 N 119.67 W 5770 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 3
G.M. Bonnin, D. Todd, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2003

Extracted: Fri Feb 4 2005

Confidence Limits | Seasonality | Location Maps | Other Info. | Grids | Maps | Help | Docs

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.13	0.20	0.25	0.34	0.41	0.55	0.67	0.97	1.32	1.75	2.20	2.71	3.21	3.64	4.71	5.62	6.81	7.99
5	0.18	0.27	0.34	0.45	0.56	0.72	0.84	1.20	1.68	2.25	2.86	3.56	4.25	4.81	6.18	7.37	8.92	10.45
10	0.22	0.33	0.41	0.56	0.69	0.84	0.98	1.38	1.96	2.65	3.40	4.27	5.11	5.75	7.32	8.73	10.54	12.24
25	0.28	0.43	0.54	0.72	0.89	1.04	1.16	1.60	2.31	3.21	4.17	5.28	6.33	7.07	8.88	10.60	12.73	14.55
50	0.34	0.52	0.65	0.87	1.08	1.21	1.30	1.77	2.59	3.67	4.80	6.10	7.32	8.13	10.10	12.05	14.42	16.28
100	0.41	0.62	0.78	1.04	1.29	1.39	1.48	1.93	2.87	4.14	5.47	6.99	8.39	9.26	11.38	13.55	16.17	18.00
200	0.49	0.75	0.93	1.25	1.55	1.61	1.70	2.11	3.14	4.65	6.18	7.94	9.54	10.43	12.69	15.11	17.96	19.72
500	0.62	0.95	1.18	1.59	1.97	2.04	2.12	2.33	3.50	5.35	7.19	9.31	11.17	12.09	14.50	17.24	20.42	21.98
1000	0.75	1.14	1.42	1.91	2.36	2.43	2.51	2.64	3.78	5.91	8.01	10.43	12.52	13.42	15.93	18.91	22.35	23.71

Text version of table

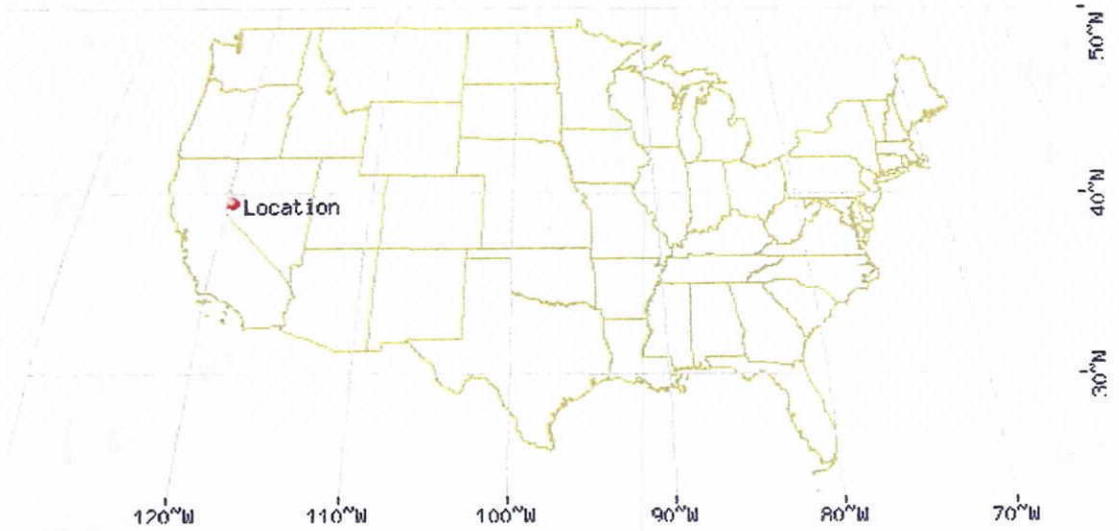
* These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval. Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.

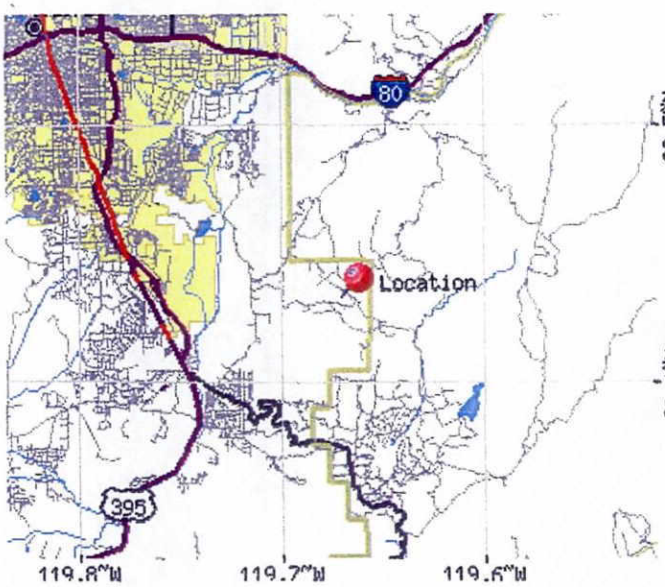
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.11	0.17	0.21	0.29	0.36	0.49	0.61	0.87	1.19	1.58	1.97	2.42	2.84	3.22	4.19	4.98	6.03	7.05
5	0.15	0.23	0.29	0.39	0.48	0.62	0.76	1.07	1.50	2.02	2.55	3.17	3.74	4.24	5.48	6.50	7.88	9.20
10	0.19	0.28	0.35	0.47	0.58	0.73	0.86	1.22	1.73	2.36	3.01	3.79	4.48	5.04	6.46	7.66	9.25	10.74
25	0.23	0.36	0.44	0.59	0.74	0.87	1.00	1.39	2.00	2.83	3.65	4.63	5.49	6.13	7.76	9.21	11.11	12.71
50	0.27	0.41	0.51	0.69	0.85	0.98	1.11	1.51	2.21	3.18	4.17	5.31	6.29	7.00	8.76	10.40	12.50	14.15
100	0.31	0.48	0.59	0.80	0.99	1.10	1.24	1.63	2.41	3.54	4.69	6.01	7.13	7.88	9.79	11.61	13.92	15.55
200	0.36	0.55	0.68	0.91	1.13	1.23	1.39	1.74	2.58	3.89	5.23	6.73	8.00	8.78	10.79	12.81	15.33	16.91
500	0.42	0.65	0.80	1.08	1.34	1.48	1.68	1.87	2.77	4.35	5.96	7.72	9.18	9.98	12.13	14.39	17.19	18.68
1000	0.48	0.73	0.91	1.23	1.52	1.70	1.93	2.10	2.92	4.70	6.52	8.50	10.13	10.90	13.14	15.59	18.59	19.96

* The **lower** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **less** than.
** These precipitation frequency estimates are based on a partial duration maxima series. **ARI** is the Average Recurrence Interval.

Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Maps -





These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server.

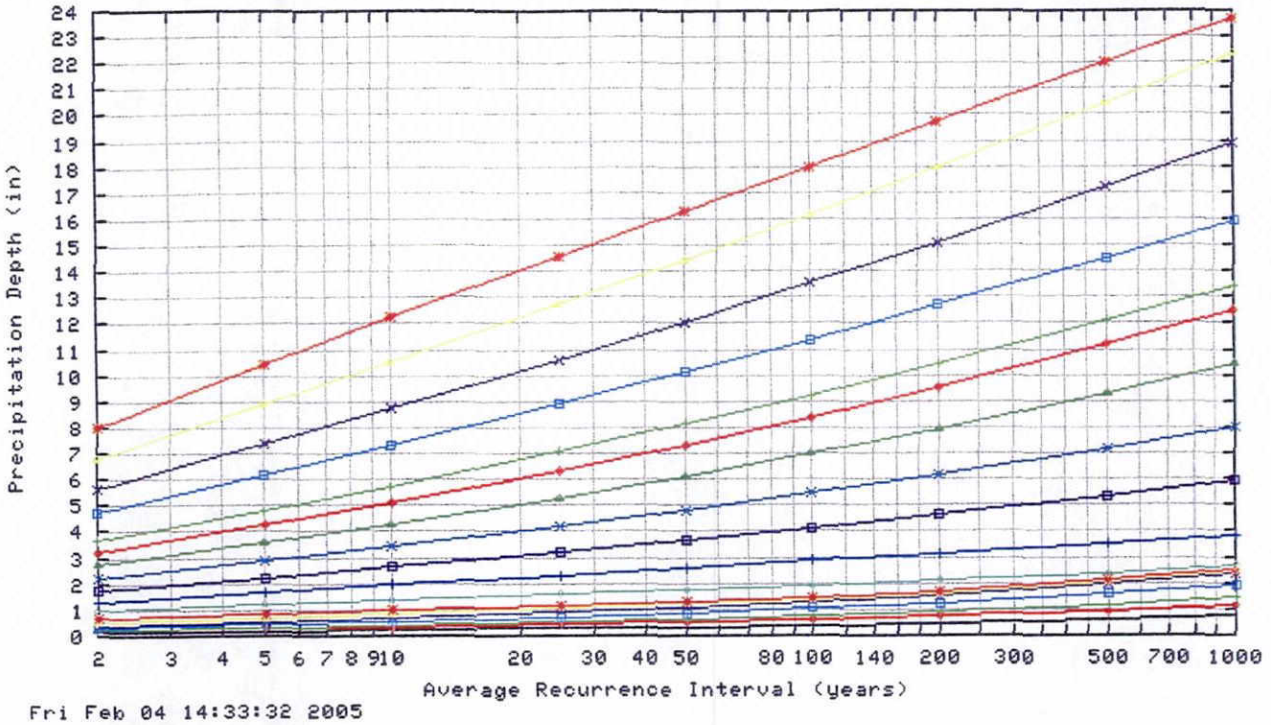
Please read disclaimer for more information.

LEGEND

- State
- County
- Indian Resv
- Lake/Pond/Ocean
- Street
- Expressway
- Highway
- Connector
- Stream
- Military Area
- National Park
- Other Park
- City
- County

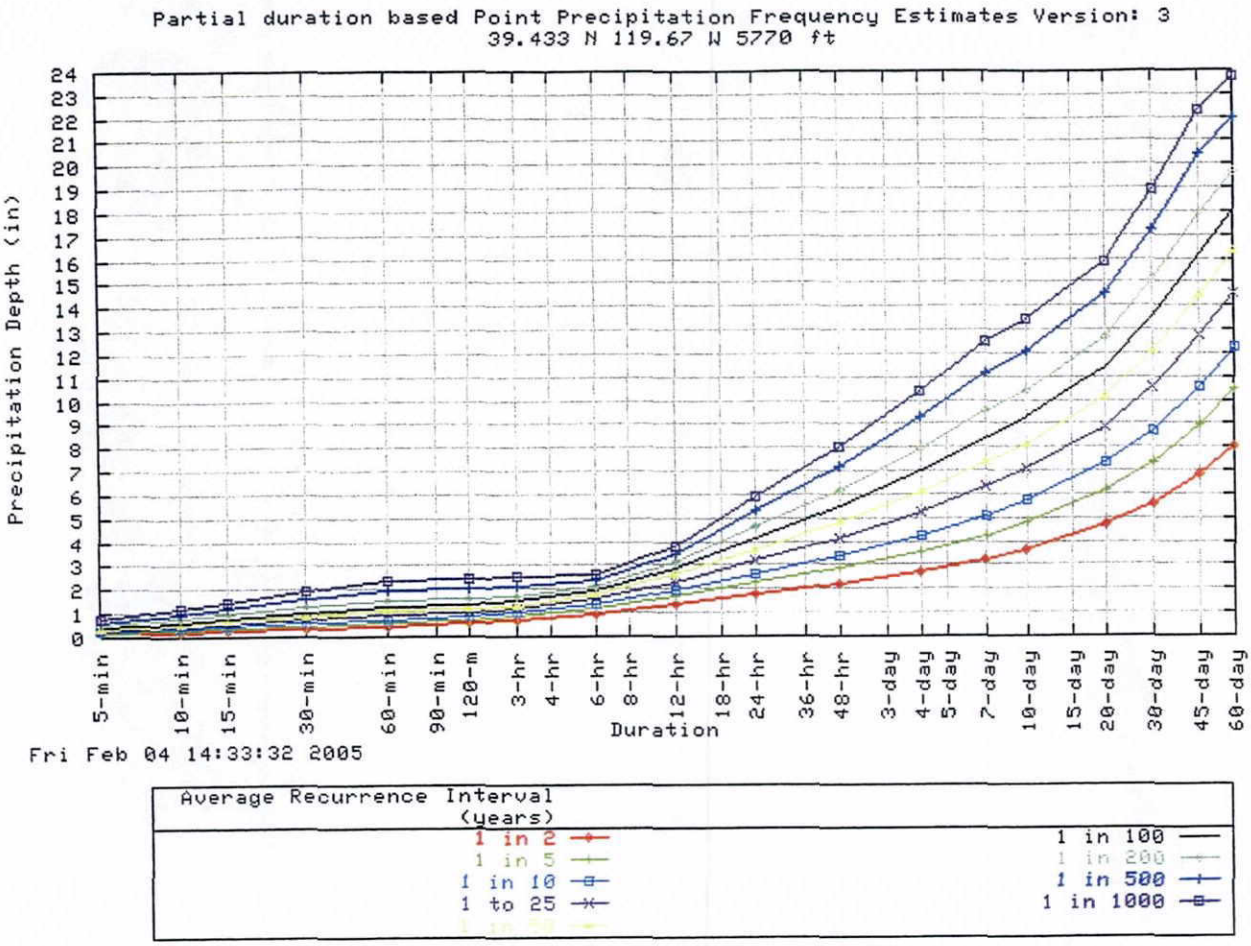
Scale 1:228583
*average--true scale depends on monitor resolution

Partial duration based Point Precipitation Frequency Estimates Version: 3
39.433 N 119.67 W 5770 ft



Fri Feb 04 14:33:32 2005

Duration			
5-min		48-hr	30-day
10-min	3-hr	4-day	
15-min	6-hr	7-day	60-day
30-min	12-hr	10-day	
60-min	24-hr	20-day	



Confidence Limits -

*** Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)**

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.15	0.24	0.29	0.39	0.49	0.64	0.76	1.09	1.48	1.95	2.48	3.05	3.66	4.16	5.34	6.39	7.69	9.04
5	0.21	0.32	0.40	0.54	0.66	0.82	0.95	1.35	1.89	2.50	3.22	4.03	4.87	5.50	7.01	8.39	10.10	11.81
10	0.26	0.39	0.49	0.66	0.81	0.98	1.11	1.55	2.20	2.95	3.83	4.83	5.85	6.58	8.33	9.96	11.94	13.83
25	0.34	0.52	0.64	0.86	1.06	1.22	1.33	1.82	2.64	3.60	4.72	5.98	7.26	8.11	10.13	12.10	14.44	16.48
50	0.41	0.63	0.78	1.05	1.30	1.44	1.52	2.02	2.98	4.13	5.45	6.92	8.42	9.35	11.55	13.82	16.41	18.50
100	0.50	0.77	0.95	1.28	1.58	1.71	1.79	2.24	3.35	4.72	6.25	7.96	9.67	10.66	13.04	15.58	18.45	20.54
200	0.62	0.94	1.17	1.57	1.95	2.02	2.10	2.47	3.72	5.34	7.12	9.09	11.04	12.08	14.61	17.45	20.60	22.58
500	0.82	1.25	1.55	2.08	2.58	2.66	2.74	3.03	4.27	6.25	8.39	10.76	13.06	14.12	16.86	20.06	23.58	25.36
1000	1.01	1.54	1.91	2.58	3.19	3.27	3.35	3.61	4.68	7.01	9.47	12.17	14.76	15.80	18.65	22.18	26.03	27.48

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than.
** These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

*** Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)**

Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available
from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the USGS for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information
about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study,
please refer to our documentation.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

[redacted] ...OR... [redacted] of this location (39.433/-119.67). Digital ASCII data can be obtained directly from **NCDC**.

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the **Western Regional Climate Center's state-specific SNOTEL station maps**.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

(301) 713-1669
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Existing and Offsite Proposed Tlag Calculation

Offsite Areas	Area (sq mi)	slope	Kn	L	Lc	Tlag	Cn
		ft/mile		miles	miles	hours	
OFF1	1.72959	1177.47	0.09	3.2485	2.3655	1.21389	81.75
OFF2	0.17000	1934.01	0.09	1.2203	0.6807	0.53675	82
OFF3	0.08165	1301.69	0.09	0.6146	0.2566	0.33116	82
OFF4	0.20624	2195.01	0.09	1.0023	0.6227	0.47835	82
OFF5	2.21900	529.02	0.09	3.4384	1.9129	1.31589	80.66
OFF6	0.19029	1396.31	0.09	0.9697	0.453	0.45901	82
OFF7	0.09313	1796.45	0.09	0.5121	0.286	0.30644	82
OFF8	0.23910	2211.52	0.09	0.2894	0.1422	0.19478	81.72

Existing Areas	Area (sq mi)	slope	Kn	L	Lc	Tlag	Cn
		ft/mile		miles	miles	hours	
EX1	1.72011	1177.50	0.09	3.25	2.37	1.214828	81.75
EX2	0.66882	599.80	0.09	1.7339	0.8858	0.797557	74.64
EX3	2.28246	473.58	0.09	3.1428	2.18239	1.358805	80.27
EX4	0.28638	818.91	0.09	1.5386	0.91193	0.735349	80.54
EX5	0.33745	1199.61	0.09	1.167	0.49356	0.514677	80.51

Time of Concentration Worksheet
Golden Hills Proposed Watersheds
Calculated by: Wood Rodgers, Inc

Sub-basin Data		Initial/Overland Time			Travel Time				Tc	Tc Urbanized Basins Check		Final Tc	Lag Time (hrs) (0.6*Tc)
No.	Area	Length (ft)	Slope (%)	Ti (min)[1]	Length (ft)	Slope (%)	Vel. (fps)[2]	Tt (min)	(Ti+Tt)	Total Length (ft)	Tc[3]	(min)	
1	0.0115	100	1	5.8	1060	0.086	0.6	30.1	35.9	1160	16.4	16.4	0.16
2	0.0957	100	2.63	4.2	4044	2.63	3.2	20.8	25.0	4144	33.0	25.0	0.25
3	0.0724	100	4.69	3.5	3416	4.69	4.3	13.1	16.6	3516	29.5	16.6	0.17
4	0.0233	100	6.2	3.2	1594	6.2	2.5	10.7	13.8	1694	19.4	13.8	0.14
5	0.0091	100	1.26	5.3	770	1.26	2.2	5.7	11.1	870	14.8	11.1	0.11
6	0.0053	100	1.45	5.1	865	1.45	2.4	6.0	11.1	965	15.4	11.1	0.11
7	0.0227	100	5.4	3.3	1845	5.4	2.3	13.2	16.5	1945	20.8	16.5	0.17
8	0.0118	100	7.66	2.9	1271	7.66	5.5	3.8	6.8	1371	17.6	6.8	0.07
9	0.0638	100	5.55	3.3	2240	5.55	4.7	7.9	11.2	2340	23.0	11.2	0.11
10	0.0949	100	16.2	2.3	2485	16.2	8.0	5.1	7.4	2585	24.4	7.4	0.07
11	0.0034	100	12.4	2.5	867	12.4	7.0	2.1	4.6	967	15.4	4.6	0.05
12	0.0346	100	16.4	2.3	998	16.4	8.1	2.1	4.3	1098	16.1	4.3	0.04
13	0.0911	100	3.65	3.8	3734	16.4	8.1	7.7	11.4	3834	31.3	11.4	0.11

[1] $T_i=1.8\ (1.1-R)*L^{1/2}/S^{1/3}$ Assume R=.78 for all urban areas

[2] velocity on paved surfaces = $2*slope^{1/2}$; velocity on open space= $slope^{1/2}$

[3] Tc=(L/180)+10

Existing Conditions Soil and CN Determination
Vegetation Cover Assumed Shrub/Brush (except for burned area in EX5)

Watershed				Soil Polygon					Composite
ID	Area (sq feet)	area_sqmil	MUSYM	muname	Area (sq feet)	Hydro	CN	Soil %	CN
1	4479625.06	1.72959	482	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	53716.61	B	61	1.2%	81.75
1	4479625.06	1.72959	531	SAGOUSPE FINE SANDY LOAM	153.10	C	73	0.0%	
1	4479625.06	1.72959	585	BARNARD-TROSI ASSOCIATION	4132683.35	D	82	92.3%	
1	4479625.06	1.72959	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	293071.99	D		6.5%	
2	1715318.06	0.66229	482	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	26148.01	B	61	1.5%	74.64
2	1715318.06	0.66229	971	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	64585.59	B	61	3.8%	
2	1715318.06	0.66229	482	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	55342.74	B	61	3.2%	
2	1715318.06	0.66229	531	SAGOUSPE FINE SANDY LOAM	31428.86	C	73	1.8%	
2	1715318.06	0.66229	911	VAMP SILT LOAM, STRONGLY SALINE-ALKALI	7202.17	C	73	0.4%	
2	1715318.06	0.66229	420	GODECKE LOAMY SAND	49773.04	C	73	2.9%	
2	1715318.06	0.66229	585	BARNARD-TROSI ASSOCIATION	1136934.09	D	82	66.3%	
2	1715318.06	0.66229	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	343903.56	D	82	20.0%	
3	5951392.32	2.29785	960	KAYO STONY SANDY LOAM, 2 TO 4 PERCENT SLOPES	367666.34	B	61	6.2%	80.27
3	5951392.32	2.29785	971	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	25706.90	B	61	0.4%	
3	5951392.32	2.29785	482	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	89113.81	B	61	1.5%	
3	5951392.32	2.29785	911	VAMP SILT LOAM, STRONGLY SALINE-ALKALI	6330.99	C	73	0.1%	
3	5951392.32	2.29785	420	GODECKE LOAMY SAND	9777.01	C	73	0.2%	
3	5951392.32	2.29785	585	BARNARD-TROSI ASSOCIATION	1604949.08	D	82	27.0%	
3	5951392.32	2.29785	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	3822387.92	D	82	64.2%	
3	5951392.32	2.29785	1520	DUCO-SMALLCONE-CAGLE ASSOCIATION	25460.28	D	82	0.4%	
4	755071.91	0.29153	971	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	16413.61	B	61	2.2%	80.54
4	755071.91	0.29153	482	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	36250.09	B	61	4.8%	
4	755071.91	0.29153	585	BARNARD-TROSI ASSOCIATION	203694.86	D	82	27.0%	
4	755071.91	0.29153	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	498713.34	D	82	66.0%	
5	782130.19	0.30198	971	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	393.11	B	62*	0.1%	82.06
5	782130.19	0.30198	252	CASSIRO GRAVELLY SANDY LOAM, 8 TO 15 PERCENT SLOPES	128194.97	C	75*	16.4%	
5	782130.19	0.30198	585	BARNARD-TROSI ASSOCIATION	317032.17	D	85*	40.5%	
5	782130.19	0.30198	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	336509.93	D	82	43.0%	

* Burned area - assumed mixed grass shrub

Offsite Watershed Soil and CN Calculations
Assuming vegetation cover is shrub/brush

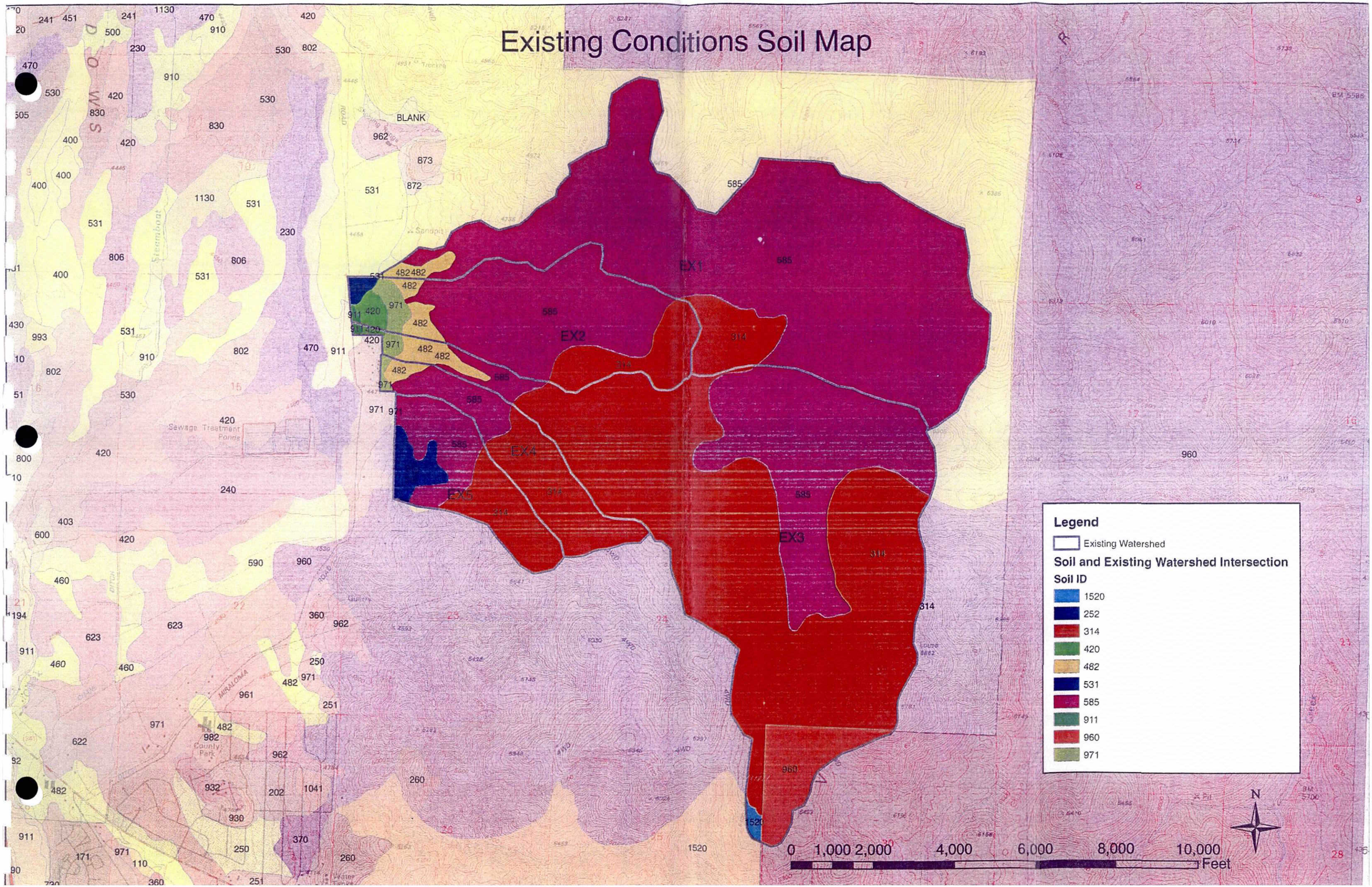
Watershed									Soil Polygon					Composite CN
ID	Area (sq feet)	area_mile	Length	Lc	Fall	Slope	AREA_AC	Area (sq mile)	MUSYM	muname	Hydro	CN	Soil %	
1	4479625.06	1.72959	17152.00	12490.00	3825	1177.47	1106.93	53716.61	482	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	B	61	1.20%	81.75
1	4479625.06	1.72959	17152.00	12490.00	3825	1177.47	1106.93	153.10	531	SAGOUSPE FINE SANDY LOAM	C	73	0.00%	
1	4479625.06	1.72959	17152.00	12490.00	3825	1177.47	1106.93	4132683.36	585	BARNARD-TROSI ASSOCIATION	D	82	92.26%	
1	4479625.06	1.72959	17152.00	12490.00	3825	1177.47	1106.93	293071.99	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	6.54%	
2	448661.98	0.17323	0.00	0.00	0	0.00	110.87	360529.36	585	BARNARD-TROSI ASSOCIATION	D	82	80.36%	82.00
2	448661.98	0.17323	0.00	0.00	0	0.00	110.87	88132.62	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	19.64%	
3	207170.48	0.07999	3245.00	1355.00	800	1301.00	51.19	207170.48	585	BARNARD-TROSI ASSOCIATION	D	82	100.00%	82.00
4	536054.38	0.20697	5292.00	3288.00	2200	2195.00	132.46	281475.95	585	BARNARD-TROSI ASSOCIATION	D	82	52.51%	82.00
4	536054.38	0.20697	5292.00	3288.00	2200	2195.00	132.46	254578.43	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	47.49%	
5	5752978.79	2.22124	18155.00	10100.00	189	529.00	1421.58	366071.88	960	KAYO STONY SANDY LOAM, 2 TO 4 PERCENT SLOPES	B	61	6.36%	80.66
5	5752978.79	2.22124	18155.00	10100.00	189	529.00	1421.58	1538451.92	585	BARNARD-TROSI ASSOCIATION	D	82	26.74%	
5	5752978.79	2.22124	18155.00	10100.00	189	529.00	1421.58	3823013.29	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	66.45%	
5	5752978.79	2.22124	18155.00	10100.00	189	529.00	1421.58	25441.71	1520	DUCO-SMALLCONE-CAGLE ASSOCIATION	D	82	0.44%	
6	481616.87	0.18595	5120.00	2392.00	1354	1396.31	119.01	9350.91	585	BARNARD-TROSI ASSOCIATION	D	82	1.94%	82.00
6	481616.87	0.18595	5120.00	2392.00	1354	1396.31	119.01	472159.50	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	98.04%	
6	481616.87	0.18595	5120.00	2392.00	1354	1396.31	119.01	106.46	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	0.02%	
7	241217.79	0.09313	2704.00	1510.00	920	1796.45	59.61	241111.33	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	99.96%	82.00
7	241217.79	0.09313	2704.00	1510.00	920	1796.45	59.61	106.46	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	0.04%	
8	59107.54	0.02282	1528.00	751.00	640	2211.52	14.61	1885.33	252	CASSIRO GRAVELLY SANDY LOAM, 8 TO 15 PERCENT SLOPES	C	73	3.19%	81.71
8	59107.54	0.02282	1528.00	751.00	640	2211.52	14.61	15194.95	585	BARNARD-TROSI ASSOCIATION	D	82	25.71%	
8	59107.54	0.02282	1528.00	751.00	640	2211.52	14.61	42027.26	314	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	D	82	71.10%	

Proposed Conditions Soil Hydro Group and CN Calculation
Taken from GIS database analysis

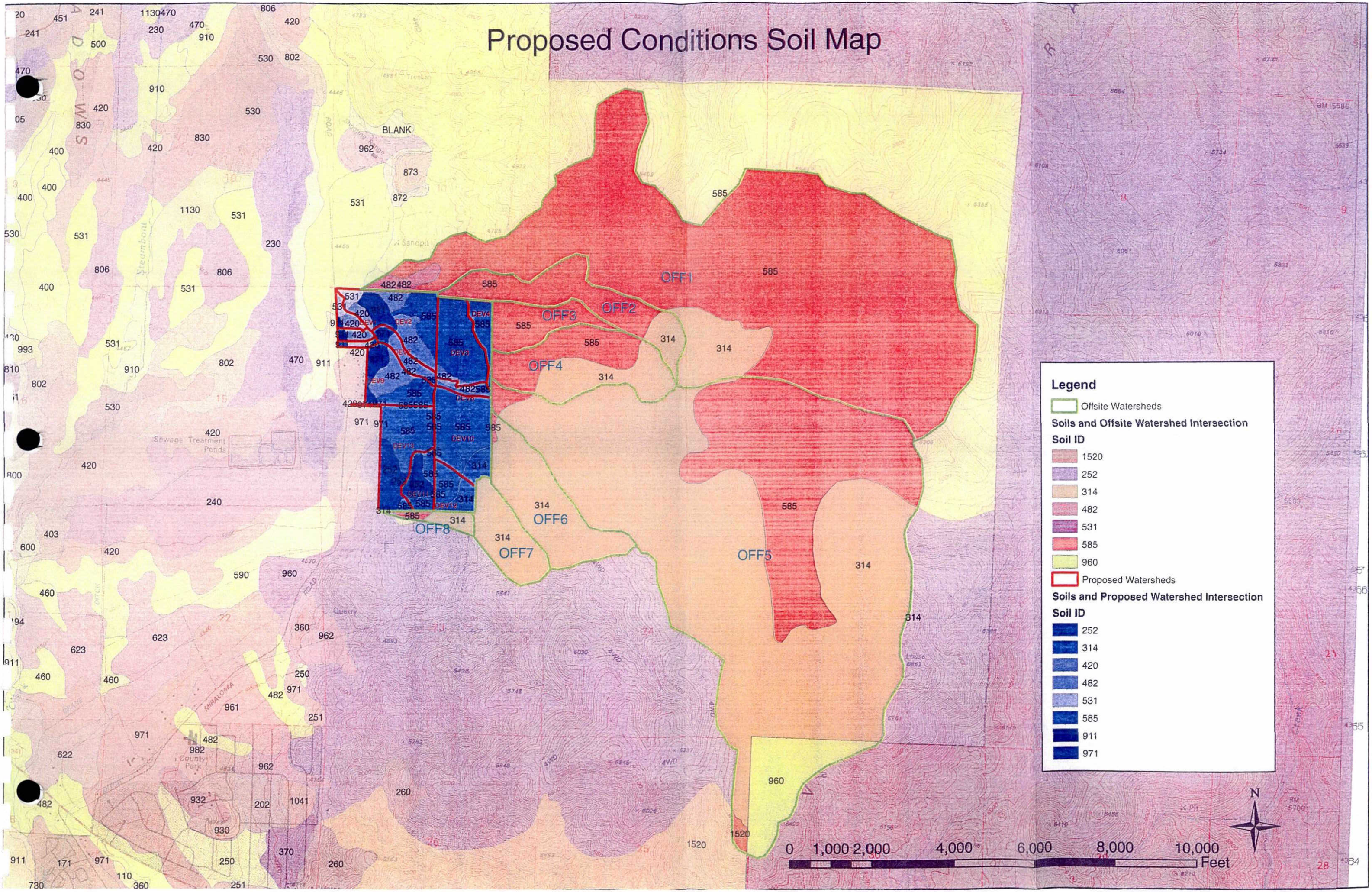
Watershed								Soil Polygon						Composite	Impervious area	
id	Area (sq feet)	AREA (ACRE)	area_mile	Lc	Slope	Houses	acre/house	MUSYM	Hydro Grp	muname	soil_area	Soil %	CN	CN	Sq feet	Percent
1	320235.91	7.35	0.01149	1160	10	16	0.459	531	C	SAGOUSPE FINE SANDY LOAM	109584.78	34.22%	80.20	80.20	28440	8.88%
1	320235.91		0.01149	1160	10			911	C	VAMP SILT LOAM, STRONGLY SALINE-ALKALI	31976.32	9.99%	80.20			
1	320235.91		0.01149	1160	10			420	C	GODECKE LOAMY SAND	178674.82	55.79%	80.20			
2	2667530.00	61.24	0.09568	4144	109	151	0.406	482	B	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	276840.65	10.45%	71.13	77.07	305940	11.47%
2	2667530.00		0.09568	4144	109			971	B	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	490938.97	18.40%	71.13			
2	2667530.00		0.09568	4144	109			482	B	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	640365.19	24.01%	71.13			
2	2667530.00		0.09568	4144	109			531	C	SAGOUSPE FINE SANDY LOAM	201472.38	7.55%	80.56			
2	2667530.00		0.09568	4144	109			420	C	GODECKE LOAMY SAND	181752.79	6.81%	80.56			
2	2667530.00		0.09568	4144	109			585	D	BARNARD-TROSI ASSOCIATION	874160.04	32.77%	85.13			
3	2017845.54	46.32	0.07238	3516	165	79	0.586	585	D	BARNARD-TROSI ASSOCIATION	1889445.28	93.64%	84.43	83.49	225400	11.17%
3	2017845.54		0.07238	3516	165			482	B	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	128400.25	6.36%	69.66			
4	649338.99	14.91	0.02329	1694	105	0		585	D	BARNARD-TROSI ASSOCIATION	649339.00	100.00%	82.00	82.00	0	0.00%
5	254007.99	5.83	0.00911	870	11	18	0.324	971	B	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	5685.53	2.24%	72.33	81.02	34400	13.54%
5	254007.99		0.00911	870	11			911	C	VAMP SILT LOAM, STRONGLY SALINE-ALKALI	64127.67	25.25%	81.22			
5	254007.99		0.00911	870	11			420	C	GODECKE LOAMY SAND	184194.69	72.52%	81.22			
6	147250.43	3.38	0.00528	965	14	0		971	B	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	24331.43	16.52%	62.00	72.02	0	0.00%
6	147250.43		0.00528	965	14			911	C	VAMP SILT LOAM, STRONGLY SALINE-ALKALI	35233.32	23.93%	74.00			
6	147250.43		0.00528	965	14			420	C	GODECKE LOAMY SAND	87685.68	59.55%	74.00			
7	633367.26	14.54	0.02272	1945	105	20	0.727	971	B	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	159412.72	25.17%	69.09	70.09	43200	6.82%
7	633367.26		0.02272	1945	105			482	B	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	433000.91	68.36%	69.09			
7	633367.26		0.02272	1945	105			420	C	GODECKE LOAMY SAND	581.96	0.09%	79.55			
7	633367.26		0.02272	1945	105			585	D	BARNARD-TROSI ASSOCIATION	40371.67	6.37%	84.55			
8	330194.94	7.58	0.01184	1371	105	5	1.516	585	D	BARNARD-TROSI ASSOCIATION	209137.71	63.34%	85.00	76.57	33840	10.25%
8	330194.94		0.01184	1371	105			482	B	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	121057.23	36.66%	62.00			
9	1777777.53	40.81	0.06377	2340	130	111	0.368	971	B	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	466710.53	26.25%	69.58	75.47	213120	11.99%
9	1777777.53		0.06377	2340	130			482	B	HOLBROOK COBBLY LOAMY SAND, 2 TO 8 PERCENT SLOPES	621369.56	34.96%	69.58			
9	1777777.53		0.06377	2340	130			420	C	GODECKE LOAMY SAND	5268.69	0.30%	80.79			
9	1777777.53		0.06377	2340	130			585	D	BARNARD-TROSI ASSOCIATION	684428.74	38.50%	84.79			
10	2645288.01	60.73	0.09489	2585	420	40	1.518	585	D	BARNARD-TROSI ASSOCIATION	2216469.69	83.79%	84.00	84.00	193200	7.30%
10	2645288.01		0.09489	2585	420			314	D	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	428818.33	16.21%	84.00			
11	932651.16	21.41	0.00335	3834		52	0.412	252	C	CASSIRO GRAVELLY SANDY LOAM, 8 TO 15 PERCENT SLOPES	492386.54	52.79%	80.53	82.89	121520	13.03%
11	932651.16		0.00335	3834				585	D	BARNARD-TROSI ASSOCIATION	438107.76	46.97%	85.52			
11	932651.16		0.00335	3834				585	D	BARNARD-TROSI ASSOCIATION	397.42	0.04%	85.52			
11	932651.16		0.00335	3834				585	D	BARNARD-TROSI ASSOCIATION	1759.43	0.19%	85.52			
12	963871.02	22.13	0.03457	1098	180	12	1.844	585	D	BARNARD-TROSI ASSOCIATION	541495.28	56.18%	84.00	84.00	24000	2.49%
12	963871.02		0.03457	1098	180			314	D	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	422375.74	43.82%	84.00			
13	2539977.02	58.31	0.00911	3834	140	122	0.478	971	B	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	37056.20	1.46%	70.26	83.18	280560	11.05%
13	2539977.02		0.00911	3834	140			971	B	ALADSHI SANDY LOAM, 2 TO 4 PERCENT SLOPES	479.10	0.02%	70.26			
13	2539977.02		0.00911	3834	140			420	C	GODECKE LOAMY SAND	293.69	0.01%	80.13			
13	2539977.02		0.00911	3834	140			252	C	CASSIRO GRAVELLY SANDY LOAM, 8 TO 15 PERCENT SLOPES	879892.44	34.64%	80.13			
13	2539977.02		0.00911	3834	140			585	D	BARNARD-TROSI ASSOCIATION	1618356.80	63.72%	85.13			
13	2539977.02		0.00911	3834	140			314	D	RISLEY-XMAN-ROCK OUTCROP ASSOCIATION	448.58	0.02%	85.13			
13	2539977.02		0.00911	3834	140			585	D	BARNARD-TROSI ASSOCIATION	1410.00	0.06%	85.13			
13	2539977.02		0.00911	3834	140			585	D	BARNARD-TROSI ASSOCIATION	2040.22	0.08%	85.13			

CN is based on average lot size in subwatershed (# of houses/area) weighted with soil type

Existing Conditions Soil Map



Proposed Conditions Soil Map



Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	OFF6 TO OFF5
Flow Element	Trapezoidal Cha
Method	Manning's Form
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.030	
Channel Slope	100000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft
Discharge	129.00	cfs

Results		
Depth	0.84	ft
Flow Area	10.6	ft²
Wetted Perim	15.33	ft
Top Width	15.06	ft
Critical Depth	1.48	ft
Critical Slope	0.013012	ft/ft
Velocity	12.22	ft/s
Velocity Head	2.32	ft
Specific Energ	3.16	ft
Froude Numb	2.57	
Flow Type	Supercritical	

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Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	CPOFF to CP8
Flow Element	Trapezoidal Cha
Method	Manning's Form
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.030	
Channel Slope	083000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft
Discharge	687.00	cfs

Results		
Depth	2.19	ft
Flow Area	36.4	ft²
Wetted Perim	23.87	ft
Top Width	23.16	ft
Critical Depth	3.69	ft
Critical Slope	0.010256	ft/ft
Velocity	18.89	ft/s
Velocity Head	5.55	ft
Specific Energ	7.74	ft
Froude Numb	2.66	
Flow Type	Supercritical	

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Worksheet
Worksheet for Irregular Channel

Project Description	
Worksheet	CP8 TO CP7
Flow Element	Irregular Chani
Method	Manning's For
Solve For	Channel Depth

Input Data		
Channel Sl(	065000	ft/ft
Discharge	*692.00*	*cfs*

Options	
Current Roughness Metho	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficiel	0.030	
Water Surface Elev	3.60	ft
Elevation Range	0.00 to 7.00	
Flow Area	35.3	ft²
Wetted Perimeter	18.31	ft
Top Width	15.62	ft
Actual Depth	3.60	ft
Critical Elevation	5.41	ft
Critical Slope	*0.010905*	*ft/ft*
Velocity	19.58	ft/s
Velocity Head	5.96	ft
Specific Energy	9.56	ft
Froude Number	2.30	
Flow Type	Supercritical	

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+36	0.030

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	7.00
0+12	3.00
0+15	0.00
0+21	0.00
0+24	3.00
0+36	7.00

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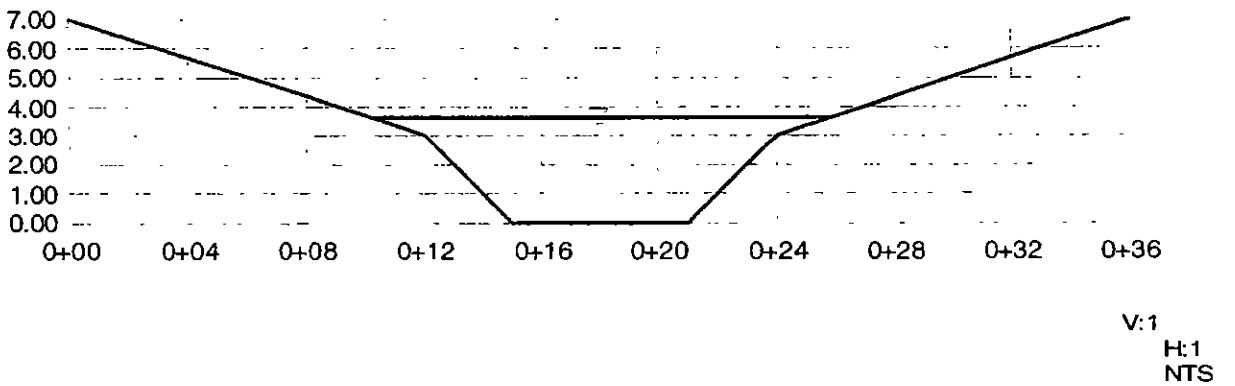
Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	CP8 TO CP7
Flow Element	Irregular Chani
Method	Manning's For
Solve For	Channel Depth

Section Data		
Mannings Coefficier	0.030	
Channel Slope	0.065000	ft/ft
Water Surface Elev	3.60	ft
Elevation Range	.00 to 7.00	
Discharge	692.00	cfs



Worksheet
Worksheet for Irregular Channel

Project Description	
Worksheet	CP7 TO CP6
Flow Element	Irregular Chan
Method	Manning's For
Solve For	Channel Depth

Input Data		
Channel Sl	015000	ft/ft
Discharge	695.00	cfs

Options	
Current Roughness Meth	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficie	0.030	
Water Surface Elev	5.08	ft
Elevation Range	0.00 to 7.00	
Flow Area	64.9	ft²
Wetted Perimeter	27.62	ft
Top Width	24.46	ft
Actual Depth	5.08	ft
Critical Elevation	5.42	ft
Critical Slope	0.010899	ft/ft
Velocity	10.72	ft/s
Velocity Head	1.78	ft
Specific Energy	6.86	ft
Froude Number	1.16	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+36	0.030

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	7.00
0+12	3.00
0+15	0.00
0+21	0.00
0+24	3.00
0+36	7.00

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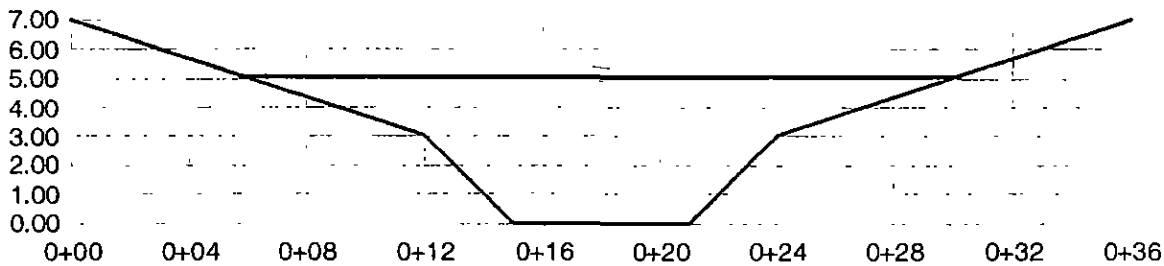
Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	CP7 TO CP6
Flow Element	Irregular Chani
Method	Manning's For
Solve For	Channel Depth

Section Data		
Mannings Coefficier	0.030	
Channel Slope	0.015000	ft/ft
Water Surface Elev	5.08	ft
Elevation Range	.00 to 7.00	
Discharge	695.00	cfs



V:1
H:1
NTS

Table
Rating Table for Trapezoidal Channel

Project Description	
Worksheet	CP3 TO CP1
Flow Element	Trapezoidal Cha
Method	Manning's Form
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.030	
Channel Slope	027000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft

Attribute	Minimum	Maximum	Increment
Discharge (cfs)	342.00	584.00	10.00

Discharge (cfs)	Depth (ft)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
342.00	2.04	10.37	33.0	22.93	22.27
352.00	2.08	10.45	33.7	23.12	22.45
362.00	2.11	10.54	34.4	23.32	22.63
372.00	2.14	10.62	35.0	23.50	22.81
382.00	2.16	10.70	35.7	23.69	22.99
392.00	2.19	10.78	36.4	23.87	23.16
402.00	2.22	10.85	37.0	24.06	23.33
412.00	2.25	10.93	37.7	24.23	23.50
422.00	2.28	11.00	38.4	24.41	23.67
432.00	2.31	11.07	39.0	24.58	23.84
442.00	2.33	11.14	39.7	24.76	24.00
452.00	2.36	11.21	40.3	24.93	24.16
462.00	2.39	11.28	41.0	25.09	24.32
472.00	2.41	11.35	41.6	25.26	24.48
482.00	2.44	11.41	42.2	25.42	24.63
492.00	2.46	11.48	42.9	25.58	24.79
502.00	2.49	11.54	43.5	25.75	24.94
512.00	2.51	11.61	44.1	25.90	25.09
522.00	2.54	11.67	44.7	26.06	25.23
532.00	2.56	11.73	45.4	26.21	25.38
542.00	2.59	11.79	46.0	26.37	25.53
552.00	2.61	11.85	46.6	26.52	25.67
562.00	2.64	11.91	47.2	26 67	25.81
572.00	2.66	11.97	47.8	26.82	25.95
582.00	2.68	12.02	48.4	26.97	26.09

Table
Rating Table for Trapezoidal Channel

Project Description	
Worksheet	OFF4 TO CP4
Flow Element	Trapezoidal Cha
Method	Manning's Formı
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.030	
Channel Slope	052000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	5.00	ft

Attribute	Minimum	Maximum	Increment
Discharge (cfs)	139.00	205.00	10.00

Discharge (cfs)	Depth (ft)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
139.00	1.40	10.77	12.9	13.87	13.41
149.00	1.45	10.97	13.6	14.18	13.71
159.00	1.50	11.17	14.2	14.48	13.99
169.00	1.54	11.35	14.9	14.77	14.27
179.00	1.59	11.53	15.5	15.05	14.54
189.00	1.63	11.70	16.2	15.32	14.79
199.00	1.67	11.86	16.8	15.59	15.04

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Table
Rating Table for Trapezoidal Channel

Project Description	
Worksheet	CP4 TO CP3
Flow Element	Trapezoidal Cha
Method	Manning's Form
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.030	
Channel Slope	083000	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Bottom Width	10.00	ft

Attribute	Minimum	Maximum	Increment
Discharge (cfs)	205.00	342.00	10.00

Discharge (cfs)	Depth (ft)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
205.00	1.15	13.26	15.5	17.27	16.90
215.00	1.18	13 45	16.0	17.47	17.08
225.00	1.21	13.64	16.5	17.65	17.26
235.00	1.24	13.82	17.0	17.84	17 44
245.00	1.27	14.00	17.5	18.02	17.61
255.00	1.30	14.16	18.0	18.20	17.78
265.00	1.32	14.33	18.5	18 37	17.94
275.00	1.35	14.49	19.0	18.54	18.10
285.00	1.38	14.65	19.5	18.71	18.26
295.00	1.40	14.80	19.9	18.87	18.42
305.00	1.43	14.95	20.4	19.03	18.57
315.00	1.45	15.09	20.9	19.19	18.72
325.00	1.48	15.23	21.3	19.35	18.87
335.00	1.50	15.37	21.8	19.50	19.02

Culvert Calculator Report
CP7

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	4,474.00	ft	Headwater Depth/Height	1.46	
Computed Headwater Elev	4,473.36	ft	Discharge	695.00	cfs
Inlet Control HW Elev.	4,472.93	ft	Tailwater Elevation	4,467.00	ft
Outlet Control HW Elev.	4,473.36	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	4,467.50	ft	Downstream Invert	4,465.30	ft
Length	110.00	ft	Constructed Slope	0.020000	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.13	ft
Slope Type	Steep		Normal Depth	1.79	ft
Flow Regime	Supercritical		Critical Depth	3.35	ft
Velocity Downstream	16.35	ft/s	Critical Slope	0.003261	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	10.00	ft
Section Size	10 x 4 ft		Rise	4.00	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	4,473.36	ft	Upstream Velocity Head	1.67	ft
Ke	0.50		Entrance Loss	0.84	ft

Inlet Control Properties					
Inlet Control HW Elev.	4,472.93	ft	Flow Control	Submerged	
Inlet Type	45° Beveled; 10 - 45° skewed headwall		Area Full	80.0	ft²
K	0.49800		HDS 5 Chart	11	
M	0.66700		HDS 5 Scale	4	
C	0.03270		Equation Form	2	
Y	0.75000				

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Culvert Calculator Report
CP5

Ive For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	4,463.00 ft	Headwater Depth/Height	1.63
Computed Headwater Elev	4,462.50 ft	Discharge	695.00 cfs
Inlet Control HW Elev.	4,461.44 ft	Tailwater Elevation	4,457.00 ft
Outlet Control HW Elev.	4,462.50 ft	Control Type	Outlet Control

Grades			
Upstream Invert	4,456.00 ft	Downstream Invert	4,455.00 ft
Length	80.00 ft	Constructed Slope	0.012500 ft/ft

Hydraulic Profile			
Profile	CompositeM2PressureProfile	Depth, Downstream	3.35 ft
Slope Type	Mild	Normal Depth	N/A ft
Flow Regime	Subcritical	Critical Depth	3.35 ft
Velocity Downstream	10.38 ft/s	Critical Slope	0.023634 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.035
Section Material	Concrete	Span	10.00 ft
Section Size	10 x 4 ft	Rise	4.00 ft
Number Sections	2		

Outlet Control Properties			
Outlet Control HW Elev.	4,462.50 ft	Upstream Velocity Head	1.17 ft
Ke	0.50	Entrance Loss	0.59 ft

Inlet Control Properties			
Inlet Control HW Elev.	4,461.44 ft	Flow Control	Submerged
Inlet Type	45° beveled; 10 - 45° skewed headwall	Area Full	80.0 ft²
K	0.49800	HDS 5 Chart	11
M	0.66700	HDS 5 Scale	4
C	0.03270	Equation Form	2
Y	0.75000		

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Culvert Calculator Report
CP1

olve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	4,461.00 ft	Headwater Depth/Height	1.40
Computed Headwater Elev:	4,460.56 ft	Discharge	584.00 cfs
Inlet Control HW Elev.	4,460.56 ft	Tailwater Elevation	4,453.00 ft
Outlet Control HW Elev.	4,460.25 ft	Control Type	Inlet Control

Grades			
Upstream Invert	4,453.54 ft	Downstream Invert	4,451.34 ft
Length	110.00 ft	Constructed Slope	0.020000 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	2.74 ft
Slope Type	Steep	Normal Depth	2.19 ft
Flow Regime	Supercritical	Critical Depth	4.19 ft
Velocity Downstream	17.79 ft/s	Critical Slope	0.003095 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 5 ft	Rise	5.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	4,460.25 ft	Upstream Velocity Head	2.10 ft
Ke	0.20	Entrance Loss	0.42 ft

Inlet Control Properties			
Inlet Control HW Elev.	4,460.56 ft	Flow Control	Submerged
Inlet Type	90° headwall w 45° bevels	Area Full	60.0 ft²
K	0.49500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	2
C	0.03140	Equation Form	2
Y	0.82000		

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Culvert Calculator Report
CPOFF

Ive For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	4,690.00 ft	Headwater Depth/Height	1.45
Computed Headwater Elev:	4,689.81 ft	Discharge	687.00 cfs
Inlet Control HW Elev.	4,689.34 ft	Tailwater Elevation	4,685.00 ft
Outlet Control HW Elev.	4,689.81 ft	Control Type	Entrance Control

Grades			
Upstream Invert	4,684.00 ft	Downstream Invert	4,680.00 ft
Length	120.00 ft	Constructed Slope	0.033333 ft/ft

Hydraulic Profile			
Profile	CompositePressureProfileS1S2	Depth, Downstream	5 00 ft
Slope Type	N/A	Normal Depth	1.50 ft
Flow Regime	N/A	Cntical Depth	3.32 ft
Velocity Downstream	8.59 ft/s	Critical Slope	0.003256 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	10.00 ft
Section Size	10 x 4 ft	Rise	4.00 ft
Number Sections	2		

Outlet Control Properties			
Outlet Control HW Elev.	4,689.81 ft	Upstream Velocity Head	1.66 ft
Ke	0.50	Entrance Loss	0.83 ft

Inlet Control Properties			
Inlet Control HW Elev.	4,689.34 ft	Flow Control	Submerged
Inlet Type	45° bevels; 10 - 45° skewed headwall	Area Full	80.0 ft²
K	0.49800	HDS 5 Chart	11
M	0.66700	HDS 5 Scale	4
C	0.03270	Equation Form	2
Y	0.75000		

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Culvert Calculator Report
CP8

olve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	4,601.20	ft	Headwater Depth/Height	1.70	
Computed Headwater Elev	4,600.79	ft	Discharge	692.00	cfs
Inlet Control HW Elev.	4,600.79	ft	Tailwater Elevation	4,595.00	ft
Outlet Control HW Elev.	4,600.78	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	4,594.00	ft	Downstream Invert	4,592.00	ft
Length	120.00	ft	Constructed Slope	0.016667	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.64	ft
Slope Type	Steep		Normal Depth	2.28	ft
Flow Regime	Supercritical		Critical Depth	3.87	ft
Velocity Downstream	16.37	ft/s	Cntical Slope	0.003868	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	8.00	ft
Section Size	8 x 4 ft		Rise	4 00	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	4,600.78	ft	Upstream Velocity Head	1.94	ft
Ke	0.50		Entrance Loss	0.97	ft

Inlet Control Properties					
Inlet Control HW Elev.	4,600.79	ft	Flow Control	Submerged	
Inlet Type	10 - 45° skewed headwall		Area Full	64.0	ft²
K	0.49800		HDS 5 Chart	11	
M	0.66700		HDS 5 Scale	4	
C	0.03270		Equation Form	2	
Y	0.75000				

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```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998             *
*           VERSION 4.1             *
*                                   *
*  RUN DATE   17MAR05  TIME  14:40:36   *
*                                   *
*************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 756-1104            *
*                                   *
*************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.. ....9.....10

              *DIAGRAM
    1         ID      GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR,   5-YEAR EVENT
    2         ID      GENERATED  2/2005 BY WOOD RODGERS INC
    3         ID =============================================================
              *
    4         IT       2 17MAR78     0200          19MAR78     0200
    5         IN       1
    6         IO       3
              *

    7         KK     EX1   RUNOFF FROM EXISTING AREA 1
    8         BA  1.7296
    9         PH                  0.18    0.34    0.56    0.72    0.84    1.20    1.68    2.25
   10         LS       0    81.8
   11         UD    1.21
              *

   12         KK     EX2   RUNOFF FROM EXISTING AREA 2
   13         BA  0.6623
   14         LS       0    74.6
   15         UD    0.80
              *

   16         KK     EX3   RUNOFF FROM EXISTING AREA 3
   17         BA  2.2979
   18         LS       0   80.27
   19         UD    1.36
              *

   20         KK     EX4   RUNOFF FROM EXISTNG AREA 4
   21         BA  0.2915
   22         LS       0    80.5
   23         UD   0.735
              *

   24         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY
              *           IN OVERLAND SHALLOW FLOW
   25         RD     618   0.014    0.04            TRAP     100    0.33
              *

   26         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL
   27         RD     850   0.009    0.03            TRAP      10    0.33
              *

   28         KK     CP3   CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
   29         HC       2
              *

   30         KK  REX3_1   ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
   31         RD     914   0.003    0.03            TRAP      10    0.33
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   32         KK     CP1   FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST
```

```
                *          CORNER OF SITE
          33    HC       3
                *
          34    KK     EX5   RUNOFF FROM OFFSITE AREA 5
          35    BA  0.3020
          36    LS       0    80.5
          37    UD    0.51
                *
          38    ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW
   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

     7          EX1
                 .
                 .
    12           .          EX2
                 .           .
                 .           .
    16           .                    EX3
                 .           .         .
                 .           .         .
                 .           .         .              EX4
    20           .           .         .               V
                 .           .         .               V
                 .           .         .          REX4_3
    24           .           .         .               V
                 .           .         .               V
                 .           .         .          REX4_3
    26           .           .         .            .
                 .           .         .            .
                 .           .         .            .
    28           .           .         .         CP3.............
                 .           .         .          V
                 .           .         .          V
    30           .           .         .     REX3_1
                 .           .         .       .
                 .           .         .       .
    32           .        CP1.....  .... .............
                 .
                 .
    34           .           .          EX5

  (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*    FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998                *
*           VERSION 4 1                 *
*                                       *
*  RUN DATE   17MAR05  TIME  14:40:36   *
*                                       *
*****************************************

*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************

                    GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR,   5-YEAR EVENT
                    GENERATED  2/2005 BY WOOD RODGERS INC
                   ---------------------------------------------------------------------

  6 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                     NMIN           2  MINUTES IN COMPUTATION INTERVAL
                     IDATE     17MAR78  STARTING DATE
                     ITIME        0200  STARTING TIME
                       NQ         1441  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE    19MAR78  ENDING DATE
                     NDTIME       0200  ENDING TIME
                     ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL      .03 HOURS
                      TOTAL TIME BASE    48.00 HOURS

               ENGLISH UNITS
                    DRAINAGE AREA         SQUARE MILES
                    PRECIPITATION DEPTH   INCHES
                    LENGTH, ELEVATION     FEET
                    FLOW                  CUBIC FEET PER SECOND
                    STORAGE VOLUME        ACRE-FEET
                    SURFACE AREA          ACRES
                    TEMPERATURE           DEGREES FAHRENHEIT

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

```
          **************
          *            *
 7 KK     *     EX1    *     RUNOFF FROM EXISTING AREA 1
          *            *
          **************

            SUBBASIN RUNOFF DATA

 8 BA         SUBBASIN CHARACTERISTICS
                    TAREA         1.73  SUBBASIN AREA

              PRECIPITATION DATA

 9 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 18     .34     .56     .72     .84    1.20    1.68    2.25      00     .00     .00     .00

                                                STORM AREA =     1.73

10 LS         SCS LOSS RATE
                    STRTL          .44  INITIAL ABSTRACTION
                   CRVNBR        81.80  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

11 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         1.21  LAG

                                                      ***

                                                  UNIT HYDROGRAPH
                                              183 END-OF-PERIOD ORDINATES
                    6.      11.      17       25       38.      50.      63.      79.      95.     112.
                  129.     151.     173.     195.     219.     249.     279.     308.     341.     376
                  412.     447.     477      506.     536.     563.     584.     604.     624.     640.
                  651.     662.     673.     676.     678.     680.     681.     679.     677.     675.
                  669.     657.     646.     635.     623.     610.     597.     583.     569.     554.
                  539.     522.     504.     485.     467.     445.     423.     401.     379.     361.
                  342.     324.     308.     295      282.     269.     257.     246.     235.     224.
                  215.     206.     196.     188.     181.     174.     168.     161      154.     147
                  141.     135.     130      124.     119.     113.     107.     102.      98.      94.
                   90.      87.      83.      79       75.      72.      69.      66.      64.      61.
                   58.      55.      53.      50.      48.      46       44.      42.      40.      38.
                   37.      35.      34.      32.      31.      30.      28.      27.      26.      25.
                   24.      23.      22.      21.      20.      19.      18.      18.      17.      16
                   15.      15.      14.      13.      13.      12.      12.      11       11.      10.
                   10.       9.       9.       9.       8.       8.       8.       7.       7.       7.
                    7.       6.       6        6.       6.       6.       5.       5.       5.       5.
                    4.       4        4.       4.       4.       3.       3.       3.       3.       3.
                    2.       2.       2.       2.       2.       1.       1.       1.       1.       1.
                    1.       0.       0

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION       EX1

     TOTAL RAINFALL =     2.24, TOTAL LOSS =     1.44, TOTAL EXCESS =      .80

   PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+    (CFS)        (HR)
                                (CFS)
+      172.      13.37                    96.          37.          19.          19.
                                (INCHES)   .514         .805         .805         .805
                                (AC-FT)     47.         74.          74.          74.

                        CUMULATIVE AREA =     1.73 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 12 KK    *     EX2    *     RUNOFF FROM EXISTING AREA 2
          *            *
          **************

            SUBBASIN RUNOFF DATA

 13 BA        SUBBASIN CHARACTERISTICS
                    TAREA          .66  SUBBASIN AREA

              PRECIPITATION DATA

  9 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .18     .34     .56     .72     .84    1.20    1.68    2.25     .00     .00     .00     .00

                                                STORM AREA =      .66
```

```
14 LS          SCS LOSS RATE
                    STRTL        .68  INITIAL ABSTRACTION
                   CRVNBR      74.60  CURVE NUMBER
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

15 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        .80  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                          122 END-OF-PERIOD ORDINATES
      5.     10.     18.     29.     41.     55.     69.     87.    106.    127.
    152.    178.    207.    237.    266.    292.    317.    336.    354.    368.
    378.    387.    389.    391.    391.    389.    387.    378.    368.    358.
    346.    335.    322.    309.    294.    278.    262.    242.    223.    207.
    191.    176.    165.    154.    144.    135.    126.    118.    110.    104.
     98.     92.     86.     81.     76.     71.     66.     61.     57.     54.
     51.     47.     44.     41.     39.     36.     34.     32.     29.     28.
     26.     24.     22.     21.     20.     19.     17.     16.     15.     14.
     13.     13.     12.     11.     10.     10.      9.      8.      8.      7.
      7.      6.      6.      6.      5.      5       5.      4.      4.      4.
      4.      4.      3.      3.      3.      3.      3.      2.      2.      2.
      2.      2.      2.      1.      1.      1.      1.      1.      1.      0.
      0.      0.

   ***            ***             ***             ***             ***

                        HYDROGRAPH AT STATION       EX2

   TOTAL RAINFALL =    2.25, TOTAL LOSS =     1.75, TOTAL EXCESS =      .49

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     48.00-HR
+   (CFS)       (HR)
                                   (CFS)
+     45.     12 93                  23           9.           4.           4.
                                (INCHES)         .317         .494         .494         .494
                                  (AC-FT)           11.          17.          17.          17.

                        CUMULATIVE AREA =      .66 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                    **************
                    *            *
 16 KK              *     EX3    *      RUNOFF FROM EXISTING AREA 3
                    *            *
                    **************

                SUBBASIN RUNOFF DATA

 17 BA              SUBBASIN CHARACTERISTICS
                         TAREA        2.30  SUBBASIN AREA

                PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ..... TP-40 .....  ..... ... TP-49 .....
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .18     .34     .56     .72     .84    1.20    1.68    2.25     .00     .00     .00     .00

                                                STORM AREA =     2.30

 18 LS              SCS LOSS RATE
                         STRTL         .49  INITIAL ABSTRACTION
                        CRVNBR       80.27  CURVE NUMBER
                         RTIMP         .00  PERCENT IMPERVIOUS AREA

 19 UD              SCS DIMENSIONLESS UNITGRAPH
                         TLAG        1.36  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                          206 END-OF-PERIOD ORDINATES
      6.     12.     18.     23.     36.     50.     63.     77.     94.    111.
    129.    146.    167.    191.    214.    238.    265.    296.    327.    359.
    392.    429.    466.    503.    539.    570.    601.    633.    663.    685.
    706.    728.    749.    761.    773     785     796.    800.    802.    804.
    806.    805.    803.    801.    799.    792.    780.    768.    756.    744.
    730.    716.    703.    689.    673.    657.    642.    625.    606.    586.
    567.    547.    524.    500.    477.    453.    434.    414.    395.    375.
    360.    346.    333.    319.    307.    295.    283.    272.    261.    251.
    241.    232.    223.    216.    209.    202.    194.    187.    180.    173.
    166.    160.    154.    149.    143.    137.    131.    125.    119.    115.
    111.    107.    103.     99.     96.     92.     88.     84.     82.     79.
     76.     73.     70.     67.     64.     61.     59.     57.     55.     53.
     51.     48.     46.     44.     43.     41.     40.     38.     37.     35.
     34.     32.     31.     30.     29.     28.     27.     26.     25.     24.
     23.     22.     21.     21.     20.     19      18.     17.     17.     16.
```

```
   16.    15.    14.    14.    13.    13.    12    12.    11.    11.
   11     10.    10.     9.     9.     9.     8.    8.     8.     8.
    8.     7.     7.     7.     7.     6.     6.    6.     6.     5.
    5.     5.     5.     4.     4.     4.     4.    4.     3.     3.
    3.     3.     3.     2.     2.     2.     2.    2.     1.     1
    1.     1.     1.     0.     0.     0

 ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      EX3

 TOTAL RAINFALL =    2.24, TOTAL LOSS =    1.51, TOTAL EXCESS =     .73

 PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                                 6-HR       24-HR       72-HR     48.00-HR
+  (CFS)       (HR)
                          (CFS)
+    188.     13.53                114.        45.        23.        23.
                        (INCHES)    .460       .729       .729       .729
                        (AC-FT)      56.        89.        89.        89.

                    CUMULATIVE AREA =    2.30 SQ MI
```

*** ***

```
          **************
          *            *
20 KK     *     EX4    *      RUNOFF FROM EXISTNG AREA 4
          *            *
          **************

   SUBBASIN RUNOFF DATA

21 BA        SUBBASIN CHARACTERISTICS
                TAREA         .29  SUBBASIN AREA

             PRECIPITATION DATA

 9 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 . ....   ..... TP-40 .....   ..... TP-49 .... .....
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .18     .34     .56     .72     .84    1.20    1.68    2.25     .00     .00     .00     .00

                                          STORM AREA =     .29

22 LS        SCS LOSS RATE
                STRTL         .48  INITIAL ABSTRACTION
               CRVNBR       80.50  CURVE NUMBER
                RTIMP         .00  PERCENT IMPERVIOUS AREA

23 UD        SCS DIMENSIONLESS UNITGRAPH
                TLAG         .74  LAG

                                          ***

                                    UNIT HYDROGRAPH
                                112 END-OF-PERIOD ORDINATES
     2.     5.    10.    16.    22.    30.    38.    48.    58.    71.
    84.    99.   115.   130.   143.   156.   165.   174.   179.   184.
   186.   187.   187.   186.   184.   180.   175.   169.   163.   157.
   150    143.   134.   126.   116.   106.    97.    89.    82.    76.
    71.    66.    61.    57.    53.    50.    47.    44.    41.    38.
    35.    33.    30.    28.    26.    24.    23.    21.    20.    18.
    17.    16     15.    14.    13.    12.    11.    10.     9.     9.
     8.     8.     7.     7.     6.     6.     5.     5.     5.     4
     4.     4.     3.     3.     3.     3.     3.     2.     2.     2.
     2.     2.     2.     2.     2.     1.     1.     1.     1.     1.
     1.     1.     1.     1.     1.     1.     0.     0.     0.     0.
     0.     0.

 ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      EX4

 TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.51, TOTAL EXCESS =     .74

 PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                                 6-HR       24-HR       72-HR     48.00-HR
+  (CFS)       (HR)
                          (CFS)
+     37.     12.83                 15.         6.         3.         3.
                        (INCHES)    .487       .744       .744       .744
                        (AC-FT)       8.        12.        12.        12.

                    CUMULATIVE AREA =     .29 SQ MI
```

*** ***

```
              **************
              *            *
24 KK         *   REX4_3   *        ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY
              *            *
              **************

                HYDROGRAPH ROUTING DATA

25 RD             MUSKINGUM-CUNGE CHANNEL ROUTING
                          L        618.  CHANNEL LENGTH
                          S      .0140  SLOPE
                          N       .040  CHANNEL ROUGHNESS COEFFICIENT
                         CA        .00  CONTRIBUTING AREA
                      SHAPE       TRAP  CHANNEL SHAPE
                         WD     100.00  BOTTOM WIDTH OR DIAMETER
                          Z        .33  SIDE SLOPE

                                                         ***
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                        COMPUTATION TIME STEP
                   ELEMENT    ALPHA        M          DT         DX       PEAK    TIME TO     VOLUME     MAXIMUM
                                                                                    PEAK                 CELERITY
                                                     (MIN)      (FT)      (CFS)     (MIN)       (IN)       (FPS)

                  - MAIN       .22       1.64       2.00      123.60     36.52    774.00        74         2.05

                                       INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN       .22       1.64       2.00                 36.52    774.00       .74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= .0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .2335E-02 PERCENT ERROR=     .0


      ***           ***           ***            ***            ***

                     HYDROGRAPH AT STATION    REX4_3

   PEAK FLOW     TIME                             MAXIMUM AVERAGE FLOW
                                       6-HR         24-HR        72-HR       48.00-HR
 +   (CFS)       (HR)
                              (CFS)
 +     37.      12.90                  15.           6.           3.           3.
                             (INCHES)  .487         .744         .744         .744
                             (AC-FT)     8.          12.          12.          12.

                         CUMULATIVE AREA =      .29 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                **************
                *            *
  26 KK         *   REX4_3   *       ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL
                *            *
                **************

                  HYDROGRAPH ROUTING DATA

  27 RD             MUSKINGUM-CUNGE CHANNEL ROUTING
                            L        850.  CHANNEL LENGTH
                            S      .0090  SLOPE
                            N       .030  CHANNEL ROUGHNESS COEFFICIENT
                           CA        .00  CONTRIBUTING AREA
                        SHAPE       TRAP  CHANNEL SHAPE
                           WD      10.00  BOTTOM WIDTH OR DIAMETER
                            Z        .33  SIDE SLOPE

                                                           ***
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                          COMPUTATION TIME STEP
                     ELEMENT    ALPHA        M          DT         DX       PEAK    TIME TO     VOLUME     MAXIMUM
                                                                                      PEAK                 CELERITY
                                                       (MIN)      (FT)      (CFS)     (MIN)       (IN)       (FPS)

                      MAIN      1.25       1.50       2.00      283.33     36.52    776.00       .74        4.56

                                         INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                      MAIN      1.25       1.50       2.00                 36.52    776.00       .74

  CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= .0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .8896E-03 PERCENT ERROR=     .0
```

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

                        HYDROGRAPH AT STATION   REX4_3

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
+   (CFS)        (HR)
                          (CFS)
+      37.      12.93                    15.           6.           3.           3.
                        (INCHES)         .487         .744         .744         .744
                        (AC-FT)             8.          12.          12.          12.

                        CUMULATIVE AREA =      .29 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
  28 KK     *      CP3   *       CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
            *            *
            **************

  29 HC          HYDROGRAPH COMBINATION
                      ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      CP3

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
+   (CFS)        (HR)
                          (CFS)
+     212.      13.47                   129.          51.          25.          25
                        (INCHES)         .463         .730         .730         .730
                        (AC-FT)            64.         101.         101.         101.

                        CUMULATIVE AREA =     2.59 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
  30 KK     *    REX3_1  *       ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
            *            *
            **************

     HYDROGRAPH ROUTING DATA

  31 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                        L        914.  CHANNEL LENGTH
                        S       .0030  SLOPE
                        N        .030  CHANNEL ROUGHNESS COEFFICIENT
                       CA          00  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD       10.00  BOTTOM WIDTH OR DIAMETER
                        Z         .33  SIDE SLOPE

                                                  ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                COMPUTATION TIME STEP
          ELEMENT    ALPHA       M          DT          DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                             PEAK                    CELERITY
                                                    (MIN)       (FT)      (CFS)     (MIN)        (IN)      (FPS)

            MAIN        .72      1.50        2.00      457.00     211.94    810.00         .73       5.67

                                  INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

            MAIN        .72      1.50        2.00                 211.94    810.00         .73

 CONTINUITY SUMMARY (AC-FT) - INFLOW=  1009E+03 EXCESS= .0000E+00 OUTFLOW= .1009E+03 BASIN STORAGE= .1381E-02 PERCENT ERROR=     .0


      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   REX3_1

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
+   (CFS)        (HR)
```

```
                    (CFS)
+     212.    13.50                129.        51.        25.        25.
                  (INCHES)          .463       730        .730       .730
                  (AC-FT)            64.       101.       101.       101.

                  CUMULATIVE AREA =    2.59 SQ MI
```

*** ***

```
          **************
          *            *
 32 KK    *     CP1    *      FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST
          *            *
          **************

 33 HC        HYDROGRAPH COMBINATION
                 ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

      ***           ***           ***           ***           ***

                      HYDROGRAPH AT STATION      CP1

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                  (CFS)
+     419.    13.33                247.        97.          49.          49.
                (INCHES)           .461        .725         .725         .725
                (AC-FT)            122.        193          193.         193.

                CUMULATIVE AREA =    4.98 SQ MI
```

*** ***

```
          **************
          *            *
 34 KK    *     EX5    *      RUNOFF FROM OFFSITE AREA 5
          *            *
          **************

            SUBBASIN RUNOFF DATA

 35 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .30  SUBBASIN AREA

              PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ... ..... TP-40 .... ..... .   ..... TP-49 .....
              5-MIN  15-MIN  60-MIN    2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY   10-DAY
                .18     .34     .56      .72      .84     1.20     1 68     2.25      .00      .00      .00      .00

                                                STORM AREA =      .30

 36 LS        SCS LOSS RATE
                 STRTL          .48  INITIAL ABSTRACTION
                 CRVNBR       80.50  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

 37 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG           .51  LAG

                                                        ***

                                                UNIT HYDROGRAPH
                                            78 END-OF-PERIOD ORDINATES
                    5.       13.       26.       41.       58.       79.      105.      134.      167.      197.
                  225.      245.      261.      272.      276.      277.      275.      268       257.      245.
                  232.      218.      201.      182.      161.      143.      126.      113.      102.       92.
                   83.       75.       69.       62.       56.       51.       46.       40.       37.       33.
                   30.       27.       25.       22.       20.       18.       16.       14.       13.       12.
                   11.       10.        9.        8.        7.        6.        6.        5.        5.        4.
                    4.        3.        3.        3.        3.        2.        2.        2.        2.        2.
                    1.        1.        1.        1.        1.        1.        0.        0.

      ***           ***           ***           ***           ***

                      HYDROGRAPH AT STATION      EX5

    TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.51, TOTAL EXCESS =     .74

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                  (CFS)
```

+ 48.	12.57		16.	6.	3.	3.
		(INCHES)	490	.744	744	744
		(AC-FT)	8.	12.	12.	12.

CUMULATIVE AREA = .30 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	EX1	172.	13.37	96.	37.	19.	1.73		
+	HYDROGRAPH AT	EX2	45	12.93	23.	9.	4.	.66		
+	HYDROGRAPH AT	EX3	188	13.53	114.	45.	23.	2.30		
+	HYDROGRAPH AT	EX4	37.	12.83	15.	6.	3.	.29		
+	ROUTED TO	REX4_3	37.	12.90	15.	6.	3.	.29		
+	ROUTED TO	REX4_3	37.	12 93	15	6.	3.	.29		
+	2 COMBINED AT	CP3	212.	13.47	129.	51.	25.	2.59		
+	ROUTED TO	REX3_1	212.	13.50	129.	51.	25.	2.59		
+	3 COMBINED AT	CP1	419.	13.33	247.	97	49.	4.98		
+	HYDROGRAPH AT	EX5	48.	12.57	16.	6.	3	.30		

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
REX4_3	MANE	2.00	36.52	774.00	.74	2.00	36.52	774.00	.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= .0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .2335E-02 PERCENT ERROR= .0

REX4_3	MANE	2 00	36.52	776.00	74	2.00	36.52	776.00	.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= .0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .8896E-03 PERCENT ERROR= .0

REX3_1	MANE	2.00	211.94	810.00	.73	2.00	211.94	810.00	.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1009E+03 EXCESS= .0000E+00 OUTFLOW= .1009E+03 BASIN STORAGE= .1381E-02 PERCENT ERROR= .0

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   17MAR05  TIME  14 40:28   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE          ID..... .1 ......2..... 3.......4.......5.......6... .. 7.......8.......9......10

              *DIAGRAM
    1         ID      GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR,   100-YEAR EVENT
    2         ID      GENERATED  2/2005 BY WOOD RODGERS INC
    3         ID  ==========================================================================
              *
    4         IT       2 17MAR78    0200          19MAR78    0200
    5         IN       1
    6         IO       3
              *
    7         KK     EX1   RUNOFF FROM EXISTING AREA 1
    8         BA  1.7296
    9         PH                    0.41    0.78    1.29    1.39    1 48    1.93    2.87    4.14
   10         LS       0    81.8
   11         UD    1.21
              *
   12         KK     EX2   RUNOFF FROM EXISTING AREA 2
   13         BA  0.6623
   14         PH                    0.41    0.78    1.29    1.39    1.48    1.93    2.87    4.14
   15         LS       0    74.6
   16         UD    0.80
              *
   17         KK     EX3   RUNOFF FROM EXISTING AREA 3
   18         BA  2.2979
   19         UD    1.36
              *
   20         KK     EX4   RUNOFF FROM EXISTNG AREA 4
   21         BA  0.2915
   22         LS       0    80.5
   23         UD   0.735
              *
   24         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY
              *          IN OVERLAND SHALLOW FLOW
   25         RD     618   0.014    0.04            TRAP     100    0.33
              *
   26         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL
   27         RD     850   0.009    0.03            TRAP      10    0.33
              *
   28         KK     CP3   CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
   29         HC       2
              *
   30         KK  REX3_1   ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
   31         RD     914   0.003    0.03            TRAP      10    0.33
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   32         KK     CP1   FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST
```

```
                 *          CORNER OF SITE
   33            HC       3
                 *

   34            KK     EX5   RUNOFF FROM OFFSITE AREA 5
   35            BA  0.3020
   36            LS       0     80.5
   37            UD    0.51
                 *
   38            ZZ
1
             SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE      (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

   7        EX1
             .
             .
  12         .         EX2
             .          .
             .          .
  17         .          .         EX3
             .          .          .
             .          .          .
  20         .          .          .          EX4
             .          .          .           V
             .          .                      V
  24         .          .          .        REX4_3
             .          .          .           V
             .          .          .           V
  26         .          .          .        REX4_3
             .          .          .
             .          .          .           .
  28         .          .         CP3.... .......
             .          .          V
             .          .          V
  30         .          .       REX3_1
             .          .          .
             .          .          .
  32        CP1.........................
             .
             .
  34         .         EX5

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************               ***************************************
*                                       *               *                                     *
*   FLOOD HYDROGRAPH PACKAGE   (HEC-1)  *               *   U.S. ARMY CORPS OF ENGINEERS      *
*             JUN   1998                *               *   HYDROLOGIC ENGINEERING CENTER     *
*           VERSION 4.1                 *               *        609 SECOND STREET            *
*                                       *               *     DAVIS, CALIFORNIA 95616         *
*  RUN DATE   17MAR05   TIME  14:40:28  *               *         (916) 756-1104              *
*                                       *               *                                     *
*****************************************               ***************************************


                    GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR,   100-YEAR EVENT
                    GENERATED  2/2005 BY WOOD RODGERS INC
                    ------------------------------------------------------------------------

 6 IO         OUTPUT CONTROL VARIABLES
                   IPRNT          3  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                   NMIN           2  MINUTES IN COMPUTATION INTERVAL
                   IDATE    17MAR78  STARTING DATE
                   ITIME       0200  STARTING TIME
                      NQ       1441  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE   19MAR78  ENDING DATE
                   NDTIME      0200  ENDING TIME
                   ICENT         19  CENTURY MARK

                COMPUTATION INTERVAL     .03 HOURS
                     TOTAL TIME BASE   48.00 HOURS

       ENGLISH UNITS
           DRAINAGE AREA           SQUARE MILES
           PRECIPITATION DEPTH     INCHES
           LENGTH, ELEVATION       FEET
           FLOW                    CUBIC FEET PER SECOND
           STORAGE VOLUME          ACRE-FEET
           SURFACE AREA            ACRES
           TEMPERATURE             DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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```
          **************
          *            *
 7 KK     *    EX1     *      RUNOFF FROM EXISTING AREA 1
          *            *
          **************

     SUBBASIN RUNOFF DATA

 8 BA      SUBBASIN CHARACTERISTICS
               TAREA        1.73  SUBBASIN AREA

           PRECIPITATION DATA

 9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           ..... HYDRO-35 .....   ..... TP-40 .....   ..... TP-49 .....
           5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR   12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
             .41    .78    1.29   1.39   1.48   1.93   2.87   4.14    .00    .00    .00    .00

                                          STORM AREA =     1.73

10 LS      SCS LOSS RATE
               STRTL         .44  INITIAL ABSTRACTION
              CRVNBR       81.80  CURVE NUMBER
               RTIMP         .00  PERCENT IMPERVIOUS AREA

11 UD      SCS DIMENSIONLESS UNITGRAPH
               TLAG        1.21  LAG

                                                  ***

                                          UNIT HYDROGRAPH
                                      183 END-OF-PERIOD ORDINATES
            6.      11.     17.     25.     38.     50.     63.     79.     95.     112.
          129.     151.    173.    195.    219.    249.    279.    308.    341.    376.
          412.     447.    477.    506.    536.    563.    584.    604.    624.    640.
          651.     662.    673.    676.    678.    680.    681.    679.    677     675
          669.     657.    646.    635.    623.    610.    597.    583.    569.    554
          539.     522.    504.    485.    467.    445.    423.    401.    379.    361.
          342.     324.    308.    295.    282.    269.    257.    246.    235.    224.
          215.     206.    196.    188.    181.    174.    168.    161.    154.    147.
          141.     135.    130.    124     119     113.    107.    102.     98.     94.
           90.      87.     83.     79.     75.     72      69.     66.     64.     61.
           58.      55      53.     50.     48.     46.     44.     42.     40.     38.
           37.      35.     34.     32.     31.     30.     28.     27.     26      25.
           24       23.     22.     21.     20.     19.     18.     18.     17.     16.
           15.      15.     14.     13.     13.     12.     12      11.     11.     10.
           10        9.      9       9.      8.      8.      8.      7.      7.      7.
            7.       6.      6.      6.      6.      6.      5.      5.      5.      5.
            4.       4.      4       4.      4.      3.      3.      3.      3.      3.
            2.       2.      2.      2.      2.      1.      1.      1.      1.      1.
            1.       0.      0.

     ***      ***      ***      ***      ***

                    HYDROGRAPH AT STATION      EX1

   TOTAL RAINFALL =    4.13, TOTAL LOSS =    1.83, TOTAL EXCESS =    2.30

  PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR       24-HR       72-HR      48.00-HR
+   (CFS)       (HR)
                          (CFS)
+    579.      13.27              250.        107.         53.         53.
                         (INCHES)  1.344       2.298       2.298       2.298
                         (AC-FT)    124.       212.        212.        212.

                    CUMULATIVE AREA =    1.73 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
12 KK     *    EX2     *      RUNOFF FROM EXISTING AREA 2
          *            *
          **************

     SUBBASIN RUNOFF DATA

13 BA      SUBBASIN CHARACTERISTICS
               TAREA         .66  SUBBASIN AREA

           PRECIPITATION DATA

14 PH                               DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           ..... HYDRO-35 .....   ..... TP-40 .....   ..... TP-49 .....
           5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR   12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
             .41    .78    1.29   1.39   1.48   1.93   2.87   4.14    .00    .00    .00    .00

                                          STORM AREA =      .66
```

```
15 LS          SCS LOSS RATE
                    STRTL          .68  INITIAL ABSTRACTION
                   CRVNBR        74.60  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

16 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .80  LAG

                                                                  ***

                                                  UNIT HYDROGRAPH
                                              122 END-OF-PERIOD ORDINATES
     5.     10.     18.     29.     41.     55.     69.     87.    106.    127.
   152.    178.    207.    237.    266.    292.    317.    336.    354.    368.
   378.    387.    389.    391.    391.    389     387.    378.    368.    358.
   346.    335.    322.    309.    294.    278.    262.    242.    223.    207.
   191.    176.    165.    154.    144.    135.    126.    118.    110.    104.
    98.     92.     86.     81.     76.     71.     66.     61.     57.     54.
    51.     47.     44.     41.     39.     36.     34.     32.     29.     28.
    26.     24.     22.     21.     20.     19.     17.     16.     15.     14.
    13.     13.     12.     11.     10.     10.      9.      8.      8.      7.
     7.      6.      6.      6.      5.      5.      5.      4.      4.      4.
     4.      4.      3.      3.      3.      3.      3.      2.      2.      2.
     2.      2.      2.      1.      1.      1.      1.      1.      1.      0.
     0.      0.

  ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION       EX2

 TOTAL RAINFALL =    4.14, TOTAL LOSS =    2.40, TOTAL EXCESS =    1.74

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                          (CFS)
+    228.      12.87                76.          31.          15.          15.
                       (INCHES)    1.060        1.740        1.740        1.740
                       (AC-FT)       37.          61.          61.          61.

                    CUMULATIVE AREA =     .66 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
17 KK     *     EX3    *       RUNOFF FROM EXISTING AREA 3
          *            *
          **************

          SUBBASIN RUNOFF DATA

18 BA          SUBBASIN CHARACTERISTICS
                    TAREA          2.30  SUBBASIN AREA

               PRECIPITATION DATA

14 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .41     .78    1.29    1.39    1.48    1.93    2.87    4.14     .00     .00     .00     .00

                                                 STORM AREA =     2.30

15 LS          SCS LOSS RATE
                    STRTL          .68  INITIAL ABSTRACTION
                   CRVNBR        74.60  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

19 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG          1.36  LAG

                                                                  ***

                                                  UNIT HYDROGRAPH
                                              206 END-OF-PERIOD ORDINATES
     6.     12.     18.     23.     36.     50.     63.     77.     94.    111.
   129.    146.    167.    191.    214.    238.    265.    296.    327.    359.
   392.    429.    466.    503.    539.    570.    601.    633.    663.    685.
   706.    728.    749.    761.    773.    785.    796.    800.    802.    804.
   806.    805.    803.    801.    799.    792.    780.    768.    756.    744.
   730.    716.    703.    689     673.    657.    642.    625.    606.    586.
   567.    547.    524.    500.    477.    453.    434.    414.    395.    375.
   360.    346.    333.    319.    307.    295.    283.    272.    261.    251.
   241.    232.    223.    216.    209.    202.    194.    187.    180.    173.
   166.    160.    154.    149.    143.    137.    131.    125.    119.    115.
   111.    107.    103.     99.     96.     92.     88.     84.     82.     79.
    76.     73.     70.     67.     64.     61.     59.     57.     55.     53.
    51.     48.     46.     44.     43.     41.     40.     38.     37.     35.
    34.     32.     31.     30.     29.     28.     27.     26.     25.     24.
    23.     22.     21.     21.     20.     19.     18.     17.     17.     16.
```

16.	15.	14.	14.	13.	13.	12.	12	11.	11.
11.	10.	10.	9	9.	9.	8.	8.	8.	8.
8.	7.	7	7.	7.	6.	6.	6.	6.	5.
5.	5.	5.	4	4.	4.	4.	4.	3.	3.
3.	3.	3.	2.	2.	2.	2.	2.	1.	1.
1.	1.	1.	0.	0.	0.				

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

                    HYDROGRAPH AT STATION        EX3

     TOTAL RAINFALL =    4.13, TOTAL LOSS =    2 39, TOTAL EXCESS =     1.73

   PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR       48.00-HR
 +   (CFS)       (HR)
                            (CFS)
 +     515.     13.43               252          107.         54.          54.
                          (INCHES)  1.018        1.734        1.734        1.734
                          (AC-FT)   125.         212.         212.         212.

                          CUMULATIVE AREA =    2.30 SQ MI
```

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

            **************
            *            *
  20 KK     *      EX4   *        RUNOFF FROM EXISTNG AREA 4
            *            *
            **************

             SUBBASIN RUNOFF DATA

  21 BA        SUBBASIN CHARACTERISTICS
                  TAREA            .29  SUBBASIN AREA

               PRECIPITATION DATA

  14 PH                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....     . ...  ........ TP-40 ...............    .......... . TP-49 ........ ...
               5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY   10-DAY
                 .41     .78    1.29     1.39     1.48     1.93     2.87     4.14      .00      00       00      .00

                                                  STORM AREA =       .29

  22 LS        SCS LOSS RATE
                  STRTL           .48  INITIAL ABSTRACTION
                  CRVNBR        80.50  CURVE NUMBER
                  RTIMP            00  PERCENT IMPERVIOUS AREA

  23 UD        SCS DIMENSIONLESS UNITGRAPH
                  TLAG             74  LAG

                                                               ***

                                                      UNIT HYDROGRAPH
                                                  112 END-OF-PERIOD ORDINATES
```

2.	5.	10.	16.	22.	30.	38.	48.	58.	71.
84.	99.	115.	130.	143.	156	165.	174.	179.	184.
186.	187.	187.	186.	184.	180.	175.	169.	163.	157.
150.	143.	134.	126.	116	106.	97.	89.	82.	76.
71.	66.	61.	57.	53.	50.	47.	44.	41.	38.
35.	33.	30.	28.	26.	24.	23.	21.	20.	18.
17.	16.	15.	14.	13.	12.	11.	10.	9.	9.
8.	8.	7.	7.	6.	6.	5.	5.	5.	4.
4.	4.	3.	3.	3.	3.	3.	2.	2.	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.								

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

                      HYDROGRAPH AT STATION        EX4

       TOTAL RAINFALL =    4.14, TOTAL LOSS =    1.94, TOTAL EXCESS =     2.20

     PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR       48.00-HR
   +   (CFS)       (HR)
                              (CFS)
   +     138.     12.80                 41.          17.          9.           9.
                            (INCHES)  1.322        2.197        2.197        2.197
                            (AC-FT)    21.          34.         34           34.

                            CUMULATIVE AREA =     29 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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          **************
          *            *
24 KK     *   REX4_3   *        ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY
          *            *
          **************

   HYDROGRAPH ROUTING DATA

25 RD      MUSKINGUM-CUNGE CHANNEL ROUTING
                 L      618.  CHANNEL LENGTH
                 S     .0140  SLOPE
                 N      .040  CHANNEL ROUGHNESS COEFFICIENT
                CA       .00  CONTRIBUTING AREA
             SHAPE      TRAP  CHANNEL SHAPE
                WD    100.00  BOTTOM WIDTH OR DIAMETER
                 Z       .33  SIDE SLOPE

                                                  ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                  COMPUTATION TIME STEP
          ELEMENT    ALPHA        M        DT        DX       PEAK    TIME TO      VOLUME    MAXIMUM
                                                                       PEAK                   CELERITY
                                              (MIN)     (FT)    (CFS)    (MIN)       (IN)      (FPS)

            MAIN       .22      1.64      2.00    206.00   137.53   770.00      2.20      3.45

                                  INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

            MAIN       .22      1.64      2.00             137.53   770.00      2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3416E+02 EXCESS= .0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= .2449E-02 PERCENT ERROR=     0

   ***        ***        ***        ***        ***

                  HYDROGRAPH AT STATION   REX4_3

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR       24-HR       72-HR      48.00-HR
+   (CFS)       (HR)
                          (CFS)
+    138.      12.83              41.         17.          9.          9.
                        (INCHES)  1.322       2.197       2.197       2.197
                        (AC-FT)    21          34.         34.         34.

                  CUMULATIVE AREA =     .29 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
26 KK     *   REX4_3   *        ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL
          *            *
          **************

   HYDROGRAPH ROUTING DATA

27 RD      MUSKINGUM-CUNGE CHANNEL ROUTING
                 L      850.  CHANNEL LENGTH
                 S     .0090  SLOPE
                 N      .030  CHANNEL ROUGHNESS COEFFICIENT
                CA       .00  CONTRIBUTING AREA
             SHAPE      TRAP  CHANNEL SHAPE
                WD     10.00  BOTTOM WIDTH OR DIAMETER
                 Z       .33  SIDE SLOPE

                                                  ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                  COMPUTATION TIME STEP
          ELEMENT    ALPHA        M        DT        DX       PEAK    TIME TO      VOLUME    MAXIMUM
                                                                       PEAK                   CELERITY
                                              (MIN)     (FT)    (CFS)    (MIN)       (IN)      (FPS)

            MAIN      1.25      1.50      2.00    425.00   137.43   771.55      2.20      7.09

                                  INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

            MAIN      1.25      1.50      2.00             137.33   772.00      2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3416E+02 EXCESS= .0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= .8090E-03 PERCENT ERROR=    .0
```

*** *** *** *** ***

HYDROGRAPH AT STATION REX4_3

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 137.	12 87		41.	17.	9.	9.
		(INCHES)	1.322	2.197	2.197	2.197
		(AC-FT)	21.	34.	34.	34.

CUMULATIVE AREA = .29 SQ MI

*** ***

```
          **************
          *            *
 28 KK    *     CP3    *      CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
          *            *
          **************
```

29 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION CP3

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 599.	13.27		293.	124.	62.	62.
		(INCHES)	1.051	1.786	1.786	1.786
		(AC-FT)	145.	247.	247.	247.

CUMULATIVE AREA = 2.59 SQ MI

*** ***

```
          **************
          *            *
 30 KK    *   REX3_1   *      ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
          *            *
          **************
```

HYDROGRAPH ROUTING DATA

31 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	914.	CHANNEL LENGTH
S	.0030	SLOPE
N	.030	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	10.00	BOTTOM WIDTH OR DIAMETER
Z	.33	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.72	1.50	1.90	914.00	598.02	797.36	1.79	8.00

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.72	1.50	2.00		597 87	798.00	1.79	

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2466E+03 EXCESS= .0000E+00 OUTFLOW= .2466E+03 BASIN STORAGE= .1345E-02 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION REX3_1

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)				

```
                    (CFS)
+     598.     13.30                293.        124.         62.         62.
                (INCHES)          1.050       1.786       1.786       1.786
                (AC-FT)             145.        247.        247.        247.

                CUMULATIVE AREA =    2.59 SQ MI
```

*** ***

```
          +**************
          +              +
 32 KK    +      CP1     +      FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST
          +              +
          +**************

 33 HC         HYDROGRAPH COMBINATION
                    ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

     ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      CP1

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                    (CFS)
+    1354.     13.20                  617.         262.         131.         131.
                (INCHES)            1.152        1.957        1.958        1.958
                (AC-FT)               306.         520.         520.         520.

                CUMULATIVE AREA =    4.98 SQ MI
```

*** ***

```
          +**************
          +              +
 34 KK    +      EX5     +      RUNOFF FROM OFFSITE AREA 5
          +              +
          +**************

            SUBBASIN RUNOFF DATA

 35 BA        SUBBASIN CHARACTERISTICS
                   TAREA          .30  SUBBASIN AREA

              PRECIPITATION DATA

 14 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                .. .. HYDRO-35 ......   . ..... TP-40 ..... ..... TP-49 .....
              5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY   10-DAY
                .41      .78     1.29     1.39     1.48     1.93     2.87     4.14      .00      .00      .00      .00

                                                  STORM AREA =      .30

 36 LS        SCS LOSS RATE
                   STRTL          .48  INITIAL ABSTRACTION
                   CRVNBR       80.50  CURVE NUMBER
                   RTIMP          .00  PERCENT IMPERVIOUS AREA

 37 UD        SCS DIMENSIONLESS UNITGRAPH
                   TLAG           .51  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            78 END-OF-PERIOD ORDINATES
                    5.       13.       26.       41.       58.       79.      105.      134.      167.      197.
                  225.      245.      261.      272.      276.      277.      275.      268.      257.      245.
                  232.      218.      201.      182.      161.      143.      126.      113.      102.       92.
                   83.       75.       69.       62.       56.       51.       46.       40.       37.       33.
                   30.       27.       25.       22.       20.       18.       16.       14.       13        12.
                   11.       10.        9.        8.        7.        6.        6.        5.        5.        4.
                    4.        3.        3.        3.        3.        2.        2.        2.        2.        2.
                    1.        1.        1.        1.        1.        1.        0.        0.

     ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      EX5

     TOTAL RAINFALL =    4.14, TOTAL LOSS =    1.94, TOTAL EXCESS =    2.20

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                    (CFS)
```

+	184.	12.57		43.	18.	9.	9.
			(INCHES)	1.335	2.197	2.197	2.197
			(AC-FT)	22.	35	35.	35.

CUMULATIVE AREA = .30 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	EX1	579	13.27	250.	107.	53.	1.73		
+	HYDROGRAPH AT	EX2	228.	12.87	76.	31.	15.	.66		
+	HYDROGRAPH AT	EX3	515.	13 43	252.	107.	54.	2.30		
+	HYDROGRAPH AT	EX4	138.	12.80	41.	17.	9.	.29		
+	ROUTED TO	REX4_3	138.	12.83	41.	17.	9.	.29		
+	ROUTED TO	REX4_3	137.	12.87	41.	17.	9.	.29		
+	2 COMBINED AT	CP3	599.	13.27	293.	124.	62.	2.59		
+	ROUTED TO	REX3_1	598.	13.30	293.	124.	62.	2.59		
+	3 COMBINED AT	CP1	1354.	13.20	617.	262.	131.	4.98		
+	HYDROGRAPH AT	EX5	184.	12.57	43.	18.	9.	.30		

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
REX4_3	MANE	2.00	137.53	770.00	2.20	2.00	137.53	770.00	2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3416E+02 EXCESS= .0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= .2449E-02 PERCENT ERROR= .0

REX4_3	MANE	2.00	137.43	771.55	2.20	2.00	137.33	772.00	2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3416E+02 EXCESS= .0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= .8090E-03 PERCENT ERROR= .0

REX3_1	MANE	1 90	598.02	797.36	1.79	2.00	597.87	798.00	1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2466E+03 EXCESS= .0000E+00 OUTFLOW= .2466E+03 BASIN STORAGE= .1345E-02 PERCENT ERROR= .0

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4 1                 *
*                                       *
* RUN DATE   25MAR05  TIME  15.08.17    *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE-GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.... ..1.......2 . . ..3.......4.. ..  5. ... .6 .. . .7. .  . 8.. ....9......10

              *DIAGRAM
    1         ID      GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR,   5-YEAR EVENT
    2         ID      GENERATED  2/2005 BY WOOD RODGERS INC
    3         ID  ********************************************************************************
              *
    4         IT       2 17MAR78    0200          19MAR78    0200
    5         IN       1
    6         IO       3
              *

    7         KK     EX1   RUNOFF FROM EXISTING AREA 1
    8         BA  1.7296
    9         PH                    0.18    0.34    0.56    0.72    0.84    1 20    1 68    2.25
   10         LS       0    81 8
   11         UD    1.21
              *

   12         KK     EX2   RUNOFF FROM EXISTING AREA 2
   13         BA  0.6623
   14         LS       0    74.6
   15         UD    0.80
              *

   16         KK     EX3   RUNOFF FROM EXISTING AREA 3
   17         BA  2.2979
   18         LS       0    80 27
   19         UD    1.36
              *

   20         KK     EX4   RUNOFF FROM EXISTNG AREA 4
   21         BA  0.2915
   22         LS       0    80.5
   23         UD   0.735
              *

   24         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY
              *          IN OVERLAND SHALLOW FLOW
   25         RD     618   0.014    0 04             TRAP     100    0.33
              *

   26         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL
   27         RD     950   0.009    0 03             TRAP      10    0.33
              *

   28         KK     CP3   CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
   29         HC       2
              *

   30         KK  REX3_1   ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
   31         RD     914   0.003    0.03             TRAP      10    0.33
              *
```

1 HEC-1 INPUT PAGE 2

```
LINE          ID .. ...1. .  ..2.. .. .3.......4.......5.......6. .....7. .....8 ......9..... 10

   32         KK     CP1   FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST
```

```
                *          CORNER OF SITE
          33    HC       3
                *
          34    KK     EX5   RUNOFF FROM OFFSITE AREA 5
          35    BA  0 3020
          36    LS       0    82 1
          37    UD    0.51
                *
          38    ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

     7        EX1

              .
    12        .         EX2

                        .
    16                            EX3
                        .           .
              .         .                                .
    20        .                                    EX4
                                                    V
              .         .           .              V
    24        .                     .          REX4_3
              .         .           .              V
                                                  V
    26                                        REX4_3
                                    .             .

              .         .
    28        .                     CP3.    ...  ..
                        .           V
              .         .           V
    30        .                   REX3_1
              .                     .
              .         .
    32      CP1  .    .  . ....   ....
              .
              .
    34                  EX5

  (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4 1                  *
*                                       *
*  RUN DATE  25MAR05  TIME  15.08.17    *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*      DAVIS, CALIFORNIA 95616          *
*          (916) 756-1104               *
*                                       *
*****************************************
```

```
                    GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR,  5-YEAR EVENT
                    GENERATED  2/2005 BY WOOD RODGERS INC
                   ========================================================================

    6 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          3  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                       NMIN           2  MINUTES IN COMPUTATION INTERVAL
                       IDATE      17MAR78  STARTING DATE
                       ITIME         0200  STARTING TIME
                         NQ          1441  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE     19MAR78  ENDING DATE
                       NDTIME        0200  ENDING TIME
                       ICENT           19  CENTURY MARK

                     COMPUTATION INTERVAL      .03 HOURS
                         TOTAL TIME BASE    48.00 HOURS

                ENGLISH UNITS
                     DRAINAGE AREA          SQUARE MILES
                     PRECIPITATION DEPTH    INCHES
                     LENGTH, ELEVATION      FEET
                     FLOW                   CUBIC FEET PER SECOND
                     STORAGE VOLUME         ACRE-FEET
                     SURFACE AREA           ACRES
                     TEMPERATURE            DEGREES FAHRENHEIT

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

```
          **************
          *            *
 7 KK     *     EX1    *      RUNOFF FROM EXISTING AREA 1
          *            *
          **************

     SUBBASIN RUNOFF DATA

 8 BA      SUBBASIN CHARACTERISTICS
               TAREA        1 73  SUBBASIN AREA

           PRECIPITATION DATA

 9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           ..... HYDRO-35 .... .     .....   .. .. TP-40 ... .  .... ...   ..... ..... TP-49 ..... .
           5-MIN  15-MIN  60-MIN     2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
             .18     34      56       72      84    1.20    1.68    2.25     .00     .00     .00     .00

                                                 STORM AREA =     1.73

10 LS      SCS LOSS RATE
               STRTL          44  INITIAL ABSTRACTION
             CRVNBR       81.80  CURVE NUMBER
               RTIMP          00  PERCENT IMPERVIOUS AREA

11 UD      SCS DIMENSIONLESS UNITGRAPH
               TLAG        1 21  LAG

                                                      ***

                                                 UNIT HYDROGRAPH
                                              183 END-OF-PERIOD ORDINATES
            6.      11.      17       25       38.      50.      63.      79.      95.     112.
          129.     151      173      195.     219.     249      279.     308.     341.     376.
          412.     447      477.     506      536.     563.     584.     604.     624.     640.
          651.     662      673      676.     678.     680.     681.     679.     677.     675.
          669.     657.     646.     635.     623.     610.     597.     583.     569.     554.
          539.     522.     504.     485.     467      445.     423.     401.     379.     361.
          342.     324.     308      295.     282.     269      257.     246.     235.     224.
          215.     206      196.     188      181.     174      168.     161.     154.     147.
          141.     135      130      124      119.     113      107.     102.      98.      94.
           90.      87       83       79.      75.      72.      69.      66.      64.      61.
           58.      55       53.      50       48.      46       44.      42.      40.      38.
           37.      35       34       32       31       30       28.      27.      26.      25.
           24       23       22.      21       20.      19       18.      18.      17.      16.
           15.      15       14       13.      13.      12.      12.      11.      11.      10.
           10        9        9        9.       8.       8        8        7.       7.       7
            7.       6        6.       6.       6.       6        5        5.       5.       5.
            4.       4        4.       4        4.       3        3.       3.       3.       3.
            2.       2.       2.       2.       2.       1.       1        1.       1.       1.
            1.       0.       0

    ***      ***      ***      ***      ***

                    HYDROGRAPH AT STATION      EX1

    TOTAL RAINFALL =    2.24, TOTAL LOSS =    1 44, TOTAL EXCESS =      80

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     48.00-HR
+   (CFS)       (HR)
                              (CFS)
+    172.     13.37             96.         37.         19          19.
                           (INCHES)        .514        .805        .805
                           (AC-FT)          47.         74.         74.

                    CUMULATIVE AREA =    1 73 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
12 KK     *     EX2    *      RUNOFF FROM EXISTING AREA 2
          *            *
          **************

     SUBBASIN RUNOFF DATA

13 BA      SUBBASIN CHARACTERISTICS
               TAREA          66  SUBBASIN AREA

           PRECIPITATION DATA

 9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           ..... HYDRO-35 ......     ..... ..... TP-40 ..... .....   ..... ..... TP-49 .....
           5-MIN  15-MIN  60-MIN     2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
             .18     .34     .56      .72      84    1.20    1.68    2.25     .00     .00     .00      00

                                                 STORM AREA =      .66
```

```
14 LS          SCS LOSS RATE
                    STRTL        .68  INITIAL ABSTRACTION
                   CRVNBR      74.60  CURVE NUMBER
                    RTIMP        00  PERCENT IMPERVIOUS AREA

15 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        .80  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                          122 END-OF-PERIOD ORDINATES
      5.      10.      18.      29.      41       55.      69.      87.      106.     127.
    152.     178.     207.     237.     266.     292.     317.     336.     354.     368
    378.     387      389.     391      391.     389.     387.     378.     368.     358.
    346.     335.     322.     309.     294      278.     262      242      223.     207.
    191.     176.     165.     154.     144.     135.     126      118.     110.     104.
     98.      92.      86       81       76.      71.      66.      61.      57.      54.
     51.      47.      44       41.      39.      36.      34.      32       29.      28.
     26.      24.      22.      21.      20.      19.      17.      16.      15.      14.
     13.      13.      12.      11.      10.      10       9.       8.       8.       7.
      7.       6.       6        6.       5       5.       5.       4.       4.       4.
      4        4.       3        3.       3       3.       3        2.       2.       2.
      2.       2.       2.       1.       1.      1.       1.       1.       1.       0.
      0.       0.

 ***              ***              ***              ***              ***

                          HYDROGRAPH AT STATION       EX2

    TOTAL RAINFALL =     2.25, TOTAL LOSS =     1.75, TOTAL EXCESS =      .49

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+   (CFS)        (HR)
                                (CFS)
+     45.        12.93                    23.          9.           4.          4.
                              (INCHES)    .317         .494         .494        .494
                              (AC-FT)       11          17.          17.         17.

                          CUMULATIVE AREA =      .66 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                 ************
                 *          *
16 KK            *    EX3   *       RUNOFF FROM EXISTING AREA 3
                 *          *
                 ************

                 SUBBASIN RUNOFF DATA

17 BA                 SUBBASIN CHARACTERISTICS
                           TAREA        2.30  SUBBASIN AREA

                      PRECIPITATION DATA

 9 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                      ..... HYDRO-35 ... .    ......... ..... TP-40 . ......... ..    . ......... TP-49 ............
                      5-MIN  15-MIN  60-MIN    2-HR     3-HR     6-HR     12-HR    24-HR    2-DAY    4-DAY    7-DAY    10-DAY
                        .18     .34     .56     .72      .84     1.20     1.68     2.25       00      .00      .00      .00

                                                      STORM AREA =     2.30

18 LS                 SCS LOSS RATE
                           STRTL         .49  INITIAL ABSTRACTION
                          CRVNBR       80.27  CURVE NUMBER
                           RTIMP         .00  PERCENT IMPERVIOUS AREA

19 UD                 SCS DIMENSIONLESS UNITGRAPH
                           TLAG        1.36  LAG

                                                      ***

                                                    UNIT HYDROGRAPH
                                              206 END-OF-PERIOD ORDINATES
      6.      12.      18.      23.      36.      50.      63.      77.      94.      111.
    129.     146      167.     191      214      238.     265      296.     327.     359.
    392.     429.     466.     503.     539.     570.     601.     633      663.     685.
    706.     728.     749.     761.     773.     785.     796.     800.     802.     804.
    806.     805.     803.     801.     799.     792.     780.     768.     756.     744.
    730.     716.     703.     689.     673.     657.     642.     625.     606.     586.
    567.     547      524.     500.     477.     453.     434.     414.     395.     375.
    360.     346.     333.     319.     307.     295.     283      272.     261.     251.
    241.     232.     223.     216      209.     202.     194.     187      180.     173.
    166.     160.     154.     149.     143.     137.     131.     125.     119.     115.
    111.     107.     103.      99.      96.      92       88.      84.      82.      79.
     76.      73.      70.      67.      64.      61       59.      57.      55.      53.
     51.      48.      46.      44.      43.      41.      40.      38.      37.      35.
     34.      32.      31.      30.      29.      28.      27       26.      25.      24.
     23       22.      21.      21.      20       19       18.      17.      17.      16.
```

16	15	14.	14.	13.	13.	12.	12.	11.	11.
11	10.	10.	9.	9.	9.	8.	8.	8.	8
8	7.	7.	7.	7.	6	6.	6.	6.	5.
5.	5	5	4.	4	4	4.	4.	3	3.
3	3.	3.	2	2	2	2	2.	1.	1.
1	1.	1.	0	0	0.				

*** *** *** *** ***

HYDROGRAPH AT STATION EX3

TOTAL RAINFALL = 2.24, TOTAL LOSS = 1.51, TOTAL EXCESS = .73

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 188	13.53		114.	45.	23.	23.
		(INCHES)	.460	.729	.729	729
		(AC-FT)	56.	89.	89.	89.

CUMULATIVE AREA = 2.30 SQ MI

*** ***

```
             **************
             *            *
20 KK        *     EX4    *         RUNOFF FROM EXISTNG AREA 4
             *            *
             **************
```

SUBBASIN RUNOFF DATA

21 BA SUBBASIN CHARACTERISTICS
TAREA .29 SUBBASIN AREA

PRECIPITATION DATA

9 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

. . . HYDRO-35	. . .	. . .	.... TP-40			....		.... TP-49	. . .		
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
18	.34	.56	.72	.84	1 20	1 68	2.25	.00	00	00	00

STORM AREA = .29

22 LS SCS LOSS RATE
STRTL 48 INITIAL ABSTRACTION
CRVNBR 80 50 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

23 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .74 LAG

***

UNIT HYDROGRAPH
112 END-OF-PERIOD ORDINATES

2	5.	10.	16.	22.	30.	38.	48	58.	71
84.	99.	115.	130.	143.	156.	165	174.	179	184.
186	187.	187.	186.	184.	180.	175.	169.	163.	157
150.	143.	134.	126.	116.	106.	97.	89.	82	76.
71	66.	61.	57.	53.	50.	47.	44.	41	38.
35	33.	30.	28.	26	24.	23.	21.	20.	18.
17.	16.	25	14.	13.	12.	11.	10.	9	9
8	8.	7.	7.	6.	6.	5.	5.	5.	4.
4	4.	3.	3.	3.	3.	3.	2.	2	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0								

*** *** *** *** ***

HYDROGRAPH AT STATION EX4

TOTAL RAINFALL = 2.25, TOTAL LOSS = 1.51, TOTAL EXCESS = .74

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 37	12.83		15.	6.	3.	3.
		(INCHES)	.487	.744	.744	.744
		(AC-FT)	8.	12.	12.	12.

CUMULATIVE AREA = .29 SQ MI

*** ***

```
24 KK      REX4_3        ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY

           HYDROGRAPH ROUTING DATA

25 RD      MUSKINGUM-CUNGE CHANNEL ROUTING
                 L      618   CHANNEL LENGTH
                 S      .0140 SLOPE
                 N      .040  CHANNEL ROUGHNESS COEFFICIENT
                CA      .00   CONTRIBUTING AREA
             SHAPE      TRAP  CHANNEL SHAPE
                WD    100.00  BOTTOM WIDTH OR DIAMETER
                 Z      .33   SIDE SLOPE

                                        ***
                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                              COMPUTATION TIME STEP
   ELEMENT   ALPHA      M        DT        DX       PEAK    TIME TO PEAK   VOLUME   MAXIMUM CELERITY
                                (MIN)     (FT)     (CFS)      (MIN)        (IN)       (FPS)
    MAIN       .22     1.64      2.00    123.60    36.52      774.00        .74        2.05

                         INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

    MAIN       .22     1.64      2.00                36.52      774.00        .74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= .0000E+00 OUTFLOW= 1156E+02 BASIN STORAGE= 2335E-02 PERCENT ERROR=    .0

      ***        ***        ***        ***        ***

                    HYDROGRAPH AT STATION   REX4_3

 PEAK FLOW    TIME                    MAXIMUM AVERAGE FLOW
                          6-HR        24-HR       72-HR      48.00-HR
+   (CFS)     (HR)       (CFS)
+     37.     12.90        15.          6.          3.          3.
                         (INCHES)     .487        .744        .744        .744
                         (AC-FT)        8          12.         12          12

                    CUMULATIVE AREA =     29 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

26 KK      REX4_3        ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL

           HYDROGRAPH ROUTING DATA

27 RD      MUSKINGUM-CUNGE CHANNEL ROUTING
                 L      850.  CHANNEL LENGTH
                 S      .0090 SLOPE
                 N      .030  CHANNEL ROUGHNESS COEFFICIENT
                CA      .00   CONTRIBUTING AREA
             SHAPE      TRAP  CHANNEL SHAPE
                WD     10.00  BOTTOM WIDTH OR DIAMETER
                 Z        33  SIDE SLOPE

                                        ***
                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                              COMPUTATION TIME STEP
   ELEMENT   ALPHA      M        DT        DX       PEAK    TIME TO PEAK   VOLUME   MAXIMUM CELERITY
                                (MIN)     (FT)     (CFS)      (MIN)        (IN)       (FPS)
    MAIN      1.25     1.50      2 00    283.33    36.52      776.00        .74        4.56

                         INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

    MAIN      1.25     1.50      2.00                36.52      776.00        .74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= .0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .8896E-03 PERCENT ERROR=    .0
```

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

                        HYDROGRAPH AT STATION    REX4_3

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                                (CFS)
+      37.     12.93                      15.           6           3.            3.
                              (INCHES)    .487         .744         .744          744
                              (AC-FT)        8           12.          12.          12.

                        CUMULATIVE AREA =      29 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
  28 KK     *      CP3   *        CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
            *            *
            **************

  29 HC          HYDROGRAPH COMBINATION
                       ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      CP3

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                                (CFS)
+     212.      13.47                     129           51          25.           25
                              (INCHES)    .463         730          730          .730
                              (AC-FT)       64          101.         101.         101.

                        CUMULATIVE AREA =     2.59 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
  30 KK     *    REX3_1  *        ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
            *            *
            **************

          HYDROGRAPH ROUTING DATA

  31 RD       MUSKINGUM-CUNGE CHANNEL ROUTING
                        L        914.  CHANNEL LENGTH
                        S       .0030  SLOPE
                        N         030  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .00  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD       10.00  BOTTOM WIDTH OR DIAMETER
                        Z         .33  SIDE SLOPE

                                                  ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                  COMPUTATION TIME STEP
          ELEMENT    ALPHA        M          DT          DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                              PEAK                    CELERITY
                                                      (MIN)        (FT)      (CFS)      (MIN)        (IN)      (FPS)

            MAIN       .72        1 50        2.00      457.00     211.94     810.00         .73       5.67

                                  INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

            MAIN       .72        1 50        2 00                 211 94     810.00         .73

CONTINUITY SUMMARY (AC-FT) - INFLOW=  1009E+03 EXCESS= .0000E+00 OUTFLOW= .1009E+03 BASIN STORAGE= .1381E-02 PERCENT ERROR=     .0

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION    REX3_1

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
```

			6-HR	24-HR	72-HR	48.00-HR
		(CFS)				
+ 212	13 50		129.	51.	25	25.
		(INCHES)	.463	730	.730	730
		(AC-FT)	64.	101	101	101.

CUMULATIVE AREA = 2.59 SQ MI

*** ***

32 KK   CP1   FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST

33 HC   HYDROGRAPH COMBINATION
ICOMP   3   NUMBER OF HYDROGRAPHS TO COMBINE

***

***   ***   ***   ***   ***

HYDROGRAPH AT STATION   CP1

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 419	13.33		247	97.	49.	49.
		(INCHES)	.461	.725	.725	.725
		(AC-FT)	122.	193.	193.	193.

CUMULATIVE AREA = 4.98 SQ MI

*** ***

34 KK   EX5   RUNOFF FROM OFFSITE AREA 5

SUBBASIN RUNOFF DATA

35 BA   SUBBASIN CHARACTERISTICS
TAREA   .30   SUBBASIN AREA

PRECIPITATION DATA

9 PH   DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

.... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
18	.34	.56	.72	.84	1.20	1.68	2.25	00	.00	00	.00

STORM AREA = .30

36 LS   SCS LOSS RATE
STRTL   .44   INITIAL ABSTRACTION
CRVNBR   82.10   CURVE NUMBER
RTIMP   .00   PERCENT IMPERVIOUS AREA

37 UD   SCS DIMENSIONLESS UNITGRAPH
TLAG   .51   LAG

***

UNIT HYDROGRAPH
78 END-OF-PERIOD ORDINATES

5.	13.	26.	41.	58.	79.	105.	134.	167.	197.
225.	245.	261.	272.	276.	277.	275.	268	257.	245.
232	218.	201.	182.	161.	143.	126.	113.	102	92.
83	75.	69.	62.	56.	51.	46.	40.	37.	33
30.	27.	25.	22.	20.	18	16.	14.	13	12.
11.	10	9.	8.	7.	6.	6.	5	5	4.
4.	3.	3.	3.	3.	2.	2.	2.	2.	2
1.	1.	1.	1.	1.	1.	0.	0.		

***   ***   ***   ***   ***

HYDROGRAPH AT STATION   EX5

TOTAL RAINFALL = 2.25, TOTAL LOSS = 1.43, TOTAL EXCESS = .82

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				

+ 54.	12.57		18.	7.	3	3
		(INCHES)	.541	.823	.823	823
		(AC-FT)	9.	13	13	13

CUMULATIVE AREA = .30 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	EX1	172	13.37	96.	37.	19.	2 73		
+	HYDROGRAPH AT	EX2	45	12.93	23	9.	4	.66		
+	HYDROGRAPH AT	EX3	188.	13.53	114	45.	23.	2.30		
+	HYDROGRAPH AT	EX4	37.	12.83	15.	6	3.	.29		
+	ROUTED TO	REX4_3	37.	12.90	15.	6.	3.	.29		
+	ROUTED TO	REX4_3	37	12.93	15.	6.	3.	.29		
+	2 COMBINED AT	CP3	212.	13.47	129.	51.	25.	2.59		
+	ROUTED TO	REX3_1	212.	13.50	129	51.	25.	2.59		
+	3 COMBINED AT	CP1	419.	13 33	247	97.	49.	4.98		
+	HYDROGRAPH AT	EX5	54	12 57	18	7.	3.	.30		

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
REX4_3	MANE	2 00	36.52	774 00	.74	2.00	36.52	774.00	74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1156E+02 EXCESS= 0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .2335E-02 PERCENT ERROR= 0

REX4_3	MANE	2.00	36 52	776.00	74	2.00	36.52	776.00	.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= 1156E+02 EXCESS= .0000E+00 OUTFLOW= .1156E+02 BASIN STORAGE= .8896E-03 PERCENT ERROR= .0

REX3_1	MANE	2.00	211.94	810 00	.73	2.00	211.94	810.00	.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1009E+03 EXCESS= 0000E+00 OUTFLOW= 1009E+03 BASIN STORAGE= .1381E-02 PERCENT ERROR= .0

*** NORMAL END OF HEC-1 ***

```
1*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            JUN  1998              *
*          VERSION 4.1              *
*                                   *
*  RUN DATE   25MAR05  TIME  15:07:19  *
*                                   *
*************************************
```

```
*************************************
*                                   *
*   U S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*        609 SECOND STREET          *
*      DAVIS, CALIFORNIA 95616      *
*          (916) 756-1104           *
*                                   *
*************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X         XXXXX  X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS.WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.. ... 3.......4 ......5.......6.......7. .. ..8     ..9. . 10
              *DIAGRAM
    1         ID      GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR,  100-YEAR EVENT
    2         ID      GENERATED  2/2005 BY WOOD RODGERS INC
    3         ID  ==========================================================================
              *
    4         IT       2 17MAR78    0200          19MAR78    0200
    5         IN       1
    6         IO       3
              *

    7         KK     EX1   RUNOFF FROM EXISTING AREA 1
    8         BA  1.7296
    9         PH                   0.41    0.78    1.29    1.39    1.48    1.93    2 87    4.14
   10         LS       0    81.8
   11         UD    1.21
              *

   12         KK     EX2   RUNOFF FROM EXISTING AREA 2
   13         BA  0.6623
   14         PH                   0.41    0 78    1.29    1.39    1 48    1 93    2.87    4 14
   15         LS       0    74.6
   16         UD    0.80
              *

   17         KK     EX3   RUNOFF FROM EXISTING AREA 3
   18         BA  2.2979
   19         UD    1 36
              *

   20         KK     EX4   RUNOFF FROM EXISTNG AREA 4
   21         BA  0.2915
   22         LS       0    80.5
   23         UD   0.735
              *

   24         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY
              *          IN OVERLAND SHALLOW FLOW
   25         RD     618   0.014    0.04            TRAP     100    0.33
              *

   26         KK  REX4_3   ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL
   27         RD     850   0 009    0.03            TRAP      10    0.33
              *

   28         KK     CP3   CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
   29         HC       2
              *

   30         KK  REX3_1   ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
   31         RD     914   0.003    0.03            TRAP      10    0.33
              *
```

1 HEC-1 INPUT PAGE 2

```
LINE          ID..... 1.......2.......3.......4.. ....5.......6.......7.......8..  ...9 .. ..10

   32         KK     CP1   FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST
```

```
                *          CORNER OF SITE
          33    HC       3
                *
          34    KK     EX5   RUNOFF FROM OFFSITE AREA 5
          35    BA  0.3020
          36    LS       0    82 1
          37    UD    0.51
                *
          38    ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW
  NO.      ( ) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    7         EX1
                .
                .
   12           .          EX2
                .           .
                .           .
   17           .           .          EX3
                .           .           .
                .           .           .
   20           .           .           .          EX4
                .           .           .           V
                .           .           .           V
   24           .           .           .       REX4_3
                .           .           .           V
                .           .           .           V
   26           .           .           .       REX4_3
                .           .           .           .
                .           .           .           .
   28           .           .          CP3.............
                .           .           V
                .           .           V
   30           .           .       REX3_1
                .           .           .
                .           .           .
   32        CP1... .. . ... .... ......
                .
                .
   34           .          EX5

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   25MAR05  TIME  15:07.19   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*          (916) 756-1104               *
*                                       *
*****************************************
```

GOLDEN HILLS SUBDIVISION EXISTING CONDITIONS 24-HOUR, 100-YEAR EVENT
GENERATED 2/2005 BY WOOD RODGERS INC

```
  6 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                     NMIN           2  MINUTES IN COMPUTATION INTERVAL
                     IDATE      17MAR78  STARTING DATE
                     ITIME         0200  STARTING TIME
                     NQ            1441  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     19MAR78  ENDING DATE
                     NDTIME        0200  ENDING TIME
                     ICENT           19  CENTURY MARK

                COMPUTATION INTERVAL      .03 HOURS
                   TOTAL TIME BASE    48.00 HOURS

          ENGLISH UNITS
               DRAINAGE AREA         SQUARE MILES
               PRECIPITATION DEPTH   INCHES
               LENGTH, ELEVATION     FEET
               FLOW                  CUBIC FEET PER SECOND
               STORAGE VOLUME        ACRE-FEET
               SURFACE AREA          ACRES
               TEMPERATURE           DEGREES FAHRENHEIT
```

*** ***

```
          **************
          *            *
 7 KK     *     EX1    *     RUNOFF FROM EXISTING AREA 1
          *            *
          **************

    SUBBASIN RUNOFF DATA

 8 BA       SUBBASIN CHARACTERISTICS
                TAREA         1.73  SUBBASIN AREA

            PRECIPITATION DATA

 9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
            ..... HYDRO-35 . ....    ..... .... TP-40 . ..........   .. . ..... TP-49  .  ......
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              .41     .78    1.29    1.39    1 48    1.93    2.87    4.14     .00     .00      00     .00

                                                STORM AREA =     1.73

10 LS       SCS LOSS RATE
                STRTL          .44  INITIAL ABSTRACTION
              CRVNBR        81.80  CURVE NUMBER
               RTIMP          .00  PERCENT IMPERVIOUS AREA

11 UD       SCS DIMENSIONLESS UNITGRAPH
                TLAG         1 21  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            183 END-OF-PERIOD ORDINATES
              6.      11.     17.     25.     38      50.     63.     79      95.     112
            129.     151.     173     195.    219.    249.    279.    308.    341.    376
            412.     447      477     506.    536.    563.    584.    604.    624.    640.
            651.     662.     673     676     678.    680.    681.    679.    677.    675
            669.     657.     646.    635     623.    610.    597     583.    569.    554.
            539.     522.     504.    485.    467     445.    423.    401.    379.    361
            342.     324.     308.    295     282.    269.    257.    246.    235.    224
            215.     206.     196     188.    181.    174.    168.    161.    154.    147
            141.     135      130.    124     119.    113.    107     102.    98.     94.
             90.      87.      83     79      75.     72.     69      66.     64.     61.
             58.      55.     53.     50      48.     46.     44.     42.     40.     38
             37.      35.     34.     32.     31.     30.     28.     27.     26.     25
             24.      23      22.     21      20      19.     18.     18.     17.     16.
             15.      15      14      13      13.     12.     12.     11.     11.     10.
             10.      9       9.      9       8.      8.      8.      7       7.      7
              7.      6.      6.      6.      6.      6.      5.      5.      5       5.
              4       4.      4       4.      4.      3.      3.      3.      3       3.
              2       2.      2       2.      2.      1       1.      1.      1.      1
              1.      0.      0.

    ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION      EX1

    TOTAL RAINFALL =     4.13, TOTAL LOSS =     1.83, TOTAL EXCESS =     2.30

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
*   (CFS)       (HR)
                  (CFS)
*     579.     13.27                    250.         107.          53.          53.
                (INCHES)              1.344        2.298        2.298        2.298
                (AC-FT)                124.          212          212.         212

                CUMULATIVE AREA =    1 73 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
12 KK     *     EX2    *     RUNOFF FROM EXISTING AREA 2
          *            *
          **************

    SUBBASIN RUNOFF DATA

13 BA       SUBBASIN CHARACTERISTICS
                TAREA           66  SUBBASIN AREA

            PRECIPITATION DATA

14 PH                               DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
            .. .. HYDRO-35 .....    ..... ..... TP-40 .............   ........... TP-49 .. ........
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              41     .78    1.29    1.39    1.48    1.93    2.87    4.14     .00     .00     .00     .00

                                                STORM AREA =      .66
```

15 LS SCS LOSS RATE
STRTL .68 INITIAL ABSTRACTION
CRVNBR 74.60 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

16 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .80 LAG

***

UNIT HYDROGRAPH
122 END-OF-PERIOD ORDINATES

5.	10.	18.	29.	41.	55	69.	87.	106.	127.
152.	178.	207.	237.	266.	292.	317.	336.	354.	368.
378.	387.	389.	391.	391.	389.	387.	378	368.	358.
346.	335.	322.	309.	294.	278.	262	242.	223.	207.
191.	176.	165.	154.	144.	135.	126.	118.	110.	104.
98.	92.	86.	81.	76.	71.	66.	61.	57.	54.
51	47.	44.	41.	39.	36.	34.	32	29.	28.
26.	24.	22	21.	20.	19.	17.	16.	15.	14.
13.	13.	12.	11.	10.	10.	9.	8.	8.	7.
7.	6.	6.	6.	5.	5	5	4.	4	4.
4.	4.	3.	3.	3.	3.	3	2.	2.	2.
2.	2.	2.	1.	1.	1	1	1	1.	0.
0.	0.								

*** *** *** *** ***

HYDROGRAPH AT STATION EX2

TOTAL RAINFALL = 4.14, TOTAL LOSS = 2.40, TOTAL EXCESS = 1.74

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48 00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 228.	12 87		76.	31.	15.	15.
		(INCHES)	1.060	1.740	1 740	1.740
		(AC-FT)	37.	61.	61.	61

CUMULATIVE AREA = .66 SQ MI

*** ***

```
 **************
 *            *
 *     EX3    *
 *            *
 **************
```

17 KK EX3 RUNOFF FROM EXISTING AREA 3

SUBBASIN RUNOFF DATA

18 BA SUBBASIN CHARACTERISTICS
TAREA 2.30 SUBBASIN AREA

PRECIPITATION DATA

14 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

.... HYDRO-35	......		....	...... TP-40	....			.....	..... TP-49	......	...
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.41	.78	1.29	1.39	1.48	1.93	2.87	4 14	.00	.00	00	.00

STORM AREA = 2.30

15 LS SCS LOSS RATE
STRTL .68 INITIAL ABSTRACTION
CRVNBR 74.60 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

19 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 1.36 LAG

***

UNIT HYDROGRAPH
206 END-OF-PERIOD ORDINATES

6	12.	18.	23.	36	50.	63.	77.	94.	111.
129.	146.	167.	191	214.	238.	265.	296.	327.	359.
392.	429.	466.	503.	539.	570.	601.	633.	663.	685.
706.	728.	749.	761.	773.	785.	796.	800.	802.	804.
806.	805.	803.	801.	799.	792.	780.	768	756.	744.
730.	716.	703.	689	673.	657.	642.	625.	606.	586.
567.	547.	524.	500.	477	453.	434.	414.	395.	375
360.	346.	333.	319.	307.	295.	283.	272.	261.	251.
241.	232.	223.	216.	209.	202.	194.	187.	180.	173.
166.	160.	154.	149.	143.	137.	131	125.	119.	115.
111.	107.	103.	99.	96.	92.	88.	84.	82.	79.
76.	73.	70.	67.	64.	61.	59	57.	55.	53.
51.	48.	46.	44.	43.	41.	40	38.	37.	35.
34.	32.	31	30.	29.	28.	27.	26.	25.	24.
23	22.	21.	21.	20	19.	18.	17.	17	16.

16.	15	14.	14	13.	13	12.	12.	11	11.
11	10	10.	9.	9	9	8.	8	8	8
8.	7.	7.	7	7	6	6	6	6	5.
5	5.	5	4.	4	4	4.	4	3.	3.
3	3	3.	2.	2	2	2	2	1.	1
1	1	1.	0.	0.	0				

*** *** *** *** ***

HYDROGRAPH AT STATION EX3

TOTAL RAINFALL = 4.13, *TOTAL LOSS =* 2.39, *TOTAL EXCESS =* 1.73

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48 00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 515.	13.43		252.	107	54	54.
		(INCHES)	1 018	1 734	1.734	1.734
		(AC-FT)	125.	212.	212.	212.

CUMULATIVE AREA = 2 30 SQ MI

*** ***

```
        ***************
        *             *
20 KK   *     EX4     *     RUNOFF FROM EXISTNG AREA 4
        *             *
        ***************
```

SUBBASIN RUNOFF DATA

21 BA SUBBASIN CHARACTERISTICS
TAREA .29 SUBBASIN AREA

PRECIPITATION DATA

14 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

.. HYDRO-35 ..			... TP-40 ...					... TP-49 ...			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.41	78	1.29	1.39	1.48	1.93	2 87	4.14	00	.00	.00	.00

STORM AREA = .29

22 LS SCS LOSS RATE
STRTL 48 INITIAL ABSTRACTION
CRVNBR 80.50 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

23 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 74 LAG

***

UNIT HYDROGRAPH
112 END-OF-PERIOD ORDINATES

2.	5.	10	16.	22.	30.	38	48.	58	71.
84.	99.	115.	130.	143.	156.	165.	174	179	184.
186	187.	187	186	184.	180.	175.	169.	163.	157.
150.	143.	134.	126.	116.	106.	97.	89.	82.	76.
71	66.	61.	57.	53.	50	47.	44.	41.	38.
35.	33.	30.	28.	26.	24.	23.	21.	20.	18.
17.	16.	15	14	13.	12.	11.	10.	9.	9.
8.	8.	7.	7	6.	6	5.	5.	5.	4.
4.	4.	3	3.	3.	3.	3.	2.	2	2.
2.	2.	2	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1	1.	1.	0.	0.	0.	0.
0.	0.								

*** *** *** *** ***

HYDROGRAPH AT STATION EX4

TOTAL RAINFALL = 4.14, TOTAL LOSS = 1.94, TOTAL EXCESS = 2.20

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 138.	12.60		41.	17.	9.	9.
		(INCHES)	1.322	2.197	2.197	2.197
		(AC-FT)	21.	34.	34.	34.

CUMULATIVE AREA = .29 SQ MI

*** ***

```
          **************
          *            *
24 KK     *   REX4_3   *        ROUTE RUNOFF FROM EXISTING AREA 4 TO DESERT WAY
          *            *
          **************

   HYDROGRAPH ROUTING DATA

25 RD        MUSKINGUM-CUNGE CHANNEL ROUTING
                    L        618   CHANNEL LENGTH
                    S        0140  SLOPE
                    N         040  CHANNEL ROUGHNESS COEFFICIENT
                   CA         .00  CONTRIBUTING AREA
                SHAPE        TRAP  CHANNEL SHAPE
                   WD      100 00  BOTTOM WIDTH OR DIAMETER
                    Z         .33  SIDE SLOPE

                                                  ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                COMPUTATION TIME STEP
   ELEMENT    ALPHA        M          DT          DX        PEAK     TIME TO PEAK   VOLUME    MAXIMUM CELERITY
                                       (MIN)       (FT)      (CFS)    (MIN)          (IN)      (FPS)
    MAIN        .22       1 64        2 00      206.00     137.53     770.00         2.20       3.45

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

    MAIN        .22       1.64        2 00                 137.53     770.00         2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3416E+02 EXCESS= .0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= 2449E-02 PERCENT ERROR= .0

   ***          ***          ***          ***          ***

                          HYDROGRAPH AT STATION   REX4_3

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                    6-HR          24-HR          72-HR          48.00-HR
+   (CFS)      (HR)
                          (CFS)
+    138.      12.83          41.            17.             9.             9.
                          (INCHES)        1.322          2.197          2.197          2.197
                          (AC-FT)            21             34             34.            34.

                          CUMULATIVE AREA =      29 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
26 KK     *   REX4_3   *        ROUTE RUNOFF FROM EXISTING AREA 4 TO CP3 IN DESERT WAY TRAP CHANNEL
          *            *
          **************

   HYDROGRAPH ROUTING DATA

27 RD        MUSKINGUM-CUNGE CHANNEL ROUTING
                    L         850.  CHANNEL LENGTH
                    S        .0090  SLOPE
                    N         .030  CHANNEL ROUGHNESS COEFFICIENT
                   CA          .00  CONTRIBUTING AREA
                SHAPE         TRAP  CHANNEL SHAPE
                   WD        10 00  BOTTOM WIDTH OR DIAMETER
                    Z           33  SIDE SLOPE

                                                  ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                COMPUTATION TIME STEP
   ELEMENT    ALPHA        M          DT          DX        PEAK     TIME TO PEAK   VOLUME    MAXIMUM CELERITY
                                       (MIN)       (FT)      (CFS)    (MIN)          (IN)      (FPS)
    MAIN       1.25       1.50        2.00      425.00     137.43     771.55         2.20       7.09

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

    MAIN       1.25       1.50        2.00                 137.33     772.00         2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3416E+02 EXCESS= .0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= .8090E-03 PERCENT ERROR= .0
```

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

                        HYDROGRAPH AT STATION   REX4_3

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR          24-HR          72-HR      48.00-HR
+   (CFS)         (HR)
                    (CFS)
+      137       12.87                    41             17             9.             9.
                (INCHES)                1.322          2 197          2.197          2.197
                 (AC-FT)                  21.            34.            34.            34.

                        CUMULATIVE AREA =      29 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
  28 KK     *       CP3  *        CONCENTRATION OF EX3 AND EX4 WITHIN DESERT WAY CHANNEL
            *            *
            **************

  29 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                 ***

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      CP3

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR          24-HR          72-HR      48.00-HR
+   (CFS)         (HR)
                    (CFS)
+      599.      13.27                   293.           124.           62             62.
                (INCHES)                1.051          1.786          1.786          1 786
                 (AC-FT)                  145            247.           247            247.

                        CUMULATIVE AREA =     2 59 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
  30 KK     *    REX3_1  *        ROUTE CP3 TO CP1 IN DESERT WAY CHANNEL
            *            *
            **************

     HYDROGRAPH ROUTING DATA

  31 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L         914.  CHANNEL LENGTH
                          S        0030  SLOPE
                          N         030  CHANNEL ROUGHNESS COEFFICIENT
                         CA          00  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD       10 00  BOTTOM WIDTH OR DIAMETER
                          Z          33  SIDE SLOPE

                                                    ***
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                       COMPUTATION TIME STEP
                    ELEMENT    ALPHA        M          DT         DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                        PEAK                   CELERITY
                                                        (MIN)      (FT)      (CFS)     (MIN)        (IN)       (FPS)

                     MAIN         .72       1 50        1.90     914.00     598.02    797.36        1.79       8.00

                                              INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                     MAIN         .72       1 50        2 00                597.87    798.00        1.79

  CONTINUITY SUMMARY (AC-FT) - INFLOW= .2466E+03 EXCESS=  0000E+00 OUTFLOW= .2466E+03 BASIN STORAGE= .1345E-02 PERCENT ERROR=     .0

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   REX3_1

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR          24-HR          72-HR      48 00-HR
+   (CFS)         (HR)
```

```
                         (CFS)
+     598.     13 30              293.        124.        62.        62
                        (INCHES)  1 050       1 786       1.786      1.786
                        (AC-FT)   145.        247         247.       247

                        CUMULATIVE AREA =    2.59 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             **************
             *            *
   32 KK     *    CP1     *      FINAL CONCENTRATION POINT WITHIN DESERT WAY CHANNEL IN NORTHWEST
             *            *
             **************

   33 HC         HYDROGRAPH COMBINATION
                      ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                     ***

       ***             ***           ***           ***           ***

                       HYDROGRAPH AT STATION      CP1

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR         24-HR        72-HR      48.00-HR
+   (CFS)        (HR)
                          (CFS)
+    1354.      13.20               617          262          131.         131.
                         (INCHES)   1.152        1.957        1.958        1.958
                          (AC-FT)   306          520.         520.         520.

                         CUMULATIVE AREA =    4.98 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             **************
             *            *
   34 KK     *    EX5     *      RUNOFF FROM OFFSITE AREA 5
             *            *
             **************

              SUBBASIN RUNOFF DATA

   35 BA        SUBBASIN CHARACTERISTICS
                     TAREA          .30  SUBBASIN AREA

                PRECIPITATION DATA

   14 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .. ..    .. .  ....... .. TP-40 .. ..... .....   ...... .... TP-49 ....... . .
                5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .41    .78    1.29    1 39    1 48    1.93    2.87    4.14     .00     .00     00     .00

                                                        STORM AREA =     .30

   36 LS        SCS LOSS RATE
                    STRTL          .44  INITIAL ABSTRACTION
                    CRVNBR       82.10  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

   37 UD        SCS DIMENSIONLESS UNITGRAPH
                    TLAG           .51  LAG

                                                                     ***

                                                       UNIT HYDROGRAPH
                                                  78 END-OF-PERIOD ORDINATES
                5.       13.      26.      41       58.      79.      105.     134.     167.     197.
              225.      245.      261      272.     276.     277.     275.     268.     257.     245.
              232.      218.      201.     182.     161.     143.     126.     113.     102.      92.
               83.       75       69.      62.      56.      51.      46       40       37.      33.
               30        27       25.      22.      20.      18.      16       14.      13.      12.
               11        10        9.       8.       7        6.       6        5.       5.       4.
                4.        3.       3.       3.       3.       2.       2.       2.       2.       2.
                1.        1.       1.       1.       1.       1.       0        0.

         ***            ***            ***            ***            ***

                         HYDROGRAPH AT STATION      EX5

      TOTAL RAINFALL =     4.14, TOTAL LOSS =     1.81, TOTAL EXCESS =     2.33

   PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                     6-HR         24-HR        72-HR      48.00-HR
+   (CFS)         (HR)
                          (CFS)
```

+ 195.	12 57		46	19.	9.	9
		(INCHES)	1.405	2.330	2 330	2.330
		(AC-FT)	23.	38	38.	38.

CUMULATIVE AREA = .30 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	EX1	579	13.27	250.	107.	53	1.73		
+	HYDROGRAPH AT	EX2	228.	12 87	76.	31.	15.	.66		
+	HYDROGRAPH AT	EX3	515.	13 43	252.	107.	54.	2.30		
+	HYDROGRAPH AT	EX4	138.	12 80	41	17.	9.	29		
+	ROUTED TO	REX4_3	138.	12.83	41.	17.	9.	.29		
+	ROUTED TO	REX4_3	137.	12.87	41.	17.	9.	29		
+	2 COMBINED AT	CP3	599	13.27	293.	124.	62.	2 59		
+	ROUTED TO	REX3_1	598.	13.30	293.	124.	62.	2.59		
+	3 COMBINED AT	CP1	1354	13 20	617.	262.	131.	4.98		
+	HYDROGRAPH AT	EX5	195.	12 57	46.	19.	9.	.30		

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
REX4_3	MANE	2.00	137 53	770.00	2 20	2.00	137.53	770.00	2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3416E+02 EXCESS= 0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= .2449E-02 PERCENT ERROR= .0

REX4_3	MANE	2.00	137.43	771.55	2 20	2.00	137.33	772.00	2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3416E+02 EXCESS= .0000E+00 OUTFLOW= .3416E+02 BASIN STORAGE= .8090E-03 PERCENT ERROR= .0

REX3_1	MANE	1.90	598.02	797.36	1.79	2.00	597.87	798.00	1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2466E+03 EXCESS= 0000E+00 OUTFLOW= .2466E+03 BASIN STORAGE= .1345E-02 PERCENT ERROR= .0

*** NORMAL END OF HEC-1 ***

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998             *
*           VERSION 4.1             *
*                                   *
*  RUN DATE   25MAR05  TIME  15:10 03   *
*                                   *
*************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*          609 SECOND STREET        *
*       DAVIS, CALIFORNIA 95616     *
*           (916) 756-1104          *
*                                   *
*************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX  XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1. ....,2.......3.......4.. ....5.. ....6... ...7.......8.... ..9.....10

              *DIAGRAM
    1         ID      GOLDEN HILLS SUBDIVISION PROPOSED CONDITIONS 24-HOUR,   5-YEAR EVENT
    2         ID      GENERATED  3/2005 BY WOOD RODGERS INC
    3         ID  <=========================================================================
              *
    4         IT       2 17MAR78    0200          19MAR78    0200
    5         IN       1
    6         IO       3
              *

    7         KK    OFF4   RUNOFF FROM OFFSITE AREA 4
    8         BA  0.2070
    9         PH                 0 18    0.34    0.56    0 72    0.84    1.20    1.68    2 25
   10         LS       0      82
   11         UD   0 478
              *

   12         KK   ROFF4   ROUTE OFFSITE WATERSHED 4 TO NORTHERN BOUNDARY OF SITE IN PROPOSED
              *          TRAPEZOIDAL CHANNEL
   13         RD    2137   0.047    0.03            TRAP       5    0.33
              *

   14         KK    OFF3   RUNOFF FROM OFFSITE AREA 3
   15         BA  0 0800
   16         LS       0      82
   17         UD    0.33
              *

   18         KK    DEV4   RUNOFF FROM PROPOSED WATERSHED 4
   19         BA  0.0233
   20         LS       0      82
   21         UD    0.14
              *

   22         KK     CP4   CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE
   23         HC       3
              *

   24         KK  RCP4_3   ROUTE CP4 TO CP3
   25         RD     636   0.091    0.03            TRAP      10    0.33
              *

   26         KK    OFF2   RUNOFF FROM OFFSITE AREA 2
   27         BA  0.1732
   28         LS       0      82
   29         UD    0.54
              *

   30         KK    DEV3
   31         BA  0.0724
   32         LS       0    83 5    11.1
   33         UD    0.17
              *
```

1 HEC-1 INPUT PAGE 2

```
LINE          ID.. ....1.......2.... ..3 ......4..... .5.......6.. ....7.......8.... ..9... ..10
```

```
34          KK     CP3   CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE
35          HC       3
            *

36          KK  RCP3_1   ROUTE CP3 TO CP1 (NORTHWEST CORNER OF SITE)
37          RD    2500   0.024    0.03            TRAP      10    0 33
            *

38          KK    OFF1   RUNOFF FROM OFFSITE AREA 1
39          BA  1.7296
40          LS       0    81.8
41          UD    1.21
            *

42          KK    DEV2   RUNOFF FROM PROPOSED WATERSHED 2
43          BA  0.0957
44          LS       0    77.1    11 5
45          UD    0.25
            *

46          KK    DEV1   RUNOFF FROM PROPOSED WATERSHED 1
47          BA  0.0115
48          LS       0    80.2     8.9
49          UD    0.16
            *

50          KK     CP1   CONCENTRATION POINT AT NORTHWEST CORNER OF SITE TO CROSS DESERT WAY
            *          IN CULVERT
51          HC       3
            *

52          KK    OFF6   RUNOFF FROM OFFSITE AREA 6
53          BA  0.1860
54          LS       0      82
55          UD   0.459
            *

56          KK   ROFF6   ROUTE OFFSITE 6 IN PROPOSED CHANNEL THROUGH DEV10
57          RD    1230   0.074    0 03            TRAP      10    0.33
            *

58          KK    OFF5   RUNOFF FROM OFFSITE AREA 5
59          BA  2.2212
60          LS       0    80.7
61          UD    1.32
            *

62          KK   CPOFF   CONCENTRATION POINT AT NORTHERN BOUNDARY OF DEV8
63          HC       2
            *
```


1

HEC-1 INPUT

```
LINE        ID.......1... .  2 ..... 3 .. ...4. .... 5. .  ..6.......7. .....8.......9......10

64          KK  ROFF56   ROUTE CPOFF TO CP8 (DOWNSTREAM BOUNDARY OF DEV8)
65          RD    1394   0.075    0.03            TRAP      10    0.33
            *

66          KK    DEV8   RUNOFF FROM PROPOSED AREA 8
67          BA  0.0119
68          LS       0    76.6    10.2
69          UD   0.070
            *

70          KK   DEV10   RUNOFF FROM PROPOSED AREA 10
71          BA  0.0949
72          LS       0    84.0     7.3
73          UD   0.070
            *

74          KK     CP8   CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV8
75          HC       3
            *

76          KK  RCP8_7   ROUTE CP8 TO CP7 (DOWNSTREAM BOUNDARY OF DEV7)
77          RD    1991   0.079    0.03            TRAP      10    0.33
            *

78          KK    DEV9   RUNOFF FROM PROPOSED AREA 9
79          BA  0.0638
80          LS       0    75.5    12.0
81          UD    0.11
            *

82          KK    DEV7   RUNOFF FROM PROPOSED AREA 7
83          BA  0.0227
84          LS       0    70.1     6.8
85          UD    0.17
            *

86          KK     CP7   COCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV7
87          HC       3
            *
```

```
 88          KK  RCP7_6   ROUTE CP7 TO CP6 (WESTERN BOUNDARY OF SITE)
 89          RD     940   0.016     0.03             TRAP       10     0.33
             *

 90          KK    DEV6   RUNOFF FROM PROPOSED AREA 6
 91          BA  0.0053
 92          LS       0    72.0
 93          UD    0.11
             *
1                                        HEC-1 INPUT                                        PAGE  4

LINE         ID.......1. .....2. .....3.......4.......5. .....6.......7..   ..8  .    9 .. ..10

 94          KK     CP6   CONCENTRATION POINT AT THE MID-WESTERN BOUNDARY OF SITE NEAR
 95          HC       2
             *

 96          KK  RCP6_5   ROUTE RUNOFF CONCENTRATING AT CP6 TO CP5 IN DAMONTE CHANNEL ALONG
             *          DESERT WAY
 97          RD     270   0.003     0.03             TRAP       10     0.33
             *

 98          KK    DEV5   RUNOFF FROM PROPOSED AREA 5
 99          BA  0.0091
100          LS       0    81.1     13.5
101          UD    0.11
             *

102          KK     CP5   CONCENTRATION POINT WITHIN DAMONTE CHANNEL ALONG DESERT WAY
103          HC       2
             *

104          KK  RCP5_1   ROUTE CP5 TO CP1 (NORTHWEST CORNER OF SITE)
105          RD    1120   0.003     0.03             TRAP       10     0 33
             *

106          KK  TOTCP1   TOTAL ADDITION OF FLOW AT NORTHWEST CORNER OF SITE
107          HC       2
             *

108          KK    OFF7   RUNOFF FROM OFFSITE AREA 7
109          BA  0.0931
110          LS       0      82
111          UD    0.31
             *

112          KK   ROFF7   ROUTE OFF7 TO THROUGH DEV7
113          RD    1035   0.136     0.03             TRAP        5     0 33
             *

114          KK   DEV12   RUNOFF FROM PROPOSED AREA 12
115          BA  0.0346
116          LS       0      84      2.5
117          UD    0.04
             *

118          KK    CP12   CONCENTRATION POINT AT THE DOWNSTREAM BOUNDARY OF DEV12
119          HC       2
             *

120          KK   RCP12   ROUTE CP12 TO CP11 (DOWNSTREAM BOUNDARY OF DEV11)
121          RD     800   0.082     0.03             TRAP        5     0.33
             *
1                                        HEC-1 INPUT                                        PAGE  5

LINE         ID.. ....1.......2.......3..... .4.......5.. ....6.... ..7 .  ...8...  ..9... . 10

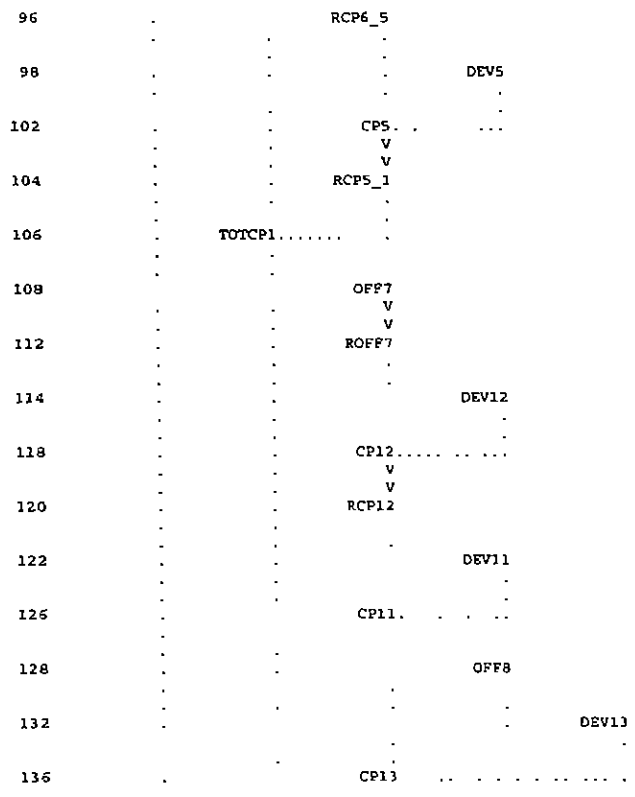
122          KK   DEV11   RUNOFF FROM PROPOSED AREA 11
123          BA  0.0335
124          LS       0    83.0     13.0
125          UD    0.05
             *

126          KK    CP11   CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV11
127          HC       2
             *

128          KK    OFF8   RUNOFF FROM OFFSITE AREA 8
129          BA  0.0228
130          LS       0    81.4
131          UD   0.195
             *

132          KK   DEV13   RUNOFF FROM PROPOSED AREA 13
133          BA  0.0911
134          LS       0    83 2     11.0
135          UD    0.20
             *

136          KK    CP13   COCENTRATION POINT ALONG THE DAMONTE RANCH HIGH SCHOOL
137          HC       3
             *
```



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*              JUN  1998             *
*           VERSION 4.1              *
*                                    *
* RUN DATE  25MAR05  TIME  15.10:03  *
*                                    *
**************************************
```

```
**************************************
*                                    *
*    U.S. ARMY CORPS OF ENGINEERS    *
*    HYDROLOGIC ENGINEERING CENTER   *
*          609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616      *
*           (916) 756-1104           *
*                                    *
**************************************
```

GOLDEN HILLS SUBDIVISION PROPOSED CONDITIONS 24-HOUR, 5-YEAR EVENT
GENERATED 3/2005 BY WOOD RODGERS INC

```
  6 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                     NMIN           2  MINUTES IN COMPUTATION INTERVAL
                    IDATE     17MAR78  STARTING DATE
                    ITIME        0200  STARTING TIME
                       NQ        1441  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE    19MAR78  ENDING DATE
                    NDTIME       0200  ENDING TIME
                    ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL      .03 HOURS
                      TOTAL TIME BASE   48.00 HOURS

       ENGLISH UNITS
            DRAINAGE AREA         SQUARE MILES
            PRECIPITATION DEPTH   INCHES
            LENGTH, ELEVATION     FEET
            FLOW                  CUBIC FEET PER SECOND
            STORAGE VOLUME        ACRE-FEET
            SURFACE AREA          ACRES
            TEMPERATURE           DEGREES FAHRENHEIT
```

*** ***

****

```
7 KK      *          *
          *   OFF4   *      RUNOFF FROM OFFSITE AREA 4
          *          *
          ************

          SUBBASIN RUNOFF DATA

8 BA        SUBBASIN CHARACTERISTICS
                TAREA          .21  SUBBASIN AREA

            PRECIPITATION DATA

9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                .... HYDRO-35 ......  . .....  ..... TP-40 ..... .  ..... .... TP-49 .....
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .18      34     .56     .72     .84    1.20    1.68    2 25      00     .00     .00     .00

                                                STORM AREA =       21

10 LS       SCS LOSS RATE
                STRTL          .44  INITIAL ABSTRACTION
                CRVNBR       82.00  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

11 UD       SCS DIMENSIONLESS UNITGRAPH
                TLAG          .48  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                            74 END-OF-PERIOD ORDINATES
                    4.      11.      21.      33.      47.      64.      86.     110.     136.     157.
                  175.     189.     197.     201.     202.     201.     195.     186.     177.     166.
                  155.     141.     125.     110.      96.      86.      76.      68.      61.      55
                   50.      45.      40.      36.      32.      29.      26.      23.      21.      19.
                   17       15.      13.      12.      11.      10.       9.       8.       7.       6.
                    6.       5        4.       4.       4.       3.       3        3.       2.       2.
                    2.       2.       2.       1.       1.       1        1.       1.       1.       1.
                    0        0.       0.       0.

    ***             ***              ***              ***              ***

                        HYDROGRAPH AT STATION     OFF4

     TOTAL RAINFALL =    2.25, TOTAL LOSS =    1 43, TOTAL EXCESS =      82

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                                  (CFS)
+      38      12.53                      12.           5.           2.           2.
                                (INCHES)   .538         .818         .818         .818
                                 (AC-FT)     6.           9.           9.           9.

                        CUMULATIVE AREA =     .21 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          ************
          *          *
12 KK     *   ROFF4  *      ROUTE OFFSITE WATERSHED 4 TO NORTHERN BOUNDARY OF SITE IN PROPOSED
          *          *
          ************

            HYDROGRAPH ROUTING DATA

13 RD         MUSKINGUM-CUNGE CHANNEL ROUTING
                    L       2137.  CHANNEL LENGTH
                    S       .0470  SLOPE
                    N         030  CHANNEL ROUGHNESS COEFFICIENT
                   CA         .00  CONTRIBUTING AREA
                SHAPE        TRAP  CHANNEL SHAPE
                   WD        5.00  BOTTOM WIDTH OR DIAMETER
                    Z         .33  SIDE SLOPE

                                                   ***

                                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                            COMPUTATION TIME STEP
                ELEMENT    ALPHA        M          DT          DX        PEAK     TIME TO PEAK     VOLUME     MAXIMUM CELERITY
                                                   (MIN)       (FT)      (CFS)       (MIN)          (IN)       (FPS)

                  MAIN      4.09      1.42        2.00      534.25      38.28      756.00           .82        9.19

                                            INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                  MAIN      4.09      1.42        2.00                  38.28      756.00           .82
```

```
CONTINUITY SUMMARY (AC-FT) - INFLOW= .9033E+01 EXCESS= .0000E+00 OUTFLOW= 9033E+01 BASIN STORAGE= .7624E-03 PERCENT ERROR=      0


      ***              ***              ***              ***              ***

                             HYDROGRAPH AT STATION    ROFF4

   PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                       6-HR         24-HR        72-HR       48.00-HR
 +   (CFS)        (HR)
                             (CFS)
 +       38.     12 60         .        12.           5            2.            2
                          (INCHES)      .538         .818         .818          818
                           (AC-FT)       6.           9.           9             9.

                          CUMULATIVE AREA =      21 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


              **************
              *            *
  14 KK       *    OFF3    *        RUNOFF FROM OFFSITE AREA 3
              *            *
              **************

                 SUBBASIN RUNOFF DATA

  15 BA            SUBBASIN CHARACTERISTICS
                         TAREA          .08  SUBBASIN AREA

                   PRECIPITATION DATA

   9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                    . .. HYDRO-35 . ....   .......   ..... TP-40 .. ....... ....   ........... TP-49 ..........
                   5-MIN  15-MIN  60-MIN    2-HR     3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                     .18     .34     .56     .72      84     1.20    1.68    2 25      00     .00     .00     .00

                                                     STORM AREA =       .08

  16 LS            SCS LOSS RATE
                        STRTL          .44  INITIAL ABSTRACTION
                        CRVNBR       82.00  CURVE NUMBER
                        RTIMP          00  PERCENT IMPERVIOUS AREA

  17 UD            SCS DIMENSIONLESS UNITGRAPH
                         TLAG           .33  LAG

                                                                   ***

                                                              UNIT HYDROGRAPH
                                                         52 END-OF-PERIOD ORDINATES
                     3.        11.        20         33.        49         69.        87         100.       108.       111.
                   111.       107.       100.        92.        82.        71.        59.         49.        42.        36.
                    30.        27.        23.        19.        16.        14.        12.         10.         9.         8.
                     6.         5.         5.         4          3.         3.         3           2.         2.         2.
                     1.         1.         1.         1.         1.         1.         1           0.         0.         0.
                     0.         0.

       ***              ***              ***              ***              ***

                              HYDROGRAPH AT STATION    OFF3

     TOTAL RAINFALL =     2.25, TOTAL LOSS =     1.43, TOTAL EXCESS =      82

   PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                       6-HR         24-HR        72-HR       48.00-HR
 +   (CFS)        (HR)
                             (CFS)
 +       19.     12.37                   5.           2.           1.            1.
                          (INCHES)      .539         .818         .818          .818
                           (AC-FT)       2.           3.           3             3.

                          CUMULATIVE AREA =     .08 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


              **************
              *            *
  18 KK       *    DEV4    *        RUNOFF FROM PROPOSED WATERSHED 4
              *            *
              **************

                 SUBBASIN RUNOFF DATA

  19 BA            SUBBASIN CHARACTERISTICS
                         TAREA          .02  SUBBASIN AREA
```

```
                PRECIPITATION DATA

 9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                .. .. HYDRO-35 .          . ..... ..   TP-40  .... ..... . .   ......... TP-49 . .........
                5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY   10-DAY
                  .18      34      56       72       84     1.20     1.68     2.25      .00      00      .00      .00

                                                STORM AREA =       02

 20 LS          SCS LOSS RATE
                      STRTL          .44  INITIAL ABSTRACTION
                     CRVNBR        82.00  CURVE NUMBER
                      RTIMP           00  PERCENT IMPERVIOUS AREA

 21 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG          .14  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                            23 END-OF-PERIOD ORDINATES
                8.       25        52.       69.       71.       63.       50.       33.       23.       17.
               12.        8.         6         4.        3.        2.        1.        1.        1.        1.
                0.        0          0

     ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION      DEV4

     TOTAL RAINFALL =     2.25, TOTAL LOSS =     1 43, TOTAL EXCESS =      .82

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                              6-HR        24-HR        72-HR      48.00-HR
+    (CFS)        (HR)
                          (CFS)
+        8       12.17                          1.           1.           0.           0.
                        (INCHES)                54)         .819         .819         .819
                        (AC-FT)                  1.           1.           1.           1.

                        CUMULATIVE AREA =       02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                ***************
                *               *
 22 KK          *      CP4      *        CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE
                *               *
                ***************

 23 HC            HYDROGRAPH COMBINATION
                       ICOMP            3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***

     ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION      CP4

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                              6-HR        24-HR        72-HR      48.00-HR
+    (CFS)        (HR)
                          (CFS)
+       56.      12.50                         18.           7.           3.           3.
                        (INCHES)               538         .818         .818         .818
                        (AC-FT)                  9.          14.          14.          14.

                        CUMULATIVE AREA =       31 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                ***************
                *               *
 24 KK          *    RCP4_3     *        ROUTE CP4 TO CP3
                *               *
                ***************

                HYDROGRAPH ROUTING DATA

 25 RD            MUSKINGUM-CUNGE CHANNEL ROUTING
                             L         636.  CHANNEL LENGTH
                             S        .0910  SLOPE
                             N         .030  CHANNEL ROUGHNESS COEFFICIENT
                            CA          .00  CONTRIBUTING AREA
                         SHAPE         TRAP  CHANNEL SHAPE
                            WD        10.00  BOTTOM WIDTH OR DIAMETER
                             Z          .33  SIDE SLOPE
```

```
                                                              ***
                                     COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                            COMPUTATION TIME STEP
                     ELEMENT    ALPHA        M          DT         DX         PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                        PEAK                   CELERITY
                                                       (MIN)      (FT)       (CFS)     (MIN)        (IN)       (FPS)

                      MAIN       3.98       1.50        .93      318 00      55.50     750.44         82       11.36


                                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                      MAIN       3.98       1.50       2.00                  55.49     750.00        .82


 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1354E+02 EXCESS= .0000E+00 OUTFLOW= .1354E+02 BASIN STORAGE= 2692E-03 PERCENT ERROR=     .0



      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   RCP4_3

   PEAK FLOW      TIME                         MAXIMUM AVERAGE FLOW
                                         6-HR        24-HR        72-HR      48.00-HR
 +   (CFS)        (HR)
                              (CFS)
 +      55       12.50                   18.          7.           3.           3.
                            (INCHES)    .538        .818         .818         .818
                             (AC-FT)      9.         14.          14           14.

                           CUMULATIVE AREA =      .31 SQ MI



 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


               **************
               *            *
   26 KK       *    OFF2    *        RUNOFF FROM OFFSITE AREA 2
               *            *
               **************

                 SUBBASIN RUNOFF DATA

   27 BA           SUBBASIN CHARACTERISTICS
                         TAREA          .17  SUBBASIN AREA

                   PRECIPITATION DATA

    9 PH                                      DEPTHS FOR    0-PERCENT HYPOTHETICAL STORM
                    .... HYDRO-35 ......    .. . ....... .  TP-40 .....  ... . ..    .... ...... TP-49 ... .......
                   5-MIN  15-MIN  60-MIN     2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                     .18     .34     .56      .72     .84    1.20    1.68    2.25     .00     .00      00     .00

                                                          STORM AREA =       .17

   28 LS           SCS LOSS RATE
                          STRTL          .44  INITIAL ABSTRACTION
                         CRVNBR        82.00  CURVE NUMBER
                          RTIMP          .00  PERCENT IMPERVIOUS AREA

   29 UD           SCS DIMENSIONLESS UNITGRAPH
                           TLAG          .54  LAG

                                                                  ***


                                                            UNIT HYDROGRAPH
                                                       83 END-OF-PERIOD ORDINATES
                     3.          7         13.         20         28.        39.        51.        66.        82.        99.
                   113.        126.       136.        143.       149.       150.       150.       149.       145.       140.
                   134.        127.       120.        112.       103.        92.        82.        73.        65.        59.
                    54.         48.        44.         40.        37.        34.        30.        28.        25.        22.
                    20.         19.        17.         15.        14         13.        11.        10.         9.         8.
                     8.          7.         6.          6.         5.         5.         4.         4.         4.         3.
                     3.          3.         2.          2.         2.         2.         2.         2.         1.         1.
                     1.          1.         1.          1.         1.         1.         1.         0.         0.         0.
                     0.          0.         0.

       ***             ***             ***             ***             ***

                         HYDROGRAPH AT STATION      OFF2

       TOTAL RAINFALL =     2.25, TOTAL LOSS =     1.43, TOTAL EXCESS =      .82

    PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
  +    (CFS)       (HR)
                              (CFS)
  +      30.      12.60                   10.          4.           2.           2.
                            (INCHES)     .537        .818         .818         .818
```

(AC-FT) 5. 8. 8 8

CUMULATIVE AREA = .17 SQ MI

*** ***

30 KK
****
* *
* DEV3 *
* *
****

SUBBASIN RUNOFF DATA

31 BA SUBBASIN CHARACTERISTICS
TAREA .07 SUBBASIN AREA

PRECIPITATION DATA

9 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.18	.34	.56	.72	.84	1.20	1 68	2.25	.00	.00	.00	00

STORM AREA = .07

32 LS SCS LOSS RATE
STRTL .40 INITIAL ABSTRACTION
CRVNBR 83.50 CURVE NUMBER
RTIMP 11.10 PERCENT IMPERVIOUS AREA

33 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .17 LAG

***

UNIT HYDROGRAPH
27 END-OF-PERIOD ORDINATES

16.	48.	101.	157	185.	185.	168.	141.	104.	75.
56	43.	32.	24.	18.	13	10.	7.	6.	4.
3.	2.	2.	1	1.	1.	0			

*** *** *** *** ***

HYDROGRAPH AT STATION DEV3

TOTAL RAINFALL = 2.25, TOTAL LOSS = 1.20, TOTAL EXCESS = 1.05

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 30.	12.20		5.	2.	1.	1.
		(INCHES)	.648	1 047	1 048	1 048
		(AC-FT)	3.	4.	4	4.

CUMULATIVE AREA = .07 SQ MI

*** ***

34 KK
****
* *
* CP3 *
* *
****

CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE

35 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION CP3

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 95.	12.47		33	13.	6.	6.
		(INCHES)	.551	.847	.848	.848
		(AC-FT)	16.	25.	25.	25.

CUMULATIVE AREA = .56 SQ MI

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 36 KK      *   RCP3_1   *        ROUTE CP3 TO CP1 (NORTHWEST CORNER OF SITE)
            *            *
            **************

              HYDROGRAPH ROUTING DATA

 37 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                        L       2500.  CHANNEL LENGTH
                        S       .0240  SLOPE
                        N        .030  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .00  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD       10 00  BOTTOM WIDTH OR DIAMETER
                        Z         .33  SIDE SLOPE

                                                    ***
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                            COMPUTATION TIME STEP
                    ELEMENT    ALPHA        M          DT         DX        PEAK    TIME TO      VOLUME     MAXIMUM
                                                                                       PEAK                  CELERITY
                                                                 (MIN)       (FT)     (CFS)      (MIN)       (IN)      (FPS)

                                MAIN       2 04       1.50       2.00     500 00     94.64     752.00        .85       8.69

                                                  INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                                MAIN       2.04       1.50       2.00                94.64     752.00        .85

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2515E+02 EXCESS= .0000E+00 OUTFLOW= .2515E+02 BASIN STORAGE= .1725E-02 PERCENT ERROR=     .0


      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   RCP3_1

   PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR     48.00-HR
 +    (CFS)       (HR)
                          (CFS)
 +       95      12.33       33          13.           6.           6.
                  (INCHES)  .551         .847         .848         .848
                  (AC-FT)     16.          25.          25.          25.

                        CUMULATIVE AREA =      56 SQ MI


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 38 KK      *    OFF1    *        RUNOFF FROM OFFSITE AREA 1
            *            *
            **************

              SUBBASIN RUNOFF DATA

 39 BA          SUBBASIN CHARACTERISTICS
                      TAREA        1.73  SUBBASIN AREA

                PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                . ... HYDRO-35 ......   .... .......... TP-40 ..............   ........... TP-49 .... . ....
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .18     .34     .56     .72     .84    1.20    1.68    2.25     .00     .00     .00     .00

                                                  STORM AREA =    1.73

 40 LS          SCS LOSS RATE
                     STRTL         .44  INITIAL ABSTRACTION
                    CRVNBR       81.80  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

 41 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        1.21  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            183 END-OF-PERIOD ORDINATES
                    6.      11.     17.     25.     38.     50.     63.     79.     95.    112.
                  129.     151.    173.    195.    219.    249.    279.    308.    341     376.
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```
          412.      447.      477.      506.      536.      563       584.      604.      624       640.
          651.      662.      673.      676.      678       680.      681.      679.      677.      675
          669.      657       646.      635       623.      610.      597.      583.      569.      554.
          539.      522.      504       485       467.      445       423       401.      379       361.
          342.      324.      308.      295       282.      269.      257       246.      235       224.
          215.      206.      196       188       181.      174.      168       161.      154       147.
          141.      135.      130.      124.      119       113       107.      102.       98.       94.
           90.       87        83.       79.       75.       72.       69.       66.       64        61
           58.       55.       53.       50.       48.       46.       44.       42.       40.       38
           37.       35.       34.       32.       31.       30.       28.       27.       26        25.
           24.       23.       22.       21.       20.       19        18        18        17        16.
           15.       15.       14.       13.       13.       12.       12        11.       11        10
           10.        9.        9.        9.        8.        8         8.        7         7         7.
            7.        6.        6.        6.        6.        6.        5.        5.        5         5.
            4.        4.        4.        4         4.        3.        3         3.        3         3
            2.        2.        2.        2.        2.        1.        1.        1.        1         1
            1.        0.        0.

   ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     OFF1

     TOTAL RAINFALL =    2.24, TOTAL LOSS -    1 44, TOTAL EXCESS =      .80

   PEAK FLOW      TIME                         MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR       72-HR      48.00-HR
 +   (CFS)        (HR)
                              (CFS)
 +     172.       13.37                  96.         37.         19.         19
                            (INCHES)    .514        .805        .805        .805
                             (AC-FT)     47.         74.         74          74.

                          CUMULATIVE AREA -    1.73 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

               **************
               *            *
 42 KK         *    DEV2    *        RUNOFF FROM PROPOSED WATERSHED 2
               *            *
               **************

                 SUBBASIN RUNOFF DATA

 43 BA             SUBBASIN CHARACTERISTICS
                         TAREA           .10  SUBBASIN AREA

                   PRECIPITATION DATA

  9 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                    .... HYDRO-35 .....      ......... .... TP-40 ........ ... .       ....... .. TP-49   .. ... ..
                   5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .18     .34     56      .72     .84    1.20    1.68    2.25     .00     .00     .00     .00

                                                        STORM AREA =      .10

 44 LS             SCS LOSS RATE-
                         STRTL          .59  INITIAL ABSTRACTION
                        CRVNBR        77.10  CURVE NUMBER
                         RTIMP        11 50  PERCENT IMPERVIOUS AREA

 45 UD             SCS DIMENSIONLESS UNITGRAPH
                          TLAG           25  LAG

                                                          ***

                                                     UNIT HYDROGRAPH
                                                40 END-OF-PERIOD ORDINATES
              8.        25.       49.       82.      121.      152.      169.      173       169.      155.
            139.       118.       93        74.       60.       49.       41.       33.       27.       22.
             18.        15        12.       10.        8.        6.        5.        4.        4.        3
              2.         2.        2.        1.        1.        1.        1.        0.        0.        0.

    ***             ***             ***             ***             ***

                           HYDROGRAPH AT STATION     DEV2

      TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.47, TOTAL EXCESS =      .78

    PEAK FLOW      TIME                         MAXIMUM AVERAGE FLOW
                                         6-HR        24-HR       72-HR      48.00-HR
  +   (CFS)        (HR)
                               (CFS)
  +      22.       12.30                   5.          2.          1.          1.
                             (INCHES)     474        .782        .783        .783
                              (AC-FT)      2.          4.          4.          4.

                           CUMULATIVE AREA =     .10 SQ MI
```

```
*************
*           *
46 KK   *  DEV1  *      RUNOFF FROM PROPOSED WATERSHED 1
*           *
*************

   SUBBASIN RUNOFF DATA

47 BA      SUBBASIN CHARACTERISTICS
             TAREA        .01  SUBBASIN AREA

           PRECIPITATION DATA

 9 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           . ... HYDRO-35 ......   . ..... .. TP-40 ..............   .... . .... TP-49 .....
           5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
             .18     .34     .56     .72      84    1.20    1.68    2.25     .00     .00     .00     .00

                                          STORM AREA =      .01

48 LS      SCS LOSS RATE
             STRTL         .49  INITIAL ABSTRACTION
           CRVNBR       80.20  CURVE NUMBER
            RTIMP        8.90  PERCENT IMPERVIOUS AREA

49 UD      SCS DIMENSIONLESS UNITGRAPH
             TLAG         .16  LAG

                                                  ***

                                          UNIT HYDROGRAPH
                                       26 END-OF-PERIOD ORDINATES
           3.      9.     19.     28.     31.     31.     27      21.     15      11.
           8.      6.      4.      3.      2.      2.      1       1.      1       0.
           0.      0.      0.      0.      0.      0.

    ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION     DEV1

  TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.38, TOTAL EXCESS =      87

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     48 00-HR
+  (CFS)       (HR)
                              (CFS)
+       4.    12.20                1.          0          0.          0.
                             (INCHES)       539         864         865        .865
                             (AC-FT)         0.          1.          1.          1

                    CUMULATIVE AREA =     01 SQ MI


*************
*           *
50 KK   *  CP1   *      CONCENTRATION POINT AT NORTHWEST CORNER OF SITE TO CROSS DESERT WAY
*           *
*************

51 HC        HYDROGRAPH COMBINATION
               ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***

    ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION     CP1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     48 00-HR
+  (CFS)       (HR)
                              (CFS)
+     177.    13.33              101          40.         20.         20.
                             (INCHES)       .509        .803        .804        804
                             (AC-FT)         50.         79.         79.         79.

                    CUMULATIVE AREA =    1.84 SQ MI


*************
*           *
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```
52 KK      *    OFF6  *        RUNOFF FROM OFFSITE AREA 6
           *          *
           ************

             SUBBASIN RUNOFF DATA

53 BA          SUBBASIN CHARACTERISTICS
                    TAREA          19  SUBBASIN AREA

               PRECIPITATION DATA

 9 PH                             DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .. ...      .. ... ....... TP-40  ....... ......   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  18     .34     .56     .72     84    1 20    1.68    2.25     .00     .00     .00     .00

                                                        STORM AREA =      .19

 54 LS         SCS LOSS RATE
                    STRTL          .44  INITIAL ABSTRACTION
                   CRVNBR        82.00  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

 55 UD         SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .46  LAG

                                                                 ***

                                                           UNIT HYDROGRAPH
                                                      71 END-OF-PERIOD ORDINATES
                4.       11.       21.       33        47.       65.       86.      111.      134.      155.
              170.      180.      187       189       188.      185.      177.      168       158       147.
              134       119.      104        90.       80.       71.       63.       56.       51.       46.
               41        37.       33.       29.       26.       23.       20.       18.       16.       14.
               13.       12.       10         9.        8.        7.        7.        6.        5.        5.
                4.        4.        3.        3.        3         2.        2.        2.        2.        2.
                1.        1         1.        1.        1.        1.        1.        0.        0.        0.
                0

     ***             ***            ***            ***             ***

                        HYDROGRAPH AT STATION       OFF6

    TOTAL RAINFALL =     2.25, TOTAL LOSS =     1.43, TOTAL EXCESS =       .82

 PEAK FLOW      TIME                       MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR       48.00-HR
 +  (CFS)       (HR)
                         (CFS)
 +      35     12.50                 11           4.           2.           2.
                        (INCHES)   .538         .818         .818         .818
                         (AC-FT)     5.           8.           8.           8.

                        CUMULATIVE AREA =      .19 SQ MI



*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           ************
           *          *
  56 KK    *   ROFF6  *        ROUTE OFFSITE 6 IN PROPOSED CHANNEL THROUGH DEV10
           *          *
           ************

             HYDROGRAPH ROUTING DATA

  57 RD        MUSKINGUM-CUNGE CHANNEL ROUTING
                        L         1230.  CHANNEL LENGTH
                        S         .0740  SLOPE
                        N          .030  CHANNEL ROUGHNESS COEFFICIENT
                       CA            00  CONTRIBUTING AREA
                    SHAPE          TRAP  CHANNEL SHAPE
                       WD         10.00  BOTTOM WIDTH OR DIAMETER
                        Z           .33  SIDE SLOPE

                                                                  ***
                                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                           COMPUTATION TIME STEP
                  ELEMENT    ALPHA       M          DT         DX         PEAK      TIME TO      VOLUME     MAXIMUM
                                                                                       PEAK                   CELERITY
                                                  (MIN)       (FT)       (CFS)       (MIN)        (IN)        (FPS)

                   MAIN       3.59      1.50       2.00     615.00       35.29      752.00         .82         9.11

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                   MAIN       3.59      1.50       2 00                  35.29      752.00         .82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8117E+01 EXCESS=  0000E+00 OUTFLOW= .8117E+01 BASIN STORAGE= .6231E-03 PERCENT ERROR=     .0
```

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

                        HYDROGRAPH AT STATION    ROFF6

 PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      48.00-HR
+   (CFS)      (HR)
                         (CFS)
+      35.     12.53                 11.          4.           2.           2.
                       (INCHES)     538          818         .818         .818
                       (AC-FT)        5.           8           8.           8.

                       CUMULATIVE AREA =     .19 SQ MI
```

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

           **************
           *            *
 58 KK     *    OFF5    *       RUNOFF FROM OFFSITE AREA 5
           *            *
           **************

             SUBBASIN RUNOFF DATA

 59 BA         SUBBASIN CHARACTERISTICS
                     TAREA        2.22  SUBBASIN AREA

               PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               . ..  HYDRO-35 ......   ........ .. .. TP-40  .. ..........   .......... TP-49 ..........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .18     34      56       72      84    1 20    1.68    2.25     .00     .00     .00     .00

                                                 STORM AREA =     2 22

 60 LS         SCS LOSS RATE
                     STRTL          .48  INITIAL ABSTRACTION
                    CRVNBR        80 70  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

 61 UD         SCS DIMENSIONLESS UNITGRAPH
                      TLAG         1.32  LAG

                                                          ***

                                                       UNIT HYDROGRAPH
                                                 200 END-OF-PERIOD ORDINATES
```

6	12.	18	24.	38.	52.	66.	80.	98.	116.
134.	152.	176	200.	224.	248.	280.	312.	344	376.
413	451	489.	528.	560	592.	624.	656.	679.	701.
723.	745.	758.	770	782.	794.	797.	799.	801.	803.
801.	799.	797	795	784	772.	760.	748.	734.	720.
706.	692.	676	660.	644	628.	609.	589.	569.	549.
525.	501.	477.	453.	433.	413.	393.	373.	358.	344.
330	316.	303.	291	279.	267.	257.	247.	237.	227.
219	212.	204	197.	190.	182	175.	168.	161.	155.
149.	143.	137	131.	125.	119.	115.	111.	107.	103.
99.	95	91.	87.	84.	81.	78.	75.	72.	69.
66	63.	60.	58.	56.	54.	51.	49.	47.	45.
43.	42.	40.	39.	37.	36.	34.	33.	31.	30
29.	28.	27.	26	25	24.	23.	22.	21.	20.
20.	19.	18.	17.	16.	16.	15.	15.	14.	13.
13.	12.	12.	11.	11.	11.	10.	10.	9.	9.
9.	8.	8	8.	8.	7.	7.	7.	7.	7.
6.	6.	6.	6.	5	5.	5.	5.	4.	4.
4.	4.	4.	3.	3.	3.	3.	3.	2.	2.
2.	2	2.	1	1.	1.	1.	1.	0.	0.

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

                        HYDROGRAPH AT STATION     OFF5

     TOTAL RAINFALL =     2.24, TOTAL LOSS =     1.49, TOTAL EXCESS =      .75

 PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      48.00-HR
+   (CFS)      (HR)
                         (CFS)
+     192.     13.50                113.          45.          22.          22.
                       (INCHES)     .475          750         .750         .750
                       (AC-FT)       56           89.          89.          89.

                       CUMULATIVE AREA =    2.22 SQ MI
```

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

            **************
            *            *
 62 KK      *    CPOFF   *      CONCENTRATION POINT AT NORTHERN BOUNDARY OF DEV8
            *            *
            **************

 63 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                  ***
     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    CPOFF

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                                    (CFS)
+     203.     13.47                 124.         49.          24.          24.
                                 (INCHES)         .477         .755         .755         .755
                                  (AC-FT)           61.          97.          97.          97.

                       CUMULATIVE AREA =    2.41 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 64 KK      *   ROFF56   *      ROUTE CPOFF TO CP8 (DOWNSTREAM BOUNDARY OF DEV8)
            *            *
            **************

               HYDROGRAPH ROUTING DATA

 65 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L       1394   CHANNEL LENGTH
                          S       .0750  SLOPE
                          N        .030  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD       10 00  BOTTOM WIDTH OR DIAMETER
                          Z         .33  SIDE SLOPE
                                                  ***
                              COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                  ELEMENT    ALPHA       M          DT          DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                       PEAK                  CELERITY
                                                    (MIN)       (FT)      (CFS)      (MIN)        (IN)       (FPS)

                    MAIN       3.61      1.50        1.42      697.00     202.96     808.86         .75      16.37

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN       3.61      1.50        2.00                 202.93     808.00         .75

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .9691E+02 EXCESS= .0000E+00 OUTFLOW= .9691E+02 BASIN STORAGE= .6481E-03 PERCENT ERROR=     .0


     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION   ROFF56

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                                    (CFS)
+     203.     13.47                 124.         49.          24           24.
                                 (INCHES)         .477         .755         .755         .755
                                  (AC-FT)           61.          97.          97.          97.

                       CUMULATIVE AREA =    2.41 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 66 KK      *     DEV8   *      RUNOFF FROM PROPOSED AREA 8
            *            *
```

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

            SUBBASIN RUNOFF DATA

 67 BA        SUBBASIN CHARACTERISTICS
                  TAREA          .01  SUBBASIN AREA

              PRECIPITATION DATA

  9 PH                            DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..   HYDRO-35 . .. .   .........  .... TP-40 ......... .....     ... . ...  TP-49 .....   . .
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                18      34     .56     .72     .84    1.20    1.68    2 25     .00     .00     .00     00

                                                  STORM AREA =      .01

 68 LS        SCS LOSS RATE
                 STRTL          .61  INITIAL ABSTRACTION
                CRVNBR        76.60  CURVE NUMBER
                 RTIMP        10.20  PERCENT IMPERVIOUS AREA

 69 UD        SCS DIMENSIONLESS UNITGRAPH
                  TLAG          .07  LAG

                                                                ***

                                                         UNIT HYDROGRAPH
                                                    12 END-OF-PERIOD ORDINATES
             19         60.       64.       42.       21.       12         6.        3.        2.        1.
              1.         0.

    ***            ***           ***           ***            ***

                        HYDROGRAPH AT STATION      DEV8

   TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.51, TOTAL EXCESS =      .74

 PEAK FLOW      TIME                             MAXIMUM AVERAGE FLOW
                                       6-HR        24-HR        72-HR      48.00-HR
+    (CFS)      (HR)
                         (CFS)
+       4      12.10                     1.           0.           0.           0.
                       (INCHES)        .453         .743         .743         .743
                        (AC-FT)          0.           0.           0.           0.

                         CUMULATIVE AREA =       .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 70 KK    *   DEV10    *        RUNOFF FROM PROPOSED AREA 10
          *            *
          **************

            SUBBASIN RUNOFF DATA

 71 BA        SUBBASIN CHARACTERISTICS
                  TAREA          09  SUBBASIN AREA

              PRECIPITATION DATA

  9 PH                            DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              . ..  HYDRO-35 ......     ............... TP-40 ............ ..     ........ ... TP-49 ........ ..
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .18     .34     .56     .72     .84    1.20    1.68    2.25     .00     .00     .00     00

                                                  STORM AREA =      .09

 72 LS        SCS LOSS RATE
                 STRTL          .38  INITIAL ABSTRACTION
                CRVNBR        84.00  CURVE NUMBER
                 RTIMP         7.30  PERCENT IMPERVIOUS AREA

 73 UD        SCS DIMENSIONLESS UNITGRAPH
                  TLAG          .07  LAG

                                                                ***

                                                         UNIT HYDROGRAPH
                                                    12 END-OF-PERIOD ORDINATES
            154.       475.       507       336.      169.       93         49.       26.       14.        7.
              4.         2.

    ***            ***           ***           ***            ***

                        HYDROGRAPH AT STATION      DEV10

   TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.23, TOTAL EXCESS =     1 02

 PEAK FLOW      TIME                             MAXIMUM AVERAGE FLOW
```

```
                                          6-HR       24-HR       72-HR     48.00-HR
 +   (CFS)      (HR)
                          (CFS)
 +     54      12.10                       7.          3.          1.          1.
                        (INCHES)         .644       1 022       1.022       1.022
                         (AC-FT)           3           5.          5.          5.

                         CUMULATIVE AREA =      .09 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
   74 KK    *      CP8   *        CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV8
            *            *
            **************

   75 HC          HYDROGRAPH COMBINATION
                      ICOMP             1  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                   -   ***

       ***              ***             ***             ***             ***

                           HYDROGRAPH AT STATION       CP8

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     48.00-HR
 +   (CFS)      (HR)
                          (CFS)
 +    208      13.47                     129.         52.         26.         26.
                        (INCHES)         .477        .764        .765        .765
                         (AC-FT)          64.        102.        103.        103.

                         CUMULATIVE AREA =     2.51 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
   76 KK    *   RCP8_7   *        ROUTE CP8 TO CP7 (DOWNSTREAM BOUNDARY OF DEV7)
            *            *
            **************

                HYDROGRAPH ROUTING DATA

   77 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                           L          1991.  CHANNEL LENGTH
                           S          .0790  SLOPE
                           N           .030  CHANNEL ROUGHNESS COEFFICIENT
                          CA            .00  CONTRIBUTING AREA
                       SHAPE           TRAP  CHANNEL SHAPE
                          WD          10.00  BOTTOM WIDTH OR DIAMETER
                           Z            .33  SIDE SLOPE

                                                                 ***
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                         COMPUTATION TIME STEP
                 ELEMENT     ALPHA       M        DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                PEAK                CELERITY
                                                 (MIN)      (FT)     (CFS)     (MIN)       (IN)      (FPS)

                   MAIN       3.70      1.50      1.98    995.50    207.74    810.39       .76      16.79

                                       INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                   MAIN       3 70      1.50      2 00              207.72    810 00       .76

 CONTINUITY SUMMARY (AC-FT) - INFLOW=  1026E+03 EXCESS= .0000E+00 OUTFLOW= .1026E+03 BASIN STORAGE= .1028E-02 PERCENT ERROR=    .0


       ***              ***             ***             ***             ***

                           HYDROGRAPH AT STATION    RCP8_7

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     48.00-HR
 +   (CFS)      (HR)
                          (CFS)
 +    208.     13.50                     129.         52.         26.         26.
                        (INCHES)          477        .764        .765        .765
                         (AC-FT)          64         102.        103.        103.
```

```
                    CUMULATIVE AREA =    2 51 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 78 KK      *    DEV9    *      RUNOFF FROM PROPOSED AREA 9
            *            *
            **************

               SUBBASIN RUNOFF DATA

 79 BA           SUBBASIN CHARACTERISTICS
                      TAREA         .06  SUBBASIN AREA

                 PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  .... HYDRO-35 . ..      . .  . .. TP-40 ......... .. ..   ...... .... TP-49  . ........
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR    12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                   .18     .34      56     .72     .84    1.20    1.68    2.25     .00     .00     .00     .00

                                                  STORM AREA =      .06

 80 LS           SCS LOSS RATE
                      STRTL         .65  INITIAL ABSTRACTION
                     CRVNBR       75.50  CURVE NUMBER
                      RTIMP       12.00  PERCENT IMPERVIOUS AREA

 81 UD           SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .11  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                             18 END-OF-PERIOD ORDINATES
                 38.      127.      224       242       206.      143       89        59.       38.       25.
                 16.       11         7.        4.         3        2.        1.        1.

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     DEV9

    TOTAL RAINFALL =    2 25, TOTAL LOSS =    1.51, TOTAL EXCESS =     .74

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     48.00-HR
+   (CFS)       (HR)
                          (CFS)
+      20.     12.13                3.          1           1.          1.
                        (INCHES)    .440        .735        .735        735
                        (AC-FT)      1.          2.          3.          3.

                        CUMULATIVE AREA =     .06 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 82 KK      *    DEV7    *      RUNOFF FROM PROPOSED AREA 7
            *            *
            **************

               SUBBASIN RUNOFF DATA

 83 BA           SUBBASIN CHARACTERISTICS
                      TAREA         .02  SUBBASIN AREA

                 PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ... . HYDRO-35 ......   . . ..... .. TP-40 ..............   ....... ... TP-49 ...........
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR    12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                   .18     .34      56     .72     .84    1.20    1.68    2.25     .00     .00      00     .00

                                                  STORM AREA =      .02

 84 LS           SCS LOSS RATE
                      STRTL         .85  INITIAL ABSTRACTION
                     CRVNBR       70 10  CURVE NUMBER
                      RTIMP        6.80  PERCENT IMPERVIOUS AREA

 85 UD           SCS DIMENSIONLESS UNITGRAPH
                      TLAG          17  LAG

                                                  ***
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```
                                          UNIT HYDROGRAPH
                                      27 END-OF-PERIOD ORDINATES
      5.      15.      32.      49.      58.      58.      53.      44.      32      23.
     17.      13.      10.       7.       6.       4        3.       2.       2       1
      1.       1.       1.       0.       0.       0.       0.

  ***          ***          ***          ***          ***

                 HYDROGRAPH AT STATION     DEV7

  TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.78, TOTAL EXCESS =     .47

 PEAK FLOW     TIME                     MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR      48.00-HR
+  (CFS)       (HR)
                       (CFS)
+      3      12.20                1.          0.          0.          0.
                     (INCHES)    .278        .474        474         474
                      (AC-FT)      0.          1.          1.          1.

                 CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
  86 KK   *     CP7    *      COCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV7
          *            *
          **************

  87 HC          HYDROGRAPH COMBINATION
                     ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                         ***

  ***          ***          ***          ***          ***

                 HYDROGRAPH AT STATION     CP7

 PEAK FLOW     TIME                     MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR       72-HR      48.00-HR
+  (CFS)       (HR)
                       (CFS)
+    210      13.50              132.         53.         27.         27
                     (INCHES)    .474        .760        762         .762
                      (AC-FT)     66.        105.        106.        106.

                 CUMULATIVE AREA =    2.60 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
  88 KK   *   RCP7_6   *      ROUTE CP7 TO CP6 (WESTERN BOUNDARY OF SITE)
          *            *
          **************

             HYDROGRAPH ROUTING DATA

  89 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                           L         940.  CHANNEL LENGTH
                           S        .0160  SLOPE
                           N         .030  CHANNEL ROUGHNESS COEFFICIENT
                          CA          .00  CONTRIBUTING AREA
                       SHAPE         TRAP  CHANNEL SHAPE
                          WD        10.00  BOTTOM WIDTH OR DIAMETER
                           Z          .33  SIDE SLOPE

                                                         ***
                              COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                 ELEMENT    ALPHA       M        DT        DX      PEAK    TIME TO    VOLUME   MAXIMUM
                                                                              PEAK               CELERITY
                                               (MIN)      (FT)     (CFS)    (MIN)      (IN)     (FPS)

                   MAIN      1.67      1.50      1.58    470.00   210.35    810.96      .76      9.89

                                    INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                   MAIN      1.67      1.50      2 00             210.31    812.00      .76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1056E+03 EXCESS= .0000E+00 OUTFLOW= 1056E+03 BASIN STORAGE= .7199E-03 PERCENT ERROR=    .0
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   ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION   RCP7_6

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      48 00-HR
+   (CFS)       (HR)
                    (CFS)
+    210.     13 53                132.          53.          27           27
                 (INCHES)          .474         .760         .762         .762
                  (AC-FT)           66.          105.         106          106.

                    CUMULATIVE AREA =     2.60 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 90 KK    *      DEV6  *        RUNOFF FROM PROPOSED AREA 6
          *            *
          **************

            SUBBASIN RUNOFF DATA

 91 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .01  SUBBASIN AREA

              PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .... .    ............. TP-40  .. .. . ... ..   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN     2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .18     .34     .56      .72      84    1.20    1 68    2.25     .00     .00     .00     .00

                                                  STORM AREA =      .01

 92 LS        SCS LOSS RATE
                 STRTL          .78  INITIAL ABSTRACTION
                CRVNBR        72 00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

 93 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .11  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                            18 END-OF-PERIOD ORDINATES
              3.       11.       19.       20.       17.       12         7.        5.        3.        2.
              1.        1.        1.        0.        0         0          0         0.

   ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION     DEV6

  TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.85, TOTAL EXCESS =     .40

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                    (CFS)
+       1.    12.17                 0.           0.           0.           0
                 (INCHES)          267         .404         404          .404
                  (AC-FT)           0.           0.           0.           0.

                    CUMULATIVE AREA =      .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 94 KK    *       CP6  *        CONCENTRATION POINT AT THE MID-WESTERN BOUNDARY OF SITE NEAR
          *            *
          **************

 95 HC        HYDROGRAPH COMBINATION
                 ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***

   ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION     CP6

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      48.00-HR
```

```
+   (CFS)        (HR)
                          (CFS)
+     210.       13.53                133.          53.          27.          27.
                       (INCHES)         .473         759          .761         .761
                        (AC-FT)          66.         106.         106.         106.

                       CUMULATIVE AREA =    2 61 SQ MI
```

*** ***

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              **************
              *            *
 96 KK        *   RCP6_5   *        ROUTE RUNOFF CONCENTRATING AT CP6 TO CP5 IN DAMONTE CHANNEL ALONG
              *            *
              **************

                 HYDROGRAPH ROUTING DATA

 97 RD             MUSKINGUM-CUNGE CHANNEL ROUTING
                          L       270   CHANNEL LENGTH
                          S      .0030  SLOPE
                          N       .030  CHANNEL ROUGHNESS COEFFICIENT
                         CA        .00  CONTRIBUTING AREA
                      SHAPE       TRAP  CHANNEL SHAPE
                         WD      10 00  BOTTOM WIDTH OR DIAMETER
                          Z        .33  SIDE SLOPE

                                                  ***
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                        COMPUTATION TIME STEP
                    ELEMENT    ALPHA       M          DT          DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                        PEAK                  CELERITY
                                                       (MIN)       (FT)      (CFS)     (MIN)        (IN)      (FPS)

                      MAIN         72      1.50          .80     270.00     210.40    812.29          76      5.66

                                              INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                      MAIN         72      1.50         2 00                210.39    812.00         .76
```

```
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1057E+03 EXCESS=  0000E+00 OUTFLOW= .1057E+03 BASIN STORAGE=  3743E-03 PERCENT ERROR=     0
```

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

                        HYDROGRAPH AT STATION   RCP6_5

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48 00-HR
+   (CFS)        (HR)
                          (CFS)
+     210.       13.53                133.          53          27.          27
                       (INCHES)         473         .759         761         .761
                        (AC-FT)          66.         106         106.         106.

                       CUMULATIVE AREA =    2.61 SQ MI
```

*** ***

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              **************
              *            *
 98 KK        *    DEV5    *        RUNOFF FROM PROPOSED AREA 5
              *            *
              **************

                 SUBBASIN RUNOFF DATA

 99 BA           SUBBASIN CHARACTERISTICS
                       TAREA        .01  SUBBASIN AREA

                 PRECIPITATION DATA

  9 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                 ..... HYDRO-35 ... ..   ........ .....  TP-40 ................   .. ........ TP-49 ............
                 5-MIN  15-MIN  60-MIN    2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY  10-DAY
                   .18     .34     .56     .72       84     1.20     1.68     2.25      .00      .00      .00     .00

                                                 STORM AREA =      .01

100 LS           SCS LOSS RATE
                       STRTL         47  INITIAL ABSTRACTION
                      CRVNBR      81.10  CURVE NUMBER
                       RTIMP      13.50  PERCENT IMPERVIOUS AREA
```

```
101 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .11  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                            18 END-OF-PERIOD ORDINATES
                    5.      18.      32.      35.      29.      20.      13.      8.      5.      4.
                    2.       1.       1.       1.       0.       0        0.      0.

     ***            ***             ***             ***             ***

                        HYDROGRAPH AT STATION      DEV5

     TOTAL RAINFALL =     2.25, TOTAL LOSS =     1.28, TOTAL EXCESS =      97

   PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+    (CFS)       (HR)
                                    (CFS)
+       4.      12.13                  1.           0.           0            0
                                (INCHES)         .593         .972          973         .973
                                (AC-FT)             0.           0.           0.          0.

                        CUMULATIVE AREA =      01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *              *
102 KK        *       CP5    *       CONCENTRATION POINT WITHIN DAMONTE CHANNEL ALONG DESERT WAY
              *              *
              **************

103 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***

     ***            ***             ***             ***             ***

                        HYDROGRAPH AT STATION      CP5

   PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+    (CFS)       (HR)
                                    (CFS)
+     211.      13 53                133.          53.          27.          27.
                                (INCHES)         .473         .760          762         .762
                                (AC-FT)            66.          106          106.        106.

                        CUMULATIVE AREA =     2 61 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *              *
104 KK        *    RCP5_1    *       ROUTE CP5 TO CP1 (NORTHWEST CORNER OF SITE)
              *              *
              **************

                HYDROGRAPH ROUTING DATA

105 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L      1120.  CHANNEL LENGTH
                          S      .0030  SLOPE
                          N       .030  CHANNEL ROUGHNESS COEFFICIENT
                         CA        .00  CONTRIBUTING AREA
                      SHAPE       TRAP  CHANNEL SHAPE
                         WD      10.00  BOTTOM WIDTH OR DIAMETER
                          Z        .33  SIDE SLOPE

                                                    ***

                                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                          COMPUTATION TIME STEP
                    ELEMENT    ALPHA      M          DT          DX        PEAK     TIME TO PEAK    VOLUME    MAXIMUM CELERITY
                                                     (MIN)       (FT)      (CFS)       (MIN)         (IN)        (FPS)

                      MAIN       .72      1 50        2.00      560.00     210.66      816.00         .76         5.66

                                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                      MAIN       .72      1 50        2.00                 210 66      816.00         .76
```

```
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1062E+03 EXCESS=  0000E+00 OUTFLOW= .1062E+03 BASIN STORAGE= .1483E-02 PERCENT ERROR=    .0

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   RCP5_1

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+   (CFS)        (HR)
                          (CFS)
+     211.      13.60                133           53.          27.          27.
                        (INCHES)      .473         .760         .762         .762
                        (AC-FT)        66.         106.         106          106.

                        CUMULATIVE AREA =    2 61 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
  106 KK    *    TOTCP1  *        TOTAL ADDITION OF FLOW AT NORTHWEST CORNER OF SITE
            *            *
            **************

  107 HC          HYDROGRAPH COMBINATION
                       ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                       ***

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   TOTCP1

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+   (CFS)        (HR)
                          (CFS)
+     385      13.47                234           93.          47           47.
                        (INCHES)      .468         .778         .779         .779
                        (AC-FT)        116.        185.         185.         185.

                        CUMULATIVE AREA =    4 45 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
  108 KK    *     OFF7   *        RUNOFF FROM OFFSITE AREA 7
            *            *
            **************

     SUBBASIN RUNOFF DATA

  109 BA          SUBBASIN CHARACTERISTICS
                       TAREA          .09  SUBBASIN AREA

                  PRECIPITATION DATA

    9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   .. ..... ..... TP-40 .................   ...... . .. TP-49  .  . .....
                  5-MIN  15-MIN  60-MIN    2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY  10-DAY
                    .18     .34     .56      .72      .84     1.20     1.68     2.25      .00      .00      .00     .00

                                                  STORM AREA =      .09

  110 LS          SCS LOSS RATE
                       STRTL          44  INITIAL ABSTRACTION
                       CRVNBR      82.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

  111 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .31  LAG

                                                       ***

                                                UNIT HYDROGRAPH
                                            48 END-OF-PERIOD ORDINATES
                    4.      14       27.      44.      67.      94.     115.     129.     137.     137.
                  134.     126.     116.     103.      89.      73.      60.      51.      43.      37.
                   31.      27.      22       19.      16.      14.      12.      10.       8.       7.
                    6.       5.       4        4.       3.       3.       2.       2.       2.       1.
                    1.       1.       1.       1.       1        0.       0.       0.
```

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

                        HYDROGRAPH AT STATION     OFF7

   TOTAL RAINFALL =    2 25, TOTAL LOSS =    1.43, TOTAL EXCESS =     .82

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR       72-HR      48.00-HR
+   (CFS)        (HR)
                          (CFS)
+     22.       12.37                   5.          2.          1.          1.
                        (INCHES)      .540        .818        .818        818
                         (AC-FT)        3.          4.          4.          4.

                        CUMULATIVE AREA =     .09 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             **************
             *            *
  112 KK     *    ROFF7   *        ROUTE OFF7 TO THROUGH DEV7
             *            *
             **************

               HYDROGRAPH ROUTING DATA

  113 RD         MUSKINGUM-CUNGE CHANNEL ROUTING
                          L          1035.  CHANNEL LENGTH
                          S          .1360  SLOPE
                          N           .030  CHANNEL ROUGHNESS COEFFICIENT
                          CA           .00  CONTRIBUTING AREA
                       SHAPE          TRAP  CHANNEL SHAPE
                          WD          5.00  BOTTOM WIDTH OR DIAMETER
                          Z            .33  SIDE SLOPE

                                                                ***
                                 COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                        COMPUTATION TIME STEP
                   ELEMENT    ALPHA       M          DT         DX        PEAK     TIME TO     VOLUME    MAXIMUM
                                                                                     PEAK                CELERITY
                                                    (MIN)      (FT)      (CFS)      (MIN)       (IN)      (FPS)

                    MAIN       6.96      1.42       1.52     517 50      22.32     742.61        .82      11.38

                                      INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                    MAIN       6.96      1.42       2.00                 22.29     742.00        .82

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .4064E+01 EXCESS= .0000E+00 OUTFLOW= .4064E+01 BASIN STORAGE= .2376E-03 PERCENT ERROR=    .0


   ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION    ROFF7

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR       72-HR      48.00-HR
+   (CFS)        (HR)
                          (CFS)
+     22.       12.37                   5           2.          1.          1.
                        (INCHES)      .540        .818        .818        .818
                         (AC-FT)        3.          4.          4.          4.

                        CUMULATIVE AREA =     .09 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             **************
             *            *
  114 KK     *    DEV12   *        RUNOFF FROM PROPOSED AREA 12
             *            *
             **************

               SUBBASIN RUNOFF DATA

  115 BA         SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                 PRECIPITATION DATA

   9 PH                               DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  .... HYDRO-35 ......   ............... TP-40 ...............   ...... .... TP-49 .... ......
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
```

```
                 18      .34      56      72      .84    1.20    1 68    2.25     00      00      00     .00

                                                      STORM AREA -       03

 116 LS          SCS LOSS RATE
                    STRTL           .38  INITIAL ABSTRACTION
                   CRVNBR         84.00  CURVE NUMBER
                    RTIMP          2.50  PERCENT IMPERVIOUS AREA

 117 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG           .04  LAG

                                                                  ***

                                                            UNIT HYDROGRAPH
                                                         8 END-OF-PERIOD ORDINATES
              189.      280      123.      48.      18.       7.       3.      1.

     ***            ***           ***           ***          ***

                     HYDROGRAPH AT STATION    DEV12

   TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.29, TOTAL EXCESS =     .96

  PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR       72-HR      48 00-HR
 +   (CFS)      (HR)
                         (CFS)
 +      21.     12 07                   2.          1.          0.          0.
                       (INCHES)       .620        .959        .959        959
                        (AC-FT)         1.          2.          2           2.

                      CUMULATIVE AREA =      .03 SQ MI


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             **************
             *            *
  118 KK     *     CP12   *        CONCENTRATION POINT AT THE DOWNSTREAM BOUNDARY OF DEV12
             *            *
             **************

  119 HC          HYDROGRAPH COMBINATION
                     ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***            ***           ***           ***          ***

                      HYDROGRAPH AT STATION     CP12

  PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR       72-HR      48.00-HR
 +   (CFS)      (HR)
                         (CFS)
 +      27.     12.07                   8.          3.          1.          1.
                       (INCHES)       .560        .856        .856        .856
                        (AC-FT)         4.          6.          6           6

                      CUMULATIVE AREA =      .13 SQ MI


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             **************
             *            *
  120 KK     *    RCP12   *        ROUTE CP12 TO CP11 (DOWNSTREAM BOUNDARY OF DEV11)
             *            *
             **************

               HYDROGRAPH ROUTING DATA

  121 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L          800.  CHANNEL LENGTH
                          S         .0820  SLOPE
                          N          .030  CHANNEL ROUGHNESS COEFFICIENT
                         CA           .00  CONTRIBUTING AREA
                      SHAPE          TRAP  CHANNEL SHAPE
                         WD          5.00  BOTTOM WIDTH OR DIAMETER
                          Z           .33  SIDE SLOPE

                                                                  ***
                                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                         COMPUTATION TIME STEP
                ELEMENT    ALPHA      M        DT        DX       PEAK    TIME TO    VOLUME    MAXIMUM
                                                                            PEAK                CELERITY
                                              (MIN)      (FT)     (CFS)    (MIN)      (IN)      (FPS)
```

```
                    MAIN        5.41       1.42        1 32     400.00      27.17     725 52        .86      10.13

                                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN        5.41       1.42        2.00                 27.00     726 00         86

CONTINUITY SUMMARY (AC-FT) - INFLOW=  5833E+01 EXCESS=  0000E+00 OUTFLOW= .5833E+01 BASIN STORAGE= .2417E-03 PERCENT ERROR=     .0


     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     RCP12

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                          (CFS)
+      27.     12.10                        8.          3.           1.           1.
                        (INCHES)          560         .856         .856         .856
                        (AC-FT)             4.          6.           6.           6

                        CUMULATIVE AREA =      .13 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


              **************
              *            *
  122 KK      *     DEV11  *        RUNOFF FROM PROPOSED AREA 11
              *            *
              **************

                SUBBASIN RUNOFF DATA

  123 BA          SUBBASIN CHARACTERISTICS
                        TAREA          .03  SUBBASIN AREA

                  PRECIPITATION DATA

    9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  . ., HYDRO-35 ... ..   ..............  TP-40 ..............   ....... ... TP-49 . .........
                  5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY  10-DAY
                    18       34     .56      .72      .84     1.20     1.68     2.25       00       00      .00     .00

                                                    STORM AREA =       03

  124 LS          SCS LOSS RATE
                        STRTL          .41  INITIAL ABSTRACTION
                       CRVNBR        83.00  CURVE NUMBER
                       RTIMP         13.00  PERCENT IMPERVIOUS AREA

  125 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG          .05  LAG

                                                        ***

                                                  UNIT HYDROGRAPH
                                               10 END-OF-PERIOD ORDINATES
                    115.      244.      166.       68.       31.       13.        6         3.        1.        0.

         ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     DEV11

       TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.20, TOTAL EXCESS =    1.05

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48 00-HR
+   (CFS)       (HR)
                          (CFS)
+      21.     12.07                        2.          1.           0.           0.
                        (INCHES)          .644       1.050        1.050        1.050
                        (AC-FT)             1.          2.           2.           2.

                        CUMULATIVE AREA =      .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


              **************
              *            *
  126 KK      *     CP11   *        CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV11
              *            *
              **************
```

```
127 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

      ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     CP11

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR     48.00-HR
+   (CFS)       (HR)
                                (CFS)
+      47     12 07                    10.           4.           2.           2.
                              (INCHES)  .576         .895         .897         897
                               (AC-FT)    5.           8.           8.           8.

                       CUMULATIVE AREA =     .16 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
128 KK      *     OFF8   *       RUNOFF FROM OFFSITE AREA 8
            *            *
            **************

              SUBBASIN RUNOFF DATA

129 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

  9 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ..... ..... . ..  .... TP-49 ..... ....
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                   18     .34     .56     .72     .84    1.20    1 68    2 25     .00     .00      00      00

                                                 STORM AREA =     .02

130 LS          SCS LOSS RATE
                     STRTL          .46  INITIAL ABSTRACTION
                     CRVNBR       81.40  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

131 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG           .19  LAG

                                                          ***

                                                  UNIT HYDROGRAPH
                                              31 END-OF-PERIOD ORDINATES
                    4       11       22.      37.      48       52       51.      46.      40.      31.
                   23       17.      14.      11.       8.       6.       5.       4.       3.       2.
                    2.       1.       1.       1.       1.       1.       0.       0.       0.       0.
                    0

      ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     OFF8

    TOTAL RAINFALL =    2.25, TOTAL LOSS =    1.46, TOTAL EXCESS =     .79

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR     48.00-HR
+   (CFS)       (HR)
                                (CFS)
+       7     12.23                     1.           0.           0.           0.
                              (INCHES)  .521         .788         .788         .788
                               (AC-FT)    1.           1.           1.           1.

                       CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
132 KK      *     DEV13  *       RUNOFF FROM PROPOSED AREA 13
            *            *
            **************

              SUBBASIN RUNOFF DATA

133 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .09  SUBBASIN AREA
```

```
                  PRECIPITATION DATA

   9 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  .   . HYDRO-35 ..  .     . . . ......... TP-40 ...........  .     ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR    12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .38     34     .56      72      .84    1.20     1 68    2 25     .00     .00      00     .00

                                                  STORM AREA =       .09

 134 LS           SCS LOSS RATE·
                      STRTL         .40  INITIAL ABSTRACTION
                      CRVNBR      83 20  CURVE NUMBER
                      RTIMP       11 00  PERCENT IMPERVIOUS AREA

 135 UD           SCS DIMENSIONLESS UNITGRAPH
                      TLAG           20  LAG

                                                                 ***

                                                          UNIT HYDROGRAPH
                                                      32 END-OF-PERIOD ORDINATES
                  14.       40.       83.      139.      182.      202.      202.      185.      161.      129.
                  95.       74        57.       45.       35.       27.       21.       17.       13.       10.
                   8.        6.        5         4.        3.        2.        2.        1.        1.        1.
                   0.        0.

      ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     DEV13

   TOTAL RAINFALL =     2.25, TOTAL LOSS =     1.22, TOTAL EXCESS =     1.03

  PEAK FLOW      TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR         24-HR         72-HR       48 00-HR
+    (CFS)        (HR)
                          (CFS)
+       34.      12.23                 6.           3.           1             1.
                          (INCHES)    638        1.031         1 032          1.032
                          (AC-FT)      3.           5.           5             5

                       CUMULATIVE AREA =      .09 SQ MI



*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


               **************
               *            *
   136 KK      *     CP13   *        COCENTRATION POINT ALONG THE DAMONTE RANCH HIGH SCHOOL
               *            *
               **************

   137 HC           HYDROGRAPH COMBINATION
                        ICOMP            3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

       ***             ***             ***             ***             ***

                         HYDROGRAPH AT STATION      CP13

   PEAK FLOW      TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR         24-HR         72-HR       48.00-HR
+    (CFS)        (HR)
                           (CFS)
+       73.      12 13                 18.           7.            3.            3.
                          (INCHES)    .592         .931          .933          .933
                          (AC-FT)      9           14.           14.           14.

                         CUMULATIVE AREA =      28 SQ MI

1
                                                     RUNOFF SUMMARY
                                                FLOW IN CUBIC FEET PER SECOND
                                              TIME IN HOURS,  AREA IN SQUARE MILES

                                              PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD          BASIN      MAXIMUM     TIME OF
               OPERATION        STATION       FLOW     PEAK                                                 AREA       STAGE     MAX STAGE
+                                                                6-HOUR      24-HOUR     72-HOUR

               HYDROGRAPH AT
+                                 OFF4         38.    12.53         12.          5           2.          .21

               ROUTED TO
+                                ROFF4         38     12.60         12.          5.          2.          .21

               HYDROGRAPH AT
+                                 OFF3         19.    12 37          5.          2.          1.          .08

               HYDROGRAPH AT
+                                 DEV4          8     12 17          1.          1           0.          .02

               3 COMBINED AT
```

+	CP4	56	12 50	18.	7.	3.	.31
+	ROUTED TO RCP4_3	55.	12.50	18.	7	3	.31
+	HYDROGRAPH AT OFF2	30.	12.60	10.	4.	2	.17
+	HYDROGRAPH AT DEV3	30	12.20	5	2.	1.	.07
+	3 COMBINED AT CP3	95.	12 47	33.	13.	6.	.56
+	ROUTED TO RCP3_1	95	12.53	33.	13.	6.	.56
+	HYDROGRAPH AT OFF1	172	13.37	96.	37.	19.	1.73
+	HYDROGRAPH AT DEV2	22	12.30	5	2.	1.	.10
+	HYDROGRAPH AT DEV1	4.	12 20	1.	0.	0.	01
+	3 COMBINED AT CP1	177.	13.33	101.	40.	20.	1.84
+	HYDROGRAPH AT OFF6	35.	12.50	11	4.	2.	.19
+	ROUTED TO ROFF6	35	12 53	11	4.	2.	.19
+	HYDROGRAPH AT OFF5	192.	13.50	113.	45	22.	2.22
+	2 COMBINED AT CPOFF	203.	13.47	124.	49.	24.	2.41
+	ROUTED TO ROFF56	203	13 47	124.	49.	24.	2.41
+	HYDROGRAPH AT DEV8	4.	12.10	1.	0.	0.	.01
+	HYDROGRAPH AT DEV10	54.	12.10	7	3.	1.	.09
+	3 COMBINED AT CP8	208	13 47	129.	52.	26.	2.51
+	ROUTED TO RCP8_7	208.	13 50	129.	52.	26.	2.51
+	HYDROGRAPH AT DEV9	20	12.13	3.	1.	1.	.06
+	HYDROGRAPH AT DEV7	3	12.20	1	0.	0.	.02
+	3 COMBINED AT CP7	210	13.50	132.	53.	27.	2.60
+	ROUTED TO RCP7_6	210.	13.53	132	53.	27.	2.60
+	HYDROGRAPH AT DEV6	1.	12.17	0.	0.	0.	.01
+	2 COMBINED AT CP6	210.	13.53	133	53.	27.	2.61
+	ROUTED TO RCP6_5	210	13.53	133.	53.	27.	2.61
+	HYDROGRAPH AT DEV5	4	12.13	1.	0.	0.	.01
+	2 COMBINED AT CP5	211	13.53	133.	53.	27.	2.61
+	ROUTED TO RCP5_1	211.	13 60	133	53.	27.	2.61
+	2 COMBINED AT TOTCP1	385.	13.47	234	93.	47.	4.45
+	HYDROGRAPH AT OFF7	22.	12.37	5.	2.	1.	.09
+	ROUTED TO ROFF7	22	12.37	5	2	1.	.09

HYDROGRAPH AT	DEV12	21.	12 07	2.	1.	0.	03
2 COMBINED AT	CP12	27.	12.07	8.	3.	1.	.13
ROUTED TO	RCP12	27.	12.10	8.	3.	1.	.13
HYDROGRAPH AT	DEV11	21	12.07	2	1	0.	.03
2 COMBINED AT	CP11	47	12.07	10.	4.	2.	.16
HYDROGRAPH AT	OFF8	7.	12 23	1.	0.	0.	02
HYDROGRAPH AT	DEV13	34.	12 23	6.	3.	1.	.09
3 COMBINED AT	CP13	71.	12.13	18	7	3.	.28

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
	ROFF4 MANE	2.00	38 28	756.00	82	2.00	38.28	756.00	.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9033E+01 EXCESS= .0000E+00 OUTFLOW= .9033E+01 BASIN STORAGE= .7624E-03 PERCENT ERROR= .0

	RCP4_3 MANE	.93	55.50	750.44	82	2.00	55.49	750.00	.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1354E+02 EXCESS= 0000E+00 OUTFLOW= .1354E+02 BASIN STORAGE= .2692E-03 PERCENT ERROR= 0

	RCP3_1 MANE	2.00	94 64	752.00	.85	2.00	94.64	752 00	85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2515E+02 EXCESS= .0000E+00 OUTFLOW= .2515E+02 BASIN STORAGE= .1725E-02 PERCENT ERROR= .0

	ROFF6 MANE	2.00	35.29	752 00	.82	2.00	35.29	752.00	.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8117E+01 EXCESS= .0000E+00 OUTFLOW= .8117E+01 BASIN STORAGE= .6231E-03 PERCENT ERROR= .0

	ROFF56 MANE	1.42	202.96	808.86	.75	2.00	202.93	808.00	75

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9691E+02 EXCESS= .0000E+00 OUTFLOW= .9691E+02 BASIN STORAGE= .6481E-03 PERCENT ERROR= .0

	RCP8_7 MANE	1.98	207.74	810.39	.76	2.00	207.72	810.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1026E+03 EXCESS= .0000E+00 OUTFLOW= .1026E+03 BASIN STORAGE= .1028E-02 PERCENT ERROR= .0

	RCP7_6 MANE	1.58	210.35	810.96	.76	2.00	210.31	812.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1056E+03 EXCESS= .0000E+00 OUTFLOW= .1056E+03 BASIN STORAGE= .7199E-03 PERCENT ERROR= .0

	RCP6_5 MANE	.80	210.40	812.29	.76	2.00	210.39	812 00	76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1057E+03 EXCESS= .0000E+00 OUTFLOW= .1057E+03 BASIN STORAGE= .3743E-03 PERCENT ERROR= 0

	RCP5_1 MANE	2.00	210.66	816.00	.76	2.00	210.66	816.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1062E+03 EXCESS= .0000E+00 OUTFLOW= .1062E+03 BASIN STORAGE= .1483E-02 PERCENT ERROR= .0

	ROFF7 MANE	1.52	22.32	742 61	.82	2.00	22.29	742.00	.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4064E+01 EXCESS= .0000E+00 OUTFLOW= .4064E+01 BASIN STORAGE= .2376E-03 PERCENT ERROR= .0

	RCP12 MANE	1.32	27 17	725.52	.86	2.00	27 00	726.00	86

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)*
*             JUN  1998             *
*          VERSION 4 1              *
*                                   *
*  RUN DATE  25MAR05  TIME  15:09:56*
*                                   *
*************************************
```


```
*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*        609 SECOND STREET          *
*      DAVIS, CALIFORNIA 95616      *
*          (916) 756-1104           *
*                                   *
*************************************
```


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE          ID.....1..... 2.....3.. . ..4..... 5.....6.... ..7...  ..8....  9 .  ..10

              *DIAGRAM
    1         ID      GOLDEN HILLS SUBDIVISION PROPOSED CONDITIONS 24-HOUR,  100-YEAR EVENT
    2         ID      GENERATED  3/2005 BY WOOD RODGERS INC
    3         ID      WITHOUT DETENTION IN SOUTHERN PORION OF SITE
    4         ID  ==========================================================================
              *
    5         IT       2 17MAR78    0200          19MAR78    0200
    6         IN       1
    7         IO       3
              *
    8         KK    OFF4   RUNOFF FROM OFFSITE AREA 4
    9         BA  0 2070
   10         PH                  0.41    0.78    1 29    1.39    1.48    1.93    2.87    4.14
   11         LS       0      82
   12         UD   0.478
              *
   13         KK   ROFF4   ROUTE OFFSITE WATERSHED 4 TO NORTHERN BOUNDARY OF SITE IN PROPOSED
              *          TRAPEZOIDAL CHANNEL
   14         RD    2137   0 047    0.03            TRAP       5    0.33
              *
   15         KK    OFF3   RUNOFF FROM OFFSITE AREA 3
   16         BA  0.0800
   17         LS       0      82
   18         UD    0 33
              *
   19         KK    DEV4   RUNOFF FROM PROPOSED WATERSHED 4
   20         BA  0.0233
   21         LS       0      82
   22         UD    0.14
              *
   23         KK     CP4   CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE
   24         HC       3
              *
   25         KK  RCP4_3   ROUTE CP4 TO CP3
   26         RD     636   0.091    0.03            TRAP      10    0.33
              *
   27         KK    OFF2   RUNOFF FROM OFFSITE AREA 2
   28         BA  0.1732
   29         LS       0      82
   30         UD    0.54
              *
   31         KK    DEV3
   32         BA  0.0724
   33         LS       0    83.5    11.1
   34         UD    0 17
              *
```



```
LINE          ID.....1.....2. . ...3.....4.....5.. ... 6.....7... ...8  .....9.....10
```

```
35          KK     CP3   CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE
36          HC       3
            *

37          KK  RCP3_1   ROUTE CP3 TO CP1 (NORTHWEST CORNER OF SITE)
38          RD    2500   0.024    0.03            TRAP       10    0.33
            *

39          KK    OFF1   RUNOFF FROM OFFSITE AREA 1
40          BA  1.7296
41          LS       0    81.8
42          UD    1.21
            *

43          KK    DEV2   RUNOFF FROM PROPOSED WATERSHED 2
44          BA  0.0957
45          LS       0    77.1    11.5
46          UD    0.25
            *

47          KK    DEV1   RUNOFF FROM PROPOSED WATERSHED 1
48          BA  0.0115
49          LS       0    80.2     8.9
50          UD    0.16
            *

51          KK     CP1   CONCENTRATION POINT AT NORTHWEST CORNER OF SITE TO CROSS DESERT WAY
            *           IN CULVERT
52          HC       3
            *

53          KK    OFF6   RUNOFF FROM OFFSITE AREA 6
54          BA  0.1860
55          LS       0      82
56          UD   0.459
            *

57          KK   ROFF6   ROUTE OFFSITE 6 IN PROPOSED CHANNEL THROUGH DEV10
58          RD    1230   0.074    0.03            TRAP       10    0.33
            *

59          KK    OFF5   RUNOFF FROM OFFSITE AREA 5
60          BA  2.2212
61          LS       0    80.7
62          UD    1.32
            *

63          KK   CPOFF   CONCENTRATION POINT AT NORTHERN BOUNDARY OF DEV8
64          HC       2
            *
```



```
LINE        ID .. ...1.......2 ......3.......4.. . ..5.. ....6.. ....7  .... 8 ..... 9. ... 10

65          KK  ROFF56   ROUTE CPOFF TO CP8 (DOWNSTREAM BOUNDARY OF DEV8)
66          RD    1394   0.075    0.03            TRAP       10    0 33
            *

67          KK    DEV8   RUNOFF FROM PROPOSED AREA 8
68          BA  0.0119
69          LS       0    76.6    10.2
70          UD   0.070
            *

71          KK   DEV10   RUNOFF FROM PROPOSED AREA 10
72          BA  0.0949
73          LS       0    84.0     7.3
74          UD   0 070
            *

75          KK     CP8   CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV8
76          HC       3
            *

77          KK  RCP8_7   ROUTE CP8 TO CP7 (DOWNSTREAM BOUNDARY OF DEV7)
78          RD    1991   0.079    0.03            TRAP       10    0 33
            *

79          KK    DEV9   RUNOFF FROM PROPOSED AREA 9
80          BA  0 0638
81          LS       0    75.5    12.0
82          UD    0.11
            *

83          KK    DEV7   RUNOFF FROM PROPOSED AREA 7
84          BA  0.0227
85          LS       0    70.1     6.8
86          UD    0.17
            *

87          KK     CP7   COCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV7
88          HC       3
```

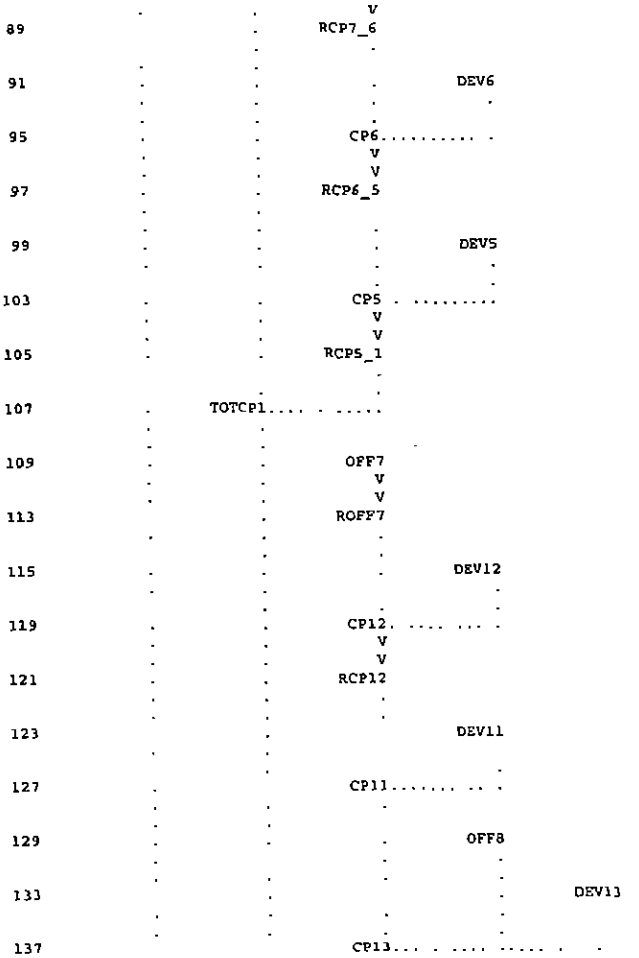
```
                *
 89             KK  RCP7_6   ROUTE CP7 TO CP6 (WESTERN BOUNDARY OF SITE)
 90             RD     940   0 016     0 03             TRAP       10     0.33
                *
 91             KK    DEV6   RUNOFF FROM PROPOSED AREA 6
 92             BA  0.0053
 93             LS       0    72.0
 94             UD    0.11
                *
1                                          HEC-1 INPUT                                                    PAGE  4

LINE            ID..... .1 ......2 ..... 3.......4.......5. .....6 .. ...7......,8... .  9. . ..10


 95             KK     CP6   CONCENTRATION POINT AT THE MID-WESTERN BOUNDARY OF SITE NEAR
 96             HC       2
                *
 97             KK  RCP6_5   ROUTE RUNOFF CONCENTRATING AT CP6 TO CP5 IN DAMONTE CHANNEL ALONG
                *            DESERT WAY
 98             RD     270   0 003     0.03             TRAP       10     0.33
                *
 99             KK    DEV5   RUNOFF FROM PROPOSED AREA 5
100             BA  0.0091
101             LS       0    81.1     13.5
102             UD    0.11
                *
103             KK     CP5   CONCENTRATION POINT WITHIN DAMONTE CHANNEL ALONG DESERT WAY
104             HC       2
                *
105             KK  RCP5_1   ROUTE CP5 TO CP1 (NORTHWEST CORNER OF SITE)
106             RD    1120   0.003     0 03             TRAP       10     0.33
                *
107             KK  TOTCP1   TOTAL ADDITION OF FLOW AT NORTHWEST CORNER OF SITE
108             HC       2
                *
109             KK    OFF7   RUNOFF FROM OFFSITE AREA 7
110             BA  0.0931
111             LS       0      82
112             UD    0.31
                *
113             KK   ROFF7   ROUTE OFF7 TO THROUGH DEV7
114             RD    1035   0.136     0.03             TRAP        5     0.33
                *
115             KK   DEV12   RUNOFF FROM PROPOSED AREA 12
116             BA  0.0346
117             LS       0      84      2.5
118             UD    0.04
                *
119             KK    CP12   CONCENTRATION POINT AT THE DOWNSTREAM BOUNDARY OF DEV12
120             HC       2
                *
121             KK   RCP12   ROUTE CP12 TO CP11 (DOWNSTREAM BOUNDARY OF DEV11)
122             RD     800   0.082     0 03             TRAP        5     0.33
                *
1                                          HEC-1 INPUT                                                    PAGE  5

LINE            ID.......1.......2.......3 ......4........5.......6.. ....7. .....8.......9  . ..10


123             KK   DEV11   RUNOFF FROM PROPOSED AREA 11
124             BA  0.0335
125             LS       0    83.0     13.0
126             UD    0.05
                *
127             KK    CP11   CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV11
128             HC       2
                *
                * KK DETEN   DETENTION TO MITIGATE INCREASE IN FLOW IN SOUTH PORTION OF PROPERTY
                * RS     1    STOR      -1
                * SA  1.26    1.35    1.43    1.52    1.60    1.69    1 77    1 86    1.90    1.
                * SA  2 00    2.07    2.15    2.22    2.29    2.36    2.43
                * SE4588.5    4589  4589.5    4590  4590.5    4591  4591.5    4592  4592.5    45
                * SE  4594    4595    4596    4597    4598    4599    4600
                * SQ     0     1.3     1.4     1.5     1.6     1.7     1.8     1.9     3.4     7
                * SQ  24.2    48.2    77.2   107.7   131.6   151.2   168.4
                *
129             KK    OFF8   RUNOFF FROM OFFSITE AREA 8
130             BA  0.0228
131             LS       0    81.4
132             UD   0.195
                *
```



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*             JUN  1998              *
*          VERSION 4.1               *
*                                    *
*  RUN DATE  25MAR05  TIME  15:09:56 *
*                                    *
**************************************
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**************************************
*                                    *
*    U.S. ARMY CORPS OF ENGINEERS    *
*    HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616      *
*           (916) 756-1104           *
*                                    *
**************************************
```

GOLDEN HILLS SUBDIVISION PROPOSED CONDITIONS 24-HOUR, 100-YEAR EVENT
GENERATED 3/2005 BY WOOD RODGERS INC
WITHOUT DETENTION IN SOUTHERN PORION OF SITE

```
   7 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT           HYDROGRAPH TIME DATA
                      NMIN           2  MINUTES IN COMPUTATION INTERVAL
                      IDATE      17MAR78  STARTING DATE
                      ITIME         0200  STARTING TIME
                        NQ          1441  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      19MAR78  ENDING DATE
                     NDTIME         0200  ENDING TIME
                     ICENT            19  CENTURY MARK

                  COMPUTATION INTERVAL      .03 HOURS
                      TOTAL TIME BASE    48.00 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
```

```
          FLOW                 CUBIC FEET PER SECOND
          STORAGE VOLUME       ACRE-FEET
          SURFACE AREA         ACRES
          TEMPERATURE          DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

        **************
        *            *
  8 KK  *     OFF4   *       RUNOFF FROM OFFSITE AREA 4
        *            *
        **************

          SUBBASIN RUNOFF DATA

  9 BA      SUBBASIN CHARACTERISTICS
                 TAREA          .21  SUBBASIN AREA

            PRECIPITATION DATA

 10 PH                        DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
            ..... HYDRO-35 ......   ............... TP-40 ..  ..........    ....... . . TP-49 ..... .....
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              .41      78    1.29    1.39    1.48    1.93    2 87    4.14     .00     .00     .00     .00

                                                 STORM AREA =      .21

 11 LS      SCS LOSS RATE
                 STRTL          .44  INITIAL ABSTRACTION
                CRVNBR        82.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

 12 UD      SCS DIMENSIONLESS UNITGRAPH
                  TLAG          .48  LAG

                                                           ***

                                                 UNIT HYDROGRAPH
                                             74 END-OF-PERIOD ORDINATES
              4.       11.       21        33        47.       64.       86.      110.      136.      157.
            175.      189.      197.      201       202.      201.      195       186       177       166.
            155.      141.      125.      110.       96        86.       76.       68.       61        55.
             50        45.       40.       36        32.       29.       26        23.       21.       19.
             17.       15.       13        12        11        10.        9.        8         7.        6.
              6.        5.        4.        4.        4.        3.        3.        3.        2.        2.
              2.        2         2.        1.        1.        1.        1         1.        1.        1.
              0.        0.        0         0.

     ***           ***           ***           ***           ***

                     HYDROGRAPH AT STATION      OFF4

   TOTAL RAINFALL =    4.14, TOTAL LOSS =    1.82, TOTAL EXCESS =    2.32

  PEAK FLOW     TIME                     MAXIMUM AVERAGE FLOW
                                 6-HR        24-HR       72-HR      48.00-HR
+   (CFS)       (HR)
                         (CFS)
+     139.     12.53              31.          13.          6.          6
                       (INCHES)  1.403        2.322       2.322       2.322
                       (AC-FT)    15           26          26.         26.

                       CUMULATIVE AREA =      .21 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

        **************
        *            *
 13 KK  *    ROFF4   *       ROUTE OFFSITE WATERSHED 4 TO NORTHERN BOUNDARY OF SITE IN PROPOSED
        *            *
        **************

          HYDROGRAPH ROUTING DATA

 14 RD      MUSKINGUM-CUNGE CHANNEL ROUTING
                       L       2137.  CHANNEL LENGTH
                       S       .0470  SLOPE
                       N        .030  CHANNEL ROUGHNESS COEFFICIENT
                      CA         .00  CONTRIBUTING AREA
                   SHAPE        TRAP  CHANNEL SHAPE
                      WD        5.00  BOTTOM WIDTH OR DIAMETER
                       Z         .33  SIDE SLOPE

                                                           ***
                             COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                   COMPUTATION TIME STEP
               ELEMENT    ALPHA      M          DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                            PEAK                 CELERITY
```

```
                                                   (MIN)      (FT)      (CFS)     (MIN)       (IN)      (FPS)

                    MAIN       4 09       1.42       2.00    712 33    139.34    754.00       2.32      13 47

                                            INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN       4.09       1.42       2 00              139.34    754 00       2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2564E+02 EXCESS= .0000E+00 OUTFLOW= .2564E+02 BASIN STORAGE= 7478E-03 PERCENT ERROR=    0


     ***            ***            ***            ***            ***

                          HYDROGRAPH AT STATION     ROFF4

  PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR       72-HR      48.00-HR
+   (CFS)       (HR)
                            (CFS)
+     139.     12.57                   31.         13.         6.           6.
                          (INCHES)    1.403       2 322       2.322        2 322
                          (AC-FT)      15.         26.         26.          26.

                          CUMULATIVE AREA =      .21 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             **************
             *            *
   15 KK     *    OFF3    *        RUNOFF FROM OFFSITE AREA 3
             *            *
             **************

                SUBBASIN RUNOFF DATA

   16 BA          SUBBASIN CHARACTERISTICS
                        TAREA          .08  SUBBASIN AREA

                  PRECIPITATION DATA

   10 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  . .  HYDRO-35  .....     ......    ..  . TP-40  .......... ....   ........ .. TP-49    . ... ..
                  5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                     41     .78    1.29     1.39     1 48     1.93     2.87    4.14     .00      00     .00     .00

                                                         STORM AREA =      .08

   17 LS          SCS LOSS RATE
                        STRTL          .44  INITIAL ABSTRACTION
                       CRVNBR        82.00  CURVE NUMBER
                        RTIMP          .00  PERCENT IMPERVIOUS AREA

   18 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG          .33  LAG

                                                                     ***

                                                              UNIT HYDROGRAPH
                                                         52 END-OF-PERIOD ORDINATES
                 3.        11.        20.        33.        49.        69.        87.        100        108        111.
               111.       107.       100.        92.        82.        71.        59.        49.        42.         36
                30.        27.        23.        19.        16.        14.        12.        10.         9.         8.
                 6.         5.         5.         4.         3.         3.         3.         2.         2          2.
                 1.         1.         1.         1.         1.         1.         1.         0.         0.         0
                 0.         0.

      ***            ***            ***            ***            ***

                           HYDROGRAPH AT STATION      OFF3

     TOTAL RAINFALL =     4.14, TOTAL LOSS =     1.82, TOTAL EXCESS =     2.32

   PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
                                       6-HR        24-HR       72-HR      48.00-HR
+    (CFS)       (HR)
                             (CFS)
+       68.     12.37                   12.          5.          2.           2.
                           (INCHES)    1.411       2.323       2.323        2.323
                           (AC-FT)       6.         10.         10.          10.

                           CUMULATIVE AREA =     .08 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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          **************
          *            *
19 KK     *    DEV4    *      RUNOFF FROM PROPOSED WATERSHED 4
          *            *
          **************

          SUBBASIN RUNOFF DATA

20 BA       SUBBASIN CHARACTERISTICS
              TAREA          .02  SUBBASIN AREA

            PRECIPITATION DATA

10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             .... HYDRO-35 ......   ... ...  ..  .. TP-40 .. ....  ....    ........... TP-49 ... .......
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              .41     .78    1.29    1.39    1.48    1.93    2 87    4.14     .00     .00     .00     .00

                                                STORM AREA =      .02

21 LS       SCS LOSS RATE
              STRTL          .44  INITIAL ABSTRACTION
              CRVNBR       82 00  CURVE NUMBER
              RTIMP          .00  PERCENT IMPERVIOUS AREA

22 UD       SCS DIMENSIONLESS UNITGRAPH
              TLAG           .14  LAG

                                                      ***

                                                UNIT HYDROGRAPH
                                             23 END-OF-PERIOD ORDINATES
                      8.       25.       52.       69        71        63        50.       33.       23.       17.
                     12.        8.        6.        4         3.        2         1.        1.        1.        1.
                      0.        0.        0.

    ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     DEV4

    TOTAL RAINFALL =    4.14, TOTAL LOSS =    1.82, TOTAL EXCESS =    2.32

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                                      (CFS)
+      31.     12.17                     4.           1.           1           1.
                                    (INCHES)      1.419        2.323        2.323        2.323
                                     (AC-FT)        2.           3.           3.           3.

                        CUMULATIVE AREA =      02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
23 KK     *     CP4    *      CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE
          *            *
          **************

24 HC       HYDROGRAPH COMBINATION
              ICOMP            3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

    ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     CP4

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
+   (CFS)       (HR)
                                      (CFS)
+     205.      12.47                    47.          19.          10.          10.
                                    (INCHES)      1.402        2.322        2.322        2.322
                                     (AC-FT)       23.          38.          38.          38.

                        CUMULATIVE AREA =      .31 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
25 KK     *   RCP4_3   *      ROUTE CP4 TO CP3
          *            *
          **************
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            HYDROGRAPH ROUTING DATA

26 RD         MUSKINGUM-CUNGE CHANNEL ROUTING
                       L       636.  CHANNEL LENGTH
                       S      .0910  SLOPE
                       N        030  CHANNEL ROUGHNESS COEFFICIENT
                      CA        .00  CONTRIBUTING AREA
                   SHAPE       TRAP  CHANNEL SHAPE
                      WD      10.00  BOTTOM WIDTH OR DIAMETER
                       Z         33  SIDE SLOPE

                                              ***
                           COMPUTED MUSKINGUM-CUNGE PARAMETERS
                               COMPUTATION TIME STEP
           ELEMENT    ALPHA      M        DT       DX      PEAK    TIME TO    VOLUME    MAXIMUM
                                                                    PEAK                CELERITY
                                         (MIN)    (FT)     (CFS)    (MIN)      (IN)      (FPS)

            MAIN       3.98     1 50        61   318.00   204.39   748.94     2.32      17.51

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

            MAIN       3.98     1.50      2 00            204.06   748.00     2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3843E+02 EXCESS= .0000E+00 OUTFLOW= .3843E+02 BASIN STORAGE= .2863E-03 PERCENT ERROR=    .0


     ***          ***          ***          ***          ***

                         HYDROGRAPH AT STATION   RCP4_3

PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR      72-HR     48.00-HR
+  (CFS)      (HR)
                          (CFS)
+    204.     12.47                   47.        19         10          10.
                        (INCHES)   1.402      2.322      2.322       2.322
                         (AC-FT)     23.        38.        38.         38.

                      CUMULATIVE AREA =      31 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             **************
             *            *
 27 KK       *    OFF2    *        RUNOFF FROM OFFSITE AREA 2
             *            *
             **************

              SUBBASIN RUNOFF DATA

 28 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .17  SUBBASIN AREA

                PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......    ............. TP-40    . ...........    .... ... .. TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR    12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .41     .78    1.29    1.39    1.48    1.93    2.87    4 14     .00     .00     .00     .00

                                                 STORM AREA =      .17

 29 LS          SCS LOSS RATE
                     STRTL          .44  INITIAL ABSTRACTION
                    CRVNBR        82.00  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

 30 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG          .54  LAG

                                                     ***

                                               UNIT HYDROGRAPH
                                          83 END-OF-PERIOD ORDINATES
                3.        7.       13.       20        28.       39.       51.       66.       82.       99.
              113.      126.      136.      143.      149       150.      150.      149.      145       140.
              134.      127.      120.      112       103.       92.       82.       73.       65.       59.
               54.       48.       44        40        37.       34.       30        28.       25.       22.
               20.       19.       17.       15.       14        13.       11.       10.        9.        8.
                8.        7.        6.        6         5.        5.        4.        4.        4.        3.
                3.        3.        2.        2         2.        2.        2.        2.        1.        1.
                1.        1.        1.        1.        1         1.        1.        0.        0.        0.
                0.        0.        0.

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

HYDROGRAPH AT STATION OFF2

TOTAL RAINFALL = 4.14, TOTAL LOSS = 1.82, TOTAL EXCESS = 2.32

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
(CFS)	(HR)					
		(CFS)				
108.	12.60		26.	11.	5.	5
		(INCHES)	1.400	2.322	2.322	2.322
		(AC-FT)	13.	21.	21.	21.

CUMULATIVE AREA = .17 SQ MI

31 KK DEV3

SUBBASIN RUNOFF DATA

32 BA SUBBASIN CHARACTERISTICS
TAREA .07 SUBBASIN AREA

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

.. HYDRO-35			..... TP-40					. ..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.41	.78	1.29	1.39	1.48	1.93	2.87	4 14	00	.00	.00	00

STORM AREA = 07

33 LS SCS LOSS RATE
STRTL .40 INITIAL ABSTRACTION
CRVNBR 83.50 CURVE NUMBER
RTIMP 11.10 PERCENT IMPERVIOUS AREA

34 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .17 LAG

***

UNIT HYDROGRAPH
27 END-OF-PERIOD ORDINATES

16.	48.	101.	157.	185.	186.	168.	141	104	75.
56.	43.	32.	24.	18.	13	10.	7.	6.	4
3.	2.	2.	1.	1.	1	0			

*** *** *** *** ***

HYDROGRAPH AT STATION DEV3

TOTAL RAINFALL = 4.14, TOTAL LOSS = 1.50, TOTAL EXCESS = 2.64

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48 00-HR
(CFS)	(HR)					
		(CFS)				
97.	12.20		12.	5.	3.	3.
		(INCHES)	1.541	2.636	2.638	2.638
		(AC-FT)	6.	10.	10.	10.

CUMULATIVE AREA = .07 SQ MI

35 KK CP3 CONCENTRATION POINT ALONG THE NORTHERN BOUNDARY OF THE SITE

36 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION CP3

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

```
                                            6-HR        24-HR       72-HR      48.00-HR
+    (CFS)        (HR)
                                (CFS)
+     342.       12.47                        85          35.         18.          18.
                              (INCHES)     1.416       2.361       2.363        2.363
                               (AC-FT)       42.         70.         70.          70.

                                CUMULATIVE AREA =     .56 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
   37 KK      *   RCP3_1   *        ROUTE CP3 TO CP1 (NORTHWEST CORNER OF SITE)
              *            *
              **************

                HYDROGRAPH ROUTING DATA

   38 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                              L          2500.  CHANNEL LENGTH
                              S          .0240  SLOPE
                              N           .030  CHANNEL ROUGHNESS COEFFICIENT
                              CA           .00  CONTRIBUTING AREA
                           SHAPE          TRAP  CHANNEL SHAPE
                              WD         10 00  BOTTOM WIDTH OR DIAMETER
                              Z             33  SIDE SLOPE

                                                            ***
                                        COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                             COMPUTATION TIME STEP
                     ELEMENT    ALPHA       M        DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                  PEAK                CELERITY
                                                   (MIN)      (FT)     (CFS)     (MIN)       (IN)       (FPS)

                      MAIN       2.04      1.50     2.00     833 33    342.17    750.00      2.36      13.31

                                             INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                      MAIN       2.04      1 50     2.00               342.17    750.00      2.36

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .7007E+02 EXCESS= .0000E+00 OUTFLOW= .7007E+02 BASIN STORAGE= .1794E-02 PERCENT ERROR=    .0


        ***           ***           ***           ***           ***

                                 HYDROGRAPH AT STATION   RCP3_1

  PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                            6-HR        24-HR       72-HR      48 00-HR
+    (CFS)        (HR)
                                (CFS)
+     342.       12.50                        85          35.         18.          18.
                              (INCHES)     1.416       2.361       2.363        2.363
                               (AC-FT)       42.         70.         70.          70.

                                CUMULATIVE AREA =     56 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
   39 KK      *    OFF1    *        RUNOFF FROM OFFSITE AREA 1
              *            *
              **************

                SUBBASIN RUNOFF DATA

   40 BA          SUBBASIN CHARACTERISTICS
                      TAREA          1 73  SUBBASIN AREA

                  PRECIPITATION DATA

   10 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ..... ......... TP-40 ...............  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN   2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .41     .78    1.29   1.39    1.48    1.93    2 87    4.14     .00     .00     .00     .00

                                                  STORM AREA =     1 73

   41 LS          SCS LOSS RATE
                      STRTL          .44  INITIAL ABSTRACTION
                      CRVNBR       81.80  CURVE NUMBER
```

RTIMP .00 PERCENT IMPERVIOUS AREA

42 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 1.21 LAG

***

UNIT HYDROGRAPH
183 END-OF-PERIOD ORDINATES

6.	11	17	25	38.	50.	63.	79	95.	112.
129.	151.	173.	195	219.	249	279.	308.	341.	376.
412.	447.	477	506.	536.	563.	584.	604.	624	640.
651.	662.	673.	676.	678.	680.	681	679.	677.	675.
669.	657.	646	635	623	610.	597.	583	569.	554.
539.	522.	504	485	467.	445.	423.	401.	379.	361.
342.	324.	308.	295	282	269.	257.	246.	235.	224.
215.	206.	196	188	181.	174.	168.	161.	154.	147.
141.	135.	130.	124	119.	113.	107.	102.	98.	94.
90.	87.	83.	79.	75.	72.	69.	66.	64.	61.
58.	55.	53.	50	48.	46.	44.	42	40.	38.
37.	35.	34.	32.	31.	30.	28.	27.	26.	25.
24.	23.	22.	21.	20.	19.	18	18	17.	16.
15.	15.	14.	13	13.	12.	12.	11.	11.	10.
10.	9.	9	9.	8.	8.	8.	7.	7.	7.
7.	6.	6.	6.	6.	6.	5	5.	5.	5.
4.	4	4	4	4.	3.	3.	3.	3.	3.
2.	2.	2.	2	2	1.	1.	1.	1.	1.
1.	0.	0							

*** *** *** *** ***

HYDROGRAPH AT STATION OFF1

TOTAL RAINFALL = 4.13, TOTAL LOSS = 1.83, TOTAL EXCESS = 2.30

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 579.	13.27		250	107	53.	53.
		(INCHES)	1 344	2.298	2.298	2 298
		(AC-FT)	124	212	212.	212.

CUMULATIVE AREA = 1 73 SQ MI

*** ***

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      **************
      *            *
43 KK *    DEV2    *        RUNOFF FROM PROPOSED WATERSHED 2
      *            *
      **************
```

SUBBASIN RUNOFF DATA

44 BA SUBBASIN CHARACTERISTICS
TAREA .10 SUBBASIN AREA

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.41	.78	1.29	1.39	1.48	1.93	2.87	4.14	.00	.00	.00	.00

STORM AREA = 10

45 LS SCS LOSS RATE
STRTL .59 INITIAL ABSTRACTION
CRVNBR 77.10 CURVE NUMBER
RTIMP 11.50 PERCENT IMPERVIOUS AREA

46 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .25 LAG

***

UNIT HYDROGRAPH
40 END-OF-PERIOD ORDINATES

8.	25.	49	82.	121.	152.	169.	173.	169.	155.
139.	118.	93.	74.	60.	49.	41.	33.	27.	22.
18.	15.	12.	10.	8.	6.	5.	4.	4.	3.
2.	2.	2	1.	1.	1.	1.	0.	0	0.

*** *** *** *** ***

HYDROGRAPH AT STATION DEV2

TOTAL RAINFALL = 4.14, TOTAL LOSS = 1.96, TOTAL EXCESS = 2.18

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

			6-HR	24-HR	72-HR	48 00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 86.	12.30		13.	6	3.	3
		(INCHES)	1.291	2.180	2.183	2 183
		(AC-FT)	7.	11	11.	11.

CUMULATIVE AREA = .10 SQ MI

*** ***

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**************
*            *
*    DEV1    *
*            *
**************
```

47 KK RUNOFF FROM PROPOSED WATERSHED 1

SUBBASIN RUNOFF DATA

48 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

.. .. HYDRO-35			..... TP-40				..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
41	.78	1.29	1.39	1.48	1 93	2.87	4.14	.00	.00	.00	.00

STORM AREA = .01

49 LS SCS LOSS RATE
STRTL .49 INITIAL ABSTRACTION
CRVNBR 80.20 CURVE NUMBER
RTIMP 8.90 PERCENT IMPERVIOUS AREA

50 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .16 LAG

***

UNIT HYDROGRAPH
26 END-OF-PERIOD ORDINATES

3.	9.	19.	28.	31	31.	27.	21.	15	11.
8.	6.	4.	3.	2	2.	1.	1.	1	0.
0	0.	0.	0.	0.	0.				

*** *** *** *** ***

HYDROGRAPH AT STATION DEV1

TOTAL RAINFALL = 4.14, TOTAL LOSS = 1.79, TOTAL EXCESS = 2.35

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 14	12.20		2.	1	0	0.
		(INCHES)	1.398	2.347	2.349	2.349
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .01 SQ MI

*** ***

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**************
*            *
*    CP1     *
*            *
**************
```

51 KK CONCENTRATION POINT AT NORTHWEST CORNER OF SITE TO CROSS DESERT WAY

52 HC HYDROGRAPH COMBINATION
TCOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION CP1

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 584.	13.27		264.	113.	57.	57.
		(INCHES)	1.334	2.289	2.292	2 292
		(AC-FT)	131.	224.	225.	225.

CUMULATIVE AREA = 1.84 SQ MI

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          **************
          *            *
53 KK     *    OFF6    *      RUNOFF FROM OFFSITE AREA 6
          *            *
          **************

   SUBBASIN RUNOFF DATA

54 BA        SUBBASIN CHARACTERISTICS
                  TAREA        .19  SUBBASIN AREA

             PRECIPITATION DATA

10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                  TP-40                        TP-49
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .41     .78    1.29    1.39    1.48    1.93    2 87    4.14      00     .00     .00     .00

                                              STORM AREA =      .19

55 LS        SCS LOSS RATE
                  STRTL         .44  INITIAL ABSTRACTION
                 CRVNBR       82 00  CURVE NUMBER
                  RTIMP         .00  PERCENT IMPERVIOUS AREA

56 UD        SCS DIMENSIONLESS UNITGRAPH
                  TLAG         .46  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            71 END-OF-PERIOD ORDINATES
                    4.       11.       21.       33.       47.       65.       86.      111.      134.      155.
                  170.      180       187.      189.      188.      185.      177.      168.      158.      147
                  134.      119.      104.       90.       80.       71        63        56.       51.       46.
                   41.       37        33.       29.       26.       23.       20.       18        16.       14.
                   13        12        10.        9         8.        7.        6.        5.        5.        5.
                    4.        4         3.        3.        3.        2.        2         2.        2.        2.
                    1         1         1         1.        1.        1         1         0.        0.        0.
                    0.

      ***               ***               ***               ***               ***

                        HYDROGRAPH AT STATION     OFF6

      TOTAL RAINFALL =     4.14, TOTAL LOSS =     1.82, TOTAL EXCESS =     2.32

   PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR      48.00-HR
+     (CFS)        (HR)
                                (CFS)
+       129      12 50                      28.          12.           6            6.
                                (INCHES)   1.404       2.322        2.322        2.322
                                (AC-FT)      14.          23.          23.          23.

                        CUMULATIVE AREA =      .19 SQ MI


          **************
          *            *
57 KK     *    ROFF6   *      ROUTE OFFSITE 6 IN PROPOSED CHANNEL THROUGH DEVLO
          *            *
          **************

   HYDROGRAPH ROUTING DATA

58 RD        MUSKINGUM-CUNGE CHANNEL ROUTING
                        L       1230.  CHANNEL LENGTH
                        S       .0740  SLOPE
                        N        .030  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .00  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD       10.00  BOTTOM WIDTH OR DIAMETER
                        Z         .33  SIDE SLOPE

                                                  ***
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                          COMPUTATION TIME STEP
                ELEMENT    ALPHA       M          DT          DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                     PEAK                  CELERITY
                                                  (MIN)       (FT)      (CFS)     (MIN)        (IN)       (FPS)
```

```
                    MAIN        3 59       1.50        1.46     615.00     128.39     750.93       2 32      14 00

                                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN        3 59       1.50        2.00                128.25     752.00       2 32

CONTINUITY SUMMARY (AC-PT) - INFLOW= .2304E+02 EXCESS= .0000E+00 OUTFLOW= .2304E+02 BASIN STORAGE= .6351E-03 PERCENT ERROR=      0


     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION    ROFF6

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
*   (CFS)       (HR)
                          (CFS)
*     128       12.53                   28           12           6.           6
                        (INCHES)      1.404        2.322        2.322        2.322
                          (AC-FT)       14.          23.          23.          23.

                        CUMULATIVE AREA =      .19 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          ************
          *          *
59 KK     *   OFF5   *       RUNOFF FROM OFFSITE AREA 5
          *          *
          ************

             SUBBASIN RUNOFF DATA

60 BA          SUBBASIN CHARACTERISTICS
                    TAREA         2.22  SUBBASIN AREA

               PRECIPITATION DATA

10 PH                                   DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                 . . . HYDRO-35 . ...    .... ..... .. . TP-40 . .. ..... .. .    .... ..... TP-49 ... ... ..
               5-MIN  15-MIN  60-MIN     2-HR     3-HR     6-HR    12-HR    24-HR    2-DAY    4-DAY    7-DAY  10-DAY
                 .41      78    1.29     1.39     1.48     1.93     2 87     4.14      .00      .00      .00      00

                                                STORM AREA =     2.22

61 LS          SCS LOSS RATE
                    STRTL          .48  INITIAL ABSTRACTION
                   CRVNBR        80 70  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

62 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         1.32  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                            200 END-OF-PERIOD ORDINATES
                  6        12.      18.      24.      30.      52.      66.      80.      98      116.
                134.      152.     176.     200.     224.     248.     280.     312      344.     376
                413.      451.     489.     528.     560.     592.     624.     656.     679.     701.
                723.      745.     758.     770.     782.     794.     797.     799.     801.     803.
                801.      799.     797.     795.     784.     772.     760.     748.     734.     720.
                706       692.     676.     660.     644.     628.     609.     589.     569      549.
                525.      501.     477.     453.     433.     413.     393.     373.     358.     344.
                330.      316.     303.     291.     279.     267.     257.     247.     237.     227.
                219.      212.     204.     197.     190.     182.     175.     168.     161.     155
                149.      143      137.     131.     125.     119.     115.     111.     107.     103.
                 99.       95.      91.      87.      84.      81.      78.      75.      72.      69
                 66.       63.      60.      58.      56.      54.      51.      49.      47.      45.
                 43.       42       40.      39.      37.      36.      34.      33       31.      30.
                 29.       28.      27.      26.      25.      24.      23.      22       21.      20
                 20.       19.      18.      17.      16.      16       15.      15.      14.      13.
                 13.       12.      12.      11.      11.      11       10.      10.       9.       9.
                  9.        8.       8.       8.       8.       7.       7.       7.       7.       7.
                  6.        6        6.       6.       5.       5.       5.       5.       4        4.
                  4.        4.       4.       3.       3.       3.       3.       3.       2.       2.
                  2.        2.       2.       1.       1.       1.       1.       1.       0.       0.

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     OFF5

   TOTAL RAINFALL =     4.13, TOTAL LOSS =     1.92, TOTAL EXCESS =     2.20

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      48.00-HR
```

```
+    (CFS)        (HR)
                           (CFS)
+      663.      13.37                 307.          132.          66.           66.
                         (INCHES)     1.286         2.205         2.205         2 205
                          (AC-FT)      152           261.          261.          261

                          CUMULATIVE AREA =     2.22 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             **************
             *            *
  63 KK      *   CPOFF    *         CONCENTRATION POINT AT NORTHERN BOUNDARY OF DEV8
             *            *
             **************

  64 HC           HYDROGRAPH COMBINATION
                        ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                   ***

      ***            ***            ***            ***            ***

                         HYDROGRAPH AT STATION     CPOFF

 PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48 00-HR
+    (CFS)        (HR)
                           (CFS)
+      687.      13.33                 334.          143.          72.           72.
                         (INCHES)     1.291         2.214         2.214         2.214
                          (AC-FT)      166.          284.          284.          284

                          CUMULATIVE AREA =     2.41 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             **************
             *            *
  65 KK      *   ROFF56   *         ROUTE CPOFF TO CP8 (DOWNSTREAM BOUNDARY OF DEV8)
             *            *
             **************

               HYDROGRAPH ROUTING DATA

  66 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                         L        1394.   CHANNEL LENGTH
                         S        .0750   SLOPE
                         N         .030   CHANNEL ROUGHNESS COEFFICIENT
                        CA          .00   CONTRIBUTING AREA
                     SHAPE         TRAP   CHANNEL SHAPE
                        WD        10.00   BOTTOM WIDTH OR DIAMETER
                         Z          .33   SIDE SLOPE

                                                                  ***
                                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                          COMPUTATION TIME STEP
                  ELEMENT    ALPHA       M          DT          DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                    PEAK                   CELERITY
                                                   (MIN)       (FT)      (CFS)     (MIN)        (IN)       (FPS)

                   MAIN       3.61       1.50        .95      697.00     686.89    799.78        2.21       24.55

                                              INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                   MAIN       3.61       1.50       2.00                 686.88    800.00        2.21

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2842E+03 EXCESS= .0000E+00 OUTFLOW= .2842E+03 BASIN STORAGE= .6838E-03 PERCENT ERROR=     .0


      ***            ***            ***            ***            ***

                         HYDROGRAPH AT STATION     ROFF56

 PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48 00-HR
+    (CFS)        (HR)
                           (CFS)
+      687.      13.33                 334.          143           72.           72
                         (INCHES)     1.291         2.214         2.214         2.214
                          (AC-FT)      166.          284           284.          284.

                          CUMULATIVE AREA =     2.41 SQ MI
```

```
67 KK        *************
             *           *
             *    DEV8   *      RUNOFF FROM PROPOSED AREA 8
             *           *
             *************

          SUBBASIN RUNOFF DATA

68 BA        SUBBASIN CHARACTERISTICS
                   TAREA         .01  SUBBASIN AREA

             PRECIPITATION DATA

10 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 .....   ..... .. . . .. TP-40 .... .... ..    ..... TP-49 .... .....
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .41     78    1.29    1.39    1 48    1.93    2.87    4.14     .00     .00     .00     .00

                                                 STORM AREA =      01

69 LS        SCS LOSS RATE
                  STRTL          .61  INITIAL ABSTRACTION
                 CRVNBR        76.60  CURVE NUMBER
                  RTIMP        10.20  PERCENT IMPERVIOUS AREA

70 UD        SCS DIMENSIONLESS UNITGRAPH
                   TLAG          .07  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            12 END-OF-PERIOD ORDINATES
                    19.       60.       64.       42        21.       12.       6.        3.        2.        1.
                     1.        0

          ***              ***              ***              ***              ***

                            HYDROGRAPH AT STATION     DEV8

          TOTAL RAINFALL =    4.14, TOTAL LOSS =    2.02, TOTAL EXCESS =    2.12

        PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                                 6-HR       24-HR       72-HR      48 00-HR
      +   (CFS)        (HR)
                                    (CFS)
      +      18.     12.10                        2.          1          0.          0
                                  (INCHES)      1.268       2.120      2.121       2 121
                                  (AC-FT)         1.          1.         1.          1.

                                  CUMULATIVE AREA =      01 SQ MI


             *************
             *           *
71 KK        *    DEV10  *      RUNOFF FROM PROPOSED AREA 10
             *           *
             *************

          SUBBASIN RUNOFF DATA

72 BA        SUBBASIN CHARACTERISTICS
                   TAREA         .09  SUBBASIN AREA

             PRECIPITATION DATA

10 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 .....   ..... ..... TP-40 .. . .... .....   ..... TP-49 .....
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .41     78    1.29    1.39    1.48    1.93    2.87    4.14     .00     .00     .00     .00

                                                 STORM AREA =      .09

73 LS        SCS LOSS RATE
                  STRTL          .38  INITIAL ABSTRACTION
                 CRVNBR        84.00  CURVE NUMBER
                  RTIMP         7.30  PERCENT IMPERVIOUS AREA

74 UD        SCS DIMENSIONLESS UNITGRAPH
                   TLAG          .07  LAG

                                                  ***

                                                UNIT HYDROGRAPH
```

```
                                                   12 END-OF-PERIOD ORDINATES
        154.      475.      507.      336.      169.       93       49.       26.       14        7.
          4.        2.

   ***          ***          ***          ***          ***

                       HYDROGRAPH AT STATION    DEV10

  TOTAL RAINFALL =    4.14, TOTAL LOSS =    1.52, TOTAL EXCESS =    2.61

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     48.00-HR
+  (CFS)       (HR)
                         (CFS)
+    176      12.10                   16.         7.          3.          3.
                        (INCHES)     1.545      2.614       2.614       2.614
                         (AC-FT)       8         13.         13.         13.

                       CUMULATIVE AREA =     .09 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

           **************
           *            *
  75 KK    *     CP8    *         CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV8
           *            *
           **************

  76 HC          HYDROGRAPH COMBINATION
                     ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                               ***

   ***          ***          ***          ***          ***

                       HYDROGRAPH AT STATION       CP8

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     48.00-HR
+  (CFS)       (HR)
                         (CFS)
+    692.     13.33                  348.       150.         75.         75.
                        (INCHES)     1.287      2.226       2 228       2.228
                         (AC-FT)     173.       299.        299.        299.

                       CUMULATIVE AREA =    2.51 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

           **************
           *            *
  77 KK    *   RCP8_7   *         ROUTE CP8 TO CP7 (DOWNSTREAM BOUNDARY OF DEV7)
           *            *
           **************

              HYDROGRAPH ROUTING DATA

  78 RD           MUSKINGUM-CUNGE CHANNEL ROUTING
                            L          1991.  CHANNEL LENGTH
                            S          .0790  SLOPE
                            N           .030  CHANNEL ROUGHNESS COEFFICIENT
                           CA            .00  CONTRIBUTING AREA
                        SHAPE           TRAP  CHANNEL SHAPE
                           WD          10.00  BOTTOM WIDTH OR DIAMETER
                            Z            .33  SIDE SLOPE

                                                               ***
                                   COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                         COMPUTATION TIME STEP
                     ELEMENT     ALPHA      M         DT         DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                   PEAK                 CELERITY
                                                     (MIN)      (FT)      (CFS)    (MIN)       (IN)      (FPS)

                       MAIN       3.70     1.50      1 33     995.50     691.76    801.89      2.23      25.04

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                       MAIN       3.70     1.50      2 00                691.73    802.00      2.23

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2988E+03 EXCESS= .0000E+00 OUTFLOW= .2988E+03 BASIN STORAGE= .1033E-02 PERCENT ERROR=    .0


   ***          ***          ***          ***          ***
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HYDROGRAPH AT STATION RCP8_7

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48 00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 692.	13.37		348	150	75	75
		(INCHES)	1.287	2.226	2 228	2.228
		(AC-FT)	173.	299	299	299.

CUMULATIVE AREA = 2.51 SQ MI

*** ***

79 KK — DEV9 — RUNOFF FROM PROPOSED AREA 9

SUBBASIN RUNOFF DATA

80 BA — SUBBASIN CHARACTERISTICS
TAREA .06 SUBBASIN AREA

PRECIPITATION DATA

10 PH — DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.41	.78	1.29	1 39	1 48	1 93	2 87	4.14	.00	.00	.00	.00

STORM AREA = 06

81 LS — SCS LOSS RATE
STRTL 65 INITIAL ABSTRACTION
CRVNBR 75.50 CURVE NUMBER
RTIMP 12.00 PERCENT IMPERVIOUS AREA

82 UD — SCS DIMENSIONLESS UNITGRAPH
TLAG 11 LAG

***

UNIT HYDROGRAPH
18 END-OF-PERIOD ORDINATES

38.	127.	224.	242.	206.	143	89.	59.	38.	25.
16	11.	7.	4.	3	2	1.	1.		

*** *** *** *** ***

HYDROGRAPH AT STATION DEV9

TOTAL RAINFALL = 4 14, TOTAL LOSS = 2.05, TOTAL EXCESS = 2.09

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48 00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 80.	12.13		8.	4	2	2.
		(INCHES)	1.238	2.087	2 089	2.089
		(AC-FT)	4.	7	7	7.

CUMULATIVE AREA = .06 SQ MI

*** ***

83 KK — DEV7 — RUNOFF FROM PROPOSED AREA 7

SUBBASIN RUNOFF DATA

84 BA — SUBBASIN CHARACTERISTICS
TAREA 02 SUBBASIN AREA

PRECIPITATION DATA

10 PH — DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.41	.78	1.29	1 39	1.48	1.93	2.87	4.14	.00	.00	.00	.00

STORM AREA = .02

```
 85 LS          SCS LOSS RATE
                     STRTL         .85  INITIAL ABSTRACTION
                    CRVNBR       70.10  CURVE NUMBER
                     RTIMP        6.80  PERCENT IMPERVIOUS AREA

 86 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG          17  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            27 END-OF-PERIOD ORDINATES
                    5.       15.       32.       49.       58        58.       53        44        32.       23.
                   17.       13.       10.        7.        6.        4.        3.        2.        2         1.
                    1.        1.        1.        0.        0.        0.        0.

     ***            ***             ***             ***             ***

                          HYDROGRAPH AT STATION     DEV7

     TOTAL RAINFALL =    4.14, TOTAL LOSS =    2.53, TOTAL EXCESS =    1.61

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     48.00-HR
+    (CFS)       (HR)
                          (CFS)
+      18.     12.20                      2.          1          0.          0.
                        (INCHES)        .977       1.613       1.615       1.615
                        (AC-FT)            1          2.          2.          2.

                        CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                ***************
                *             *
 87 KK          *       CP7   *       COCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV7
                *             *
                ***************

 88 HC          HYDROGRAPH COMBINATION
                     ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***

     ***            ***             ***             ***             ***

                          HYDROGRAPH AT STATION     CP7

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     48.00-HR
+    (CFS)       (HR)
                          (CFS)
+     695.     13.37                    358         155.         78.         78.
                        (INCHES)      1.281       2.216       2.220       2.220
                        (AC-FT)         178.        307.        308.        308.

                        CUMULATIVE AREA =    2.60 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                ***************
                *             *
 89 KK          *    RCP7_6   *       ROUTE CP7 TO CP6 (WESTERN BOUNDARY OF SITE)
                *             *
                ***************

              HYDROGRAPH ROUTING DATA

 90 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L        940.  CHANNEL LENGTH
                          S       .0160  SLOPE
                          N        .030  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD       10.00  BOTTOM WIDTH OR DIAMETER
                          Z         .33  SIDE SLOPE

                                                  ***
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                            COMPUTATION TIME STEP
                    ELEMENT    ALPHA       M          DT         DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                       PEAK                   CELERITY
                                                       (MIN)      (FT)      (CFS)     (MIN)        (IN)       (FPS)

                      MAIN       1.67      1.50        1.06     470.00     695.02    801.91        2.22      14.71
```

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1 67	1.50	2.00	695.02	802.00	2 22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3078E+03 EXCESS= 0000E+00 OUTFLOW= .3078E+03 BASIN STORAGE= .7405E-03 PERCENT ERROR= 0

*** *** *** *** ***

HYDROGRAPH AT STATION RCP7_6

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 695.	13 37		358.	155.	78.	78.
		(INCHES)	1.281	2.216	2.220	2.220
		(AC-FT)	178.	307.	308.	308.

CUMULATIVE AREA = 2 60 SQ MI

*** ***

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              **************
              *            *
  91 KK       *    DEV6    *        RUNOFF FROM PROPOSED AREA 6
              *            *
              **************
```

SUBBASIN RUNOFF DATA

92 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

. HYDRO-35			.... TP-40 ...			....		.... TP-49 ...			..
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
41	.78	1.29	1.39	1.48	1.93	2.87	4.14	.00	00	.00	.00

STORM AREA = .01

93 LS SCS LOSS RATE
STRTL .78 INITIAL ABSTRACTION
CRVNBR 72.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

94 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .11 LAG

***

UNIT HYDROGRAPH
18 END-OF-PERIOD ORDINATES

3	11.	19.	20	17.	12.	7.	5.	3.	2.
1	1.	1.	0.	0.	0.	0.	0.		

*** *** *** *** ***

HYDROGRAPH AT STATION DEV6

TOTAL RAINFALL = 4.14, TOTAL LOSS = 2.58, TOTAL EXCESS = 1.56

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	48.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 5.	12.13		1.	0.	0.	0.
		(INCHES)	.984	1.559	1.559	1.559
		(AC-FT)	0.	0.	0.	0.

CUMULATIVE AREA = .01 SQ MI

*** ***

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              **************
              *            *
  95 KK       *    CP6     *        CONCENTRATION POINT AT THE MID-WESTERN BOUNDARY OF SITE NEAR
              *            *
              **************
```

```
 96 HC          HYDROGRAPH COMBINATION
                      ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION      CP6

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+   (CFS)         (HR)
                    (CFS)
+     695.       13.37                359.         155           78.          78.
                (INCHES)              1.280        2.215        2.218        2.218
                 (AC-FT)              178.          308.         308.         308.

                        CUMULATIVE AREA =     2.61 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 97 KK      *    RCP6_5  *        ROUTE RUNOFF CONCENTRATING AT CP6 TO CP5 IN DAMONTE CHANNEL ALONG
            *            *
            **************

               HYDROGRAPH ROUTING DATA

 98 RD           MUSKINGUM-CUNGE CHANNEL ROUTING
                        L        270.  CHANNEL LENGTH
                        S       .0030  SLOPE
                        N        .030  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .00  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD       10.00  BOTTOM WIDTH OR DIAMETER
                        Z         .33  SIDE SLOPE

                                                          ***
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                     COMPUTATION TIME STEP
                  ELEMENT    ALPHA        M          DT          DX        PEAK     TIME TO      VOLUME     MAXIMUM
                                                                                       PEAK                  CELERITY
                                                      (MIN)       (FT)      (CFS)     (MIN)        (IN)      (FPS)

                    MAIN        .72       1 50          .53     270.00     694.99    802.37        2.22       8.41

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN        .72       1.50         2.00                694.96    802.00        2 22

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .3083E+03 EXCESS= .0000E+00 OUTFLOW= .3083E+03 BASIN STORAGE= .3814E-03 PERCENT ERROR=     .0


     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   RCP6_5

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      48.00-HR
+   (CFS)         (HR)
                    (CFS)
+     695.       13.37                359.         155.          78.          78.
                (INCHES)              1.280        2.215        2.218        2.218
                 (AC-FT)              178.          308          308.         308.

                        CUMULATIVE AREA =     2.61 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 99 KK      *      DEV5  *        RUNOFF FROM PROPOSED AREA 5
            *            *
            **************

               SUBBASIN RUNOFF DATA

100 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .01  SUBBASIN AREA

                PRECIPITATION DATA
```

```
 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  . ... HYDRO-35 . ....   .. ... . ..... TP-40 . ..... ..   .. ..... TP-49 .  .....
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    41     .78    1.29    1.39    1.48    1 93    2.87    4 14     .00      00      00      00

                                                  STORM AREA =      .01

 101 LS           SCS LOSS RATE
                        STRTL         .47  INITIAL ABSTRACTION
                       CRVNBR       81.10  CURVE NUMBER
                        RTIMP       13.50  PERCENT IMPERVIOUS AREA

 102 UD           SCS DIMENSIONLESS UNITGRAPH
                        TLAG         .11  LAG

                                                        ***

                                                    UNIT HYDROGRAPH
                                                 18 END-OF-PERIOD ORDINATES
                    5.       18.       32.       35.       29.       20.       13.        8.        5.        4.
                    2.        1.        1.        1         0.        0         0.        0.

      ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION     DEV5

    TOTAL RAINFALL =     4.14, TOTAL LOSS =     1.64, TOTAL EXCESS =     2.50

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                              6-HR       24-HR       72-HR      48.00-HR
+   (CFS)         (HR)
                                (CFS)
+       14       12.13                          1.          1.          0.          0.
                              (INCHES)       1.465       2.501       2.503       2.503
                               (AC-FT)          1.          1.          1.           1

                              CUMULATIVE AREA =      .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                  ***************
                  *             *
 103 KK           *       CP5   *        CONCENTRATION POINT WITHIN DAMONTE CHANNEL ALONG DESERT WAY
                  *             *
                  ***************

 104 HC           HYDROGRAPH COMBINATION
                        ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

      ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION      CP5

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                              6-HR       24-HR       72-HR      48 00-HR
+   (CFS)         (HR)
                                (CFS)
+      695.      13.37                        360.        156.         78.         78
                              (INCHES)       1.280       2.215       2.219       2 219
                               (AC-FT)        179.        309.        309.        309.

                              CUMULATIVE AREA =     2.61 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                  ***************
                  *             *
 105 KK           *    RCP5_1   *        ROUTE CP5 TO CP1 (NORTHWEST CORNER OF SITE)
                  *             *
                  ***************

                     HYDROGRAPH ROUTING DATA

 106 RD             MUSKINGUM-CUNGE CHANNEL ROUTING
                              L       1120.  CHANNEL LENGTH
                              S       .0030  SLOPE
                              N        .030  CHANNEL ROUGHNESS COEFFICIENT
                             CA         .00  CONTRIBUTING AREA
                          SHAPE        TRAP  CHANNEL SHAPE
                             WD       10.00  BOTTOM WIDTH OR DIAMETER
                              Z         .33  SIDE SLOPE

                                                        ***
                                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                            COMPUTATION TIME STEP
```

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.72	1.50	2.00	1120.00	694.91	804.00	2.22	8.41

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.72	1.50	2.00		694.91	804.00	2.22	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3095E+03 EXCESS= .0000E+00 OUTFLOW= .3095E+03 BASIN STORAGE= 1793E-02 PERCENT ERROR= .0

HYDROGRAPH AT STATION RCP5_1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	48.00-HR
		(CFS)				
695.	13.40		360.	156.	78.	78.
		(INCHES)	1.279	2.215	2.219	2.219
		(AC-FT)	178.	309.	309.	309

CUMULATIVE AREA = 2.61 SQ MI

107 KK TOTCP1 — TOTAL ADDITION OF FLOW AT NORTHWEST CORNER OF SITE

108 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

HYDROGRAPH AT STATION TOTCP1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	48.00-HR
		(CFS)				
1274.	13.33		623.	269.	135.	135.
		(INCHES)	1.302	2.246	2.249	2.249
		(AC-FT)	309.	533.	534.	534.

CUMULATIVE AREA = 4.45 SQ MI

109 KK OFF7 — RUNOFF FROM OFFSITE AREA 7

SUBBASIN RUNOFF DATA

110 BA SUBBASIN CHARACTERISTICS
TAREA .09 SUBBASIN AREA

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.41	.78	1.29	1.39	1.48	1.93	2.87	4.14	.00	.00	00	.00

STORM AREA = .09

111 LS SCS LOSS RATE
STRTL .44 INITIAL ABSTRACTION
CRVNBR 82.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

112 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .31 LAG

UNIT HYDROGRAPH
48 END-OF-PERIOD ORDINATES

4.	14.	27	44.	67.	94.	115.	129.	137.	137.
134	126.	116.	103.	89.	73	60.	51.	43.	37
31.	27	22.	19.	16.	14.	12.	10.	8.	7.
6	5.	4.	4.	3.	3	2.	2.	2.	1.
1	1.	1.	1.	1.	0	0.	0.		

HYDROGRAPH AT STATION OFF7

TOTAL RAINFALL = 4.14, TOTAL LOSS = 1.82, TOTAL EXCESS = 2 32

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	48 00-HR
		(CFS)				
82	12 33		14.	6.	3.	3
		(INCHES)	1.411	2.323	2.323	2.323
		(AC-FT)	7.	12.	12	12.

CUMULATIVE AREA = .09 SQ MI

```
113 KK      ROFF7       ROUTE OFF7 TO THROUGH DEV7
```

HYDROGRAPH ROUTING DATA

```
114 RD      MUSKINGUM-CUNGE CHANNEL ROUTING
                 L      1035   CHANNEL LENGTH
                 S      .1360  SLOPE
                 N       .030  CHANNEL ROUGHNESS COEFFICIENT
                CA        .00  CONTRIBUTING AREA
             SHAPE       TRAP  CHANNEL SHAPE
                WD       5.00  BOTTOM WIDTH OR DIAMETER
                 Z        .33  SIDE SLOPE
```

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	6 96	1.42	1.03	517 50	81 92	741.75	2.32	16.72

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	6.96	1.42	2.00		81.83	742.00	2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1153E+02 EXCESS= .0000E+00 OUTFLOW= .1153E+02 BASIN STORAGE= .2440E-03 PERCENT ERROR= .0

HYDROGRAPH AT STATION ROFF7

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	48.00-HR
		(CFS)				
82.	12.37		14.	6.	3.	3.
		(INCHES)	1.411	2.323	2.323	2.323
		(AC-FT)	7.	12.	12.	12.

CUMULATIVE AREA = .09 SQ MI

```
115 KK      DEV12       RUNOFF FROM PROPOSED AREA 12
```

```
                SUBBASIN RUNOFF DATA

 116 BA           SUBBASIN CHARACTERISTICS
                       TAREA          .03  SUBBASIN AREA

                  PRECIPITATION DATA

  10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....  ..... TP-40 . . ... ..... ..... TP-49 .....
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .41      78    1.29    1.39    1 48    1.93    2.87    4.14     .00     .00     .00     .00

                                                STORM AREA =      .03

 117 LS           SCS LOSS RATE
                       STRTL          .38  INITIAL ABSTRACTION
                      CRVNBR        84.00  CURVE NUMBER
                       RTIMP         2.50  PERCENT IMPERVIOUS AREA

 118 UD           SCS DIMENSIONLESS UNITGRAPH
                       TLAG           04  LAG

                                                      ***

                                                   UNIT HYDROGRAPH
                                                8 END-OF-PERIOD ORDINATES
                    189.      280.      123.       48.       18.        7.        3.        1.

          ***              ***              ***              ***              ***

                            HYDROGRAPH AT STATION    DEV12

          TOTAL RAINFALL =    4 14, TOTAL LOSS =    1.60, TOTAL EXCESS =    2.54

        PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                                6-HR       24-HR       72-HR      48.00-HR
      +   (CFS)        (HR)
                                  (CFS)
      +      70.     12 07                        6           2.          1            1.
                                (INCHES)      1 523       2 536       2 536        2.536
                                 (AC-FT)          3           5.          5            5.

                            CUMULATIVE AREA =      .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                  **************
                  *            *
 119 KK           *     CP12   *       CONCENTRATION POINT AT THE DOWNSTREAM BOUNDARY OF DEV12
                  *            *
                  **************

 120 HC             HYDROGRAPH COMBINATION
                         ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

          ***              ***              ***              ***              ***

                            HYDROGRAPH AT STATION     CP12

        PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                                6-HR       24-HR       72-HR      48.00-HR
      +   (CFS)        (HR)
                                  (CFS)
      +      96.     12.07                       20.          8.          4            4.
                                (INCHES)      1.434       2 380       2.380        2.380
                                 (AC-FT)         10.          16.         16           16.

                            CUMULATIVE AREA =      .13 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                  **************
                  *            *
 121 KK           *    RCP12   *       ROUTE CP12 TO CP11 (DOWNSTREAM BOUNDARY OF DEV11)
                  *            *
                  **************

                  HYDROGRAPH ROUTING DATA

 122 RD             MUSKINGUM-CUNGE CHANNEL ROUTING
                           L         800   CHANNEL LENGTH
                           S       .0820   SLOPE
                           N        .030   CHANNEL ROUGHNESS COEFFICIENT
                          CA         .00   CONTRIBUTING AREA
```

```
     SHAPE        TRAP  CHANNEL SHAPE
       WD         5.00  BOTTOM WIDTH OR DIAMETER
       Z           .33  SIDE SLOPE

                                                  ***
                    COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                 COMPUTATION TIME STEP
ELEMENT     ALPHA        M          DT          DX        PEAK     TIME TO PEAK   VOLUME   MAXIMUM CELERITY
                                    (MIN)       (FT)      (CFS)       (MIN)        (IN)        (FPS)

MAIN         5.41       1.42         .91      400 00      95.15       725.06       2.38        14.66

                              INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN         5.41       1.42        2.00                  94.49       726 00       2 38

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1621E+02 EXCESS= .0000E+00 OUTFLOW= .1621E+02 BASIN STORAGE= .2206E-03 PERCENT ERROR=     .0

      ***          ***          ***          ***          ***

                          HYDROGRAPH AT STATION    RCP12

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                    6-HR         24-HR        72-HR       48.00-HR
+   (CFS)       (HR)
                          (CFS)
+     94.      12.20                20.           8.           4.           4.
                          (INCHES)  1.434        2 380        2.380        2 380
                          (AC-FT)     10.          16.          16.          16

                          CUMULATIVE AREA =      .13 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
123 KK    *    DEV11   *       RUNOFF FROM PROPOSED AREA 11
          *            *
          **************

             SUBBASIN RUNOFF DATA

124 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                .. .. HYDRO-35 .....   .... .... ..... TP-40      ..... ..  ........... TP-49 ..........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR    12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .41     .78    1.29    1.39    1 48    1.93    2 87    4 14     .00     .00     .00     .00

                                                STORM AREA =      .03

125 LS          SCS LOSS RATE
                     STRTL          .41  INITIAL ABSTRACTION
                     CRVNBR       83.00  CURVS NUMBER
                     RTIMP        13.00  PERCENT IMPERVIOUS AREA

126 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG           .05  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            10 END-OF-PERIOD ORDINATES
                     115.       244.       166.        68.        31.        13          6          3.         1.         0.

      ***          ***          ***          ***          ***

                          HYDROGRAPH AT STATION    DEV11

    TOTAL RAINFALL =    4.14, TOTAL LOSS =    1.51, TOTAL EXCESS =    2.63

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                    6-HR         24-HR        72-HR       48.00-HR
+   (CFS)       (HR)
                          (CFS)
+     67.      12.07                 6.           2.           1.           1.
                          (INCHES)  1.537        2.632        2 633        2 633
                          (AC-FT)     3.           5.           5.           5.

                          CUMULATIVE AREA =      .03 SQ MI
```

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

            **************
            *            *
127 KK      *      CP11  *        CONCENTRATION POINT AT DOWNSTREAM BOUNDARY OF DEV11
            *            *
            **************

128 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                    ***

      ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     CP11

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR     48.00-HR
+   (CFS)        (HR)
                    (CFS)
+      159.     12.07                  25.          11.           5           5.
                (INCHES)            1.454        2 430        2.433       2.433
                 (AC-FT)               13           21.          21.         21.

                          CUMULATIVE AREA =      .16 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
129 KK      *      OFF8  *        RUNOFF FROM OFFSITE AREA 8
            *            *
            **************

               SUBBASIN RUNOFF DATA

130 BA           SUBBASIN CHARACTERISTICS
                       TAREA          02  SUBBASIN AREA

                 PRECIPITATION DATA

 10 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                .... HYDRO-35 ... ..   ..... . ..... TP-40 . .........   ......... TP-49 ..... .....
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .41     .78    1.29    1 39    1.48    1.93    2.87    4.14     .00     .00     .00     .00

                                                STORM AREA =      .02

131 LS           SCS LOSS RATE
                      STRTL          .46  INITIAL ABSTRACTION
                     CRVNBR        81.40  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

132 UD           SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .19  LAG

                                                                    ***

                                                    UNIT HYDROGRAPH
                                                31 END-OF-PERIOD ORDINATES
                    4.       11.       22.       37.       48.       52.       51.       46.       40.       31.
                   23        17.       14.       11.        8.        6.        5.        4.        3.        2.
                    2.        1.        1.        1.        1.        1.        0.        0.        0.        0.
                    0

      ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     OFF8

    TOTAL RAINFALL =     4.14, TOTAL LOSS =     1.87, TOTAL EXCESS =     2.27

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR     48.00-HR
+   (CFS)        (HR)
                    (CFS)
+       25.     12.23                   3.           1            1.          1.
                (INCHES)            1.390        2.273        2.273       2.273
                 (AC-FT)               2.           3.           3.          3.

                          CUMULATIVE AREA =      .02 SQ MI


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

```
          **************
          *            *
133 KK    *    DEV13   *        RUNOFF FROM PROPOSED AREA 13
          *            *
          **************

     SUBBASIN RUNOFF DATA

134 BA       SUBBASIN CHARACTERISTICS
                  TAREA         .09  SUBBASIN AREA

             PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             . ... HYDRO-35 ......   .....   ..... TP-40 .............   ........... TP-49 . ..... ...
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .41    .78    1 29    1.39    1 48    1.93    2.87    4.14     .00     .00     .00     00

                                              STORM AREA =      .09

135 LS       SCS LOSS RATE
                  STRTL         .40  INITIAL ABSTRACTION
                 CRVNBR       83.20  CURVE NUMBER
                  RTIMP       11.00  PERCENT IMPERVIOUS AREA

136 UD       SCS DIMENSIONLESS UNITGRAPH
                  TLAG          .20  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          32 END-OF-PERIOD ORDINATES
                    14       40.      83.     139      182.     202.     202.     185.     161.     129
                    95       74.      57.      45.      35.      27.      21.      17.      13.      10.
                     8        6.       5.       4.       3        2.       2.       1.       1        1
                     0.       0.

          ***             ***             ***             ***             ***

                            HYDROGRAPH AT STATION     DEV13

     TOTAL RAINFALL =     4.14, TOTAL LOSS =     1.53, TOTAL EXCESS =     2.61

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR      48.00-HR
+   (CFS)         (HR)
                          (CFS)
+     112.       12.23                   15.          6.          3.          3.
                        (INCHES)       1.528       2.610       2.614       2.614
                        (AC-FT)            7          13.         13.         13.

                        CUMULATIVE AREA =      .09 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
137 KK    *    CP13    *        COCENTRATION POINT ALONG THE DAMONTE RANCH HIGH SCHOOL
          *            *
          **************

138 HC       HYDROGRAPH COMBINATION
                  ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***

          ***             ***             ***             ***             ***

                            HYDROGRAPH AT STATION     CP13

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR      48.00-HR
+   (CFS)         (HR)
                          (CFS)
+     248        12 13                   44.         18.          9.          9.
                        (INCHES)       1.473       2.476       2.479       2.479
                        (AC-FT)           22.          36.         36.         36.

                        CUMULATIVE AREA =      .28 SQ MI

1
                                              RUNOFF SUMMARY
                                    FLOW IN CUBIC FEET PER SECOND
                                    TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD          BASIN    MAXIMUM    TIME OF
          OPERATION      STATION    FLOW    PEAK                                              AREA     STAGE      MAX STAGE
+                                                      6-HOUR      24-HOUR     72-HOUR

          HYDROGRAPH AT
+                        OFF4        139.   12.53          31.         13.          6.        .21
```

	ROUTED TO							
+		ROFF4	139.	12.57	31.	13	6.	.21
	HYDROGRAPH AT							
+		OFF3	68.	12.37	12	5.	2.	.08
	HYDROGRAPH AT							
+		DEV4	31.	12.17	4.	1	1.	.02
	3 COMBINED AT							
+		CP4	205.	12.47	47	19.	10.	.31
	ROUTED TO							
+		RCP4_3	204.	12.47	47.	19	10.	.31
	HYDROGRAPH AT							
+		OFF2	108.	12.60	26.	11	5.	.17
	HYDROGRAPH AT							
+		DEV3	97.	12.20	12	5.	3.	.07
	3 COMBINED AT							
+		CP3	342.	12.47	85	35.	18.	.56
	ROUTED TO							
+		RCP3_1	342.	12.50	85	35.	18.	.56
	HYDROGRAPH AT							
+		OFF1	579.	13.27	250.	107.	53.	1.73
	HYDROGRAPH AT							
+		DEV2	86.	12.30	13.	6.	3.	.10
	HYDROGRAPH AT							
+		DEV1	14.	12.20	2.	1	0.	.01
	3 COMBINED AT							
+		CP1	584.	13.27	264	113.	57.	1.84
	HYDROGRAPH AT							
+		OFF6	129.	12.50	28	12.	6.	.19
	ROUTED TO							
+		ROFF6	128.	12 53	28	12	6.	.19
	HYDROGRAPH AT							
+		OFF5	663.	13.37	307	132	66.	2.22
	2 COMBINED AT							
+		CPOFF	687.	13.33	334	143	72.	2.41
	ROUTED TO							
+		ROFF56	687.	13.33	334.	143	72.	2.41
	HYDROGRAPH AT							
+		DEV8	18.	12.10	2.	1.	0.	.01
	HYDROGRAPH AT							
+		DEV10	176.	12.10	16.	7	3.	.09
	3 COMBINED AT							
+		CP8	692	13.33	348.	150	75.	2.51
	ROUTED TO							
+		RCP8_7	692.	13.37	348.	150.	75.	2.51
	HYDROGRAPH AT							
+		DEV9	80.	12.13	8	4.	2.	.06
	HYDROGRAPH AT							
+		DEV7	18.	12.20	2.	1	0.	.02
	3 COMBINED AT							
+		CP7	695.	13.37	358.	155.	78.	2 60
	ROUTED TO							
+		RCP7_6	695.	13.37	358.	155	78.	2.60
	HYDROGRAPH AT							
+		DEV6	5.	12.13	1.	0	0	.01
	2 COMBINED AT							
+		CP6	695.	13.37	359.	155.	78.	2.61
	ROUTED TO							
+		RCP6_5	695.	13.37	359	155.	78.	2.61
	HYDROGRAPH AT							
+		DEV5	14.	12.13	1.	1	0.	.01
	2 COMBINED AT							
+		CP5	695.	13.37	360	156.	78.	2.61
	ROUTED TO							

	RCP5_1	695.	13.40	360.	156	78.	2.61
2 COMBINED AT	TOTCP1	1274	13.33	623.	269.	135.	4.45
HYDROGRAPH AT	OFF7	82.	12.33	14.	6.	3.	.09
ROUTED TO	ROFF7	82.	12.37	14.	6.	3.	.09
HYDROGRAPH AT	DEV12	70.	12.07	6.	2	1.	.03
2 COMBINED AT	CP12	96.	12.07	20.	8.	4.	.13
ROUTED TO	RCP12	94.	12.10	20.	8.	4	.13
HYDROGRAPH AT	DEV11	67.	12.07	6.	2	1.	03
2 COMBINED AT	CP11	159.	12.07	25.	11.	5	.16
HYDROGRAPH AT	OFF8	25.	12.23	3.	1.	1.	.02
HYDROGRAPH AT	DEV13	112.	12.23	15.	6.	3.	.09
3 COMBINED AT	CP13	248.	12.13	44.	18.	9.	28

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
ROFF4	MANE	2.00	139.34	754.00	2.32	2.00	139.34	754.00	2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2564E+02 EXCESS= .0000E+00 OUTFLOW= .2564E+02 BASIN STORAGE= .7473E-03 PERCENT ERROR= .0

RCP4_3	MANE	61	204.39	748.94	2.32	2.00	204.06	748.00	2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3843E+02 EXCESS= .0000E+00 OUTFLOW= .3843E+02 BASIN STORAGE= .2863E-03 PERCENT ERROR= .0

RCP3_1	MANE	2 00	342.17	750.00	2.36	2.00	342 17	750.00	2.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7007E+02 EXCESS= .0000E+00 OUTFLOW= .7007E+02 BASIN STORAGE= .1794E-02 PERCENT ERROR= .0

ROFF6	MANE	1.46	128.39	750.93	2.32	2.00	128.25	752.00	2.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2304E+02 EXCESS= .0000E+00 OUTFLOW= .2304E+02 BASIN STORAGE= .6351E-03 PERCENT ERROR= .0

ROFF56	MANE	.95	686.89	799.78	2.21	2.00	686.88	800.00	2.21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2842E+03 EXCESS= .0000E+00 OUTFLOW= .2842E+03 BASIN STORAGE= .6838E-03 PERCENT ERROR= .0

RCP8_7	MANE	1.33	691.76	801.89	2.23	2.00	691.73	802.00	2.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= 2988E+03 EXCESS= .0000E+00 OUTFLOW= .2988E+03 BASIN STORAGE= .1033E-02 PERCENT ERROR= .0

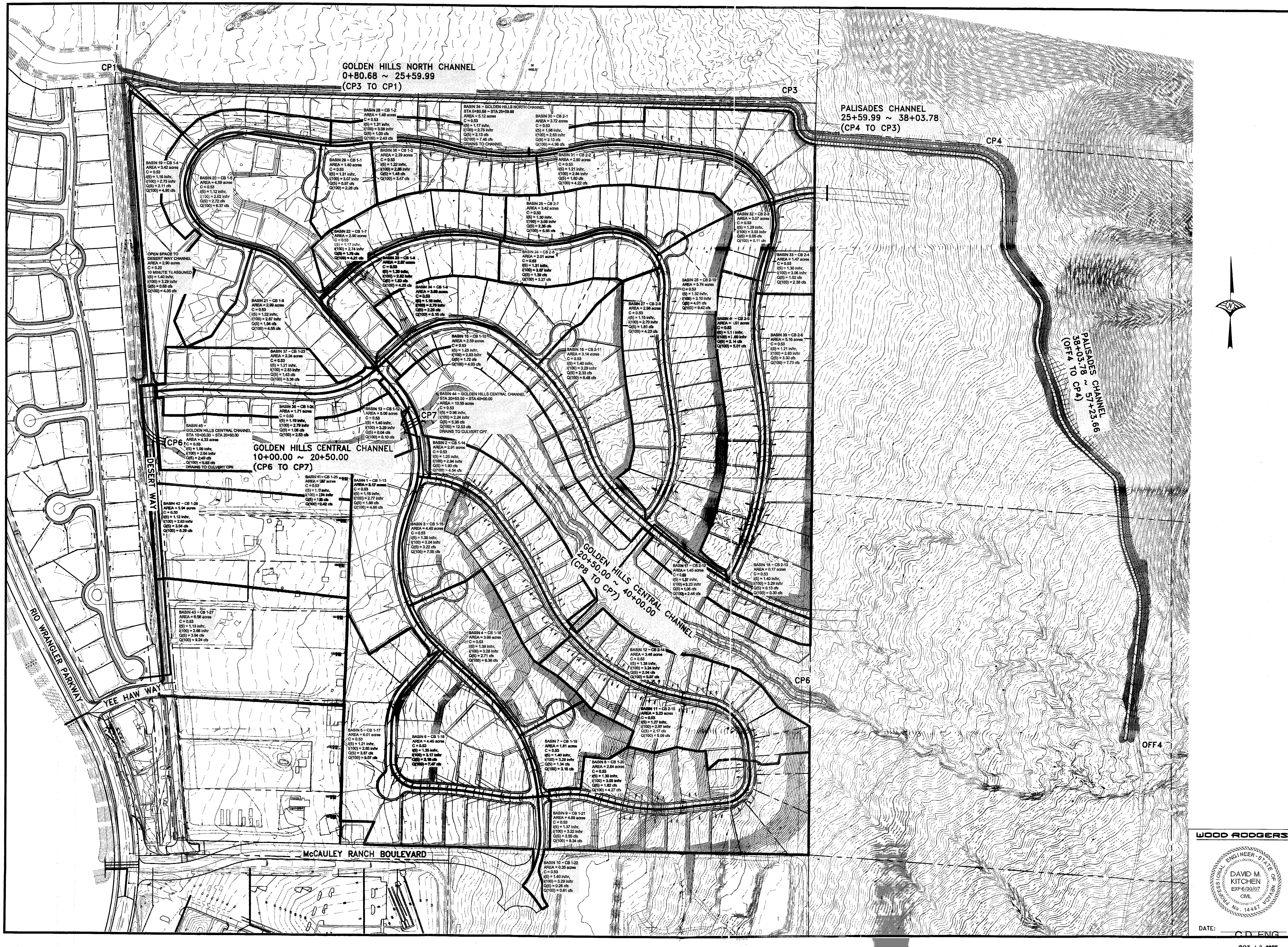
RCP7_6	MANE	1.06	695.02	801.91	2.22	2.00	695.02	802.00	2.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3078E+03 EXCESS= .0000E+00 OUTFLOW= .3078E+03 BASIN STORAGE= .7405E-03 PERCENT ERROR= .0

RCP6_5	MANE	.53	694.99	802.37	2.22	2.00	694.96	802.00	2.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= 3083E+03 EXCESS= .0000E+00 OUTFLOW= .3083E+03 BASIN STORAGE= .3814E-03 PERCENT ERROR= .0

RCP5_1	MANE	2.00	694.91	804 00	2.22	2.00	694.91	804.00	2.22



INITIAL SUBMITTAL

IMPROVEMENT PLANS FOR

GOLDEN HILLS PHASES 1A & 1B

DRAINAGE PLAN FOR GOLDEN HILLS PHASES 1 & 2

CITY OF RENO NEVADA

WOOD RODGERS
ENGINEERING · MAPPING · PLANNING · SURVEYING
6774 South McCarran Blvd. Reno, NV. 89509
Tel 775.823.4068 Fax 775.823.4066

DATE: JULY 2005
SCALE: H: 1" = 150' V: N/A
DRAWN BY: DK
DESIGNED BY: DK
CHECKED BY: DK/GP

NO.	DESCRIPTION	ENGR	INIT	BY	COUNTY APPROVED	DATE

WOOD RODGERS

PROFESSIONAL ENGINEER · STATE OF NEVADA
DAVID M. KITCHEN
EXP. 6/30/07
CIVIL
No. 14487

DATE:

PROJECT NO. 1452.003

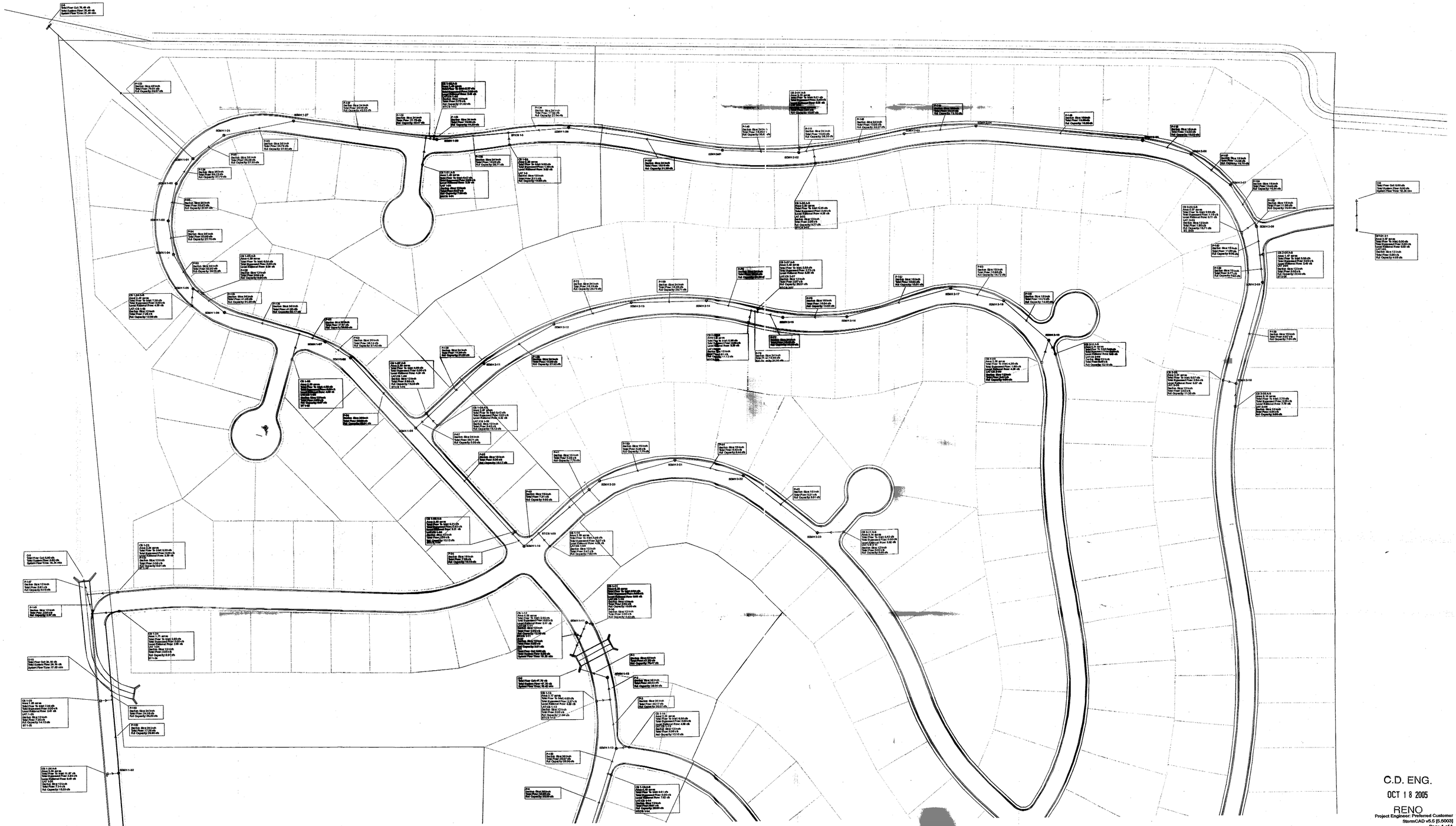
DRAWING

DR-1

SHT 51 OF 58

C.D. ENG
OCT 18 2005
RENO

Scenario: Base



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OCT 18 2005
RENO
Project Engineer: Preferred Customer
StormCAD v5.5 [5.5003]
Page 1 of 1

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OCT 18 2005

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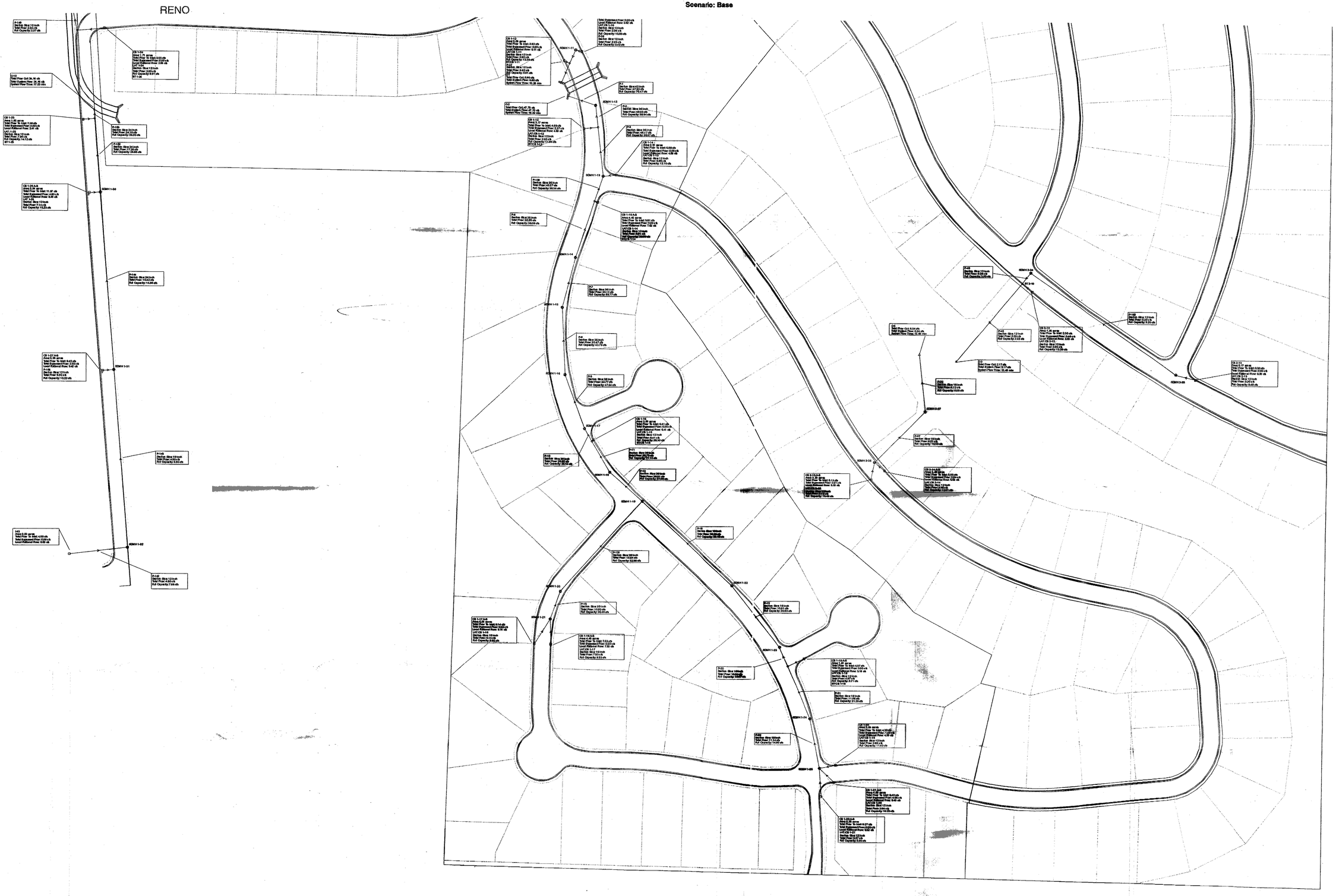
Scenario: Base



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Scenario: Base

C.D. ENG.
OCT 19 2005

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 37 Brookside Road Waterbury, CT 06710 USA +1-203-755-1666

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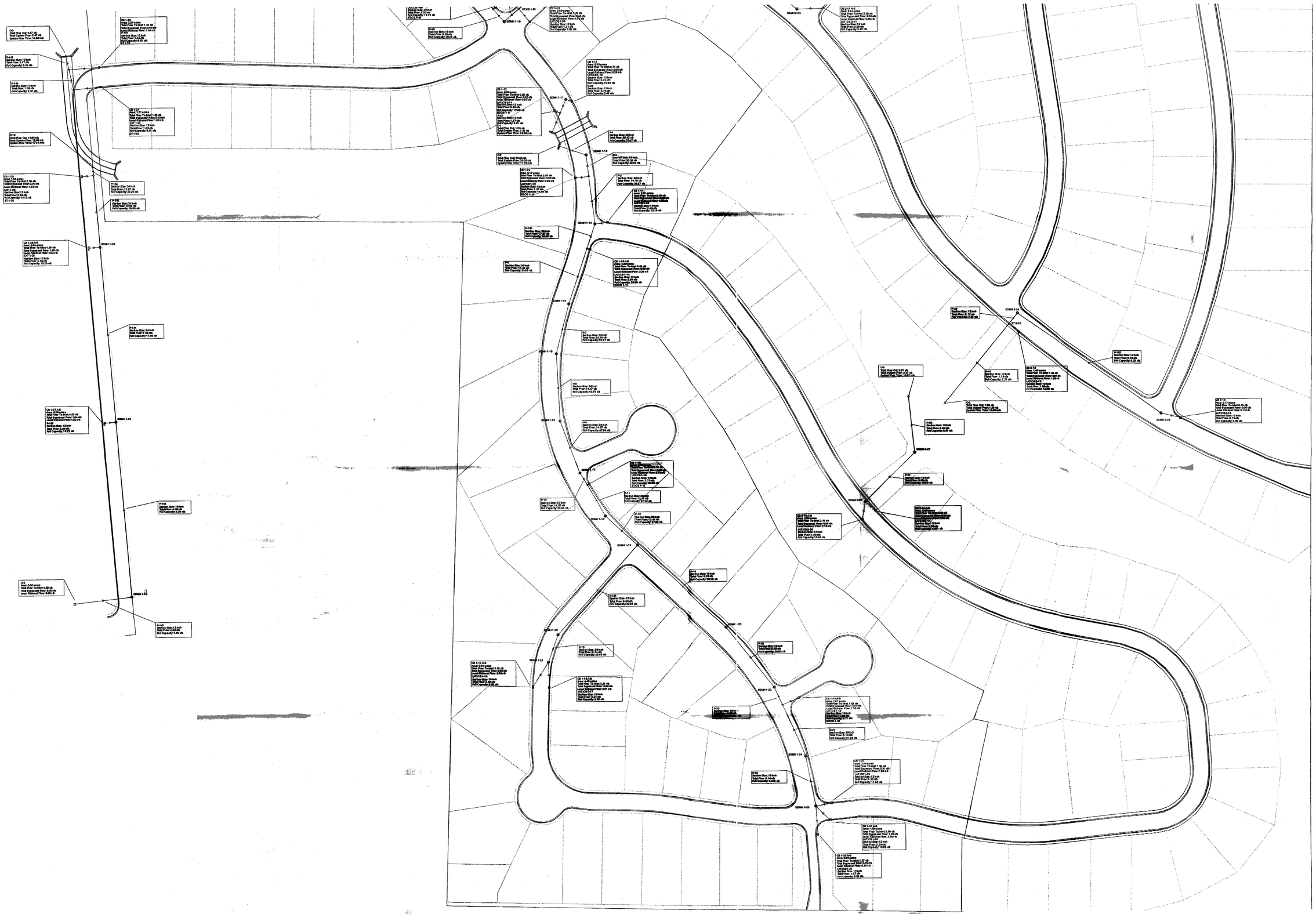

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